

City of Richwood — TEXAS —

CITY COUNCIL MEETING AGENDA

Monday, March 11, 2024 at 6:00 PM

Richwood City Hall, 1800 Brazosport Blvd. N.

BE IT KNOWN THAT a City of Richwood City Council will meet Monday, March 11, 2024, beginning at 6:00 PM at Richwood City Hall, located at 1800 Brazosport Blvd. N., Richwood, Texas 77531 with the following agenda:

- I. CALL TO ORDER
- II. INVOCATION
- III. PLEDGES OF ALLEGIANCE
- IV. ROLL CALL OF COUNCIL MEMBERS
- V. PUBLIC COMMENTS
- VI. PROCLAMATION
 - [A.](#) Fair Housing Month, April 2024
- VII. CONSENT AGENDA
 - [A.](#) Approve minutes from regular meeting held February 12, 2024.
 - [B.](#) Budget Report, January 2024.
 - [C.](#) Reaffirm the City of Richwood's Financial Policy.
 - [D.](#) Reaffirm the City of Richwood's Purchasing Policy.
 - [E.](#) Reaffirm the City of Richwood Investment Policy.
 - [F.](#) Approve Resolution 24-R-83 - Federal Procurement Policies
 - [G.](#) Approve Resolution 24-R-84 - Civil Rights Policies
 - [H.](#) Approve Resolution 24-R-85 - 2024 Brazoria County Hazard Mitigation Action Plan
- VIII. PRESENTATION
 - A. Fiscal Year 2023 Financial Audit Presentation - Clayton Rogers, Pattillo Brown & Hill, LLP
- IX. EXECUTIVE SESSION

Pursuant to Chapter 551.071, Consultation with Counsel on legal matters:

 1. Texas Municipal League Intergovernmental Risk Pool
- X. ACTION AS A RESULT OF EXECUTIVE SESSION
- XI. DISCUSSION AND ACTION ITEMS
 - [A.](#) Discuss and consider Ordinance 24-514 declaring all positions unopposed and cancelling the May 4, 2024, General Election.
 - [B.](#) Discussion and possible action authorizing the Public Works Director to execute a GPS tracking agreement for vehicles and equipment.
 - C. Consider items removed from consent agenda

- XII. CAPITAL IMPROVEMENT PROJECTS UPDATE
- XIII. CITY MANAGER'S REPORT
- XIV. COUNCIL MEMBER COMMENTS & REPORTS
- XV. MAYOR'S REPORT
- XVI. ITEMS OF COMMUNITY INTEREST
- XVII. FUTURE AGENDA ITEMS
- XVIII. ADJOURNMENT

The City Council may go into Executive Session on any item listed on the Agenda in accordance with Section 551-071 of the Government Code (attorney-client privilege).

This facility is wheelchair accessible and accessible parking spaces are available. Requests for accommodations or interpretive services must be made 48 hours prior to this meeting. Please contact the City Secretary's Office at (979) 265-2082 or FAX (979) 265-7345 for further information.

I, Kirsten Garcia, do hereby certify that I did, on March 07, 2024 at 11:00 AM post this notice of meeting on the bulletin board at 1800 N. Brazosport Blvd., Richwood, TX, in compliance with the Texas Open Meetings Law.

Kirsten Garcia, City Secretary
City of Richwood

Proclamation

I, Michael Durham, by the authority vested in me as Mayor of the City of Richwood, Texas, do hereby proclaim

The month of April As “Fair Housing Month”

WHEREAS, the Department of Housing and Urban Development has initiated the sponsorship of activities during the month of April of each year designed to reinforce the Department’s commitment to the concept of Fair Housing and Equal Opportunity; and

WHEREAS, the City of Richwood affirmatively supports the efforts of the Federal Government and the State of Texas to assure equal access to all Americans to rental housing and homeownership opportunities; and

WHEREAS, the City of Richwood welcomes this opportunity to reaffirm its commitment to provide equal access to housing to all of its residents without regard to race, color, religion, sex (including gender identity and sexual orientation), disability, familial status, national origin or source of income; and

WHEREAS, the City of Richwood affirmatively supports programs that will educate the public concerning their rights to equal housing opportunities and to participate in efforts with other organizations to assure every person their right to fair housing; and

WHEREAS, the City of Richwood is honored to join the Federal Government, the State of Texas, and local jurisdictions across America in celebrating the rich diversity of our people and the right of all citizens to live where they choose without fear of discrimination.

NOW, THEREFORE, WE, the City Council of the City of Richwood, do hereby proclaim April as the month to celebrate and honor all efforts which guarantee the right to live free of discriminatory housing practices and proclaim this month as:

In testimony, witness my hand and the seal of the City of Richwood, this 11th day of March, A.D. 2024.

Michael Durham, Mayor
City of Richwood

MINUTES

RICHWOOD CITY COUNCIL MEETING

Monday, February 12, 2024 at 6:00 PM

BE IT KNOWN THAT a City of Richwood City Council will meet Monday, February 12, 2024, beginning at 6:00 PM at Richwood City Hall, located at 1800 Brazosport Blvd. N., Richwood, Texas 77531 with the following agenda:

I. CALL TO ORDER

The meeting was called to order at 6:00 p.m.

II. INVOCATION

Tricia Ditto, Finance Director, led the invocation.

III. PLEDGES OF ALLEGIANCE

Mayor Durham led the pledges.

IV. ROLL CALL OF COUNCIL MEMBERS

| | |
|------------------------------|---------|
| Michael Durham, Mayor: | Present |
| Mike Johnson, Position 1: | Absent |
| Mike Challenger, Position 2: | Present |
| Amanda Reynolds, Position 3: | Present |
| Rory Escalante, Position 4: | Present |
| Jeremy Fountain, Position 5: | Absent |

Others present: Eric Foerster, City Manager; Kirsten Garcia, City Secretary; Tricia Ditto, Finance Director
Police Chief, Stephen Mayer; Phillip Knop, City Attorney.

V. PUBLIC COMMENTS

Jeff Barry, Texas House of Representatives candidate, introduced himself to the board.

VI. CONSENT AGENDA

- A. Budget Report, December 2023
- B. Fiscal Year 2024 Investment Report, Quarter 1
- C. 2023 Racial Profiling and Analysis Report
- D. Minutes from regular meeting held January 08, 2024.
- E. Minutes from special meeting held January 23, 2024.

Motion to approve consent agenda.

Motion made by Mike Challenger, Seconded by Amanda Reynolds.

Voting Yea: Mike Challenger, Amanda Reynolds, Rory Escalante

VII. DISCUSSION AND ACTION ITEMS

- A. Discuss, consider, and approve the Brazosport Water Supply Corporation reservoir updates and a resolution supporting the project.
Presentation from the Brazosport Water Supply Corporation.
Discussion held on reason for need of support.

Discussion held on feedback received for the project.

Motion to approve resolution supporting the project.

Motion made by Amanda Reynolds, Seconded by Rory Escalante.

Voting Yea: Mike Challenger, Amanda Reynolds, Rory Escalante

- B. Discuss and consider amending the Employee Policy and Procedure Manual, specifically policies: Policy #901, Eligibility for Sick Leave; Policy #902, Rate of Computation of Sick Leave; Policy #904, Documentation of Sick Leave; Policy #1001, Injuries on the Job; Policy #1004, Additional Personal Leave Without Pay.

Eric Foerster, City Manager, presented.

Councilman challenger stated the item is related to issues requiring consultation with the Attorney.

Motion to table. Motion made by Michael Challenger.

Motion died for lack of second.

Kirsten Garcia, Cit Secretary, presented proposed changes and why staff recommends the amendments.

Motion to approve item B.

Motion made by Amanda Reynolds, Seconded by Rory Escalante.

Voting Yea: Amanda Reynolds, Rory Escalante

Voting Nay: Mike Challenger

- C. Consider approving staff to auction playground equipment at a lower reserve than previously submitted.

Kirsten Garcia, Cit Secretary presented.

Discussion held on equipment status and previous auctions.

Motion to approve item C.

Motion made by Amanda Reynolds, Seconded by Rory Escalante.

Voting Yea: Mike Challenger, Amanda Reynolds, Rory Escalante

- D. Discuss and consider awarding Construction Contract 3-2023 for the ARPA (American Rescue Plan Act Grant) Generator Project.

Clif Custer, Public Works Director, presented.

Discussion held on scope of the project.

Discussion held on revenues from bond funds being used.

Motion to award Construction Contract 3-2023 for the ARPA (American Rescue Plan Act Grant) Generator Project to Texas Municipal and Industrial.

Motion made by Amanda Reynolds, Seconded by Rory Escalante.

Voting Yea: Amanda Reynolds, Rory Escalante

Voting Nay: Mike Challenger

- E. Discussion, consideration, and possible action regarding the proposed Service Center Expansion.

Clif Custer, Public Works Director, presented.

Discussion was held on total costs vs equipment savings.

Discussion held on the usage of shipping containers for storage.

Discussion was held on the need to clean up the area.

Discussion held on fuel tank removal and process.

Motion to approve the demolition of the fuel station and any work that goes with the plan.

Motion made by Amanda Reynolds, Seconded by Rory Escalante.

Voting Yea: Mike Challenger, Amanda Reynolds, Rory Escalante

Council woman Reynolds requested a memorial be proposed to replace the PK forest name somewhere else in town.

F. Consider items removed from consent agenda

No items removed from the consent agenda.

VIII. CAPITAL IMPROVEMENT PROJECTS UPDATE

Clif Custer, Public Works Director, presented.

Discussion held on water plant.

IX. CITY MANAGER'S REPORT

Eric Foerster spoke regarding recycling information from KRB, may be an agenda item.

X. COUNCIL MEMBER COMMENTS & REPORTS

Mike Challenger spoke regarding overall goals of sustainability, wants to make sure we are on a path of sustainability.

XI. MAYOR'S REPORT

Mayor reported regarding the tragic events today,

XII. ITEMS OF COMMUNITY INTEREST

Reminder for the deadline to file for a place on the ballot for the 2024 general election.

Information given on the upcoming Servolution event.

Reminder given about elections on March 5.

XIII. FUTURE AGENDA ITEMS

Audit

Green City Recyclers

KRB Update

Public Management - Grant Opportunity

GPS Tracking - one-step GPS

If any update / TML

XIV. ADJOURNMENT

Being there no further business, the meeting was adjourned at 7:25 p.m.

These minutes were read and approved on the 11th day of March 2024.

Mayor

ATTEST:

City Secretary



AGENDA MEMORANDUM – MARCH 11, 2024

ITEM # CONSENT

CONTACT: Patricia Ditto, Finance Director

SUBJECT: Monthly Budget Summary Report

SUMMARY: Receive and/or approve the January 2024 Budget Report

BACKGROUND INFORMATION:

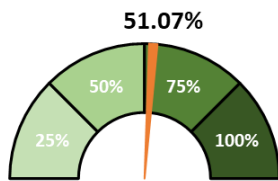
The information provided is for the FY 2023-2024 budget period, month ending January 31, 2024. This summary highlights several key points related to the current month’s activity for the General Fund and for the Water and Sewer Enterprise Fund. The attached report is unaudited, and this month may include corrections from prior months.

DISCUSSION:

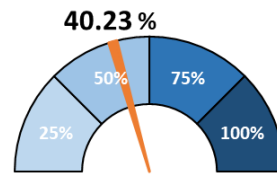
Attached is the budget report for January 2024, which is the fourth month of Fiscal Year 24. 33.3% of the year has passed. The report reflects the original budget as approved for FY24 as well as the revised budget reflecting all budget amendments approved by council since the original budget was approved. *This budget report is a preliminary report reflecting current year to date figures that are unaudited and may be adjusted at a future time.*

10-General Fund

As of January 31, 2024, General Fund revenues total \$1,756,788. General Fund expenditures total \$1,182,272.



General Fund Revenue as % of Budget



General Fund Expenditures as % of Budget

Revenue (GF)

Total Revenue collected in the General fund is at 51.07% of budget projection.

- M & O (Maintenance and Operations) Property tax (including current, delinquent and penalties) received through the end of January is \$1,460,050, 66.09% of projected property taxes for the year. Ad Valorem taxes are due on February 1.

City of Richwood

TEXAS

- Sales Tax revenue received in January was earned in November. Sales tax is received 2 months after it is earned. The revenue received in October and November was posted to revenue in FY23. Accordingly, the revenue earned in August and September 2024, will be posted as revenue for FY24 even though it will not be received by the city until October and November. The chart reflects the revenue when received, not earned. Total received is approximately \$2,000 behind this time last year.

| MONTH RECEIVED | FY 2023 | | | | FY 2024 | | | |
|----------------|--------------|------------|------------|-------------------|--------------|------------|-----------|-------------------|
| | GENERAL FUND | TRANS FUND | CCPD | TOTAL | GENERAL FUND | TRANS FUND | CCPD | TOTAL |
| DEC | 44,369.52 | 11,092.39 | 10,760.96 | 66,222.87 | 50,390.06 | 12,597.52 | 12,174.92 | 75,162.50 |
| JAN | 52,644.29 | 13,161.07 | 12,957.41 | 78,762.77 | 51,357.01 | 12,839.25 | 12,379.34 | 76,575.60 |
| FEB | 55,858.64 | 13,964.65 | 13,634.73 | 83,458.02 | | | | 0.00 |
| MAR | 56,308.72 | 14,077.18 | 13,767.76 | 84,153.66 | | | | 0.00 |
| APR | 51,255.32 | 12,813.83 | 12,475.55 | 76,544.70 | | | | 0.00 |
| MAY | 58,663.20 | 14,665.80 | 14,074.45 | 87,403.45 | | | | 0.00 |
| JUN | 47,805.40 | 11,951.34 | 11,489.95 | 71,246.69 | | | | 0.00 |
| JUL | 56,403.73 | 14,100.94 | 13,673.07 | 84,177.74 | | | | 0.00 |
| AUG | 55,897.00 | 13,974.00 | 13,604.00 | 83,475.00 | | | | 0.00 |
| SEPT | 50,036.00 | 12,509.00 | 15,295.00 | 77,840.00 | | | | 0.00 |
| OCT* | 67,678.00 | 16,919.00 | 16,418.00 | 101,015.00 | | | | 0.00 |
| NOV* | 43,116.91 | 10,779.23 | 10,341.29 | 64,237.43 | | | | 0.00 |
| YEAR TOTAL | 640,036.73 | 160,008.43 | 158,492.17 | 958,537.33 | 101,747.07 | 25,436.77 | 24,554.26 | 151,738.10 |

- Permits and Licenses revenues total \$9,384 this month, year to date total of \$23,907. This is compared to \$19,045 collected at this time last year. Inspection fees collected are \$12,980 year to date.
- Municipal Court revenue for the month of January is \$5,652, for a total year to date of \$25,047. This compares to \$36,030 at this time last year.
- Interest revenue is at \$6,840 this month, \$30,078 year to date.
- The Ambulance fee, new this fiscal year, is at \$33,681.
- Credit Card Fees Revenue began this month. Due to limitations with Xpress Bill Pay, all revenue is posted to Fund 30 Enterprise. An entry will be made at year end to offset all credit card costs posted to General fund.

Expenditures (GF)

Expenditures in the General Fund are currently shown at \$1,182,272, 40.23% of budget. The City Maintenance department is currently showing as over budget due to equipment purchases, which were approved for FY23 but not made available until this current fiscal year.

Transfers (GF)

All approved interfund transfers have been completed.

City of Richwood TEXAS

25 -Transportation Fund

I have included the Transportation Fund budget report to show spending on both Maintenance and Operations as well as on the capital projects approved by Council.

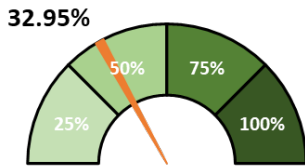
Revenue for the Transportation Fund comes in three categories:

| | |
|--|----------------|
| Sales Tax – .25% is assessed for street needs. | YTD – \$25,437 |
| Transportation Fee - \$5 per utility account | YTD - \$47,860 |
| Interest | YTD - \$11,234 |

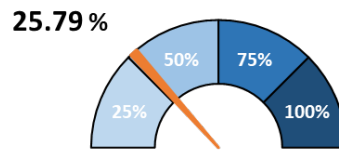
The negative amount showing in Streets M&R for this period is due to a miscoding of capital project expenditures that were moved to the correct GL during the month.

30-Water, Sewer, and Solid Waste Fund

Operating Revenues in January total \$949,618 year to date. Operating expenses are \$636,805.



Enterprise Fund Revenue as % of Budget



Enterprise Fund Operating Expense as % of Budget

- Credit Card Fee Revenue began this month and is posted to the Water department. \$4,730 was received in January.
- There have been three Water Impact fees collected this year for a total of \$7,242. All Impact Fees are posted to Fund 32 Utility Capital Improvements and do not show in this budget report.

RECOMMENDATION: Council to approve January 2024 Budget Summary Report for General Fund, Transportation Fund, and the Water & Sewer Enterprise Fund.

**City of Richwood
Fiscal Year 2024 Operational Budget Report
10/1/2023 -01/31/2024**

| 10 General Fund | Prior YTD | Current Period | Current YTD | Original Budget | Revised Budget | Remaining Budget | % Earned/Used |
|--|---------------------|-------------------|---------------------|---------------------|---------------------|---------------------|----------------------|
| Revenue | | | | | | | 33.3% of year |
| Taxes | 1,584,938.10 | 541,566.12 | 1,610,044.47 | 3,045,188.00 | 3,045,188.00 | 1,435,143.53 | 52.87% |
| Property taxes, including delinquent & penalties | 1,441,550.10 | 490,209.11 | 1,460,049.98 | 2,209,188.00 | 2,209,188.00 | | 66.09% |
| Franchise Taxes | 46,374.19 | 0.00 | 48,247.42 | 196,000.00 | 196,000.00 | | 24.62% |
| Sales Tax | 97,013.81 | 51,357.01 | 101,747.07 | 640,000.00 | 640,000.00 | | 15.90% |
| Licenses and permits | 19,044.64 | 9,384.08 | 23,907.32 | 54,150.00 | 54,150.00 | 30,242.68 | 44.15% |
| Intergovernmental revenue | 0.00 | 7,000.00 | 8,372.68 | 1,100.00 | 1,100.00 | (7,272.68) | Ahead of Budget |
| Charges for services - Municipal Bldg Rental | 2,775.00 | 800.00 | 2,135.00 | 9,000.00 | 9,000.00 | 6,865.00 | 23.72% |
| Municipal Court Revenue | 36,030.20 | 5,651.76 | 25,046.81 | 130,000.00 | 130,000.00 | 104,953.19 | 19.27% |
| Special Revenues | 7,050.00 | 23.00 | 4,857.00 | 1,050.00 | 1,050.00 | (3,807.00) | Ahead of Budget |
| Interest | 18,219.91 | 6,839.72 | 30,078.38 | 50,000.00 | 50,000.00 | 19,921.62 | 60.16% |
| Miscellaneous revenue | 12,708.95 | 13,769.21 | 52,346.18 | 149,152.00 | 149,152.00 | 96,805.82 | 35.10% |
| Inspection Fees | 10,120.00 | 3,830.00 | 12,980.00 | 30,000.00 | 30,000.00 | | |
| Miscellaneous Income | 1,788.95 | 950.71 | 4,710.68 | 10,000.00 | 10,000.00 | | |
| Parks & Recreation - Park Pavillion Rentals | 800.00 | 250.00 | 375.00 | 3,500.00 | 3,500.00 | | |
| Parks & Recreation - Sports Field Rental | 0.00 | 300.00 | 600.00 | 3,600.00 | 3,600.00 | | |
| Credit Card Fee Revenue | 0.00 | 0.00 | 0.00 | 1,000.00 | 1,000.00 | | |
| Ambulance Fee Revenue | 0.00 | 8,438.50 | 33,680.50 | 101,052.00 | 101,052.00 | | |
| Total Revenue | 1,680,766.80 | 585,033.89 | 1,756,787.84 | 3,439,640.00 | 3,439,640.00 | 1,682,852.16 | 51.07% |
| Expenditures | | | | | | | |
| General Government Administration | | | | | | | |
| Personnel & Benefits | 154,268.72 | 61,210.74 | 178,849.22 | 528,232.00 | 528,232.00 | 349,382.78 | 33.86% |
| Supplies | 7,647.71 | 206.30 | 2,388.56 | 18,500.00 | 18,500.00 | 16,111.44 | 12.91% |
| Maintenance & Repair | 1,831.73 | 0.00 | 1,831.62 | 5,900.00 | 5,900.00 | 4,068.38 | 31.04% |
| Utilities | 3,442.16 | 1,104.78 | 5,640.12 | 11,550.00 | 11,550.00 | 5,909.88 | 48.83% |
| Professional Services | 92,316.91 | 7,563.97 | 84,548.39 | 152,800.00 | 152,800.00 | 68,251.61 | 55.33% |
| Other Services | 27,859.50 | 1,273.25 | 34,521.60 | 94,000.00 | 94,000.00 | 59,478.40 | 36.73% |
| Capital Equipment | 39,905.83 | 340.98 | 2,849.59 | 7,600.00 | 7,600.00 | 4,750.41 | 37.49% |
| Total Administration | 327,272.56 | 71,700.02 | 310,629.10 | 818,582.00 | 818,582.00 | 507,952.90 | 37.95% |
| Judicial | | | | | | | |
| Personnel & Benefits | 24,376.47 | 8,598.16 | 25,793.57 | 79,311.00 | 79,311.00 | 53,517.43 | 32.52% |
| Supplies | 0.00 | 0.00 | 0.00 | 1,300.00 | 1,300.00 | 1,300.00 | 0.00% |
| Professional Services | 10,797.20 | 0.00 | 8,860.00 | 19,500.00 | 19,500.00 | 10,640.00 | 45.44% |
| Other Services | 130.00 | 0.00 | 0.00 | 500.00 | 500.00 | 500.00 | 0.00% |
| Total Judicial | 35,303.67 | 8,598.16 | 34,653.57 | 100,611.00 | 100,611.00 | 65,957.43 | 34.44% |
| Permitting & Inspections | | | | | | | |
| Personnel & Benefits | 8,095.00 | 2,943.00 | 11,208.00 | 30,000.00 | 30,000.00 | 18,792.00 | 37.36% |
| Supplies | 0.00 | 0.00 | 0.00 | 1,000.00 | 1,000.00 | 1,000.00 | 0.00% |
| Professional Services | 0.00 | 0.00 | 0.00 | 1,000.00 | 1,000.00 | 1,000.00 | 0.00% |
| Total Permitting & Inspections | 8,095.00 | 2,943.00 | 11,208.00 | 32,000.00 | 32,000.00 | 20,792.00 | 35.03% |
| Special Revenue Expenditures | | | | | | | |
| Supplies | 0.00 | 0.00 | 495.00 | 1,500.00 | 1,500.00 | 1,005.00 | 33.00% |
| Total Special Revenue Expenditures | 0.00 | 0.00 | 495.00 | 1,500.00 | 1,500.00 | 1,005.00 | 33.00% |
| Total General Government | 370,671.23 | 83,241.18 | 356,985.67 | 952,693.00 | 952,693.00 | 595,707.33 | 37.47% |
| Public Safety Police Department | | | | | | | |
| Personnel & Benefits | 319,316.73 | 100,917.42 | 294,725.08 | 929,557.00 | 929,557.00 | 634,831.92 | 31.71% |
| Supplies | 18,707.19 | 1,180.01 | 9,297.19 | 52,000.00 | 52,000.00 | 42,702.81 | 17.88% |
| Maintenance & Repair | 6,674.33 | 2,011.82 | 9,290.73 | 29,900.00 | 29,900.00 | 20,609.27 | 31.07% |
| Utilities | 6,074.55 | 1,825.61 | 7,159.44 | 19,500.00 | 19,500.00 | 12,340.56 | 36.72% |
| Professional Services | 132,285.56 | 0.00 | 71,743.66 | 198,085.00 | 198,085.00 | 126,341.34 | 36.22% |
| Other Services | 14,429.16 | 0.00 | 12,878.76 | 20,200.00 | 20,200.00 | 7,321.24 | 63.76% |
| Capital Equipment | 748.40 | 187.10 | 5,688.90 | 7,249.00 | 7,249.00 | 1,560.10 | 78.48% |
| Total Police Department | 498,235.92 | 106,121.96 | 410,783.76 | 1,256,491.00 | 1,256,491.00 | 845,707.24 | 32.69% |
| Fire Department | | | | | | | |
| Personnel & Benefits | 5,334.22 | 0.00 | 2,278.00 | 35,200.00 | 35,200.00 | 32,922.00 | 6.47% |

| 10 General Fund | Prior YTD | Current Period | Current YTD | Original Budget | Revised Budget | Remaining Budget | % Earned/Used |
|---|---------------------|-------------------|---------------------|---------------------|---------------------|---------------------|--------------------|
| Supplies | 3,311.80 | 192.40 | 1,701.29 | 17,500.00 | 17,500.00 | 15,798.71 | 9.72% |
| Maintenance & Repair | 5,895.62 | 5,553.78 | 16,822.27 | 34,500.00 | 34,500.00 | 17,677.73 | 48.76% |
| Utilities | 1,711.60 | 528.41 | 1,956.84 | 6,150.00 | 6,150.00 | 4,193.16 | 31.82% |
| Professional Services | 69,334.00 | 0.00 | 38,311.00 | 161,000.00 | 161,000.00 | 122,689.00 | 23.80% |
| Other Services | 14,203.24 | 972.00 | 20,394.72 | 32,000.00 | 32,000.00 | 11,605.28 | 63.73% |
| Capital Equipment | 38,121.24 | 242.72 | 32,954.89 | 59,712.00 | 59,712.00 | 26,757.11 | 55.19% |
| Total Fire Department | 137,911.72 | 7,489.31 | 114,419.01 | 346,062.00 | 346,062.00 | 231,642.99 | 33.06% |
| Code Enforcement | | | | | | | |
| Personnel & Benefits | 14,243.52 | 8,488.01 | 24,074.14 | 69,421.00 | 69,421.00 | 45,346.86 | 34.68% |
| Supplies | 163.20 | 0.00 | 644.09 | 2,200.00 | 2,200.00 | 1,555.91 | 29.28% |
| Maintenance & Repair | 0.00 | 0.00 | 25.50 | 1,000.00 | 1,000.00 | | |
| Professional Services | 0.00 | 0.00 | 0.00 | 1,000.00 | 1,000.00 | 1,000.00 | 0.00% |
| Other Services | 0.00 | 0.00 | 522.24 | 900.00 | 900.00 | 377.76 | 58.03% |
| Total Code Enforcement | 14,406.72 | 8,488.01 | 25,265.97 | 74,521.00 | 74,521.00 | 48,280.53 | 33.90% |
| Total Public Safety | 650,554.36 | 122,099.28 | 550,468.74 | 1,677,074.00 | 1,677,074.00 | 1,126,605.26 | 32.82% |
| Public Works | | | | | | | |
| City Maintenance | | | | | | | |
| Personnel & Benefits | 31,824.54 | 13,000.45 | 40,756.66 | 121,689.00 | 121,689.00 | 80,932.34 | 33.49% |
| Supplies | 10,140.41 | 373.04 | 4,398.76 | 25,825.00 | 25,825.00 | 21,426.24 | 17.03% |
| Maintenance & Repair | 12,429.81 | 2,288.94 | 10,159.43 | 29,860.00 | 29,860.00 | 19,700.57 | 34.02% |
| Utilities | 8,670.97 | 3,549.62 | 13,639.31 | 38,400.00 | 38,400.00 | 24,760.69 | 35.52% |
| Other Services | 2,753.67 | 0.00 | 5,897.96 | 22,800.00 | 22,800.00 | 16,902.04 | 25.87% |
| Capital Equipment | 15,008.17 | 0.00 | 185,781.80 | 0.00 | 0.00 | (185,781.80) | Over Budget |
| Total City Maintenance | 80,827.57 | 19,212.05 | 260,633.92 | 238,574.00 | 238,574.00 | (22,059.92) | Over Budget |
| Parks and Recreation | | | | | | | |
| Supplies | 1,740.23 | 181.86 | 479.34 | 5,100.00 | 5,100.00 | 4,620.66 | 9.40% |
| Maintenance & Repair | 3,528.54 | 1,618.73 | 7,674.90 | 32,000.00 | 32,000.00 | 24,325.10 | 23.98% |
| Utilities | 927.32 | 319.99 | 1,047.62 | 3,500.00 | 3,500.00 | 2,452.38 | 29.93% |
| Other Services | 5,075.35 | 0.00 | 4,982.03 | 17,100.00 | 17,100.00 | 12,117.97 | 29.13% |
| Total Parks and Recreation | 11,271.44 | 2,120.58 | 14,183.89 | 57,700.00 | 57,700.00 | 43,516.11 | 24.58% |
| Emergency/Disaster | | | | | | | |
| Contract Labor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% |
| Total Emergency/Disaster | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00% |
| Miscellaneous | 0.00 | 0.00 | 0.00 | 12,960.00 | 12,960.00 | 12,960.00 | 0.00% |
| Development Agreements | 0 | 0 | 0 | 12,960.00 | 12,960.00 | 12,960.00 | 0.00% |
| Total Expenditures | 1,113,324.60 | 226,673.09 | 1,182,272.22 | 2,939,001.00 | 2,939,001.00 | 1,756,728.78 | 40.23% |
| Other Financing Sources and Uses | | | | | | | |
| Sources | | | | | | | |
| Transfers In | 15,000.00 | 0.00 | 25,000.00 | 25,000.00 | 25,000.00 | 0.00 | Over Budget |
| Total Sources | 15,000.00 | 0.00 | 25,000.00 | 25,000.00 | 25,000.00 | 0.00 | 100.00% |
| Uses | | | | | | | |
| Transfers Out | 362,651.61 | 0.00 | 334,000.00 | 334,000.00 | 334,000.00 | 0.00 | 100.00% |
| Total Uses | 362,651.61 | 0.00 | 334,000.00 | 334,000.00 | 334,000.00 | 0.00 | 100.00% |
| Total Other Financing Sources and Uses | (347,651.61) | 0.00 | (309,000.00) | (309,000.00) | (309,000.00) | 0.00 | |
| Total - 10 GENERAL FUND | 219,790.59 | 358,360.80 | 265,515.62 | 191,639.00 | 191,639.00 | (73,876.62) | |

| City of Richwood Operational Budget Report 10/1/2023 -01/31/2024 | | | | | | | |
|--|--------------------|--------------------|--------------------|-------------------|-------------------|--------------------|------------------------|
| 25 Transportation Fund | Prior YTD | Current Period | Current YTD | Annual Budget | Revised Budget | Remaining Budget | % Earned/Used |
| Revenue | | | | | | | |
| Taxes | | | | | | | |
| 404126 Sales Tax - Streets | 24,253.46 | 12,839.25 | 25,436.77 | 160,000.00 | 160,000.00 | 134,563.23 | 15.90% |
| Total Taxes | 24,253.46 | 12,839.25 | 25,436.77 | 160,000.00 | 160,000.00 | 134,563.23 | 15.90% |
| Charges for services | | | | | | | |
| 404125 Transportation Fee | 47,375.00 | 11,984.49 | 47,859.49 | 142,500.00 | 142,500.00 | 94,640.51 | 33.59% |
| Total Charges for services | 47,375.00 | 11,984.49 | 47,859.49 | 142,500.00 | 142,500.00 | 94,640.51 | 33.59% |
| Interest | | | | | | | |
| 404110 Interest Earnings | 7,075.00 | 1,035.62 | 11,233.54 | 2,000.00 | 2,000.00 | -9,233.54 | Ahead of Budget |
| Total Interest | 7,075.00 | 1,035.62 | 11,233.54 | 2,000.00 | 2,000.00 | -9,233.54 | Ahead of Budget |
| Total Revenue | 78,703.46 | 25,859.36 | 84,529.80 | 304,500.00 | 304,500.00 | 219,970.20 | 27.76% |
| Expenditures | | | | | | | |
| Maintenance & Repair | | | | | | | |
| 405380 Streets M&R | 60,732.66 | -52,986.82 | 47,004.41 | 207,500.00 | 207,500.00 | 240,694.37 | 22.65% |
| 405382 Sidewalks M&R | 2,115.00 | 0.00 | 0.00 | 47,500.00 | 47,500.00 | 47,500.00 | 0.00% |
| 405385 Drainage M&R | 42,374.12 | 1,523.00 | 7,054.02 | 47,500.00 | 47,500.00 | 40,445.98 | 14.85% |
| Total Maintenance & Repair | 105,221.78 | -51,463.82 | 54,058.43 | 302,500.00 | 302,500.00 | 328,640.35 | 17.87% |
| Capital Improvements | | | | | | | |
| 405915 Capital Expenditures - Streets | 332,153.74 | 283,143.92 | 345,188.21 | 0.00 | 0.00 | -316,488.21 | |
| Total Capital Improvements | 332,153.74 | 283,143.92 | 345,188.21 | 0.00 | 0.00 | -316,488.21 | |
| Total Expenditures | 437,375.52 | 231,680.10 | 399,246.64 | 302,500.00 | 302,500.00 | -16,547.86 | |
| Other Financing Sources and Uses | | | | | | | |
| Sources | | | | | | | |
| Transfers In | | | | | | | |
| 404128 Transfer from Bond Fund | 245,749.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| Total Transfers In | 245,749.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| Total Sources | 245,749.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| Total Other Financing Sources and Uses | 245,749.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| Total - 25 Transportation | -112,923.06 | -205,820.74 | -314,716.84 | 2,000.00 | 2,000.00 | 236,518.06 | |

| City of Richwood Operational Budget Report 10/1/2023 -01/31/2024 | | | | | | | |
|--|---------------------|--------------------|---------------------|---------------------|---------------------|---------------------|------------------------|
| 30 Water & Sewer Enterprise Fund | Prior YTD | Current Period | Current YTD | Annual Budget | Revised Budget | Remaining Budget | % Earned/Used |
| Net Operating Income (Loss) | | | | | | | |
| Operating income | | | | | | | 33.3% of year |
| Sewer Department | 313,365.57 | 83,048.38 | 334,117.17 | 981,504.00 | 981,504.00 | 647,386.83 | 34.04% |
| Water Department | 451,374.50 | 128,498.54 | 495,761.98 | 1,519,867.00 | 1,519,867.00 | 1,024,105.02 | 32.62% |
| Solid Waste Department | 112,611.33 | 31,522.49 | 119,739.09 | 381,000.00 | 381,000.00 | 261,260.91 | 31.43% |
| Total Operating income | 877,351.40 | 243,069.41 | 949,618.24 | 2,882,371.00 | 2,882,371.00 | 1,932,752.76 | 32.95% |
| Operating expense | | | | | | | |
| Sewer Department | | | | | | | |
| Personnel & Benefits | 61,313.11 | 15,209.64 | 50,758.00 | 212,594.00 | 212,594.00 | 161,836.00 | 23.88% |
| Supplies | 1,732.40 | 375.28 | 2,697.04 | 8,500.00 | 8,500.00 | 5,802.96 | 31.73% |
| Maintenance & Repair | 14,179.28 | 714.45 | 9,645.68 | 67,740.00 | 67,740.00 | 58,094.32 | 14.24% |
| Professional Services | 128,156.03 | 94,451.30 | 131,357.80 | 715,000.00 | 715,000.00 | 583,642.20 | 18.37% |
| Other Services (insurance) | 3,872.72 | 0.00 | 7,334.36 | 4,650.00 | 4,650.00 | (2,684.36) | Over Budget |
| Total Sewer Department | 209,253.54 | 110,750.67 | 201,792.88 | 1,008,484.00 | 1,008,484.00 | 806,691.12 | 20.01% |
| Water Department | | | | | | | |
| Personnel & Benefits | 81,939.34 | 29,602.70 | 93,549.70 | 262,978.00 | 262,978.00 | 169,428.30 | 35.57% |
| Supplies | 8,967.38 | 3,220.68 | 12,695.51 | 27,600.00 | 27,600.00 | 14,904.49 | 46.00% |
| Maintenance & Repair | 94,254.60 | 4,615.87 | 54,331.20 | 146,720.00 | 146,720.00 | 92,388.80 | 37.03% |
| Utilities | 17,698.24 | 7,301.29 | 29,646.92 | 66,600.00 | 66,600.00 | 36,953.08 | 44.51% |
| Professional Services | 77,441.13 | 5,561.78 | 11,123.56 | 230,500.00 | 230,500.00 | 219,376.44 | 4.83% |
| Other Services | 129,292.83 | 16,671.43 | 118,281.13 | 433,040.00 | 433,040.00 | 314,758.87 | 27.31% |
| Capital Equipment | 1,203.08 | 300.77 | 1,203.08 | 3,610.00 | 3,610.00 | 2,406.92 | 33.33% |
| Total Water Department | 410,796.60 | 67,274.52 | 320,831.10 | 1,171,048.00 | 1,171,048.00 | 850,216.90 | 27.40% |
| Solid Waste Department | | | | | | | |
| Professional Services | 97,539.32 | 28,620.73 | 114,181.42 | 290,000.00 | 290,000.00 | 175,710.58 | 39.37% |
| Total Solid Waste Department | 97,539.32 | 28,620.73 | 114,181.42 | 290,000.00 | 290,000.00 | 175,818.58 | 39.37% |
| Total Operating expense | 717,589.46 | 206,645.92 | 636,805.40 | 2,469,532.00 | 2,469,532.00 | 1,832,726.60 | 25.79% |
| Total Net Operating Income (Loss) | 159,761.94 | 36,423.49 | 312,812.84 | 412,839.00 | 412,839.00 | 100,026.16 | 75.77% |
| Non-Operating Items | | | | | | | |
| Non-operating income | | | | | | | |
| Interest income | 148.05 | 0.00 | 1,392.59 | 2,500.00 | 2,500.00 | 1,107.41 | 55.70% |
| Grants | 54,874.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | At Budget |
| Other income | 1,623.30 | 216.42 | 855.27 | 3,000.00 | 3,000.00 | 2,144.73 | 28.51% |
| Transfers In | 0.00 | 0.00 | 70,000.00 | 70,000.00 | 70,000.00 | 0.00 | At Budget |
| Total Non-operating income | 56,645.38 | 216.42 | 72,247.86 | 75,500.00 | 75,500.00 | 3,252.14 | 95.69% |
| Non-operating expense | | | | | | | |
| Debt Service | 179,874.30 | 81,376.06 | 184,754.81 | 435,981.00 | 435,981.00 | 251,226.19 | 42.38% |
| Transfers Out | 125,979.02 | 0.00 | 56,000.00 | 56,000.00 | 56,000.00 | 0.00 | At Budget |
| Total Non-operating expense | 305,853.32 | 81,376.06 | 240,754.81 | 491,981.00 | 491,981.00 | 251,226.19 | 48.94% |
| Depreciation Expense | 94,673.92 | 0.00 | 0.00 | 300,000.00 | 300,000.00 | 300,000.00 | 0.00% |
| Total Non-Operating Items | (343,881.86) | (81,159.64) | (168,506.95) | (716,481.00) | (716,481.00) | 547,974.05 | Ahead of Budget |
| Total - 30 Water & Sewer Enterprise Fund | (184,119.92) | (44,736.15) | 144,305.89 | (303,642.00) | (303,642.00) | 447,947.89 | Ahead of Budget |

Budget Amendments:

Financial Management Policies
Effective date: March 11, 2024
Approval: _____
Eric Foerster, City Manager

The intent of these Financial Policies is to enable the City of Richwood, Texas to achieve a long term, stable and positive financial condition while conducting its operations consistent with the Council-Manager form of government as established by the City Charter. The more specific purpose of the Financial Policies and Administrative Procedures is to provide guidelines for the financial management staff in planning and directing the City's day-to-day financial affairs and in developing recommendations to the City Manager and to the City Council.

The scope of these policies spans:

- Operating Budget Management
- Accounting and Financial Reporting
- Revenue Management
- Expenditure Control
- Financial Position and Fund Balances
- Cash Management and Internal Controls
- Debt Management
- Capital Assets Policy
- Internal Control

These are designed to help the City by:

Presenting fairly and with full disclosure the financial position and results of financial operations of the City in conformity to GAAP, and

Determining and demonstrating compliance with finance-related legal and contractual issues in accordance with provisions of the Texas Local Government Code, the City Charter and other pertinent legal documents and mandates.

General Implementation and Compliance Guidelines

Oversight Responsibility. An oversight committee should be designated to perform the function of:

- Fiscal Policy Review
- Auditor Selection Recommendation
- Investment Policy Review and Guidance
- Annual Review

Based upon the results and recommendations of the Committee review, the Council will annually approve the fiscal policies.

Implementation and Compliance. The Director of Finance will be accountable for implementing these policies and will to the best of her or his knowledge make the City Manager and the City Council aware of any variances in practice from these policies or any other deviation from prudent financial practices in accordance with GAAP, the City Charter, the Texas Local Government Code and other state laws or ethics of the profession.

1. Operating Budget Management

1.1 Overview

Budgeting is an essential element of the financial planning, control, and evaluation process of municipal government. The City's operating budget is the City's annual financial operating plan.

1.2 Preparation

The Budget Director, in conjunction with the Finance Director, shall prepare expanded budget preparation and management procedures as part of the Finance Department Standard Operating Procedures Manual. These procedures shall be within the guidelines as provided in the policies stated below and shall be reviewed on an annual basis and updated, as necessary.

The budget shall include the six basic segments for review and evaluation listed below:

1. Salaries and Benefit costs
2. Professional Services and Supplies
3. Maintenance and Repair
4. Capital purchases and supplemental projects/programs
5. Debt
6. Projected Revenues

A combined budget summary shall be included with schedule interfund transfers. Fund balances will be identified as restricted, unrestricted, designated and/or undesignated.

1.3 Duties of City Manager - Budget Execution and Financial Management

The budget is prepared by the Finance Director with the cooperation of all City departments and is submitted to the City Manager who makes necessary changes and transmits the documents to the City Council. The budget should be presented to the City Council on or before the first day of the eleventh month of the fiscal year.

In accordance with the City Charter:

The City Manager shall submit to the Council a budget for the ensuing fiscal year and an accompanying message.

The City Manager's budget message shall include:

1. An outline of the proposed financial programs for the next fiscal year with explanations of any changes from previous years in expenditures and major changes of policy and a complete statement regarding the financial condition of the City.

2. An estimate of all revenue from taxes and other sources, including the present tax structure rates and property evaluations for the ensuing year.
3. A carefully itemized list of proposed expenditures by fund, department, and category of expenditure (salaries and benefits, services and supplies, maintenance and repairs, capital outlay, debt, and miscellaneous) for the budget year, as compared to actual expenditures of the last ended fiscal year, and an estimate of final expenditures for the current fiscal year.
4. A description of all outstanding bond indebtedness, showing amount date of issue, rate of interest and maturity date, as well as any other indebtedness which the City has incurred, and which remains outstanding.
5. A projection of revenues and expenditures together with a list of capital projects that should be considered within the next five years.

1.4 Includes All Operating Funds

The City's budget will include all operating funds of the City including, but not limited to, the General Fund, Utility Fund, and Debt Service Funds and Capital Project Funds.

1.5 Amendments to Budget Formally Approved by the Council

In accordance with Section 9.16 of the City Charter:

Under conditions which may arise and which could not reasonably have been foreseen in the normal process of planning the budget, the Council may, by a majority vote of the full elected membership, amend or change the budget to provide for any additional expense in which the general welfare of the citizenry is involved. These amendments shall be by ordinance and shall become an attachment to the original budget.

1.6 Budget Due Date

In accordance with Section 9.02 of the City Charter:

On or before the first day of the eleventh month of the fiscal year, the City Manager shall submit to the Council a budget of ensuing fiscal year and an accompanying message.

1.7 Balanced Budget

The operating budget will be balanced with current revenues inclusive of beginning resources, greater than or equal to current expenditures/expenses.

1.8 Periodic Monitoring of Budget Performance

Periodic financial reports will be prepared to enable the department managers to manage their budgets and to enable the Director of Administrative Services to monitor and control the budget as authorized by the City Manager.

Accounting and Financial Reporting

2.1 Financial Practices and Reporting

The City strives to present fairly and with full disclosure the financial position operations of the City. The City's financial reporting shall conform to Generally Accepted Accounting Principles (GAAP) as promulgated by the Governmental Accounting Standards Board (GASB), and Government Finance Officers Association (GFOA).

2.2 Awards

- A Budget Presentation book will be presented to the Government Finance Officer's Association (GFOA) for evaluation and consideration for the Distinguished budget Presentation Award. It is the goal of the City to receive this award annually.
- The Certificate of Achievement for Excellence in Financial Reporting (COA) for the preparation of an Annual Comprehensive financial Report shall be considered for submission.
- Texas Transparency Stars assure our citizenry that we are doing all we can to maintain financial transparency. Five areas of eligibility are Traditional Finances, Contracts and Procurement, Economic Development, Public Pensions, and Debt Obligations. The Finance department is encouraged to apply for, receive and maintain these awards.

2.3 Timely Interim Financial Reports

On a monthly basis, the financial director shall prepare a written summary of the City's financial affairs and submit it to the City Manager. Each such report shall accurately reflect the City's revenue and expenditure/expense performance as well as any additional information that reflects the City's fiscal policies.

2.4 Independent Audit

The Council shall provide for an independent annual audit of all City accounts and other evidence of the financial transactions of the City. The Council may provide for more frequent audits as it deems necessary.

2.5 Qualifications of the Auditor

Audits shall be made by a Certified Public Accountant (CPA) or firm of such accountants who have no personal interest, direct or indirect, in the fiscal affairs of the City or of any of its officers. The auditor must demonstrate that it has competent staff to conduct the City's audit in accordance with generally accepted auditing standards and contractual requirements. The auditor must be registered as a partnership or corporation of certified public accountants, holding a license under Article 41a-1, Section 9, of the Civil Statutes of Texas, capable of demonstrating that it has sufficient staff which will enable it to conduct the City's audit in accordance with generally accepted auditing standards as required by the City Charter and applicable state and federal laws.

2.6 Auditor Timing

The Auditor's report on the City's financial statements will be completed within 120 days of the City's fiscal year end.

2.7 Auditor Rotation and Evaluation

The City will not require an auditor rotation, however, per GFOA guidelines, an auditor rotation shall occur no less than every 5 years, at which time the Council may circulate requests for proposals for auditor services.

2.8 Management Letter

The auditor will prepare and will jointly review the Management Letter with the City Council within thirty days of its receipt by the staff. Within days of this joint review, the

Director of Administrative Services shall respond in writing to the City Manager and City Council regarding the auditor's Management Letter, addressing the issues contained therein. The Council shall schedule its formal acceptance of the auditor's report upon the resolution of any issues resulting from the joint review.

2.9 Timely Accounts Payable Processing

The City will follow the Texas Prompt Payment Act for timely accounts payable processing and will strive to uphold those rules and regulations.

2.10 Timely CFR Submittal

The ACFR shall be prepared in accordance with GAAP. The ACFR shall be presented to the Council within 120 calendar days of the City's fiscal year end. If City staffing limitations preclude such timely reporting, the Director of Administrative Services will inform the City Council of the delay and reasons, therefore.

Revenue Management

3.1 Simplicity

The City, where possible and without sacrificing accuracy, will strive to keep the revenue system simple in order to reduce compliance costs and to make it more understandable to the taxpayer or service recipient. The City will avoid nuisance taxes, fees or charges as revenue sources.

3.2 Certainty

A knowledge and understanding of revenue sources increase the reliability of the revenue system. The City will understand its revenue sources and enact consistent collection policies to provide assurances that the revenue base will materialize according to budgets and plans.

3.3 Equity

The City shall make every effort to maintain equity in its revenue system structure. The City shall seek to minimize or eliminate all forms of subsidization between entities, funds, services, utilities, and customers. The City shall require that there be a balance in the revenue system. The revenue base will have the characteristic of fairness and neutrality as it applies to cost of service, willingness to pay and ability to pay.

3.4 Diversification and Stability

In order to protect from fluctuations in a revenue source due to fluctuations in the economy and variations in weather, a diversified revenue system will be maintained which has a stable source of income.

3.5 Non-Recurring Revenues

One-time or non-recurring revenues will not be used to finance current ongoing operations. Non-recurring revenues should be used only for one-time expenditures such as long-lived capital needs. They will not be used for budget balancing purposes.

3.6 Property Tax Revenues

All real and business personal property located within the City shall be valued at 100% of the fair market value for any given year based on the current appraisal supplied to the City by the Brazoria County Appraisal District. A 99% collection rate shall serve each year as a goal for tax collections. All delinquent taxes shall be aggressively pursued each year. Tax accounts delinquent greater than 150 days shall be turned over to the Delinquent Tax Attorney as provided in the agreement between the Brazoria County Tax Assessor/Collector and the City. A penalty shall be assessed to compensate the attorney as allowed by State law, and in accordance with the attorney's contract.

3.7 Interest Income

Interest earned from the investment of the City's idle cash balances, whether pooled or not, will be distributed to the funds in accordance with the operating and capital budgets, which, wherever possible, will be in accordance with the equity balance of the fund from which monies were provided to be invested.

3.8 Utility Rates

The city will review and adopt utility rates in a manner consistent with legal guidelines for such rates that will generate revenues required to fully cover operating expenditures, meet the legal restrictions of all applicable bond covenants, and provide for an adequate level of working capital needs. This policy does not preclude drawing down cash balances to finance current operations. However, it is considered best that any extra cash balances be used instead to finance capital projects. Components of Utility Rates will include debt and transfers to the General Fund for an administrative fee, which will be charged to the Utility Fund for services of general overhead, such as administration, finance, personnel, data processing and legal counsel. This fee will be documented each year as a part of the annual budgetary process.

3.9 Revenue Monitoring

Revenues actually received will be regularly compared to budgeted revenues and variances will be investigated. This process will be summarized in the appropriate budget report.

Expenditure Control

4.1 Appropriations

The level of budgetary control is the fund level in all funds. When budget transfers between funds are necessary, these must be approved by the Council. Unused appropriation may be transferred to any item required for the same general purpose.

4.2 Purchasing

The Finance Director shall develop, in conjunction with the City Manager, purchasing procedures. These procedures shall be a part of the Standard Operating Procedures maintained by the Finance Department. These policies will address compliance with all applicable State bid law requirements. A copy of this policy shall be distributed to all Department Directors, who will be responsible for monitoring compliance within their department.

The City Council may approve an ordinance giving the City Manager general authority to contract expenditures without further approval of the Council, for all budgeted items not exceeding limits set by the Council. All contracts for expenditures involving more than the set limits must be expressly approved in advance by the Council. All contracts or purchases involving more than the limits set by the Council shall be let to the lowest bidder whose submittal is among those responsive to the competitive bidding as provided by law or ordinance. The City Council, or City Manager in such cases as he is authorized to contract for the City, shall have the right to reject any and all bids.

4.4 Prompt Payments

All invoices approved for payment by the proper City authorities shall be paid by the Finance Department within thirty (30) calendar days of receipt in accordance with the provisions of Article 601F, Section 2 of the State of Texas Civil Statutes.

4.5 Reporting

Monthly reports will be prepared showing actual expenditures compared to budgeted expenditures. Any deficits within the year will be adjusted.

4.6 Risk Management

The City will aggressively pursue every opportunity to provide for the public's and City employee's safety and to manage its risks. The goal shall be to minimize the risk of loss of resources through liability claims with an emphasis of safety programs. All reasonable options will be investigated to finance risks. Such options may include risk transfer, insurance, and risk retention. Where risk is retained, reserves will be established based upon actuarial determinations and not be used for purposes other than for financing losses.

4.7 Contingency Account Expenditures

In accordance with Section 7.08 Contingent Appropriation:

Provisions shall be made in the annual budget and the appropriation ordinance for a contingent appropriation in an amount not more than ten percent (10%) of the total general fund expenditures, to be used in case of unforeseen items of expenditures. The contingent appropriation shall apply to current operating expenses and shall not include any reserve funds of the City. Such contingent appropriation shall be under the control of the City Manager and distributed by him only after prior approval by the City Manager. The proceeds of the contingent appropriation shall be disbursed only by transfer to other departmental appropriation, the spending of which shall be charged to the department or activities for which the appropriations are made.

Financial Position and Fund Balances

5.1 Overview

Enterprise funds are used to account for operations that are financial and operated in a manner similar to private business enterprises where the intent of the City Council is that the costs of providing goods or services to the general public on a continuing basis be financed or recovered primarily through user charges; or where the City Council has decided that periodic determination of net income is appropriate for accountability purposes. The City uses only one enterprise fund - the Utility Fund.

5.2 General Fund

The general fund reserve balance shall be established over a period of time through use of conservative forecasting and budgeting of revenue sources and efficient management and control of expenditures. The general fund is the primary fund of the City. This fund is used to account for all financial resources not accounted for in other funds.

5.3 Debt Service Fund

The City's debt service fund, sometimes called a "sinking fund," accounts for the accumulation of financial resources for the payment of principal and interest of the City's general obligation (property tax supported) debt, including lease purchases not financed by proprietary funds.

5.4 Utility Fund

This fund is used to account for water and wastewater system services provided for residents of the City, including administration, operations maintenance, debt service and billing and collecting.

Internal Controls

6.1 Written Procedures

The Finance Director is responsible for developing city wide written guidelines for accounting, cash handling and other financial matters, which will be approved by the City Manager. The Finance Department will assist department directors as needed in tailoring these guidelines into detailed written procedures to fit each department's requirements.

6.2 Departmental Internal Control Responsibility

Each department director is responsible to the City Manager to ensure that good internal controls are followed throughout his or her department and that all guidelines on accounting and internal control recommendations are addressed.

6.3 Staff Training

The City will support the continuing education efforts of all financial staff including the investment in time and materials for maintaining a current perspective concerning financial issues. Staff will be held accountable for communicating, teaching, and sharing with other staff members all information and training materials acquired from seminars, conferences and related education efforts.

6.4 Adequacy of Staff

Staffing levels will be adequate for the fiscal functions of the City to function effectively. Overtime shall be used only to address temporary or seasonal demands that require excessive hours. Workload shedding alternatives will be explored before adding staff.

6.5 Centralized Cash Collections Points

The City will establish central locations in order to collect cash.

6.6 Projection of Cash Needs

The Finance Director will work closely with the Director of Public Works to project cash requirements in conjunction with the issuance of bonds and investment of bond proceeds.

6.7 Investments Management

The underlying theme will be that idle cash will be invested with the intent to: 1) safeguard assets, 2) maintain liquidity and 3) maximize return. Where legally permitted, pooling of investments will be done.

The City Manager and Finance Director or designee shall promptly invest all City funds with the City's Depository Bank in accordance with the provisions of the current Depository agreement or in any negotiable instrument that the Council has authorized under the provisions of the Public Funds Investment Act of 1987, and in accordance with the City Council approved investment policy.

6.8 Cash Management

The City's cash flow will be managed to maximize the cash available to invest. Such cash management will entail the centralization of cash collections, where feasible, including property tax payments, utility bills, building and related permits and licenses, and other collection offices as appropriate.

The Finance Department personnel shall, on payments authorized by the Council, use the facsimile check signing software, bearing signatures of the City Manager and the City Assistant City Manager, and/or City Secretary.

The Finance Department may transfer funds, via electronic transfer, through instructions to the City's Depository bank only for payment of properly authorized obligations of the City. Electronic payments shall be made in accordance with the conditions and control procedures as set forth in the current Depository contract and in the Finance Department Standard Operating Procedures.

6.9 Quarterly Financial and Investment Reports

Within 30 days of the end of each quarter, a report on investment performance will be provided to the Council. This report shall be prepared in the manner set forth in the Investment policy adopted by the City Council.

6.10 Safeguarding of Cash and Other Liquid Assets

These assets will be reasonably safeguarded and properly accounted for, and prudently insured. Responsibility for the safeguarding of the City's fixed assets lies with the head of the department in which the fixed asset is assigned. The Finance Department shall supervise the process of affixing numbered property tags and shall maintain the permanent records of the City's fixed assets. These records shall include description, cost, and department of responsibility, date of acquisition, depreciation and expected useful life.

The Finance Department shall also perform an annual inventory of assets using an appropriate sampling method. Such inventory shall be performed by the Finance Director or her or his designated agent in the presence of designated department personnel from the department of responsibility.

6.11 Periodic Reviews of Control Procedures

The City shall conduct periodic reviews of control procedures.

Debt Management

7.1 Annual Five Year Debt Capacity Analysis

The City will complete, annually, a five (5) year debt capacity analysis. In accordance with recommendations made by the Government Finance Officers Association (GFOA), this debt capacity analysis should include:

Statutory or constitutional limitations affecting the amount that can be used, such as:

- Legally authorized debt limits, and
- Tax or expenditure ceilings
- Other legal limitations, such as coverage requirements or additional bond test imposed by bond covenants.

Measures of the tax and revenue base, such as:

- Projections of key, relevant economic variables,
- Population trends,
- Utilization trends for services underlying revenues, and
- Factors affecting tax collections, assessment practices and collection rates

Debt service obligations, such as

- Existing debt service requirements, and
- Debt service as a percentage of expenditures, or tax or system revenues

Measures of debt burden on the community, such as:

- Debt per capita,
- Debt as a percentage of personal income,
- Debt as a percentage of full or equalized assessed property value, and
- Overlapping or underlying debt

Tax-exempt market factors affecting interest costs, such as:

- Interest rates,
- Market receptivity,
- Credit rating

7.2 Rating Agency Presentations

Full disclosure of operations and open lines of communication shall be made to the rating agencies. City staff, with the assistance of financial advisors, shall prepare the necessary materials and presentation to the rating agencies.

7.3 Bond Counsel and Financial Advisor

The staff will maintain open lines of communication with the City's Bond Counsel, along with the Financial Advisor, in order to periodically assess the City's use of debt as an appropriate method of financing and the financing options available to the City.

7.4 Long Term Debt Schedules

The Finance Department shall maintain up to date schedules of long-term debt schedules, which include payment dates, payment amounts split between principal and interest and paying agent(s) for the issue.

7.5 Debt Policy

The City's Debt Policy will strive to be in compliance with the recommendations as set forth by GFOA.

- The purposes for which debt may be issued.
- Legal debts limitations or limitations established by policy, including limitations on the pledge of the issuer's general credit.
- Use of moral obligations pledges.
- Type of debt permitted to be issued and criteria for issuance of:
 - ⇒ Short term and long-term debt
 - ⇒ General obligation and revenue debt
 - ⇒ Fixed and variable rate debt
 - ⇒ Lease backed debt
 - ⇒ Special obligation and revenue debt
 - ⇒ Conduit issues
 - ⇒ Taxable debt
- Structural features that may be considered, such as:
 - ⇒ Maturity of the debt
 - ⇒ Setting the maturities of the debt equal or less than the useful life of the project
 - ⇒ Use of zero-coupon bonds, capital appreciation bonds, deep discount bonds or premium bonds
 - ⇒ Redemption provisions
 - ⇒ Use of credit enhancement
 - ⇒ Use of senior lien and junior lien obligations
 - ⇒ Use of derivative products
- Credit objectives, such as:
 - ⇒ Maintenance of specific credit ratings
 - ⇒ Adherence to benchmark direct and overall debt ratios and other affordability targets
- Method of selecting outside finance professionals
- Policy on refunding of debt
- Compliance with federal tax law provisions

Capital Asset Policy

The City shall recognize all real or personal property that is purchased, constructed, or donated to the City and that has a value equal to or greater than the capitalization threshold for the particular classification of the asset and an estimated life of greater than one year.

8.1 Classifications

Land and Improvements

- Land consists of site, preparation, and site improvements other than buildings that ready land for its intended use. All costs associated are added to the cost of the land.

- Land and improvements are inexhaustible assets and do not depreciate over time.
- All acquisitions of land and improvements will be capitalized.

Buildings and Improvements

- Buildings are structures that are permanently attached to the land. Building improvements materially extend the useful life of a building and will be recorded as an addition of value to the existing building if the expenditure for the improvement is at the capitalization threshold or increases the life or value of the building by 25% of the original life period or cost.
- Buildings shall have an estimated useful life of at least 50 years and subsequent improvements that change the use or function of the building shall be depreciated.
- The capitalization threshold for buildings and improvements is \$100,000.

Infrastructure and Improvements

- Infrastructure assets are linear and continuous in nature, such as, streets, water lines, sewer lines, drainage lines, etc. Improvements shall materially extend the useful life or increase the value of the infrastructure, or both. Additions and improvements shall increase the capacity of the asset. (Example: adding additional lanes to a highway would be capitalized)
- Infrastructure shall have an estimated useful life of at least 50 years.
- The capitalization threshold for infrastructure is \$500,000.

Equipment

- All purchases of equipment that is used for operations and meets the minimum capitalization threshold shall be capitalized.
- Equipment shall have an estimated useful life from 5-8 years.
- The capitalization threshold for equipment is \$10,000.

Construction in Progress

- Construction in progress is the construction activity of buildings, infrastructure, systems, additions, reconstruction, installations, and repairs, which are substantially incomplete.
- Depreciation is not applicable while assets are accounted for as Construction in Progress. See appropriate capital asset category.
- Construction in progress shall be capitalized to their appropriate capital asset categories upon the execution of completion contract documents, occupancy, or when the asset is placed into service.

8.2 Written Procedures

The Finance Department is responsible for developing citywide guidelines for the accounting, tagging, disposition and reporting of all capital assets.

8.3 Annual Review

This policy shall be reviewed annually by the Director of Finance and in conjunction with the City's annual financial audit. The City's external auditors shall review the City's policy and compliance with said policy.

City of Richwood
Finance Department
POLICY AND PROCEDURES

Purchasing Policy
Effective date: March 11, 2024

It is the policy of the City of Richwood, Texas to provide cost effective methods for acquiring goods, meet operational needs, and encourage competitiveness on the part of vendors.

RESPONSIBILITY. Department Directors are ultimately responsible for ensuring that all policies and procedures are followed. The City’s purchasing system is considered de-centralized (each departments’ responsibility) except for those goods, services, and equipment that qualify or are designated otherwise.

It is the responsibility of each employee:

- ✓ To understand and comply with the procedures and guidelines described in this policy and to adhere to appropriate departmental operational procedures for purchasing goods and services on behalf of the City.
- ✓ To understand that no purchase made by an employee shall bind the City to receive and or pay for the goods or service procured, unless authorized by the appropriate Department Director.
- ✓ To have specific authorization or prior approval to incur expenses chargeable to the City of Richwood.
- ✓ To forward all applicable paperwork to the Finance Department as promptly as possible to expedite processing.

DELEGATON OF PURCHASING AUTHORITY. The City Manager as authorized by the City Council of Richwood, is delegated the authority to procure materials and services for the City of Richwood. The City Manager has also granted this authority to certain City employees.

AUTHORITY AND APPROVALS. The City Manager or his designee must approve all invoices that exceed \$1,000. Any procurement made that will exceed \$50,000 must be approved by the City Council. The City Manager has established the following approval levels:

| | | |
|---|------|----------|
| Department Designee | \$0> | \$ 2,500 |
| Department Director | \$0> | \$ 5,000 |
| Finance Director | \$0> | \$10,000 |
| City Manager | \$0> | \$50,000 |
| City Manager with City Council (resolution) | over | \$50,000 |

TYPES OF PURCHASES.

All contracts greater than \$50,000 shall be awarded by **competitive sealed bidding**. When the City determines that the use of competitive sealed bidding is either not practicable or advantageous to the City, a contract may be entered into by use of the **sealed proposals method**. Section 252.022 (a)(7) of the Local Government Code allows an exemption from bidding procedure for a procurement of items that are available from **only one source**. **Credit cards** are also issued to individual employees and at the discretion of the City Manager. For more info, see City of Richwood, Texas Credit Card Policy and Procedures.

LOCAL VENDORS. To provide for the purchase of goods and services by the City, if price and quality are equal, preference shall be given to local vendors and local products.

VENDOR INFORMATION. Departments are available to meet with vendor representatives between 8:00a.m. and 5:00p.m. Monday thru Friday. Meetings should be by appointment.

The City staff will assist vendors in understanding the City's purchasing and payment processing procedures. New vendors are required to submit a "vendor payment form", a completed W-9 form, and a "Conflict of Interest" form prior to invoices being submitted for payment.

- ✓ The Finance Department shall maintain a database vendor file of Richwood vendors and assign vendor numbers. All user departments are encouraged to utilize this list when soliciting or placing orders.
- ✓ Any vendor that has not been used in the past 24 months will be considered inactive and dropped from the vendor database. Vendors that are dropped shall be considered new vendors and required to fill out vendor forms again.

INVOICES are prepared by the vendor and sent to the Finance Department at 1800 Brazosport Blvd N, Richwood, Texas 77531. The information provided by the vendor must match our current vendor file. (Note: All invoices should be date stamped upon receipt by Finance.)

PAYMENT PROCEDURES. Due to the volume of invoices received by the Finance Department, it is important to verify all goods received as soon as possible. This prompt receipting of goods and the subsequent preparation of the payment documents ensures that the payment will be processed in a timely manner, allowing the City to maximize discount terms. If there is a problem with the merchandise, i.e. damaged items, an incomplete order, incorrect items received or any other problem, the vendor should be notified, and the problem corrected before the payment is prepared. If the problem can not be corrected, contact the Finance Department for assistance.

ADVANCE PAYMENTS. Advance payments by the City are permitted but discouraged and shall be made only when necessary and approved by the City Manager and/or Finance Director. Agreements containing provisions for advance payments shall provide for periodic payments that are tied to delivered goods or services, rather than total contract price or lump sum advances.

CUT OFF DATE. The check process is run weekly. Invoices are due in Finance no later than noon on each Wednesday in order to be processed for the check run. The Finance Department reserves the right to control the processing of invoices for any reason.

CHECK PREPARATION. The Finance Department prepares a check for each vendor and verifies total invoices to the check amount for accuracy. Any errors are corrected, and a final check register is run and archived. Checks are sent to the vendors via US mail or customer pick up.

BANK DRAFTS. The Finance Director may set up recurring bank drafts. These drafts may be set up for any recurring fee or charge.

ACH REMITTANCE.

The Finance Department may pay a vendor through the ACH system if the vendor prefers this payment method. Vendors must provide their banking information, which will be entered into the accounts payable system. The ACH file will be transmitted to the bank and the payments will be made directly from our account.

PROBLEM AREAS IN PAYMENT PROCESSING. Several problems on a payment document can cause a payment to be delayed. For example:

- ✓ No authorized signature included on the invoice. All invoices must be signed-off for payment by the department designee, Director, Finance Director, or City Manager.
- ✓ Invoices or other documentation do not match the payment documentation.
- ✓ The vendor information on file does not match the vendor information on the invoice.



INVESTMENT POLICY AND STRATEGY

APPROVED AND ADOPTED ON MARCH 11, 2024

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**CITY OF RICHWOOD
INVESTMENT POLICY**

1.0 INVESTMENT AUTHORITY AND SCOPE OF POLICY

1.01 Purpose

To establish and provide specific policy and guidelines for the conduct of the investment program of the City of Richwood.

1.02 Policy

It is the policy of the City of Richwood (the “City”) to invest public funds in a manner, which will provide safety of principal while earning the highest reasonable market return in meeting the daily cash flow demands of the City. All funds will be invested in compliance with all federal, state and local statutes, rules and regulations and all Governmental Accounting Standards Board Statements, and related financial accounting standards.

This policy satisfies the requirement of Chapter 2256 of the Texas Government Code, Public Funds Investment Act (PFIA), hereinafter referred to as the “Public Funds Investment Act” or “PFIA” of “Act”.

1.03 Scope

This Investment Policy shall apply to all the funds and investments of the City as well as any other funds held in custody by the City, and include the following funds:

1. General Fund
2. Special Revenue Funds
3. Capital Project Funds
4. Enterprise Funds
5. Trust & Agency Funds
6. Debt Service Funds
7. Internal Service Funds
8. Component Units, excluding those which have adopted a separate investment policy.
9. Any other funds or component units as created by the City.

These funds, as well as funds that may be created from time-to-time, shall be administered in accordance with the provisions of this policy. All funds invested under this policy shall be considered as a pooled group for investment purposes.

Deferred compensation and the retirement system assets the City set aside or holds for its employees are not subject to this policy.

1.04 Delegation of Investment Authority

The City Manager and the Director of Finance are hereby designated as Investment Officers for the City. The City may use other employees or the services of a contractor to aid the investment officer(s) in the execution of their duties. Otherwise, unless authorized by law, no other individual(s) has the authority to deposit, withdraw, transfer or manage the investments of the City. The City may designate a registered investment advisor to invest for the City and act as an additional Investment Officer. Authority granted to a person(s) to deposit, withdraw, invest, transfer or manage the City’s investments is effective until rescinded by City Council or until termination of the person’s employment or contract.

The Director of Finance is responsible for the management of the investment program. The Investment Officers are responsible for the daily operations of the investment function. The Director of Finance shall be responsible for all transactions undertaken and shall establish a system of controls to regulate the activities of subordinate officials.

1.05 Ethics and Conflict of Interest

Investment Officers shall refrain from personal business activities that could conflict with the proper execution of the investment program, or which could impair their ability to make impartial investment decisions.

Investment Officers who have a personal business relationship with a business organization seeking to sell an investment to the City and who have anyone related within the second degree by affinity or consanguinity to an individual seeking to sell an investment to the City shall file a statement (Attachment B) disclosing that personal interest to the Director of Finance, City Manager, the City Council and the Texas Ethics Commission.

An Investment Officer has a personal business relationship with a business organization if:

- 1) The investment officer owns 10% or more of the voting stock or shares of the business organization or owns \$5,000 or more of the fair market value of the business organization;
- 2) Funds received by the investment officer from the business organization exceed 10% of the investment officer’s gross income for the previous year; or
- 3) The investment officer has acquired from the business organization during the previous year investments with a book value of \$2,500 or more for the personal account of the investment officer.

2.0 INVESTMENT OBJECTIVES

2.01 Objective

City investments shall be made in accordance with federal and state laws, this Investment Policy and Investment Strategy and ordinances of the City. The City’s investment portfolio shall be designed with the objective of attaining a market rate of return in accordance with

its designated benchmark based on the City’s cash flow requirements throughout budgetary and economic cycles, commensurate with the City’s investment risk constraints and the cash flow characteristics of the portfolio.

2.02 Safety of Principal

The primary objective of the City’s investment program is to ensure the safety of all funds. To attain this objective, it is the City’s intent to invest in the safest types of securities, pre-qualify broker/dealers,, and advisors and to hold all investments until maturity in order to ensure the return of all invested principal unless as stipulated in Section 4.09 of the policy.

2.03 Liquidity

The City’s investment should be based on a cash flow analysis, which will provide the liquidity necessary to pay all expected and unexpected obligations. Liquidity shall be achieved by matching investment maturities with budgetary and economic cycles. A portion of the portfolio will be maintained in liquid short-term investments that can be converted to cash, if necessary, to meet disbursement requirements. Investment pools and no-load money market mutual funds provide daily liquidity and may be utilized as a competitive yield alternative to fixed maturity investments.

2.04 Diversification

The City of Richwood shall diversify its portfolio to eliminate the risk of loss resulting from over concentration of assets in a specific maturity, a specific issuer or a specific class of investments. Investment shall always be selected that provide for stability of income and reasonable liquidity.

2.05 Yield

It will be the objective of the City to earn a reasonable market yield throughout budgetary and economic cycles within the parameters imposed by its safety and liquidity objectives, investment strategies, and state and federal law. Return on investment is of secondary importance to safety and liquidity objectives. The yield and level of risk for the portfolio will be benchmarked against the yield of the one-year Treasury Bill during the comparable period as well as against an agency note with approximately the same maturity as the weighted average maturity of the portfolio.

2.06 Maturity

The portfolio shall be structured primarily to meet City obligations and secondarily to achieve a reasonable return of interest. The maximum allowable stated maturity of any individual investment owned by the City shall be five (5) years from date of purchase. The settlement date is considered the date of purchase. However, the City may collateralize its demand deposit accounts, certificates of deposits, and repurchase agreements using longer-dated investments not to exceed ten (10) years.

The maximum weighted average maturity based on the overall portfolio shall not exceed 36 months, or 1095 days.

2.07 Investment Training

City designated Investment Officers shall take and maintain training in accordance with the training requirements as set forth in the Act (Section 2256.008). An external auditor shall review documentation of annual training requirements annually.

2.08 Quality and Capability of Investment Management

Investment Officers always shall be cognizant of the standard of care and the investment objectives as set forth in the Act and the City’s Investment Policy.

2.09 Investment Strategy

In accordance with the Act (2256.005(d)) a separate written investment strategy shall be developed for each portfolio/fund or pooled group of funds under the City’s control. The strategy shall be reviewed on an annual basis with formal action by the City Council stating that the strategy has been reviewed and recording any changes made.

2.10 Cash Management

Effective cash management is recognized as essential to good fiscal management. Cash management is defined as the process of managing monies in order to ensure maximum cash availability to the City for investment use. The City shall maintain a comprehensive cash management program that includes collection of accounts receivable, prudent investment of its available cash, disbursement of payments in accordance with invoice terms and the management of banking services.

3.0 AUTHORIZED INVESTMENTS

3.01 Authorized Investments

Authorized investments under this policy shall be limited to the instruments listed below as authorized and defined by the Public Funds Investment Act.

- A. Direct obligations of the United States or its agencies and instrumentalities.
- B. Direct obligations of the State of Texas or its agencies and instrumentalities
- C. Collateralized Certificates of Deposit of banks or savings banks doing business in Texas, collateralized to 102%, and guaranteed or insured by the Federal Deposit Insurance Corporation or its successor; or secured by obligations of the United State Government, including mortgage backed securities, which pass the bank test, but excluding those mortgage backed securities defined in Section 2256.009(b) of the Act.
- F. Constant dollar local government investment pools as defined by the Act (2256.016 and 2256.019) and approved by City Council resolution.
- G. AAA-rated, SEC registered no-load Money Market Mutual Funds and no-load mutual fund including funds that invest in commercial paper and as further defined in Sections 2256.013 and 2256.014 of the Act.

- H. Interest bearing bank deposits that are guaranteed or insured by the Federal Deposit Insurance Corporation (FDIC) and that are fully collateralized at 102% of the ledger balance.
- J. Certificates of deposit through the Certificate of Deposit Account Registry Service (CDARS) program.

3.02 Certificates of Deposit

- A. Depository Certificates of Deposit (CD) may be purchased from any depository institution located in the State of Texas.
It is not necessary for a Texas depository institution to be on the City's approved broker/dealer list as CD's are considered depository in nature. Prior to purchase, however, all agreements with the depository institution must be completed prior to the purchase of a CD from the depository institution.
- B. Amounts purchased over the FDIC limit whether from a depository institution or brokerage firm must be collateralized.

3.03 Unauthorized Investments

Specifically, prohibited investments are:

1. Collateralized mortgage obligations (CMO), excluding Pools which invest in CMOs
2. Commercial Paper, excluding Pools which invest in Commercial Paper
3. All swaps including but not limited to even-basis swaps, interest rate swaps
4. Forwards and futures
5. Options
6. Foreign Exchange
7. Planned amortization classes (PAC)
8. Regular floaters tied to government securities
9. Investments with various interest rate caps, floors, and collars
10. Investment pools in which the City would own more than 10% of the market value of the pool
11. Any other investments that are not on the authorized investment list

3.04 Investments with Required Ratings

Investments with minimum required ratings such as investment pools and no-load mutual funds do not qualify as authorized investments during the period the investment does not have the minimum rating. Investment ratings shall be checked monthly online by an Investment Officer to ensure that the ratings have not been downgraded. The City shall take all prudent measures that are consistent with its investment policy to liquidate investments that do not have the minimum rating.

3.05 Exemptions for Existing Investments

Any investment currently held that does not meet the guidelines of this policy, but were authorized investments at the time of purchase, is not required to be liquidated; however,

the City shall take all prudent measures consistent with this Investment Policy to liquidate an investment that does not or no longer qualifies as an authorized investment.

4.0 INVESTMENT CONTROLS

4.01 Selection of Investment Broker/Dealers

The Investment Officers will maintain a list of financial institutions, primary broker/dealers, and local government investment pools authorized by the City Council to provide investment services to the City. Annually, the City Council will approve the list (Attachment C) of financial institutions and broker/dealers authorized to conduct business with the City. Investment Officers shall not conduct business with any firm not approved by City Council, except for the purchase of CD's from Texas depository institutions.

All financial institutions and broker/dealers who desire to become qualified bidders for investment services must fill out an application and return it to the City by the stated day and time. After review of all applicants, a list of selected financial institutions and broker/dealers will be prepared by the Investment Officers and reviewed by the Investment Committee. The following may be required with the application: most recent audited financial statement, list of local government clients, and statements of qualifications. Additions to the approved broker/dealer list will be made at a minimum bi-annually.

Criteria used in the selection of the authorized broker/dealers will include, but are not limited, to material litigation against the firm, regulatory status of the dealer, completed packet, references from local government clients, background and expertise in investment of public funds.

Up to ten firms shall be selected to appear on the City's approved list. If, after a firm is selected, they no longer qualify to appear on the City's approved dealer list, or provide services inconsistent with acceptable levels, the Investment Officers may recommend City Council to remove the firm from the approved list and replace it with a qualified firm.. Should an approved bank merge with or be acquired by another bank while on the City's approved list, the new bank must agree to meet the same collateralization and certification requirements, or the bank shall be removed from the approved list.

4.02 Certification

A written copy of this Investment Policy shall be presented to any firm seeking to engage in a financial transaction with the City. The authorized representative of the firm shall execute a written instrument substantially in the form of Attachment A of this Policy and to the effect that the representative has:

1. received and thoroughly reviewed the investment policy of the City; and
2. acknowledged that the organization has implemented reasonable procedures and controls in effort to preclude investment transactions that are not authorized by the

City's Investment Policy except to the extent that the authorization is dependent on an analysis of the makeup of the City's entire portfolio or requires interpretation of subjective investment standards.

The Investment Officer(s) may not transact business with any firm that has not executed and returned this certification. (2256.005(l)).

The City may contract with a registered investment advisor for the management of the City's portfolio. The advisor shall review the Policy and execute all transactions in accordance with the provisions and controls of the Policy.

4.03 Delivery vs. Payment Settlement

It shall be the policy of the City that all securities shall be purchased on a "Delivery vs. Payment" (DVP) basis, except for investment pools and mutual funds. By so doing, City funds are not released until the City or its approved custodian has received the securities purchased or pledged.

4.04 Internal Control and Annual Audit

The Director of Finance or designee shall establish a system of internal controls. The controls shall be designed to prevent losses of public funds arising from fraud, employee error, misrepresentation of third parties, or imprudent actions by employees or Investment Officers of the City. Controls and managerial emphasis deemed most important include the following:

Imperative Controls:

- A. Safekeeping receipts and record management
- B. Documentation of investment bidding
- C. Written confirmations
- D. Reconciliation and comparisons of security receipts with investments and bank records
- E. Compliance with investment policies
- F. Accurate and timely reporting
- G. Adequate training and development of Investment Officers

Controls Where Practical

- A. Control of collusion
- B. Segregation of duties
- C. Clear delegation of authority
- D. Staying informed about market conditions, changes and trends that require adjustments in investment strategies.

The City, in conjunction with its annual financial audit, shall perform a compliance audit of management controls on investments and adherence to the City's established investment

policies. This annual audit shall be performed by an external auditor and will include formal review of the quarterly reports.

4.05 Standard of Care

Investments shall be made with judgment and care, under prevailing circumstances, that a person of prudence, discretion, and intelligence would exercise in the management of the person’s own affairs, not for speculation, but for investment, considering the probable safety of capital and the probable income to be derived.

In determining whether an investment officer has exercised prudence with respect to an investment decision, the determination shall be made taking into consideration:

1. the investment of all funds over which the officer had responsibility rather than a consideration as to the prudence of a single investment; and
2. whether the investment decision was consistent with the City’s Investment Policy.

The Director of Finance and the Investment Officers are not personally responsible for changes in the market.

4.06 Competitive Bidding

The investment officer shall obtain competitive bids from at least three brokers or financial institutions on all purchases and sales of investment instruments transacted on the secondary market. The requirement for competitive bids shall not apply to a) transactions with money market funds and local government investment pools (which are deemed to be made at prevailing market rates), b) treasury and agency securities purchased at issuance through an approved broker/dealer or financial institution, and c) fully insured certificates of deposit placed in accordance with the conditions prescribed in Section 2256.010(b) of the Act. In situations where the exact security being offered is not offered by other dealers, offers on the closest comparable investment may be used to establish a fair market price for the security. Quotes will be accepted either written or electronically, or a combination thereof. An exception to this rule may be made when time limitations preclude the bidding process.

The investment will be made with the broker/dealer offering the greatest return and quality to the City. If three bids/offers are solicited but three responses are not received within the time frame specified in the solicitation of the bid/offer, the Investment Officer may act based on the responses received as long as the solicitation of and failure to receive the bids/offers is documented. Any investments purchased must have the signature of at least two Investment Officers, when both are present.

4.07 Portfolio Diversification

The City will diversify its investments by security type, institution, and broker/dealer. Requests for bids/offers from broker/dealers shall rotate among approved broker/dealers

to ensure that the same brokers are not solicited for every bid/offer request, and to ensure competition among broker/dealers.

With the exception of U.S Treasury Securities and interest-bearing checking accounts that are fully collateralized, no more than 75% of the City’s total investment portfolio will be invested in a single security type. If the City elects to participate in more than one investment pool, the total percent invested in all pools shall not exceed the maximum percent allowed.

Diversification requirements are as follows:

| <u>Investment Type</u> | <u>Maximum Investment %</u> |
|--------------------------------|-----------------------------|
| Certificates of Deposit** | Up to 75% |
| US Treasury Bills/Notes | Up to 100% |
| Other US Government Securities | Up to 50% |
| Authorized Investment Pools | Up to 75% in total |
| CDARS Program | Up to 25% |
| No-Load MM Mutual Funds | Up to 50% |
| No-Load Mutual Funds | Per PFIA |
| Sweep Accounts/DDA*** | Up to 100% |

** FDIC coverage or fully collateralized

*** Fully collateralized at 102% of value

4.08 Electronic Funds Transfer

The City may use electronic means to transfer or invest all funds collected or controlled by the City.

4.09 Selling of Securities Before Maturity

While it is the City’s intent to hold securities to maturity to ensure safety of principal, if the City needs to sell securities in order to meet disbursement needs or to take advantage of interest rates, the City Manager and the Director of Finance must both approve the sale of the security.

5.0 Arbitrage

Arbitrage rebate provisions require that the City compute earnings on investments from each issue of bonds on an annual basis to determine if a rebate to the IRS is required. The City is required to perform specific calculations relative to the actual yield earned on the investment of the funds and the yield that could have been earned if the funds had been invested at a rate equal to the yield on the bonds sold by the City. The regulations require extreme precision in the monitoring and recording facets of the investments, and particularly as it relates to yields and computations in order to ensure compliance. Failure

to comply can dictate that the bonds become taxable, retroactively from the date of issuance, or subject the City to severe penalties.

The City's investment position as it relates to arbitrage regulations is as follows: Investments on bond proceeds will be made with safety of principal and liquidity in mind, but with a competitive rate of return. When project timing and cash flows allow, bond proceeds may be invested in instruments allowed under Section 3.0, if the investment can be purchased solely with the individual bond proceeds, and not commingled with operating funds or multiple issues. All investments purchased with bond funds shall be documented clearly and reported to the City's arbitrage consultant for tracking and review. Arbitrage rebate calculations will be performed annually on all debt issues and funds set aside annually for any positive arbitrage. When present positive arbitrage will be re-bated to the IRS, as necessary.

6.0 Investment Reporting

The Investment Officers shall report to City Council on no less than a quarterly basis in accordance with the Act (2256.023). The report shall include a detailed listing of all purchases, sales, and payments and a description of each security held as well as a management summary information.

The report must be prepared and signed by all Investment Officers and contain a statement of compliance regarding the City's Investment Policy and the Act (2256.023).

Market prices used to determine market value in the investment reports shall be obtained from an independent source.

7.0 INVESTMENT COLLATERAL AND SAFEKEEPING

7.01 Collateral

The Investment Officer(s) or Investment Advisor shall ensure that all City funds in time and demand deposits, all uninsured collected balances plus accrued interest, if any, certificates of deposits and/or repurchase agreements are insured or collateralized consistent with the Public Funds Collateral Act (Texas Government Code 2257) and federal law as well as the then current bank depository contract. The City chooses to accept collateral based on the list of investments authorized under the Public Funds Investment Act. The right of collateral substitution may be granted with the approval of the City Manager or Finance Director. Also, the City Manager or the Finance Director may approve and release pledged collateral. The City shall request additional collateral in the event Investment Officer(s) deems that deposits or investments are not sufficiently protected by the pledged collateral.

The market value of the pledged securities used as collateral will equal 102% of the ledger balance of time and demand deposits, plus principal and accrued interest on certificates of

deposit, and repurchase agreements and be held by an independent party outside the bank's or counter-parties' holding company. Pledged collateral will be evidenced by original safekeeping receipts, which are held in the Federal Reserve Bank and is readily available to the City. The City's bank and/or third-party custodian will always be responsible for the monitoring and maintaining of margin levels.

7.02 Safekeeping

All pledged securities will be held by an independent third-party custodian selected by the City, with all securities held in the City of Richwood's name. The custodial safekeeping institution shall annually provide a copy of their most recent report on internal controls (Statement of Auditing Standards No. 70, or SAS 70). Safekeeping receipts shall be maintained by the Investment Officer(s) and shall be available for review upon request.

8.0 INVESTMENT POLICY and INVESTMENT STRATEGY ADOPTION

The City's Investment Policy and Investment Strategy shall be adopted by resolution annually by the City Council. Any modifications made thereto must be approved by the City Council and documented by formal action.

CITY OF RICHWOOD

9.0 INVESTMENT STRATEGY

The City of Richwood shall adopt by resolution a separate written investment strategy for each of the funds under its control. For Investment purposes, the City shall use a “Pooled Fund Group” which means that all funds under the City’s control shall be treated as one fund with respect to its investment strategy.

9.01 Suitability

Investments are to be purchased based on the financial requirements of the City. The City of Richwood shall strive to maintain the level of investment of all fund balances, reserves and bond funds as close as possible to 100%. Any investment eligible in the Investment Policy is suitable for all City funds, including component units.

9.02 Safety of Principal

Investments of the City shall be undertaken in a manner that seeks to ensure the preservation of capital in the overall portfolio. All investments shall be of high quality with no perceived default risk. It is the City’s full intent, at the time of purchase, to hold all investments until maturity in order to ensure the return of all invested principal.

9.03 Liquidity

The City’s investment portfolio will remain sufficiently liquid to enable the City to meet all operating requirements that might be reasonably anticipated. Liquidity shall be achieved by matching investment maturities with budgetary and economic cycles, and forecasted cash flow requirements. A portion of the portfolio will be maintained in liquid short-term securities that can be converted to cash if necessary, to meet disbursement requirements. Investment pools and money market mutual funds provide daily liquidity and may be utilized as a competitive yield alternative to fixed maturity investments.

9.04 Marketability

The City shall invest in securities that, if the need arises, can be liquidated before maturity. Investments will never be prematurely sold at less than book value plus accrued interest, without the approval of the Director of Finance and the City Manager.

9.05 Diversification

The City will diversify its investments by security type and by broker/dealer. Except for U.S. Treasury securities and fully collateralized demand deposit accounts, no more than 75% of the City's total investment portfolio will be invested in a single security type.

9.06 Yield

The investment portfolio shall obtain a competitive rate of return throughout budgetary and economic cycles, commensurate with the investment risk constraints and the cash flow needs. The City shall attempt to obtain an acceptable return provided that the requirements of safety and liquidity are first met. The yield of the one-year U.S. Treasury Bill shall be a yield objective or benchmark as well as benchmarked against an agency note with maturity, which approximates the weighted average maturity of the portfolio

10.0 GLOSSARY and ATTACHMENTS

GLOSSARY of Definitions

Accrued Interest: Term designating the interest due on a bond or other fixed income security that must be paid by the buyer of a security to its seller.

Agency: A security, almost always debt, issued by a corporation sponsored by the U.S. Government. Examples: bonds of the Tennessee Valley Authority.

Agency Notes: One to two-year obligations offered at a discount from par by U.S. Government Agencies, such as the Federal National Mortgage Association, the Federal Home Administration, and the Farm Credit System.

Bid: The price offered by a buyer of securities – when you are selling securities, you ask for a bid.

Broker: A broker brings buyers and sellers together for a commission.

Certificate of Deposit (CD): A time deposit with a specific maturity evidenced by a certificate.

Collateral: Evidence of deposit or other property, which a borrower pledges to secure repayment of a loan. Also refers to securities pledged by a bank to secure deposits of public monies.

Component Unit: Based on generally accepted account principles, the Richwood Economic Development Corporation, TIRZ #2, and the Development Authority of Richwood are considered component units of the City, and as such are included in the City's annual financial reports.

Confirmation: Commonly called a "confirm." The confirmation is a notice to a customer that payment is due on a purchase, or that net proceeds are available on a sale of securities. Federal securities law requires that a confirmation be sent promptly following each purchase and sale.

Conflict of Interest: Term used to describe a financial situation where a person prejudicially places personal affairs before those of constituents that the person is supposed to serve or represent.

Coupon: (a) The annual rate of interest that a bond's issuer promises to pay the bondholder on the bond's face value. (b) A certificate attached to a bond evidencing interest due on a payment date.

Current Maturity: Used to designate the remaining lifetime of an already outstanding bond.

Dealer: A dealer, as opposed to a broker, acts as a principal in all transactions, buying and selling for his own account.

Delivery versus Payment: Delivery of securities first, with an exchange of money for the securities after delivery.

Derivatives: (a) Financial instruments whose return profile is linked to, or derived from, the movement of one or more underlying indices or securities, and may include a leveraging factor, or (2) financial contracts based upon notional amounts whose value is derived from an underlying index or security.

Discount: The difference between the cost price of a security and its maturity value when quoted at lower than face value. A security selling below original offering price shortly after sale is also considered to be at a discount.

Discount Securities: Non-interest-bearing money market instruments that are issued at a discount and redeemed at maturity for full face value. Example: U.S. Treasury Bills.

Discount Yield: Measurement of return that computes interest on face value of security rather than on the dollar amount invested. Used in figuring yield on U.S. Treasury Bills.

Diversification: Dividing investment funds among a variety of securities offering independent returns.

Equivalent Bond Yield: Used to compare the discount yield on money market securities to the coupon yield on government bonds.

Face Value: The dollar amount that appears on the face of the bond certificate. It is the dollar amount the issuer promises to pay to the holder at maturity. Also called par value.

Federal Credit Agencies: Agencies of the Federal government set up to supply credit to various classes of institutions and individuals. Examples: S&L's, small business firms, students, farmers, farm cooperatives.

Federal Deposit Insurance Corporation (FDIC): A federal agency that insures bank deposits, currently up to \$250,000 per depositor.

Federal Funds Rate: The rate of interest at which Fed funds are traded. This rate is currently pegged by the Federal Reserve through open-market operations.

Federal Farm Credit Bank (FFCB): Fiscal agent for the Farm Credit System, a public government sponsored enterprise (GSE) created in 1916 to lend to agricultural and rural America. Funds for loans are obtained through the issuance of Farm Credit Debt Securities.

Federal Home Loan Bank (FHLB): Government sponsored wholesale banks (currently 12 regional banks), which lend funds and provide correspondent banking services to member commercial banks, thrift institutions, credit unions, and insurance companies. The mission of the FHLB is to liquefy the housing related assets of its members who must purchase stock in their district Bank.

Federal Home Loan Mortgage Corporation (FHLMC or Freddie Mac): Public government sponsored enterprise (GSE) created in 1970 to expand the secondary market for mortgages in the US. Along with other GSEs, Freddie Mac buys mortgages on the secondary market, pools them, and sells them as a mortgage-backed security to investors on the open market. This secondary mortgage market increases the supply of money available for mortgage lending and increases the money available for new home purchases.

Federal National Mortgage Association (FNMA or Fannie Mae): FNMA is a federal corporation working under the auspices of the Department of Housing and Urban Development (HUD). It is the largest single provider of residential mortgage funds in the United States. FNMA is a private stockholder-owned corporation. The corporation's purchases include a variety of adjustable mortgages and second loans, in addition to fixed-rate mortgages. FNMA's securities are also highly liquid and are widely accepted. FNMA assumes and guarantees that all security holders will receive timely payment of principal and interest.

Federal Open Market Committee (FOMC): Consists of the seven members of the Federal Reserve Board and five of the twelve Federal Reserve Bank Presidents. The Committee periodically meets to set Federal Reserve guidelines regarding purchases and sales of Government Securities in the open market as a means of influencing the volume of bank credit and money.

Federal Reserve System: The central bank of the United States created by Congress and consisting of a seven-member Board of Governors in Washington D.C., 12 regional banks and about 5,700 commercial banks that are members of the system.

Financial Assets: Cash and other assets that, in the normal course of operations, will become cash.

Government National Mortgage Association (GNMA or Ginnie Mae): A fixed income security that represents an undivided interest in a pool of federally insured mortgages put together by GNMA. GNMA securities are commonly backed by FHA or VA mortgages.

Liquidity: A liquid assets is one that can be converted easily and rapidly into cash without a substantial loss of value. In the money market, a security is said to be liquid if the spread between bid and asked prices is narrow and reasonable sizes can be done at those quotes.

Local Government Investment Pool (LGIP): An entity created under the public funds investment act to invest public funds jointly on behalf of the entities that participate in the pool and whose investment objectives in order of priority are 1) preservation and safety of principal, 2) liquidity, and 3) yield.

Market Value: The price at which a security is trading and could presumably be purchased or sold.

Master Repurchase Agreement: A written contract covering all future transactions between the parties to repurchase-reverse repurchase agreements that establishes each party's rights in the transactions.

Maturity: The date upon which the principal or stated value of an investment becomes due and payable.

Money Market: The market in which short-term debt instruments (bills, commercial paper, etc.) with a one-year maturity or less, and often 30-days or less, are issued and traded.

Offer: The price asked by a seller of securities.

Overnight Repo: A repurchase agreement with expiration set for the following business day.

Par Value: The dollar amount that appears on the face of the bond certificate. It is the dollar amount the issuer promises to pay to the holder at maturity. Also, called face value.

Portfolio: Collection of securities held by an investor.

Primary Dealer: A designation given by the Federal Reserve System to commercial banks or broker/dealers who meet specific criteria, including capital requirements and participation in Treasury auctions.

Principal: The face amount (par value) of a debt security.

Rate of Return: The yield obtainable on a security based on its purchase price or its current market price. For bonds and notes, it is the coupon rate divided by the price.

Repurchase Agreement (REPO): A holder of securities sells these securities to an investor with an agreement to repurchase them at a fixed price on a fixed date.

Safekeeping: A services to customers rendered by banks for a fee whereby securities and valuables of all types and descriptions are held in the bank's vault for protection.

Secondary Market: A market made for the purchase and sale of outstanding issues following the initial distribution.

Securities and Exchange Commission: Agency created by Congress to protect investors in security related transactions by administering securities legislation.

Sell: To transfer ownership for a monetary consideration. The term is used in conjunction with the disposition of stocks, bonds, or other financial assets.

Structured Notes: Notes issued by Government Sponsored Enterprises (FFCB, FHLB, FHLMC, FNMA, SLMA, etc.) and Corporations that have imbedded options (e.g.: call features, step-up coupons, floating rate coupons, derivative based returns) into their debt structure. Their market

performance is impacted by the fluctuation of interest rates, the volatility of the imbedded options and shifts in the shape of the yield curve.

Treasury Bills: A non-interest-bearing discount security issued by the U.S. Treasury to finance the national debt. Most bills are issued to mature in three months, six months, or one year.

Treasury Bonds: Long-term coupon bearing U.S. Treasury Securities issued as direct obligations of the U. S. Government and having initial maturities of more than 10 years.

Treasury Notes: Medium-term coupon-bearing U.S. Treasury securities issued as direct obligations of the U.S. Government and having initial maturities from two to ten years.

Uniform Net Capital Rule: Securities and Exchange Commission requirement that member firms as well as nonmember broker-dealers in securities maintain a maximum ratio of indebtedness to liquid capital of 15 to 1; also called net capital rule and net capital ratio.

ATTACHMENT A

CERTIFICATION BY BUSINESS ORGANIZATION

This certification is executed on behalf of City of Richwood (the Investor) and _____ (the Business Organization) pursuant to the Public Funds Investment Act, Chapter 2256, Texas Government Code (the Act) in connection with investment transactions conducted between the Investor and the Business Organization.

The undersigned Qualified Representative of the Business Organization hereby certifies on behalf of the Business Organization that:

1. The undersigned is a Qualified Representative of the Business Organization offering to enter into an investment transaction with the Investor as such terms are used in the Public Funds Investment Act, Chapter 2256, Texas Government Code and
2. The Qualified Representative of the Business Organization has received and reviewed the Investment Policy furnished by the Investor and
3. The Qualified Representative of the Business Organization has implemented reasonable procedures and controls in an effort to preclude imprudent investment transactions conducted between the Business Organization and the Investor that are not authorized by the entity's investment policy, except to the extent that this authorization is dependent on an analysis of the makeup of the entity's entire portfolio or required an interpretation of subjective investment standards.
4. The Business Organization will rely upon instructions from only the persons authorized on behalf of the City of Richwood as stated in the Investment Policy and City's resolution designating investment officers.

Registered Principal or Authorized Representative:

Signature: _____
 Name: _____
 Title: _____
 Date: _____

Broker Assigned to the Account:

Signature: _____
 Name: _____
 Title: _____
 Date: _____

ATTACHMENT B

STATEMENT OF ETHICS & CONFLICTS OF INTEREST

Investment officer(s) for the City of Richwood shall refrain from personal business relationships with business organizations that could conflict with the proper execution of the investment programs of the City, or which could impact their ability to make objective and impartial investment decisions. This would apply only to personal business relationships with business organizations that been approved by City Council to conduct investment transactions with or on the behalf of the City of Richwood.

An Investment Officer is considered to have a personal business relationship with a business organization if:

1. The Investment Officer owns ten (10) percent or more of the voting stock or shares of the business organization or owns \$5,000 or more of the fair market value of the business.
2. Funds received by the Investment Officer from the business organization exceeds ten (10) percent of the Investment Officer’s annual gross income for the previous year.
3. The Investment Officer has acquired from the business organization during the previous year investments with a book value of \$2,500 or more for the personal account of the Investment Officer.

_____ I do hereby certify that I **do not** have a personal business relationship with any business organization approved to conduct investment transactions with the City of Richwood, not am I related with the second degree by affinity or consanguinity to an individual seeking to sell an investment to the City of Richwood as of the date of this statement.

_____ I do hereby certify that I **do** have a personal business relationship with any business organization approved to conduct investment transactions with the City of Richwood, not am I related with the second degree by affinity or consanguinity to an individual seeking to sell an investment to the City of Richwood as of the date of this statement.

City Manager

Finance Director

Date

Date

ATTACHMENT C

APPROVED/AUTHORIZED LIST OF BROKER/DEALERS

APPROVED/AUTHORIZED LIST OF PUBLIC DEPOSITORIES

First National Bank of Lake Jackson
Brazos National Bank

**APPROVED/AUTHORIZED LIST OF
LOCAL GOVERNMENT INVESTMENT POOLS**

TexPool
TexStar
LOGIC

Certificates of deposit may be purchased from Texas depository institutions, which are not on the approved broker/list, as they are considered depository in nature. Certificates of deposit purchased from brokerage firms, however, must be on the approved broker/dealer list as they fall under the Public Funds Investment Act. All deposits over the FDIC limit must be collateralized.

MEMORANDUM

To: The Honorable Mayor and Members of the Richwood City Council
From: Patricia Ditto, Finance Director
Date: March 11, 2024
Subject: Investment Policy & Strategy Review

The Texas Public Funds Investment Act requires annual review and approval of the city’s Investment Policy and Strategy. The current policy was updated and approved on July 20, 2020. It is now for the review and approval. The document that I am proposing has no changes from the policy approved previously. I have reviewed it and see no necessary changes. Approval of the document will keep the City in complete compliance with the Act and with current best practices for municipal investment programs.

In addition, after reviewing our cash & investments, I have found the following, as of 01/31/2024:

- Cash accounts total \$1,871,645.58, 28.84% of total cash and investments
- Investments equate to \$4,619,016.32, 71.16% of total cash and investments
 - Pooled Investment Funds hold \$4,088,799.39, 63% of total cash and investments
 - Restricted funds held for capital projects currently under construction:
 - Logic for the 2019B Utility capital project holds \$279,754.22
 - General Fund Unrestricted funds hold \$1,433,946.99
 - Replacement Fund Assigned funds hold \$92,805.23
 - CCPD Fund Restricted funds hold \$271,885.17
 - Contingency Fund Committed funds hold \$1,130,008.57
 - Transportation Fund Assigned funds hold \$222,361.29
 - Certificates of Deposit hold \$530,216.93, 8.16% of total cash and investments

No single investment surpasses the diversification requirements of our Investment Policy and Strategy.

RESOLUTION 24-R-83

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RICHWOOD TEXAS,
ADOPTING A PROCUREMENT POLICY IN RELATION TO FEDERAL GRANTS**

WHEREAS, the City from time to time applies for Federal grant funding; and

WHEREAS, such grant applications require the City to provide their procurement policies to ensure appropriate expenditure of any funds awarded.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF RICHWOOD, TEXAS:

Section 1. That the Procurement Policy, attached hereto as “Exhibit A”, is hereby adopted as the official Procurement Policy of the City of Richwood, Texas for all Federal Grants.

Section 2. To the extent that any federal grant was applied for under a previous procurement policy of the City, that policy shall remain in effect only for the purposes of procurement under the particular grant as awarded.

Section 3. The City Council hereby adopts such policy effective immediately upon its passage.

Passed this 11th day of March, 2024.

Michael Durham, City Mayor
City of Richwood, Texas

Attest

Kirsten Garcia, City Secretary
City of Richwood, Texas



ATTACHMENT "A"

CITY OF RICHWOOD
Procurement Policies and Procedures for Federal Grants

Policies

1. Those closely involved in the establishment of the written selection criteria and selection shall have no potential conflicts of interest with any of the individuals, firms, or agencies under review (e.g., family relationships, close friendships, business dealings). Any person who might potentially receive benefits from grant-assisted activities may not participate in the decision-making process. Nepotism and conflict of interest regulations can be found in the Texas Government Code Chapter 573, Texas Local Government Code Chapter 171, and 2 CFR 200.318 – 2 CFR 200.326 and Appendix II to Part 200.
2. All procurement transactions will be conducted in a manner providing full and open competition.
 - a. No unreasonable requirements are placed on firms in order for them to qualify;
 - b. No unnecessary experience or excessive bonding required;
 - c. Noncompetitive pricing practices between firms or between affiliated companies is disallowed;
 - d. Noncompetitive contracts to consultants that are on retainer contracts;
 - e. No organizational conflicts of interest;
 - f. If a "brand name" product is specified, an equal or like product is acceptable; and
 - g. A vendor that intends to respond to the Request for Proposals, Request for Qualifications and/or Invitation for Bid may not participate in the development or drafting of specifications, requirements, statements of work, or invitations for bids or requests for proposals, including, but not limited to, the development of the scoring criteria, the final selection of firms to be contacted, or the scoring of proposals.
3. All procurement transactions shall incorporate a clear and accurate description of the technical requirements for the material, product, or service to be procured.
4. All procurement transactions shall identify all requirements which the offerors must fulfill and all other factors to be used in evaluating bids or proposals.
5. If the City of Richwood uses a prequalified list when acquiring goods or services, the City of Richwood will ensure the list is updated regularly, provides enough qualified sources to ensure maximum open and free competition.
6. All procurement transactions must conform to applicable local, state, and federal laws and regulations.
7. Small and minority businesses, women's business enterprises, and labor surplus area firms are encouraged to participate. If the awarded vendor is a prime contractor and may use subcontractors, the following affirmative steps are required of the prime contractor:
 - a. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
 - b. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;



- c. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
- d. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises;
- e. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

Procedures

Procurement Cycle Steps

Need Defined—City of Richwood Finance department submits request and specifications. Purchaser reviews request and specifications for unnecessary or duplicative items in accordance with 2 CFR 200.318 (d).

Procurement Method Selected—Based on type and estimated cost of good/service as well as purchasing authority, purchaser determines the procurement method that will result in a best value acquisition for the City of Richwood.

Contract Cost and Price - A cost or price analysis must be conducted in connection with every procurement action more than the federal Simplified Acquisition Threshold including contract modifications (2 CFR 200.323).

The simplified acquisition threshold for federal procurement actions is currently set by the Federal Acquisition Regulation at 48 CFR Subpart 2.1 (Definitions) and in accordance with 41 U.S.C. 1908 as \$50,000, but this threshold is periodically adjusted for inflation. 2 C.F.R. §200.88

The method and degree of analysis is dependent on the facts surrounding the particular procurement situation, but as a starting point, an independent estimate must be made before receiving bids or proposals. 2 C.F.R. § 200.323(a).

Cost analysis is the evaluation of the separate elements (e.g., labor, materials, etc.) that make up a contractor's total cost proposal or price (for both new contracts and modifications) to determine if they are allowable, directly related to the requirement and ultimately, reasonable.

Price analysis is essentially price comparison. It is the evaluation of a proposed price (i.e., lump sum) without analyzing any of the separate cost elements of which it is composed.

Solicitation— City of Richwood creates the appropriate solicitation document, with terms and conditions and evaluation criteria clearly defined, and notifies vendor sources for an informal or formal bid process.

Receipt of Bids and Responses to Solicitation—Vendors submit their response to the solicitation.



Evaluation and Awards— City of Richwood reviews the responses from vendors, determines compliance with the solicitation and makes an award recommendation based on the pre-defined best value criteria.

Negotiation of Profit - Federal Guidelines require negotiations of profit as a separate element of the price for each contract and modification in which there is no price competition and, in all cases, where cost analysis must be performed. 2 C.F.R. § 200.323(b)

The City of Richwood will use one of the following five methods of procurement described at 2 CFR Section 200.320: (1) procurement by micro-purchases, (2) procurement by small purchase procedures, (3) procurement by sealed bids, (4) procurement by competitive proposals, or (5) procurement by noncompetitive proposals.

1. Simplified Acquisition Procedures for Purchases Below Micro-Purchase Threshold

For purposes of this section, the micro-purchase threshold is \$3,000.

Procurement by micro-purchase is the acquisition of supplies or services, the aggregate dollar amount of which does not exceed the micro-purchase threshold (§200.67 Micro-purchase). To the extent practicable, the City of Richwood must distribute micro-purchases equitably among qualified suppliers. Micro-purchases may be awarded without soliciting competitive quotations if the non-Federal entity considers the price to be reasonable.

2. Small Purchase

Small purchase procedures are those relatively simple and informal procurement methods for securing services, supplies, or other property that cost less than the lesser of the Federal Simplified Acquisition Threshold or the \$50,000 threshold defined in state law (Local Government Code §262.003 for counties and §252.021 for municipalities. If small purchase procedures are used, price or rate quotations must be obtained from an adequate number of qualified sources.

For service contracts that are under the small purchase threshold and do not fall under professional services as defined in Section 2254.002(2) of Local Government Code, the City of Richwood may receive quotes and award the contract to any reasonable and responsible bidder. The local governing body has the final authority to award contracts.

3. Construction and Materials Contracts

In order for sealed bidding to be feasible, the following conditions should be present:

- a. A complete, adequate, and realistic specification or purchase description is available;
- b. Two or more responsible bidders are willing and able to compete effectively for the business; and
- c. The procurement lends itself to a firm fixed price contract and the selection of the successful bidder can be made principally on the basis of price.

If sealed bids are used, the following requirements apply:

- a. Bids must be solicited from an adequate number of known suppliers, providing them sufficient response time prior to the date set for opening the bids, for local, and tribal governments, the invitation for bids must be publicly advertised;

City of Richwood

TEXAS

- b. The invitation for bids, which will include any specifications and pertinent attachments, must define the items or services in order for the bidder to properly respond;
- c. All bids will be opened at the time and place prescribed in the invitation for bids, and for local and tribal governments, the bids must be opened publicly;
- d. A firm fixed price contract award will be made in writing to the lowest responsive and responsible bidder. Where specified in bidding documents, factors such as discounts, transportation cost, and life cycle costs must be considered in determining which bid is lowest. Payment discounts will only be used to determine the low bid when prior experience indicates that such discounts are usually taken advantage of; and
- e. Any or all bids may be rejected if there is a sound documented reason.

4. Professional Services Contracts

This method is generally used when conditions are not appropriate for the use of sealed bids. If this method is used, the following requirements apply:

- a. Requests for proposals must be publicized and identify all evaluation factors and their relative importance. Any response to publicized requests for proposals must be considered to the maximum extent practical;
- b. Proposals must be solicited from an adequate number of qualified sources;
- c. The City of Richwood must have a written method for conducting technical evaluations of the proposals received and for selecting recipients;
- d. Contracts must be awarded to the responsible firm whose proposal is most advantageous to the program, with price and other factors considered; and
- e. The City of Richwood may use competitive proposal procedures for qualifications-based procurement of architectural/engineering (A/E) professional services whereby competitors' qualifications are evaluated and the most qualified competitor is selected, subject to negotiation of fair and reasonable compensation. The method, where price is not used as a selection factor, can only be used in procurement of A/E professional services. It cannot be used to purchase other types of services though A/E firms are a potential source to perform the proposed effort.

5. Noncompetitive Proposals

This method may be used only when one or more of the following circumstances apply:

- a. The item is available only from a single source;
- b. The public exigency or emergency for the requirement will not permit a delay resulting from competitive solicitation;
- c. The Federal awarding agency or pass-through entity expressly authorizes noncompetitive proposals in response to a written request; or
- d. After solicitation of a number of sources, competition is determined inadequate.

These Policies and Procedures are implemented through of the City of Richwood's administrative team of:

Mayor: Michael Durham

City Manager:

Eric Foerster City

Secretary: Kirsten

Garcia Finance

Director: Patricia

Ditto

Michael Durham, Mayor

Date



CITY OF RICHWOOD

Procurement Policies and Procedures for Federal Grants

Policies

1. Those closely involved in the establishment of the written selection criteria and selection shall have no potential conflicts of interest with any of the individuals, firms, or agencies under review (e.g., family relationships, close friendships, business dealings). Any person who might potentially receive benefits from grant-assisted activities may not participate in the decision-making process. Nepotism and conflict of interest regulations can be found in the Texas Government Code Chapter 573, Texas Local Government Code Chapter 171, and 2 CFR 200.318 – 2 CFR 200.326 and Appendix II to Part 200.
2. All procurement transactions will be conducted in a manner providing full and open competition.
 - a. No unreasonable requirements are placed on firms in order for them to qualify;
 - b. No unnecessary experience or excessive bonding required;
 - c. Noncompetitive pricing practices between firms or between affiliated companies is disallowed;
 - d. Noncompetitive contracts to consultants that are on retainer contracts;
 - e. No organizational conflicts of interest;
 - f. If a “brand name” product is specified, an equal or like product is acceptable; and
 - g. A vendor that intends to respond to the Request for Proposals, Request for Qualifications and/or Invitation for Bid may not participate in the development or drafting of specifications, requirements, statements of work, or invitations for bids or requests for proposals, including, but not limited to, the development of the scoring criteria, the final selection of firms to be contacted, or the scoring of proposals.
3. All procurement transactions shall incorporate a clear and accurate description of the technical requirements for the material, product, or service to be procured.
4. All procurement transactions shall identify all requirements which the offerors must fulfill and all other factors to be used in evaluating bids or proposals.
5. If the City of Richwood uses a prequalified list when acquiring goods or services, the City of Richwood will ensure the list is updated regularly, provides enough qualified sources to ensure maximum open and free competition.
6. All procurement transactions must conform to applicable local, state, and federal laws and regulations.
7. Small and minority businesses, women's business enterprises, and labor surplus area firms are encouraged to participate. If the awarded vendor is a prime contractor and may use subcontractors, the following affirmative steps are required of the prime contractor:
 - a. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
 - b. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;



- c. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
- d. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises;
- e. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

Procedures

Procurement Cycle Steps

Need Defined—City of Richwood Finance department submits request and specifications. Purchaser reviews request and specifications for unnecessary or duplicative items in accordance with 2 CFR 200.318 (d).

Procurement Method Selected—Based on type and estimated cost of good/service as well as purchasing authority, purchaser determines the procurement method that will result in a best value acquisition for the City of Richwood.

Contract Cost and Price - A cost or price analysis must be conducted in connection with every procurement action more than the federal Simplified Acquisition Threshold including contract modifications (2 CFR 200.323).

The simplified acquisition threshold for federal procurement actions is currently set by the Federal Acquisition Regulation at 48 CFR Subpart 2.1 (Definitions) and in accordance with 41 U.S.C. 1908 as \$50,000, but this threshold is periodically adjusted for inflation. 2 C.F.R. §200.88

The method and degree of analysis is dependent on the facts surrounding the particular procurement situation, but as a starting point, an independent estimate must be made before receiving bids or proposals. 2 C.F.R. § 200.323(a).

Cost analysis is the evaluation of the separate elements (e.g., labor, materials, etc.) that make up a contractor's total cost proposal or price (for both new contracts and modifications) to determine if they are allowable, directly related to the requirement and ultimately, reasonable.

Price analysis is essentially price comparison. It is the evaluation of a proposed price (i.e., lump sum) without analyzing any of the separate cost elements of which it is composed.

Solicitation— City of Richwood creates the appropriate solicitation document, with terms and conditions and evaluation criteria clearly defined, and notifies vendor sources for an informal or formal bid process.

Receipt of Bids and Responses to Solicitation—Vendors submit their response to the solicitation.



Evaluation and Awards— City of Richwood reviews the responses from vendors, determines compliance with the solicitation and makes an award recommendation based on the pre-defined best value criteria.

Negotiation of Profit - Federal Guidelines require negotiations of profit as a separate element of the price for each contract and modification in which there is no price competition and, in all cases, where cost analysis must be performed. 2 C.F.R. § 200.323(b)

The City of Richwood will use one of the following five methods of procurement described at 2 CFR Section 200.320: (1) procurement by micro-purchases, (2) procurement by small purchase procedures, (3) procurement by sealed bids, (4) procurement by competitive proposals, or (5) procurement by noncompetitive proposals.

1. Simplified Acquisition Procedures for Purchases Below Micro-Purchase Threshold

For purposes of this section, the micro-purchase threshold is \$3,000.

Procurement by micro-purchase is the acquisition of supplies or services, the aggregate dollar amount of which does not exceed the micro-purchase threshold (§200.67 Micro-purchase). To the extent practicable, the City of Richwood must distribute micro-purchases equitably among qualified suppliers. Micro-purchases may be awarded without soliciting competitive quotations if the non-Federal entity considers the price to be reasonable.

2. Small Purchase

Small purchase procedures are those relatively simple and informal procurement methods for securing services, supplies, or other property that cost less than the lesser of the Federal Simplified Acquisition Threshold or the \$50,000 threshold defined in state law (Local Government Code §262.003 for counties and §252.021 for municipalities). If small purchase procedures are used, price or rate quotations must be obtained from an adequate number of qualified sources.

For service contracts that are under the small purchase threshold and do not fall under professional services as defined in Section 2254.002(2) of Local Government Code, the City of Richwood may receive quotes and award the contract to any reasonable and responsible bidder. The local governing body has the final authority to award contracts.

3. Construction and Materials Contracts

In order for sealed bidding to be feasible, the following conditions should be present:

- a. A complete, adequate, and realistic specification or purchase description is available;
- b. Two or more responsible bidders are willing and able to compete effectively for the business; and
- c. The procurement lends itself to a firm fixed price contract and the selection of the successful bidder can be made principally on the basis of price.

If sealed bids are used, the following requirements apply:

- a. Bids must be solicited from an adequate number of known suppliers, providing them sufficient response time prior to the date set for opening the bids, for local, and tribal governments, the invitation for bids must be publicly advertised;

City of Richwood

TEXAS

- b. The invitation for bids, which will include any specifications and pertinent attachments, must define the items or services in order for the bidder to properly respond;
- c. All bids will be opened at the time and place prescribed in the invitation for bids, and for local and tribal governments, the bids must be opened publicly;
- d. A firm fixed price contract award will be made in writing to the lowest responsive and responsible bidder. Where specified in bidding documents, factors such as discounts, transportation cost, and life cycle costs must be considered in determining which bid is lowest. Payment discounts will only be used to determine the low bid when prior experience indicates that such discounts are usually taken advantage of; and
- e. Any or all bids may be rejected if there is a sound documented reason.

4. Professional Services Contracts

This method is generally used when conditions are not appropriate for the use of sealed bids. If this method is used, the following requirements apply:

- a. Requests for proposals must be publicized and identify all evaluation factors and their relative importance. Any response to publicized requests for proposals must be considered to the maximum extent practical;
- b. Proposals must be solicited from an adequate number of qualified sources;
- c. The City of Richwood must have a written method for conducting technical evaluations of the proposals received and for selecting recipients;
- d. Contracts must be awarded to the responsible firm whose proposal is most advantageous to the program, with price and other factors considered; and
- e. The City of Richwood may use competitive proposal procedures for qualifications-based procurement of architectural/engineering (A/E) professional services whereby competitors' qualifications are evaluated and the most qualified competitor is selected, subject to negotiation of fair and reasonable compensation. The method, where price is not used as a selection factor, can only be used in procurement of A/E professional services. It cannot be used to purchase other types of services though A/E firms are a potential source to perform the proposed effort.

5. Noncompetitive Proposals

This method may be used only when one or more of the following circumstances apply:

- a. The item is available only from a single source;
- b. The public exigency or emergency for the requirement will not permit a delay resulting from competitive solicitation;
- c. The Federal awarding agency or pass-through entity expressly authorizes noncompetitive proposals in response to a written request; or
- d. After solicitation of a number of sources, competition is determined inadequate.

City of Richwood — TEXAS —

These Policies and Procedures are implemented through of the City of Richwood’s administrative team of:

Mayor: Michael Durham

City Manager: Eric Foerster

City Secretary: Kirsten Garcia

Finance Director: Patricia Ditto

Michael Durham, Mayor

Date

RESOLUTION 2023-R-84
Regarding Civil Rights
The City of Richwood, Texas

Whereas, the City of Richwood, Texas, (hereinafter referred to as “City of Richwood”) has been awarded CDBG-MIT funding through a CDBG-MIT grant from the Texas General Land Office (hereinafter referred to as “GLO”);

Whereas, the City of Richwood, in accordance with Section 109 of the Title I of the Housing and Community Development Act. (24 CFR 6); the Age Discrimination Act of 1975 (42 U.S.C. 6101-6107); and Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) and for construction contracts greater than \$10,000, must take actions to ensure that no person or group is denied benefits such as employment, training, housing, and contracts generated by the CDBG activity, on the basis of race, color, religion, sex, national origin, age, or disability;

Whereas, the City of Richwood, in consideration for the receipt and acceptance of federal funding, agrees to comply with all federal rules and regulations including those rules and regulations governing citizen participation and civil rights protections;

Whereas, the City of Richwood, in accordance with Section 3 of the Housing and Urban Development Act of 1968, as amended, and 24 CFR Part 75, is required, to the greatest extent feasible, to provide training and employment opportunities to lower income residents and contract opportunities to businesses in the Section 3 Service Area;

Whereas, the City of Richwood, in accordance with Section 104(1) of the Housing and Community Development Act, as amended, and State’s certification requirements at 24 CFR 91.325(b)(6), must adopt an excessive force policy that prohibits the use of excessive force against non-violent civil rights demonstrations;

Whereas, the City of Richwood, in accordance with Executive Order 13166, must take reasonable steps to ensure meaningful access to services in federally assisted programs and activities by persons with limited English proficiency (LEP) and must have an LEP plan in place specific to the locality and beneficiaries for each CDBG-MIT project;

Whereas, the City of Richwood, in accordance with Section 504 of the Rehabilitation Act of 1973, does not discriminate on the basis of disability and agrees to ensure that qualified individuals with disabilities have access to programs and activities that receive federal funds; and

Whereas, the City of Richwood, in accordance with Section 808(e)(5) of the Fair Housing Act (42 USC 3608(e)(5)) that requires HUD programs and activities be administered in a manner affirmatively to further the policies of the Fair Housing Act, agrees to conduct at least one activity during the contract period of the CDBG-MIT contract, to affirmatively further fair housing;

Whereas, the City of Richwood, agrees to maintain written standards of conduct covering conflicts of interest and governing the actions of its employees engaged in the selection, award and administration of contracts.

NOW, THEREFORE, BE IT RESOLVED BY THE CITYCOUNCIL OF THE CITY OF RICHWOOD, TEXAS, that:

The City of RICHWOOD REAFFIRMS The following policies:

1. Citizen Participation Plan and Grievance Procedures (Form A1013);
2. Excessive Force Policy (Form A1003);
3. Fair Housing Policy (Form A1015).
4. Section 504 Policy and Grievance Procedures (Form A1004); and
5. Code of Conduct Policy (Form A1002).

The City affirms its commitment to conduct a project-specific analysis and take all appropriate action necessary to comply with program requirements for the following:

6. Section 3 economic opportunity;
7. Limited English Proficiency; and
8. Activity to affirmatively Furth Fair Housing choice.

PASSED AND APPROVED on this 11th day of March 2024.

Michael Durham, Mayor

ATTEST:

Kirsten Garcia, City Secretary

CITIZEN PARTICIPATION PLAN

TEXAS COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM

COMPLAINT PROCEDURES

These complaint procedures comply with the requirements of the Texas Department of Agriculture's Texas Community Development Block Grant (CDBG-MIT) Program and Local Government Requirements found in 24 CFR §570.486 (Code of Federal Regulations). Citizens can obtain a copy of these procedures at the City of Richwood, 1800 Brazosport Blvd N., Richwood, Tx 77531, 979-265-2082, during regular business hours.

Below are the formal complaint and grievance procedures regarding the services provided under the CDBG-MIT project.

1. A person who has a complaint or grievance about any services or activities with respect to the CDBG-MIT project, whether it is a proposed, ongoing, or completed CDBG-MIT should contact City of Richwood, at 1800 Brazosport Blvd N., Richwood, Tx 77531 or may call, 979-265-2082.
2. A copy of the complaint or grievance shall be transmitted by the City Secretary to the entity that is the subject of the complaint or grievance and to the City Attorney within five (5) working days after the date of the complaint or grievance was received.
3. The City shall complete an investigation of the complaint or grievance, if practicable, and provide a timely written answer to the person who made the complaint or grievance within ten (10) days.
4. If the investigation cannot be completed within ten (10) working days per 3 above, the person who made the grievance or complaint shall be notified, in writing, within fifteen (15) days where practicable after receipt of the original complaint or grievance and shall detail when the investigation should be completed.
5. If necessary, the grievance and a written copy of the subsequent investigation shall be forwarded to the CDBG-MIT for their further review and comment.
6. If appropriate, provide copies of grievance procedures and responses to grievances in both English and Spanish, or other appropriate language.

TECHNICAL ASSISTANCE

When requested, the City shall provide technical assistance to groups that are representative of persons of low- and moderate-income in developing proposals for the use of CDBG-MIT funds. The City, based upon the specific needs of the community's residents at the time of the request, shall determine the level and type of assistance.

PUBLIC HEARING PROVISIONS

For each public hearing scheduled and conducted by the City, the following public hearing provisions shall be observed:

1. Public notice of all hearings must be published at least seventy-two (72) hours prior to the scheduled hearing. The public notice must be published in a local newspaper. Each public notice must include the date, time, location, and topics to be considered at the public hearing. A published newspaper article can also be used to meet this requirement so long as it meets all content and timing requirements. Notices should also be prominently posted in public buildings and distributed to local Public Housing Authorities and other interested community groups.
2. When a significant number of non-English speaking residents are a part of the potential service area of the CDBG-MIT project, vital documents such as notices should be published in the predominant language of these non-English speaking citizens.
3. Each public hearing shall be held at a time and location convenient to potential or actual beneficiaries and will include accommodation for persons with disabilities. Persons with disabilities must be able to attend the hearings and the City must make arrangements for individuals who require auxiliary aids or services if contacted at least two days prior to the hearing.
4. A public hearing held prior to the submission of a CDBG-MIT application must be held after 5:00 PM on a weekday or at a convenient time on a Saturday or Sunday.
5. When a significant number of non-English speaking residents can be reasonably expected to participate in a public hearing, an interpreter should be present to accommodate the needs of the non-English speaking residents.

The City shall comply with the following citizen participation requirements for the preparation and submission of an application for a CDBG-MIT project:

1. At a minimum, the City shall hold at least one (1) public hearing prior to submitting the application to the Texas Department of Agriculture.
2. The City shall retain documentation of the hearing notice(s), a listing of persons attending the hearing(s), minutes of the hearing(s), and any other records concerning the proposed use of funds for three (3) years from closeout of the grant to the state. Such records shall be made available to the public in accordance with Chapter 552, Texas Government Code.
3. The public hearing shall include a discussion with citizens as outlined in the applicable CDBG-MIT application manual to include, but is not limited to, the development of housing and community development needs, the amount of funding available, all eligible activities under the CDBG-MIT program, and the use of past CDBG-MIT contract funds, if applicable. Citizens, with particular emphasis on persons of low- and moderate-income who are residents of slum and blight areas, shall be encouraged to submit their views and proposals regarding community development and housing needs. Citizens shall be made aware of the location where they may submit their views and proposals should they be unable to attend the public hearing.
4. When a significant number of non-English speaking residents can be reasonably expected to participate in a public hearing, an interpreter should be present to accommodate the needs of the non-English speaking residents.

The City must comply with the following citizen participation requirements in the event that the City receives funds from the CDBG-MIT program:

1. The City shall also hold a public hearing concerning any substantial change, as determined by CDBG-MIT, proposed to be made in the use of CDBG-MIT funds from one eligible activity to another again using the preceding notice requirements.

2. Upon completion of the CDBG-MIT project, the City shall hold a public hearing and review its program performance including the actual use of the CDBG-MIT funds.
3. When a significant number of non-English speaking residents can be reasonably expected to participate in a public hearing, for either a public hearing concerning substantial change to the CDBG-MIT project or for the closeout of the CDBG-MIT project, publish notice in both English and Spanish, or other appropriate language and provide an interpreter at the hearing to accommodate the needs of the non-English speaking residents.
4. The City shall retain documentation of the CDBG-MIT project, including hearing notice(s), a listing of persons attending the hearing(s), minutes of the hearing(s), and any other records concerning the actual use of funds for a period of three (3) years from closeout of the grant to the state. Such records shall be made available to the public in accordance with Chapter 552, Texas Government Code.

Michael Durham, Mayor

Date

Excessive Force Policy

In accordance with 24 CFR 91.325(b)(6), City of Richwood hereby adopts and will enforce the following policy with respect to the use of excessive force:

1. It is the policy of City of Richwood to prohibit the use of excessive force by the law enforcement agencies within its jurisdiction against any individual engaged in non-violent civil rights demonstrations;
2. It is also the policy of City of Richwood to enforce applicable State and local laws against physically barring entrance to or exit from a facility or location that is the subject of such non-violent civil rights demonstrations within its jurisdiction.
3. City of Richwood will introduce and pass a resolution adopting this policy.

As officers and representatives of City of Richwood, we the undersigned have read and fully agree to this plan, and become a party to the full implementation of this program.

Michael Durham, Mayor

Date

Fair Housing Policy

In accordance with Fair Housing Act, the City of Richwood hereby adopts the following policy with respect to the Affirmatively Furthering Fair Housing:

1. City of Richwood agrees to affirmatively further fair housing choice for all seven protected classes (race, color, religion, sex, disability, familial status, and national origin).
2. City of Richwood agrees to plan at least one activity during the contract term to affirmatively further fair housing.
3. City of Richwood will introduce and pass a resolution adopting this policy.

As officers and representatives of the City of Richwood, we the undersigned have read and fully agree to this plan, and become a party to the full implementation of this program.

Michael Durham, Mayor

Date

**Section 504 Policy Against Discrimination
based on Handicap and Grievance Procedures**

In accordance with 24 CFR Section 8, Nondiscrimination based on Handicap in federally assisted programs and activities of the Department of Housing and Urban Development, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Section 109 of the Housing and Community Development Act of 1974, as amended (42 U.S.C. 5309), City of Richwood hereby adopts the following policy and grievance procedures:

1. Discrimination prohibited. No otherwise qualified individual with handicaps in the United States shall, solely by reason of his or her handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance from the Department of Housing and Urban Development (HUD).
2. The City of Richwood does not discriminate on the basis of handicap in admission or access to, or treatment or employment in, its federally assisted programs and activities.
3. The City of Richwood recruitment materials or publications shall include a statement of this policy in 1. above.
4. The City of Richwood shall take continuing steps to notify participants, beneficiaries, applicants and employees, including those with impaired vision or hearing, and unions or professional organizations holding collective bargaining or professional agreements with the recipients that it does not discriminate on the basis of handicap in violation of 24 CFR Part 8.
5. For hearing and visually impaired individuals eligible to be served or likely to be affected by the CDBG-MIT program, City of Richwood shall ensure that they are provided with the information necessary to understand and participate in the CDBG-MIT program.
6. Grievances and Complaints
 - A. Any person who believes she or he has been subjected to discrimination on the basis of disability may file a grievance under this procedure. It is against the law for City of Richwood to retaliate against anyone who files a grievance or cooperates in the investigation of a grievance.
 - B. Complaints should be addressed to: City Secretary, 1800 Brazosport Blvd N., Richwood, Tx 77531, 979-265-2082, who has been designated to coordinate Section 504 compliance efforts
 - C. A complaint should be filed in writing or verbally, contain the name and address of the person filing it, and briefly describe the alleged violation of the regulations.
 - D. A complaint should be filed within thirty (30) working days after the complainant becomes aware of the alleged violation.
 - E. An investigation, as may be appropriate, shall follow a filing of a complaint. The investigation will be conducted by City Secretary. Informal but thorough investigations will afford all interested persons and their representatives, if any, an opportunity to submit evidence relevant to a complaint.
 - F. A written determination as to the validity of the complaint and description of resolution, if any, shall be issued by City Secretary, and a copy forwarded to the complainant with fifteen (15) working days after the filing of the complaint where practicable.
 - G. The Section 504 coordinator shall maintain the files and records of the City of Richwood relating to the complaints files.

- H. The complainant can request a reconsideration of the case in instances where he or she is dissatisfied with the determination/resolution as described in f. above. The request for reconsideration should be made to the City of Richwood within ten working days after the receipt of the written determination/resolution.
- I. The right of a person to a prompt and equitable resolution of the complaint filed hereunder shall not be impaired by the person's pursuit of other remedies such as the filing of a Section 504 complaint with the U.S. Department of Housing and Urban Development. Utilization of this grievance procedure is not a prerequisite to the pursuit of other remedies.
- J. These procedures shall be construed to protect the substantive rights of interested persons, to meet appropriate due process standards and assure that the City of Richwood complies with Section 504 and HUD regulations.

Michael Durham, Mayor

Date

CODE OF CONDUCT
CONFLICT OF INTEREST POLICY PERTAINING TO PROCUREMENT PROCEDURES

As a Grant Recipient of a CDBG-MIT contract, the City of Richwood shall avoid, neutralize or mitigate actual or potential conflicts of interest so as to prevent an unfair competitive advantage or the existence of conflicting roles that might impair the performance of the CDBG-MIT contract or impact the integrity of the procurement process.

For procurement of goods and services, no employee, officer, or agent of the City of Richwood shall participate in the selection, award, or administration of a contract supported by CDBG-MIT funds if he or she has a real or apparent conflict of interest. Such a conflict could arise if the employee, officer or agent; any member of his/her immediate family; his/her partner; or an organization which employs or is about to employ any of the parties indicated herein, has a financial or other interest in or a tangible personal benefit from a firm considered for a contract.

No officer, employee, or agent of the City of Richwood shall solicit or accept gratuities, favors or anything of monetary value from contractors or firms, potential contractors or firms, or parties to sub-agreements, except where the financial interest is not substantial or the gift is an unsolicited item of nominal intrinsic value.

Contractors that develop or draft specifications, requirements, statements of work, or invitations for bids or requests for proposals must be excluded from competing for such procurements.

For all other cases, no employee, agent, consultant, officer, or elected or appointed official of the state, or of a unit of general local government, or of any designated public agencies, or subrecipients which are receiving CDBG-MIT funds, that has any grant-related function/responsibility, or is in a position to participate in a decision-making process or gain inside information, may obtain a financial interest or benefit from the federal or state grant activity.

The conflict of interest restrictions and procurement requirements identified herein shall apply to a benefitting business, utility provider, or other third party entity that me or all work under a CDBG-MIT contract in order to meet any National Program Objectives.

Any person or entity including any benefitting business, utility provider, or other third party entity that is receiving assistance, directly or indirectly, under a CDBG-MIT contract or award, or that is required to complete some or all work under the CDBG-MIT contract in order to meet a National Program Objective, that might potentially receive benefits from CDBG-MIT awards may not participate in the selection, award, or administration of a contract supported by CDBG funding.

Any alleged violations of these standards of conduct shall be referred to the City of Richwood's Attorney. Where violations appear to have occurred, the offending employee, officer or agent shall be subject to disciplinary action, including but not limited to dismissal or transfer; where violations or infractions appear to be substantial in nature, the matter may be referred to the appropriate officials for criminal investigation and possible prosecution.

Michael Durham, Mayor
City of Richwood

Date



AGENDA MEMORANDUM

CONTACT: ERIC FOERSTER- CITY MANAGER

SUBJECT: ADOPTION OF THE 2024 BRAZORIA COUNTY HAZARD MITIGATION PLAN

SUMMARY: This mitigation plan minimizes the impact of disasters by identifying risks and developing long-term strategies. By sharing information with Brazoria County, the City of Richwood is included in the Brazoria County Plan.

BACKGROUND INFORMATION: This is an updated plan compared to our last, which was adopted in 2018.

Hazard mitigation planning reduces loss of life and property by minimizing the impact of disasters. It begins with state, tribal and local governments identifying natural disaster risks and vulnerabilities that are common in their area. After identifying these risks, they develop long-term strategies for protecting people and property from similar events. Mitigation plans are key to breaking the cycle of disaster damage and reconstruction.

ISSUE: Disaster Planning

FISCAL IMPACT: None at this time

RECOMMENDATION: Staff Recommends the approval of this resolution.

RESOLUTION 24-R-85

**A RESOLUTION ADOPTING THE REGIONAL HAZARD
MITIGATION PLAN – 2024 UPDATE FOR BRAZORIA
COUNTY**

WHEREAS the City of Richwood recognizes the threat that natural hazards pose to people and property within its jurisdiction; and

WHEREAS the City of Richwood has prepared a multi-hazard mitigation plan, hereby known as (title and date of mitigation plan) in accordance with federal laws, including the [Robert T. Stafford Disaster Relief and Emergency Assistance Act](#), as amended; the [National Flood Insurance Act of 1968](#), as amended; and the [National Dam Safety Program Act](#), as amended; and

WHEREAS the 2024 Regional Hazard Mitigation Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in its jurisdiction from the impacts of future hazards and disasters; and

WHEREAS adoption by the City of Richwood demonstrates its commitment to hazard mitigation and achieving the goals outlined in the 2024 Regional Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED THAT THIS CITY COUNCIL HEREBY:

In accordance with the City of Richwood charter, the City of Richwood adopts the 2024 Regional Hazard Mitigation Plan. While content related to the City of Richwood may require revisions to meet the plan approval requirements, changes occurring after adoption will not require the City of Richwood to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

PASSED AND APPROVED on this 11th day of March 2024.

Michael Durham, Mayor

ATTEST:

Kirsten Garcia, City Secretary

Brazoria County Hazard Mitigation Plan

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Appendices

Appendix A – Planning Process

Appendix B – Critical & Valuable Assets

Appendix C – HAZUS Report

Appendix D - Repetitive Loss Properties

Appendix E – Future Mitigation Additions

Acronym List

| | |
|---------------|---|
| RHMP | Regional Hazard Mitigation Plan |
| HMAP | Hazard Mitigation Plan |
| H-GAC | Houston-Galveston Area Council |
| FEMA | Federal Emergency Management Agency |
| TDEM | Texas Division of Emergency Management |
| TX | Texas |
| CRS | Community Rating System |
| NFIP | National Flood Insurance Program |
| HGMP | Hazard Mitigation Grant Program |
| CHARM | Community Health and Resource Management |
| mph | miles per hour |
| NOAA | National Oceanic and Atmospheric Administration |
| NSSL | National Severe Storm Laboratory |
| OEM | Office of Emergency Management |
| ArcGIS | Geographic Information System |
| RL | repetitive loss |
| KBDI | Keetch-Byram Drought Index |
| WUI | Wildland Urban Interface |
| FM | Farm to Market road |
| PHDI | Palmers Hydrological Severity Index |
| USDA | United States Department of Agriculture |
| LAL | Lightning Activity Levels |
| NCDC | National Climate Data Center |
| CDC | Centers for Disease Control and Prevention |
| NCEI | National Centers for Environmental Information |
| SPIA | Sperry-Piltz Ice Accumulation |
| NWS | National Weather Service |
| LEP | Linear Extensibility Percent |
| COLE | Coefficient of Linear Extent |
| PMT | Plan Maintenance Team |

Part 1: INTRODUCTION

Brazoria County’s previous Hazard Mitigation Plan was adopted in 2006 and updated in 2011 as part of a seven-county Regional Hazard Mitigation Plan (RHMP). Due to new regulation and planning recommendations, Brazoria County prepared a new countywide multi-jurisdictional Hazard Mitigation Plan (HMAP). Brazoria County partnered with the Houston- Galveston Area Council (H-GAC) for both the 2006 and 2011 plans and continued this partnership during the development and adoption of the HMAP.



Image source: <https://www.wikipedia.org/>

History

On April 28, 2006, the Federal Emergency Management Agency (FEMA) and the Texas Division of Emergency Management (TDEM) approved the first RHMP. H-GAC prepared the regional plan in coordination with FEMA and TDEM to ensure it met all applicable state and federal requirements. H-GAC updated the RHMP in 2011 to re-assess vulnerabilities and increase the number and diversity of mitigation action items. The plan includes a more robust assessment of natural hazards, newly uncovered vulnerabilities, more advanced analysis techniques, and a more effective and informed mitigation strategy. In 2018, Brazoria County and H-GAC developed a county HMAP and included a fresh look at specific county hazards and new mitigation efforts to address this in Brazoria County.

Purpose of Plan

The purpose of Brazoria County’s HMAP is to reduce the loss of life and property within the county and lessen the negative impacts of natural disasters. Vulnerability to several natural hazards has been identified through research, analysis, and public input. These hazards threaten the safety of residents and have the potential to damage or destroy both public and private property, disrupt the local economy, and impact the overall quality of life of individuals who live, work, and play in the county. While natural hazards cannot be eliminated, the effective reduction of a hazard’s impact can be accomplished through thoughtful planning and action.

The concept and practice of reducing risks to people and property from known hazards is generally referred to as hazard mitigation. One of the most effective tools a community can use to reduce hazard vulnerability is developing, adopting, and updating a hazard mitigation plan as needed. A hazard mitigation plan establishes the broad community vision and guiding principles for reducing hazard risk, including the development of specific mitigation actions designed to eliminate or reduce identified vulnerabilities.

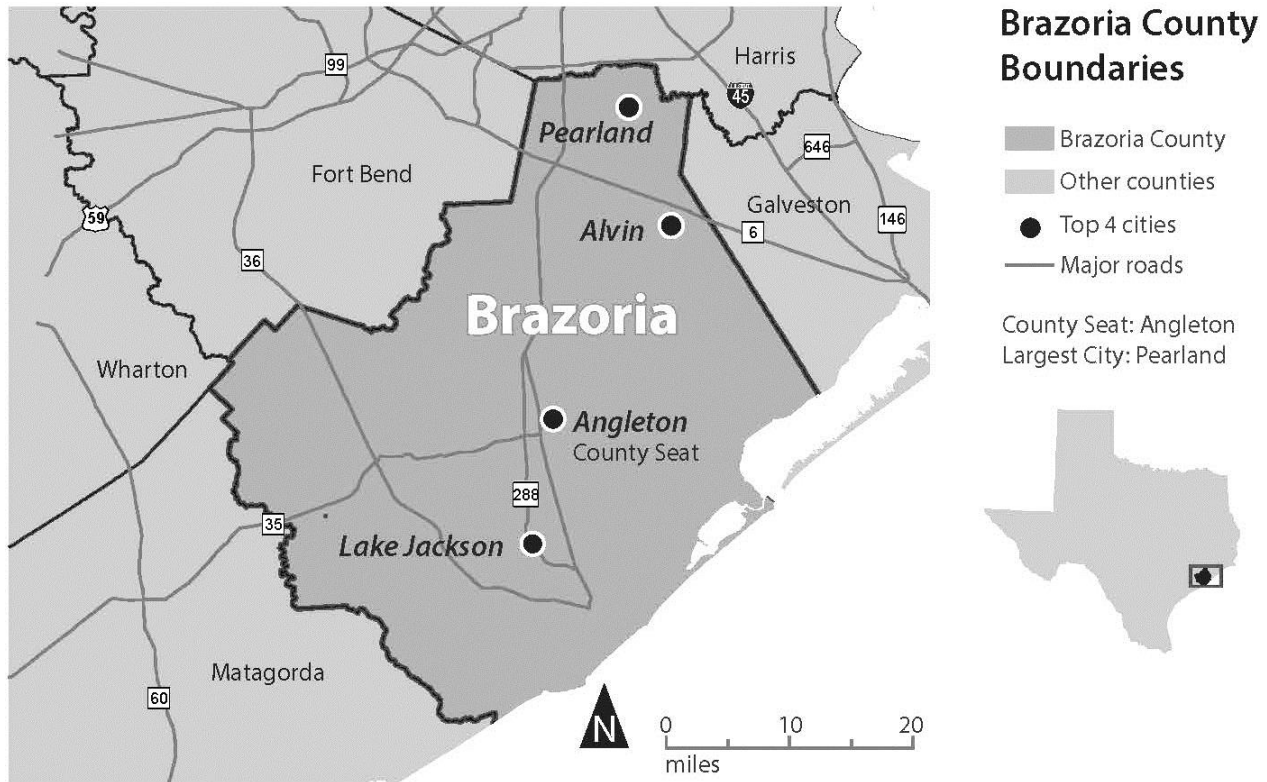
Scope of Plan

Brazoria County is in the east-central region of Texas along the coast, and scope of the HMAP includes the following participating jurisdictions:

- Brazoria County
- Brazosport ISD
- Sweeny ISD
- Baileys Prairie
- Bonney
- Brazoria
- Brookside Village
- Clute
- Danbury
- Iowa Colony
- Hillcrest Village
- Holiday Lakes
- Jones Creek
- Lake Jackson

- Liverpool
- Manvel
- Oyster Creek
- Quintana
- Richwood
- Surfside Village
- Sweeny
- Damon ISD
- West Columbia
- Brazosport College
- Drainage District 11
- Velasco Drainage District
- Freeport
- Port Freeport
- Alvin ISD
- Danbury ISD

Planning Area Map



The plan, developed in accordance with state and federal rules and regulations governing local hazard mitigation plans, was adopted by the participating jurisdictions and shall be routinely monitored and revised to maintain compliance with all state and federal regulations. All Climate change factors will be considered in this plan relating to future mitigation projects and increased hazard potential. Increased awareness and focus in vulnerable areas, at-risk populations and underserved communities are forefront in plan development with equitable and impartial treatment of all individuals in the entire community. No new hazards were observed in climate changes to alter the current mitigation strategies developed in this plan.

The HMAP profiles the following hazards:

- Flooding
- Hurricanes and Tropical Storms
- Wildfire
- Drought
- Lightning
- Heat
- Hail
- Winter Weather
- Tornado
- Dam/Levee Failure
- Coastal Erosion
- Expansive Soils

Presidential Declared Disasters

Brazoria County has persevered through many natural disasters. The table below lists the presidential declared disasters that the County has experienced since 1973. Each disaster is costly and challenging. The goal of this HMAP is mitigation and reduce the impact of future disasters.

| Year | Declaration Type | Title |
|-------------|----------------------------|----------------|
| 1973 | Major Disaster Declaration | Flood |
| 1979 | Major Disaster Declaration | Flood |
| 1979 | Major Disaster Declaration | Flood |
| 1983 | Major Disaster Declaration | Hurricane |
| 1991 | Major Disaster Declaration | Severe Storm |
| 1991 | Major Disaster Declaration | Flood |
| 1994 | Major Disaster Declaration | Flood |
| 1998 | Major Disaster Declaration | Severe Storm |
| 1998 | Major Disaster Declaration | Severe Storm |
| 1998 | Major Disaster Declaration | Flood |
| 1999 | Emergency Declaration | Fire |
| 2001 | Major Disaster Declaration | Coastal Storm |
| 2002 | Major Disaster Declaration | Coastal Storm |
| 2002 | Major Disaster Declaration | Severe Storm |
| 2003 | Major Disaster Declaration | Hurricane |
| 2005 | Major Disaster Declaration | Hurricane |
| 2005 | Emergency Declaration | Hurricane |
| 2005 | Emergency Declaration | Hurricane |
| 2006 | Major Disaster Declaration | Fire |
| 2007 | Emergency Declaration | Hurricane |
| 2008 | Major Disaster Declaration | Hurricane |
| 2008 | Emergency Declaration | Hurricane |
| 2008 | Emergency Declaration | Hurricane |
| 2015 | Major Disaster Declaration | Severe Storm |
| 2015 | Major Disaster Declaration | Severe Storm |
| 2016 | Major Disaster Declaration | Flood |
| 2017 | Major Disaster Declaration | Hurricane |
| 2020 | Emergency Declaration | Tropical Storm |
| 2021 | Emergency Declaration | Winter Storm |
| 2021 | Major Disaster Declaration | Winter Storm |

Source: Presidential Declared Disasters List (1950-2023), FEMA

Part 2: Planning Process

Part 2: PLANNING PROCESS

This section includes a description of the process used by Brazoria County and participating jurisdictions to develop the 2023 HMAP.

Overview

Hazard mitigation planning can be described as the means to break the repetitive cycle of disaster loss. A core assumption of hazard mitigation is that pre-disaster investments will significantly reduce the demand for post-disaster assistance by alleviating the need for emergency response, repair, recovery, and reconstruction. All Climate change factors will be considered in this plan relating to future mitigation projects and increased hazard potential. Increased awareness and focus in vulnerable areas, at-risk populations and underserved communities are forefront in plan development with equitable and impartial treatment of all individuals in the entire community. No new hazards were observed in climate changes to alter the current mitigation strategies developed in this plan.

Hazard mitigation planning is the process of identifying natural hazards, understanding community capabilities and resources, identifying and assessing hazard vulnerability and risk, and determining how to minimize or manage those risks. Brazoria County approached the hazard mitigation planning process by establishing a Planning Team. The next step of the planning process was the assessment of hazards and how they can impact specific assets. H-GAC conducted a hazard analysis in 2017 and the county, with updated information, presented this at the kick-off meeting and Planning Team on November 9, 2022.

After hazard identification and analysis, communities considered their vulnerability to the identified threats. Crucial input from the participating jurisdictions and members of the public helped inform a vulnerability and risk assessment for the entire county. This information gathered from meetings with the Planning Team, online participation and input from the participating jurisdictions, and natural hazard modeling techniques was used to produce a comprehensive vulnerability assessment.

The planning process culminated in a Mitigation Strategy, i.e. identification of specific mitigation actions, which when viewed, represents a comprehensive strategy to reduce the impact of hazards. The Planning Team then began the process of developing an overarching Mitigation Strategy, and a long-term approach to update and maintain the HMAP. Specific mitigation actions are identified in this plan and included in the Appendix E. Responsibility for each mitigation action is assigned to a specific individual, department or agency along with a schedule for its implementation. Plan maintenance procedures (Part 8 of this plan) establish procedures to monitor progress, including the regular evaluation and enhancement of the Plan. Multijurisdictional coordination and integration of the HMAP into local planning mechanisms was also addressed. The established maintenance procedures ensure that the plan remains a dynamic and functional document over time.

Plan Development Resources

The Brazoria County HMAP was developed using existing plans, studies, reports, and technical information. Materials and historic data were used to inform participants throughout the planning process, evaluate and analyze hazards, and develop the mitigation strategy.

| Plan Development Resources: Existing Documents and Data | |
|---|---|
| FEMA Disaster Declarations | FEMA Flood Map Services |
| H-GAC Land Use & Demography Database | Houston-Galveston Area Regional Plan |
| 2011 Regional Hazard Mitigation Plan | NOAA Storm Event Database |
| State of Texas Hazard Mitigation Plan | Texas A&M Forest Service Wildfire Reports |
| US Census American Fact Finder | USDA Census of Agriculture Reports |
| USGS Homeland Infrastructure Foundation-Level Data | Brazoria County Disaster Recovery Plan |
| Brazoria County Emergency Operations Plan | 2017 Brazoria County Hazard Mitigation Plan |

Planning Team

Brazoria County and participating jurisdictions established the Planning Team in Fall 2022 in preparation for the first meeting and hazard mitigation planning workshop held on October 19-20, 2022. Members were asked to attend all meetings in person but were provided an online alternative if they were unable to do so. Online materials, surveys, forms, and documentation are provided in Appendix A. Representatives from the County Office of Emergency Management served as liaisons between stakeholders, staff, and members of the public who were unable to attend the meetings, the County’s Office of Emergency Management sent out a series of emails to the planning team to invite them to the meeting and to participate in the online forums. In addition to the list below a TDEM Chief and TDEM Hazard Mitigation Planner/Supervisor were part of the workshop and advised the team.

| Jurisdiction | Title | Contact Method |
|---------------------------|---|----------------|
| Velasco Drainage District | Superintendent | Email |
| Freeport | Fire Chief / EMC | Email |
| Port Freeport | Director of Protective Services | Email |
| Sweeny | City Manager | Email |
| Bailey's Prairie | Mayor | Email |
| Angleton | Emergency Management Coordinator | Email |
| Drainage District 11 | Superintendent | Email |
| Lake Jackson | City Manager | Email |
| Iowa Colony | Mayor | Email |
| Brazoria | City Manager | Email |
| Holiday Lakes | Mayor | Email |
| Surfside Beach | City Secretary | Email |
| Liverpool | Mayor | Email |
| Alvin ISD | Superintendent | Email |
| West Columbia | City Manager | Email |
| Brazoria County | Deputy Emergency Management Coordinator | Email |
| Clute | Fire Marshal / EMC | Email |
| Richwood | City Manager & Chief of Police | Email |
| Hillcrest Village | Mayor | Email |
| Danbury | Mayor | Email |
| Bonney | Mayor | Email |
| Brookside Village | Mayor | Email |
| Oyster Creek | Mayor | Email |
| Quintana | Mayor | Email |
| Jones Creek | Mayor | Email |
| Manvel | Mayor | Email |
| Brazosport ISD | Superintendent | Email |
| Brazosport College | Emergency Management Coordinator | Email |
| Alvin ISD | Director Safety and Security | Email |

Stakeholders

There were a variety of stakeholders throughout the community and neighboring jurisdictions that were a part of the planning process; these stakeholders either attended meetings, contacted the planning team with their input or both. The chart below shows these stakeholders and their titles. Their input was utilized throughout the plan and specifically in the Hazard Analysis and Mitigation Strategy sections of this plan.

| National, Regional, and Local Agencies | | |
|---|---|-------------------------------|
| Stakeholder | Title | Contact Method |
| Texas A&M AgriLife | Extension Program Specialist | Email/ Hosted CHARM Meeting |
| The Trust for Public Land | Senior Vice President and Director of Conservation Strategies | Email/ Phone |
| U.S Army Corps of Engineers | Civil Engineer & Flood Risk Manager | Email/ Attended CHARM Meeting |
| Neighboring Communities and Regulatory Authorities | | |
| Stakeholder | Title | Contact Method |
| TDEM | County Engineer | Email/ Attended CHARM Meeting |
| Brazoria Drainage District #4 | District Engineer | Email/ Attended CHARM Meeting |
| Chambers County | Emergency Management Coordinator | Email/ Phone Call |

Meeting Dates & Details

November 9, 2022: Hazard Mitigation Kick-off Meeting

Brazoria County and the Planning Team hosted a Kick-off meeting at new Brazoria County Emergency Operations Center 520 North Front Street Angleton, TX 77515 on November 9, 2022. The purpose of the meeting was for Brazoria County and participating jurisdictions to gather feedback and input on the draft Hazard Analysis and discuss local vulnerabilities. The Planning Team and local jurisdictions were given a presentation and provided large maps displaying the analysis of various hazards. Participants worked with the planning team to improve the accuracy of the analysis and pinpoint the vulnerabilities of each hazard within their communities. Meeting participants also discussed their current ability to mitigate these threats and how to draft a mitigation action to address them. Prior to the meeting, community members and jurisdiction stakeholders were invited. Past meetings and information from the initial HMAP are documented and information was also gleaned from the 2017 HMAP. Public involvement data was used to update the new plan and process. Past actions used for gathering the public’s information online, web based, press releases, public service announcements, and other advertisements in newspapers and on the radio. See Appendix A for meetings agenda, attendees list, and press releases.

October 19-20, 2022: Hazard Mitigation Workshop (G-318)

Brazoria County hosted a Planning Team workshop at the Lake Jackson Civic Center for local jurisdiction officials and staff on October 19-20, 2022. The purpose of this workshop was to develop a framework to begin the updating of our HMAP and mitigation strategy. TDEM staff presented the materials and helped formulate a procedure with steps to update our existing plan. Presentations and examples were offered on appropriate topics and workgroup discussions occurred about strategy development. Planning Team members outlined a Mitigation Strategy and refined their mitigation actions. See Appendix A for the workshop information, agenda and sign-in sheet.

October 27, 2022: Community Health and Resource Management (CHARM) Workshop

The County and City of West Columbia had the opportunity to partner with Texas A&M's AgriLife and US Army Corps of Engineers to host a workshop for all jurisdictions in the county (<https://tcwp.tamu.edu/charm/>); members of the planning team attended. The workshop utilized GIS to explore current conditions including data such as 100 year-floodplain overlays and social vulnerability throughout the area. After current conditions were presented, the workshop participants discussed what they wanted future land use to look like given the current conditions.

Ongoing 2022-2023: Request for Public Comment

Brazoria County hosted a draft of the HMAP on its website, and provided an online method for the public to submit comments and feedback on the draft. The comments and feedback will be discussed at planning meetings when the plan is up for adoption. The jurisdictions' HMAP adoption meeting dates and public comments were also provided on the same webpage. Press releases were then sent to all local media outlets to notify the public of the opportunity to comment online or by phone at each jurisdiction. Each jurisdiction also notified the public as described in Part 8 of this plan.

February 2, 2023: Public Open House for The Freeport Project – Lake Jackson Civic Center

The Freeport Project, a component of the Sabine Pass to Galveston Bay Program (S2G Program), hosted a public open house on February 2, 2023, to provide the public with information about project progress. The Freeport Project is one of three mitigation projects included in the S2G Program and focuses on improvements to the existing hurricane flood protection system in the Freeport area. These improvements will reduce the risk of flooding from coastal storm surge, while not inducing adverse impacts to area residents and businesses within the Freeport area. The Freeport Project is a partnership of the U.S. Army Corps of Engineers (USACE) and its non-Federal sponsor, the Velasco Drainage District.

Plan Adoption - 2023

To be completed after Plan Adoption.

The participation of small school districts (Danbury ISD, Sweeny ISD and Damon ISD) was through conversations at meetings, email question & answer correspondence. These school districts are small and under resourced and represent underserved communities and vulnerable populations. Their participation in planning helped develop strategies with emphasis on their respective populations. This correspondence and planning involved each school superintendent and mayor of these three smaller school districts.

Non-profit participation and representation in our planning process, at planning meetings and through email correspondence, provided valuable information to help formulate strategies to included insight into the vulnerable populations they serve.

The United Way of Brazoria County liaison, Women's Center Director, Action's Inc. Executive Director, Brazosport CARE Director and the Gulf Coast Transit Manager all worked with the planning team and gave meaningful guidance/insight to help form strategies that would impact the populations they serve in a positive way. These non-profit organizations worked with their respective populations and community leaders to gain awareness into what mitigation strategies would benefit them.

Participation invitations and continued interaction with vulnerable populations will be done through our non-profit organizations.

Participation & Public Input

Public input and participation are crucial elements of hazard mitigation planning. Feedback and input from the November 2022 Hazard Mitigation Kick-off meeting, surveys and other meetings were used to identify vulnerabilities in each jurisdiction, identify valuable assets, and develop the risk assessment. Covid 19 has altered the way Brazoria County gathered public input and the “in-person” meetings have not been recommended. We have incorporated a county-wide method of obtaining public opinion through surveys, email and social media outlets. Online surveys, resources, a mitigation action survey with a place to submit comments on the draft plan were made public on Brazoria County’s website and social media accounts with links to participating jurisdictions’ websites. (see Appendix A). Examples of online participation include submitting mitigation actions, completing the hazard mitigation survey, and conversations over email. The Brazoria County Office of Emergency Management also distributed hardcopies of the surveys at various public locations and to each participating jurisdiction. These jurisdictions then had the option to either mail in the survey responses or hand deliver them to Brazoria County. The data from returned surveys was used to develop the risk assessment and identify vulnerabilities.

The chart below demonstrates the method and type of participation by each jurisdiction.

| Jurisdiction | Representative attended Hazard Mitigation Meeting(s) | Participated in Mitigation Strategy Development | Online Participation |
|---------------------------|--|---|----------------------|
| Brazoria County | x | x | x |
| Pearland | x | x | x |
| Brazosport College | x | x | x |
| Bailey’s Prairie | x | x | x |
| Bonney | | | x |
| Brazoria | x | x | x |
| Brookside Village | x | x | x |
| Clute | x | x | x |
| Danbury | x | x | x |
| Iowa Colony | x | x | x |
| Hillcrest Village | x | x | x |
| Holiday Lakes | x | x | x |
| Jones Creek | x | | x |
| Lake Jackson | x | x | x |
| Liverpool | | | x |
| Manvel | x | x | x |
| Oyster Creek | | | x |
| Quintana | | | x |
| Richwood | x | x | x |
| Surfside Beach | | x | x |
| Sweeny | | x | x |
| West Columbia | x | x | x |
| Brazosport ISD | x | x | x |
| Velasco Drainage District | x | x | x |
| Port of Freeport | x | x | x |
| Drainage District 11 | x | x | x |
| Freeport | x | x | x |
| Alvin ISD | | x | X |

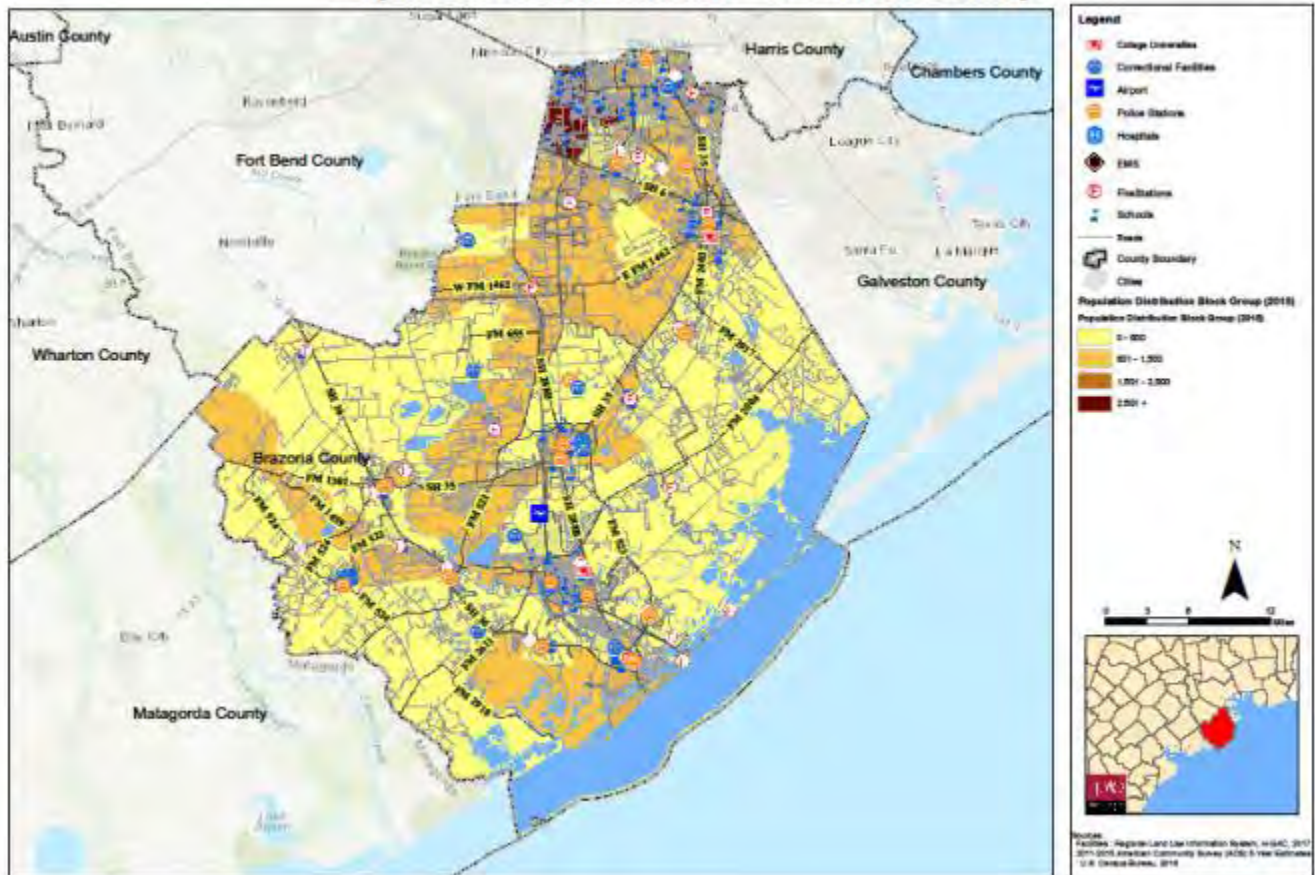
Part 3: County Profile

Part 3: COUNTY PROFILE

Brazoria County is a coastal county located south of Houston, west of Galveston County. The southern portion of the county is home to coastal marshes, the Brazoria National Wildlife Refuge and the San Bernard National Wildlife Refuge. The Brazos River cuts through the western half of the county before it enters the Gulf of Mexico at the Port of Freeport. State Highway 6 runs east-west through the northern end of Brazoria County with State Highways 35, 36, and 288 sweeping generally north-south.

The 2020 census showed Brazoria County is home to 372,031 residents. The current population is closer to 390,000 and is forecast to grow rapidly, reaching 574,000 by 2040. The county is home to eight cities boasting more than 8,000 residents: Pearland (125,828), Lake Jackson (28,177), Alvin (27,098), Angleton (19,429), Freeport (10,696), Clute (10,604), Manvel (9,992) and Iowa Colony (8,154).

Population Distribution : Brazoria County

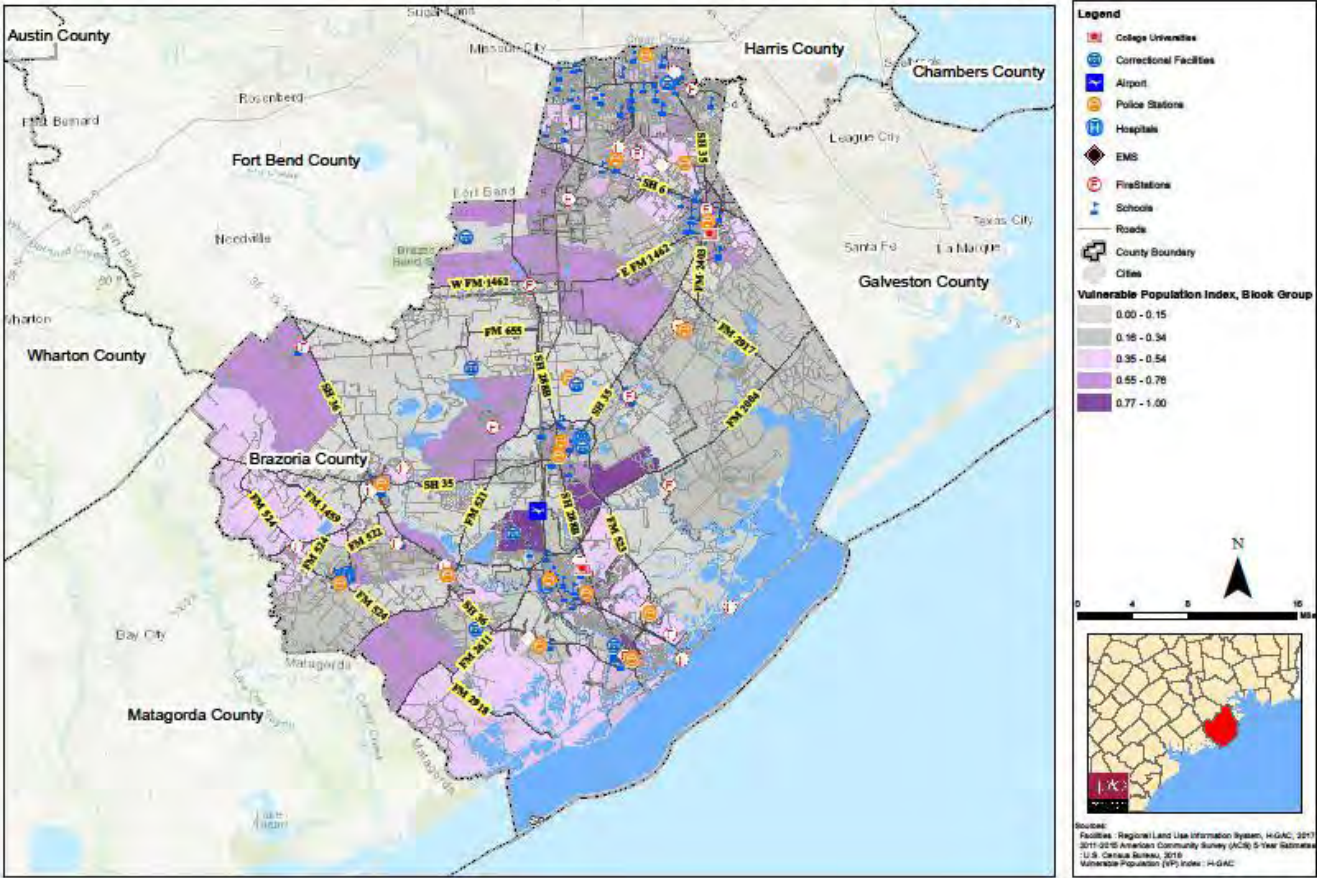


The county's robust economy is geographically divided between agriculture in the western portion of the county, petrochemical production in the Brazosport area in the southern portion of the county; public services and banking in the mid-county/Angleton area; and burgeoning residential construction, retail, and medical services sectors in the suburban northern portion of the county, including Pearland, part of the Houston metropolitan area. The deep-water Port of Freeport is undergoing an expansion and will be the only terminal capable of receiving Panamax ships on the Texas Coast (Panamax ships are the largest sized ships that are able to pass through the Panama Canal). Agriculture, particularly rice and cattle production have a significant history in the county; this sector continues to be a foundation in the county contributing over 1 billion dollars to the local economy annually. The Port of Freeport also supports 37,200 jobs within Brazoria County and 12,000 direct jobs.

Brazoria County's median household income is one of the largest in the region* at \$87,958. The county also has a high rate of homeownership (73.6%) and a median home value of \$225,200. Residents of the county spend approximately 54% of their income on costs related to housing and transportation.

Although Brazoria County is largely residential (the majority of Brazoria County residents work in neighboring Harris County), Brazoria County's economy has grown in pace with its residential development.^[iv] Business services are the largest employment cluster, with approximately 18,000 employees. Many of these jobs are related to the support activities for oil and gas operations.^[v] Retail, healthcare, distribution, and manufacturing are important private sector employers. Retail trade comprised 12 percent of employment in 2014, and retail sales totaled \$6.3 billion in 2012.^[vi] Several major national retailers have distribution centers in Brazoria County. Healthcare is a growing sector of the economy as many of the institutions based in the Texas Medical Center have opened or are planning to open hospitals in the county. The county has one of the highest median home values in the region at \$225,200 and over 40% of its housing units have been built since 2000.

Vulnerable Population Map : Brazoria County



The Vulnerable Population Index identifies areas throughout Brazoria County that may not have the means or the resources to act when a natural disaster occurs in Brazoria County. For the purposes of this plan, vulnerable populations include any households without a car, single female household with child/children in the home, individuals living below the poverty line, individuals who are disabled, individuals who are Hispanic, individuals who are non-Hispanic, and non-white, and individuals 65 years and older. The areas in the county with the greatest proportion of these individuals is defined as the most vulnerable areas in Brazoria County. On the map, the areas that are deep purple (or black if printed in black and white) are where the greatest proportion of the vulnerable population is located in Brazoria County. Cities that have the largest proportion of the vulnerable population in

Brazoria County include Angleton, West Columbia, and Bailey's Prairie. Defining and mapping vulnerable populations provides the opportunity to demonstrate where perhaps the most need is throughout Brazoria County.

*The region includes Austin, Brazoria, Chambers, Colorado, Fort Bend, Galveston, Harris, Liberty, Matagorda, Montgomery, Walker, Waller and Wharton counties.

[\[i\] Houston-Galveston Area Council](#)

[\[ii\] U.S. Census Bureau](#)

[\[iii\] Texas Association of Counties](#)

[\[iv\] U.S. Census Bureau](#)

[\[v\] U.S. Cluster Mapping](#)

[\[vi\] U.S. Census](#)

[\[vii\] DATA USA, Workforce Solutions](#)

[\[viii\] USDA Census of Agriculture](#)

[\[ix\] Community Impact Newspaper](#)

[\[x\] National Weather Service](#)

[\[xi\] Workforce Solutions](#)

[\[xii\] Federal Reserve Bank of Saint Louis](#)

The changes and increases in population do not currently show any impacts of hazards listed in the plan.

Brazoria County has seen significant growth in population since the last plan update. This growth has had no change in vulnerability in the planning area. This increase in population has been factored into the current planning and mitigation strategies.

Part 4: Hazard Identification

Part 4: HAZARD IDENTIFICATION

The State of Texas's Hazard Mitigation Plan has identified 5 major natural hazards that affect the region. These include hurricane, flood, wildfire, drought, and tornadoⁱ. The local planning team identified 12 natural hazards which could affect the county and local jurisdictions.

Flooding

Flooding is one of the most frequently occurring, destructive, and costly natural hazards facing Texas.ⁱⁱ There are two main categories for floods: general and flash flooding. General flooding is typically a long-term event that can last from a couple of days to weeks. This type of flooding is characterized by an overflow of water from an existing waterway, including rivers, streams, and drainage ditches. Flash flooding is an event that typically lasts a few minutes to less than 6 hours. These floods are characterized by heavy rain or water from a dam failure that inundates waterways and infrastructure, such as bridges and roads. Either type of flooding can destroy infrastructure, homes, and other structures, and pulling cars off roads. However, flash flooding typically is considered the most dangerous type of flooding, because of its "speed and the unpredictability"ⁱⁱⁱ. Generally, the impact of flooding is intensified in urban areas because of less impervious surfaces and in suburban or rural areas because of building in vulnerable areas. While 100 and 500-year floodplains are identified throughout the county and local jurisdictions, flooding can occur outside of these areas.

Lightning

Lightning can be seen throughout thunderstorms, hurricanes, intense forest fires, and winter storms. Lightning occurs when positive and negative charges build within a cloud leading to a rapid discharge of electricity^{iv}. While there are several types, lightning is typically classified as ground flashes or cloud flashes. One of the more common lightning strikes are cloud-to-ground lightning; these strikes are classified as ground flashes. Cloud-to-ground lightning starts as a channel of negative charge, called a stepped leader, zigzagging downward in roughly 50-yard segments in a forked pattern^v

Lightning often strikes tall structures, such as trees and skyscrapers, but can also strike open fields or other areas depending on where the electrical charges form. Lightning causes an average of 80 deaths and 300 injuries each year in the United States.⁷ In 2017, 16 people were killed by lightning in the United States, two of these deaths occurred in Texas, but not in the county.^{vi}

Hail

Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into balls of ice. To be considered hail, frozen precipitation needs to be at least .2 inches. Size of hail can range from pea-sized (1/4 inch in diameter) to softball-sized (4 1/2 inches in diameter). Quarter sized hail (1 inch in diameter) and above is considered severe by the National Oceanic and Atmospheric Administration's (NOAA) National Severe Storm Laboratory. Hail storms can result in significant damage to vehicles, buildings, and crops. Severe hail and hail swaths can result in an accumulation of hail on roadways and roofs, which may result in car accidents or roofs collapsing.^{vii} As of 2015, Texas had the highest level of hail loss claims throughout the country. According to the National Insurance Crimes Bureau, hail loss claims totaled 400,000 dollars in Texas from 2013 to 2015. However, damage from hail typically occurs in northern Texas rather than southern Texas.

Winter Weather

A winter storm is any event in which the main type of precipitation is snow, sleet, or freezing rain, according to (NOAA), 70 percent of injuries related to winter storms are in automobiles. Winter storms form with cold air, lift, and moisture.^{viii} While there are several types of winter storms, ice storms and snow flurries or showers with light accumulation are the most likely in the region. The main concerns with winter weather are road conditions and power outages.

Hurricanes and Tropical Storms

Tropical cyclones with sustained winds of 74 mph and above are classified as hurricanes. Hurricanes can reach wind speeds of 156 mph or more, which would be considered a category five on the Saffir-Simpson scale with potential for catastrophic damage. Hurricanes generally have a well-defined center, called the eye. Hurricane season is generally June 1st through November 30th each year.^{ix} However, hurricanes can and have formed outside of this season. Hurricanes are one of the top natural hazards affecting the region, with high winds and flooding considered two of the main impacts from hurricanes and tropical storms.^x

Tropical cyclones (rotating low-pressure weather systems that have organized thunderstorms, but no fronts) with sustain winds of at least 39 mph and no higher than 73 mph are classified as tropical storms. Tropical storms generally have ill-defined centers and slower moving winds than hurricanes.¹²

Flooding is also a concern for the county during these events. Hurricane Harvey is a recent example of the impact flooding during hurricanes and tropical storms has on the region, county, and local jurisdictions. Hurricane Harvey made landfall on August 25th, 2017 as a category four hurricane near Rockport, Texas; Hurricane Harvey traveled further inland as a tropical storm over the next few days. The tropical storm triggered general and flash flooding throughout the region with recorded rainfall measuring as high as 60.58 inches in the region. Flooding was seen throughout the county and local jurisdictions.

Windstorms are identified by the State of Texas as a common hazard affecting the region. The plan addresses the concerns of windstorms through the hurricane/ tropical storm and tornado sections.

Tornado

Tornadoes are a violently rotating column of air touching the ground, usually attached to the base of a thunderstorm.^{xi} However, tornadoes have formed during hurricanes and tropical storms. Tornadoes form when there is a change in a storm's speed and direction. Tornadoes can have wind speeds that range from 40 mph to 300 mph and move at 10 mph to 20 mph. However, tornadoes typically last a few minutes. The damage seen from a tornado is largely due to the strength of the winds, but strong hail and lightning often accompany tornadoes.^{xii}

Wildfire

Wildfires are any non-structure fire, except prescribed fires that occur in wildland areas, including prairies or forest. as many as 90 percent of wildland fires in the United States are cause by humans and the other 10 percent are started by lava or lightning.^{xiii} In understanding that most wildfires are started by people, the Texas Forest Service assigns a high priority to year-round wildfire prevention activities that reduce risks to residents and property. Texas Forest Service prevention campaigns use radio, TV, print, and web-based products along with local outreach programs to increase wildfire awareness and deliver fire safety messages. Texas Forest Service works with local and county officials to keep them informed of fire danger and the likelihood of large damaging wildfires. In 2017, five Texans

died due to wildfires in north Texas; Texas faced more than 21 million dollars in damages from wildfires throughout the state.^{xiv}

Drought

Drought varies greatly in length and extent. High temperatures, high winds, and low humidity can worsen drought conditions and can make areas more susceptible to wildfire. Human demands and actions, such as farming and animal grazing, can also hasten drought-related impacts. There are typically four types of drought: meteorological, agricultural, hydrological, and socio-economic. Meteorological droughts are typically defined by the level of dryness over a given period. Hydrological droughts are defined by the decline of soil/ground water or stream flow or lake/ river levels. Agricultural droughts refer to the impact of low rainfall and storm water or reduced ground water or reservoir levels needed for agriculture. Socio-economic drought considers the impact of drought conditions on supply and demand of some economic goods such as grains.^{18, xv} There are a wide range of effects that can occur from drought, including decreased land prices, loss of wetlands, increased energy demand, and increase of mental health disorders.^{xvi} Impacts seen in Texas from drought in the past, include wildfires, loss of agricultural crops including rice and wheat fields, and increase in energy cost and demand.^{xvii}

Coastal Erosion

There are several types of erosion including soil and coastal erosion. Soil erosion is comprised of two types: wind erosion and water erosion. Wind erosion is a common occurrence, which typical occurs when winds blow across flat, sparsely vegetated, or disturbed land, lifting soil into the air or displacing soil to a new location. Wind erosion can cause soil deterioration and air pollution.^{xviii} Water erosion can occur over land or in streams and channels. Water erosion that takes place over land may result from rain, shallow sheets of water flowing off the land, or surface flow, which is concentrated in areas of lower elevation. Stream channel erosion may occur as the volume and velocity of water flow increases enough to cause movement of the streambed and bank soils.^{xix} Major storms, such as hurricanes, may cause significant erosion by combining high winds with heavy surf and storm surge to significantly affect the rate of coastal erosion.^{xx}

Coastal erosion in the county is a central concern for communities located along the coast. Coastal erosion is the wearing away of beaches and bluffs due to storms, wave action, sea level rise, and human activities. Coastal erosion is responsible for an estimated 500 million dollars per year in property loss throughout the U.S. Coastal erosion can impact local economies that depend on tourism and ports, and high property values for beachfront homes and establishments. Additionally, coastal erosion can greatly impact wetlands and destroy natural ecosystem and natural barriers that can help to protect from other natural hazards including hurricanes.

Heat Events

While the National Weather Service defines excessive heat as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks, a Heat Event is more loosely defined. A heat event could be a period where the county experiences high temperatures which could affect residents particularly children and the elderly. According to the National Weather Service, the county particularly in summer months experiences typical daily temperatures more than 90 degrees and humidity more than 75 percent. These high temperatures mixed with high percentage of humidity can affect the elderly and children even though these are not above average temperatures for the county.

Dam/ Levee Failure

Aging infrastructure and increased uncertainty of other natural hazards such as flooding are factors in the rising concern of dam and levee failure. Rising flood levels can create a levee breach or dam failure resulting in flashing flooding within as little as six hours or less. Aging infrastructure and other factors such as debris or melting snow may create a dam failure or levee breach over a greater period, weeks to months. The results of a dam failure or levee failure can result in residential and commercial buildings flooded outside of the identified 100 to 500-year floodplain and increase flood water levels during a flood event.^{xxi}

There are 51 known dams and levees in Brazoria County. These dams are maintained by public, state, federal, local, or partnering entities. All dams have been classified as 'Low' in the hazard potential classification. The failure of a dam or levee during a major rain event would cause additional flood damage, but substantial economic, environmental, or lifeline losses are not expected. Only the communities at risk of experiencing impacts from a dam or levee failure are profiled. Those jurisdictions include Unincorporated Brazoria County, Bailey's Prairie, Brazoria, Holiday Lakes, Oyster Creek, West Columbia, Port of Freeport, and Freeport. The remaining jurisdictions participating in this plan are not at risk for dam and failure and will not be profiled.

Expansive Soils

Expansive soils are soils and soft rock that tend to swell or shrink due to changes in moisture content. Expansive soils (bentonite, smectite, or other reactive clays) expand when the soil particles attract water and can shrink when the clay dries. Changes in soil volume present a hazard primarily to structures built on top of expansive soils. In Texas, most expansive soils are in band 200 miles west of the coastline, stretching approximately from Beaumont to Brownsville. These areas receive the most moisture and are also vulnerable to droughts, which can cause the soils to contract. Problems associated with expansive soils are sinking or broken foundations or ruptured pipelines. In the region, the problems associated with expansive soils typically occur during drought periods.^{xxii} Drought may also worsen the effects of land subsidence. Land subsidence is identified as a common hazard by the State of Texas. However, land subsidence was not brought up throughout the planning process and there were no recorded events or damage found throughout the county. Consequently, land subsidence is not identified as a natural hazard in this plan.

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Part 5: Risk Assessment

Part 5: RISK ASSESSMENT

A Vulnerability Assessment is the process of identifying threats by natural hazards to the population and infrastructure. By identifying the greatest vulnerabilities within the County, it becomes possible to develop a Mitigation Strategy that effectively allocates resources for addressing the most serious vulnerabilities. For this assessment, the Planning Team conducted three main processes to identify the vulnerabilities within Brazoria County:

- Cataloging critical and valuable assets within the County.
- Conducting a capability assessment.
- Assessing the County’s vulnerability to each hazard and ranking these hazards according to degree of risk.

H-GAC maintains a database of critical facilities. During our kick-off meeting on November 9, 2022, Brazoria County and local jurisdiction officials reviewed and updated this list, including adding additional valuable assets within the community. Following this process, the Planning Team determined 461 facilities are critical or valuable assets. Through a Hazus analysis, the Planning Team also identified residential and commercial units. Appendix B contains a comprehensive list of the facilities. The full Hazus analysis is catalogued in Appendix C. A summary of the facilities is provided below.

Critical Facilities & Valuable Assets

| Asset Description | Quantity |
|---|----------|
| Emergency Operation Centers | 11 |
| Medical Facilities and Emergency Rooms | 21 |
| Fire Station | 34 |
| Police Station | 50 |
| Utility, Electrical, and Waste Water Facilities | 76 |
| Correctional Facilities | 8 |
| College University Campus and Buildings | 5 |
| Schools | 91 |
| Nursing Home | 59 |
| Dams | 53 |
| Natural Gas Receipt Delivery | 5 |
| Brownfields & Superfund Sites | 3 |
| Shelters | 45 |
| Housing Units | 146,180 |
| Commercial Units | 37,287 |

AUTHORITY

The Plan is tailored specifically for participating jurisdictions within Brazoria County and plan participants including Planning Team members, stakeholders, and the general public who participated in the Plan Update development process. The Plan complies with all requirements promulgated by the Texas Division of Emergency Management (TDEM) and all applicable provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390), and the Bunning Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108-264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). Additionally, the Plan complies with the Interim Final Rules for the Hazard Mitigation Planning and Hazard Mitigation Grant Program (44 CFR, Part 201), which specify the criteria for approval of mitigation plans required in Section 322 of the DMA 2000 and standards found in FEMA’s “Local Mitigation Plan Review Guide” (April 2023), and the “Local Mitigation Planning Handbook” (March 2013). Additionally, the Plan is developed in accordance with FEMA’s Community Rating System (CRS) Floodplain Management Plan standards and policies.

Risk Assessment Survey

The Planning Team ranked the hazards by scoring the frequency, impact, and vulnerability of each. Impact and vulnerability ratings were weighted more heavily than frequency scores when determining overall risk. Additionally, communities described the loss or damage, and provided specific data that expand on the descriptions provided below.

| Frequency Ratings | Impact Ratings | Vulnerability Ratings |
|---|---|---|
| Unlikely: Rare and isolated occurrences; Unlikely to occur within the next 5 years. | Negligible: Less than 10 percent of property and population impacted in the planning area. | Low: Hazard results in little to no damage, and negligible loss of property, services, and no loss of life. Planning area is not vulnerable to this hazard. |
| Likely: Frequent and regular occurrences; Likely to occur within the next 5 years. | Limited: 10 to 25 percent of property and population impacted in the planning area. | Moderate: Hazard results in some damage, and moderate loss of property, services, and potentially loss of life. Planning area is moderately vulnerable to this hazard. |
| Very Likely: Consistent and predictable occurrences; Likely to occur more than once in the next 5 years. | Significant: 25 to 75 percent of property and population impacted in the planning area. | High: Hazard results in extensive damage, and extensive loss of property, services, and potentially loss of life. Planning area is highly vulnerable to this hazard. |
| | Extensive: 75 to 100 percent of property and population impacted in the planning area. | Extreme: Hazard results in catastrophic damage, loss of property, services, and loss of life. Planning area is extremely vulnerable to this hazard. |

Hazards Ranked by Risk

Each identified hazard poses a risk to Brazoria County. Ranking the hazards from greatest to lowest risk allows the communities to prioritize their resources and focus efforts where they are most needed.

| Risk Rating | Ranking | Hazards |
|-------------|---------|--------------------------------|
| High | 1 | Flooding |
| | 2 | Hurricanes and Tropical Storms |
| | 3 | Tornadoes |
| Moderate | 4 | Drought |
| | 5 | Lightning |
| | 6 | Heat Events |
| | 7 | Winter Weather |
| Low | 8 | Expansive Soils |
| | 9 | Hail |
| | 12 | Coastal Erosion |

Capability Assessment

The participating jurisdictions completed a capability assessment survey to collect data on hazards that affect communities, the communities' ability to mitigate damages from these hazards, and current plans or programs in place to help mitigate natural hazards. The Planning Team used this information to assess the risk within each community and to determine a strategy to integrate the HMAP into their current planning mechanisms.

- | | |
|-------------------------------------|--|
| HMP: Hazard Mitigation Plan | SARA: SARA Title III Emergency Response Plan |
| DRP: Disaster Recovery Plan | TP: Transportation Plan |
| CP: Comprehensive Land Use Plan | REG-PL: Regional Planning |
| FMP: Floodplain Management Plan | SO: Subdivision Ordinance |
| SMP: Stormwater Management Plan | FDPO: Flood Damage Prevention Ordinance |
| EOP: Emergency Operations Plan | MA: Mutual Aid Agreements |
| COOP: Continuity of Operations Plan | CRS: Community Rating System |
| REP: Radiological Emergency Plan | CIP: Capital Improvements Plan (that regulates infrastructure in hazard areas) |

| Jurisdiction | DRP | CP | FMP | SMP | EOP | COOP | REP | SARA | TP | REG | SO | AB | MA | FDPO | CRS | CIP |
|--------------------------------|-----|----|-----|-----|-----|------|-----|------|----|-----|----|----|----|------|-----|-----|
| Unincorporated Brazoria County | | | | | X | | | | | X | | X | X | | | |
| Alvin | | | | | | | | | | X | | X | X | | | |
| Angleton | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X |
| Bailey's Prairie | X | X | X | | X | | X | | X | X | X | X | | X | | |
| Bonney | | | | | | | | | | X | | X | | | | |
| Brazoria | | | | | X | | | | | X | X | X | X | | | |
| Brookside Village | X | | | | | | | | | X | | X | X | | | |
| Clute | X | | X | | X | | | | | X | | X | X | | | X |
| Danbury | | | | | | | | | | X | | X | | | | |
| Hillcrest | | | | | | | | | | X | | X | X | | | |
| Holiday Lakes | | | X | | | | | | | X | | X | X | X | | |
| Iowa Colony | | X | X | | X | | X | | | X | X | X | X | X | | X |
| Jones Creek | | | | | X | | | | | X | | X | X | X | | |
| Lake Jackson | X | X | X | X | X | | | | X | X | X | X | X | | X | X |
| Liverpool | | | | | | | | | | X | | X | X | | | |
| Manvel | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X |
| Oyster Creek | | | | | | | | | | X | | X | | | | |
| Quintana | | | | | | | | | | X | | X | | | | |
| Richwood | | | | | X | X | | X | | X | | X | X | | | X |
| Surfside Beach | X | | X | X | X | | | | | X | X | X | X | X | X | X |
| Sweeny | X | | X | | X | X | X | | X | X | | X | X | | | X |
| West Columbia | X | | X | | X | X | X | | X | X | | X | X | | | X |
| Alvin ISD | | | | | | | | | | | | X | | | | |
| Freeport | | | | X | | | | | | | X | | X | X | | |
| Brazosport ISD | | | | | | | | | | | | | | | | |
| Port Freeport | | | | | X | | | | | X | | X | | | | |
| Velasco Drainage District | X | | X | X | X | | | | | X | | X | | | | |

Brazoria County has not adopted building codes for developments. Brazoria County does not regulate land use and has not adopted zoning ordinances in the county.

All participating jurisdictions have adopted the NFIP minimum floodplain management criteria.

Brazoria County has a Floodplain administrator and maintains that each participating jurisdiction has adopted the latest effective Flood Insurance Rate Map (FIRM).

Our Floodplain Administrator enforces and regulates the floodplain management regulations and permit development in SFHAs.

Brazoria County Floodplain Administrator implements and addresses commitments and requirements of the NFIP.

Expand and Improve

All participating jurisdiction examined their existing authorities, policies, programs and resources. Each participating jurisdiction then identified ways to improve upon and expand their existing authorities to support the mitigation strategy.

| Jurisdiction | Capability Expansion Opportunities |
|--------------------------------|---|
| Unincorporated Brazoria County | Identified their local budget as a factor that decreases their capability to implement mitigation actions and reduce future damages. Brazoria County will apply for state and federal funding to help fund mitigation actions that reduce the impact of natural hazards. They will also expand their mutual aid agreements and continuity of operations plan to include more jurisdictions in the county. |
| Alvin | Expand and improve their floodplain regulation practices to reduce the effects of flooding on their community. |
| Angleton | Identified an inadequate budget as a factor that decreases their capability to implement mitigation actions and reduce future damages. Angleton will apply for state and federal funding to help fund mitigation actions that reduce the impact of natural hazards. They also plan to expand their mutual aid agreements to address flood emergency response needs. |
| Bailey’s Prairie | Identified the need to improve their fire protection compliance practices. Bailey's Prairie will also expand their local budget to resolve their shortage of technical and administrative staff needed to more effectively implement the HMAP. Baileys Prairie will apply for state and federal funding to help fund mitigation actions that reduce the impact of natural hazards, send technical staff to continuing education courses, and work with elected officials and the public to increase their budget to meet their administrative staff needs and improve infrastructure. |
| Bonney | Expand their mutual aid agreement practices, and consider drafting and implementing a disaster recovery plan. |
| Brazoria | Identified the local budget as a factor that decreases their capability to fund technical staff that can implement the mitigation strategy. Brazoria will apply for state and federal funding to help fund mitigation actions that reduce the impact of natural hazards. They will expand their mutual aid to better coordinate emergency response services with neighboring jurisdictions and Brazoria County. |
| Brookside | Brookside will supplement their local budget by applying for state and federal funding to help fund mitigation actions that reduce the impact of natural hazards. The jurisdiction will also expand their mutual aid agreements with neighboring jurisdictions in the county. |
| Clute | Expand their NFIP compliance practices, send technical staff to continuing education courses, and consider the adoption of mutual aid agreements with neighboring jurisdictions. |
| Danbury | Expand their floodplain regulation practices to reduce the effects of flooding on their community. The city will also consider drafting and implementing a disaster recovery plan and expanding their mutual aid agreements. |
| Hillcrest | Expand their mutual aid agreement practices, and consider drafting and implementing a disaster recovery plan, and emergency operations plan. |
| Holiday Lakes | Expand their NFIP compliance practices, improve their current regulation of development in the floodplain, and will consider adopting stronger fire codes. |
| Iowa Colony | Expand their mutual aid agreements to better coordinate emergency response services with the neighboring jurisdictions and Brazoria County. |

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|---------------------------|--|
| Jones Creek | Expand outreach efforts to enroll more residents in their existing education and notification strategy. |
| Lake Jackson | Expand their mutual aid agreements to better coordinate emergency response services with the neighboring jurisdictions and Brazoria County, and consider the adoption of continuity of operations plan. Lake Jackson identified their Capital Improvements Plan has a program that could be expanded to better mitigate against the natural hazards in their community. Officials will take steps to allocate their budget toward projects that reduce the impacts of natural hazards. |
| Liverpool | Craft mutual aid agreements and interlocal agreements with the neighboring jurisdictions and Brazoria County. |
| Manvel | Consider becoming a CRS community to improve NFIP compliance and strengthen flood mitigation practices. |
| Oyster Creek | Develop and implement a drainage plan or partner with a drainage district to address flooding damages in Oyster Creek. |
| Quintana | Develop new mutual aid agreements to better coordinate emergency response services with the neighboring jurisdictions and Brazoria County, and consider the adoption of continuity of operations plan. |
| Richwood | Identified their Capital Improvements Plan has a program that could be expanded to better mitigate against the natural hazards in their community. Richwood will take steps to allocate their budget toward projects that reduce the impacts of natural hazards. |
| Surfside Beach | Expand their mutual aid agreements to better coordinate emergency response services with the neighboring jurisdictions and Brazoria County. |
| Sweeny | Sweeny will supplement their local budget by applying for state and federal funding to help fund mitigation actions that reduce the impact of natural hazards. They will also expand their mutual aid agreements and emergency operations plan to include more jurisdictions in the county. |
| Alvin ISD | Further relationship with County and local emergency coordinators to expand outreach and mitigation efforts across the district |
| Freeport | Expand outreach efforts to enroll more residents in their existing education and notification strategy. |
| West Columbia | Expand and improve their Capital Improvements Plan strategy to better mitigate against the natural hazards in their community. West Columbia will take steps to allocate their budget toward projects that reduce the impacts of natural hazards. |
| Port of Freeport | Improve the Emergency Operations Plan to ensure that communication and utilities are not at risk in the event of a natural disaster. |
| Velasco Drainage District | Expand their NFIP compliance practices, improve their current regulation of development in the floodplain, and will consider expanding their emergency operations plan. |
| Brazosport ISD | Collaborate with local and County emergency management officials to implement projects that help to reduce the impacts of natural hazards. |
| Brazosport College | Work with local jurisdictions and County emergency management officials to implement projects that help to reduce the impacts of natural hazards. |
| Sweeny ISD | Expand relationships with County and local emergency coordinators to expand outreach and mitigation efforts across the district |
| Drainage District 11 | Identify problem areas, areas for future development and constraints affecting the watershed and expand relationships with County and local emergency coordinators |
| Danbury ISD | Increase relationships with local and County emergency management officials to implement projects that help to reduce the impacts of natural hazards |
| Damon ISD | Develop new mutual aid agreements to better coordinate emergency response services with the neighboring jurisdictions and Brazoria County. |

Part 6: Hazard Analysis & Vulnerability Assessment

Part 6: HAZARD & VULNERABILITY ANALYSIS

Introduction

After the potential hazards in the county were identified, the Planning Team reviewed historic data and conducted an analysis in ArcGIS for each hazard. This analysis was presented at the November 9, 2022, Kick-off meeting. At this meeting, stakeholders provided many firsthand accounts of damage caused by natural disasters. These reports were taken into consideration and included in the hazard analysis when possible. The result of that process has determined 12 different natural hazards require mitigation efforts. The maps and the discussion that follow are a compilation of data analysis, historic information, and public feedback.

Damon ISD is a very small school district with only 1 school in the northwest corner of Brazoria County on Highway 36. They would be included with all the Hazards identified with unincorporated Brazoria County for the purposes of this plan. This school district is a noted vulnerability and we are currently working with this under resourced jurisdiction to assist with strategies leading to mitigation actions.

- 6.1 Flooding
- 6.2 Wildfire
- 6.3 Hurricanes and Tropical Storms
- 6.4 Drought
- 6.5 Lightning
- 6.6 Heat Events
- 6.7 Winter Weather
- 6.8 Hail
- 6.9 Tornado
- 6.10 Dam and Levee Failure
- 6.11 Expansive Soils
- 6.12 Coastal Erosion

There has not been any significant historical occurrences and data with hazards since the last plan update in 2017.

Part 6.1: Flooding

6.1 Flooding

Floodplains are the primary tool used by FEMA to determine areas at risk of flooding. The periodic flooding of lands adjacent to rivers, streams, and shorelines is a natural and inevitable occurrence that can be expected based upon established recurrence intervals. The recurrence interval of a flood is the average time interval, in years, that can be anticipated between flood events of a certain magnitude. Using the recurrence interval with land and precipitation modeling, forecasters can estimate the probability and likely location of flooding. These are expressed as floodplains. The most commonly used floodplain measurements are the 100-year floodplain and the 500-year floodplain. The 100-year floodplain has a 1 in 100 chances of flooding each year. The 500-year floodplain is estimated to have a 1 in 500 chances of occurring each year.

Flooding causes widespread and varying degrees of damage. The magnitude or extent of flood damage is expressed by using the maximum depth of flood water during a specific flood event. Structures inundated by 4-feet or more of flood water are considered an absolute loss. Other forms of loss, such as roads, bridges, agriculture, services, or death or injury are also summarized by jurisdiction in this plan.

Historic Occurrences

The National Oceanic and Atmospheric Administration (NOAA) collects historic climate data for the entire nation. NOAA's storm event data can be accessed on the National Climatic Data Center (NCDC) storm events database. A condensed version of the Brazoria County flood events data from 2000 - present is provided in the table below. No deaths, injuries, or crop damages were reported in the last 17 years in the county.

| Jurisdiction | Date | Property Damage | Notes |
|-----------------------|-----------|-----------------|--|
| Unincorporated | 9/13/2000 | \$150,000 | Several roads and railroad underpass impassable in Freeport and Clute. Water inside a house in Clute. Cars flooded and high water in streets in Clute, Freeport, and Danbury. Total of 7.7 inches of rainfall in Angleton. |
| Unincorporated | 6/5/2001 | \$0 | Flooding from T.S. Allison. |
| Freeport | 6/7/2001 | \$0 | Flooding from the remnants of T.S. Allison |
| Unincorporated | 6/8/2001 | \$0 | Flooding from the remnants of T.S. Allison |
| Unincorporated | 6/8/2001 | \$0 | Flooding from the remnants of T.S. Allison |
| Countywide | 6/9/2001 | \$0 | Flooding from the remnants of T.S. Allison |
| Countywide | 6/9/2001 | \$0 | Flooding from the remnants of T.S. Allison |
| Unincorporated | 8/30/2001 | \$30,000 | Highway 35 underpass, South Johnson Street and surrounding streets underwater in Alvin; street flooding in Angleton. |
| Unincorporated | 8/31/2001 | \$500,000 | High water in Alvin, Manvel, and Danbury. |
| Unincorporated | 9/2/2001 | \$80,000 | Homes flooded in the Shadow Bend subdivision on Austin Bayou in Danbury. Numerous streets flooded, including Highway 6 between Manvel and Alvin and Highway 36 in Damon. |
| Angleton | 8/15/2002 | \$50,000 | Street flooding in Angleton and Lake Jackson. |
| Alvin | 8/15/2002 | \$90,000 | Several roads in and around Alvin have high water; water is in homes in Alvin. |
| Freeport | 9/6/2002 | \$25,000 | Numerous roads flooded and impassable from Freeport to Lake Jackson. |
| Sweeny | 9/7/2002 | \$250,000 | Waist deep water and flooding in Sweeny. |
| Freeport | 9/9/2002 | \$30,000 | Two feet of water on streets in Freeport. |
| Countywide | 9/10/2002 | \$30,000 | Countywide flooding due to training cells. |
| Countywide | 11/5/2002 | \$35,000 | Numerous roads closed due to high water on extremely saturated grounds. |
| Unincorporated | 12/4/2002 | \$2,000 | Flooding in extreme northeast portion of county. |
| Lake Jackson | 9/4/2003 | \$10,000 | Bumper-high street flooding. Water threatening homes in the Winding Woods subdivision. |

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|-----------------------|------------|-------------|--|
| Manvel | 10/9/2003 | \$15,000 | Flooding over County Road 190, west of Highway 146, forced its closure. Subdivision along Highway 6 in Manvel experienced flooding. |
| Sweeny | 6/23/2004 | \$5,000 | Roads flooded in and around Sweeny. |
| Brazoria | 10/16/2006 | \$500,000 | Approximately 115 homes flooded in several locations. Several roads flooded including County Road 5995 near Bastrop Bayou, Highway 36 and County Road 304 near Jones Creek, and near County Road 769B. |
| Freeport | 4/25/2007 | \$15,000 | Water reported in a couple of homes in and around the old Velasco District. |
| Angleton | 5/28/2007 | \$110,000 | Three flooded homes with over a foot of water in them off Henderson Road. Reports of 50 more flooded homes, or homes with water damage, in Angleton. |
| Angleton | 5/28/2007 | 0 | Flooding across Highway 288 near the intersections of FM 523 and County Roads 340 and 341. Flooding also reported on Highway 35 between Angleton and West Columbia. |
| Unincorporated | 7/1/2010 | 0 | Numerous roads were closed due to high water in Sweeny and West Columbia. |
| Sweeny | 7/1/2010 | \$500,000 | Heavy rainfall caused flooding of 30 to 35 homes in the town of Sweeny. |
| West Columbia | 7/1/2010 | \$1,250,000 | Flooding of 40 to 45 homes and businesses in the town of West Columbia. |
| Brazoria | 1/22/2015 | \$1,000 | The intersection of CR 353 and CR 354 between West Columbia and Brazoria was barricaded. |
| Lake Jackson | 4/14/2015 | \$0 | Heavy rain caused residential street flooding that left some roadways impassable across northern Lake Jackson. |
| Unincorporated | 4/17/2015 | \$5,000 | Street flooding in the town of Richwood. |
| Angleton | 5/12/2015 | \$75,000 | Widespread flooding was reported with water in homes in Angleton. |
| Unincorporated | 8/28/2016 | \$12,000 | Nearly 6 inches over a relatively short period of time caused flood waters to be reported entering a few homes in northern Freeport. There were reports of water in at least 5 homes in Velasco along 800 north Avenue F. There were numerous reports of flooded roadways and standing water in the Dow Chemical plant. |
| Danbury | 4/18/2017 | \$450,000 | Over 60 homes had a couple of inches of water in the town of Danbury. The worst flooding occurred in the eastern and western side of town, or near the sloughs. Sections of County Roads 208, 201 and 211 were impassable due to the flooding. |
| Unincorporated | 4/18/2017 | \$0 | Flood waters from Halls Bayou came over sections of FM 2004, from FM 2917 to near the Galveston County line, forcing road closures. |
| Iowa Colony | 8/26/2017 | \$0 | There were numerous water rescues within the county; from Pearland down to the Angleton-Lake Jackson area. Flash flood waters, from sheet flooding and bayous/creeks coming out of banks, completely inundated hundreds to thousands of homes and businesses. Roads and highways in and along the Highway 288 corridor were flooded and therefore closed for long time periods. Major record flooding of the Brazos, San Bernard and Oyster Creek caused the flooding of hundreds to thousands of vicinity homes, vehicles and businesses. Numerous roads and homes were inundated with flood waters on east side of Oyster Creek including the Columbia Lakes, Mallard Lakes, Great Lakes, Riverside Estates and Bar X subdivisions as well as homes along CR 39. Other county roads that became impassable due to high flood waters include FM 1462, Highways 35 and 90, FM 950, CR 25, 380A, CR 42 and FM 521. The Phillips refinery outside of the town of Sweeny took on water from the west near Little Linville Bayou. Hanson Riverside County Park along the San Bernard River southwest of West Columbia was inundated and water over-topped the Phillips Terminal. |
| Unincorporated | 8/28/2017 | \$0 | Sections of FM 523 near Highway 288 north of Angleton was closed due to flooding. Major record flooding of the Brazos, San Bernard and Oyster Creek caused the flooding of hundreds to thousands of vicinity homes, vehicles and businesses. Numerous Roads and homes were inundated with flood waters on east side of Oyster Creek including the Columbia Lakes, Mallard Lakes, Great Lakes, Riverside Estates and Bar X subdivisions as well as homes along CR 39. Other county roads that became impassable due to high flood waters include, but are not limited to, FM 1462, Highways 35 and 90, FM 950, CR 25, 380A, CR 42 and FM 521. The Phillips refinery outside of the town of Sweeny took on water from the west near Little Linville Bayou. Hanson Riverside County Park along the San Bernard River southwest of West Columbia was inundated and water over-topped the Phillips Terminal. |
| Iowa Colony | 8/28/2017 | \$0 | Sections of FM 521 near FM 1462 in the Rosharon area were closed due to flooding. Major record flooding of the Brazos, San Bernard and Oyster Creek caused the flooding of hundreds to thousands of vicinity homes, vehicles and businesses. Numerous Roads and homes were inundated with flood waters on east |

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|-----------------|-----------|-----|--|
| | | | side of Oyster Creek including the Columbia Lakes, Mallard Lakes, Great Lakes, Riverside Estates and Bar X subdivisions as well as homes along CR 39. Other county roads that became impassable due to high flood waters include, but are not limited to, FM 1462, Highways 35 and 90, FM 950, CR 25, 380A, CR 42 and FM 521. The Phillips refinery outside of the town of Sweeny took on water from the west near Little Linville Bayou. Hanson Riverside County Park along the San Bernard River southwest of West Columbia was inundated and water over-topped the Phillips Terminal. |
| Brazoria | 8/28/2017 | \$0 | Parts of SH 36 and FM 521 around the town of Brazoria were closed due to flooding. Major record flooding of the Brazos, San Bernard and Oyster Creek caused the flooding of hundreds to thousands of vicinity homes, vehicles and businesses. Numerous Roads and homes were inundated with flood waters on east side of Oyster Creek including the Columbia Lakes, Mallard Lakes, Great Lakes, Riverside Estates and Bar X subdivisions as well as homes along CR 39. Other county roads that became impassable due to high flood waters include, but are not limited to, FM 1462, Highways 35 and 90, FM 950, CR 25, 380A, CR 42 and FM 521. The Phillips refinery outside of the town of Sweeny took on water from the west near Little Linville Bayou. Hanson Riverside County Park along the San Bernard River southwest of West Columbia was inundated and water over-topped the Phillips Terminal. |

Source: <https://www.ncdc.noaa.gov/stormevents/>

Brazoria County Disaster Declarations

There have been twenty-four federally declared flood disasters in Brazoria County since 1973. These events are considered the most significant flood events in Brazoria County’s recent history.

| Date | Disaster Number | Title | Date (Cont.) | Disaster Number | Title |
|-------------|------------------------|--------------------------------------|---------------------|------------------------|--|
| 7/11/1973 | 398 | Severe Storms & Flooding | 7/17/2003 | 1479 | Hurricane Claudette |
| 7/28/1979 | 595 | Storms & Flash Floods | 9/2/2005 | 3216 | Hurricane Katrina Evacuation |
| 9/25/1979 | 603 | Severe Storms & Flooding | 9/21/2005 | 3261 | Hurricane Rita |
| 8/19/1983 | 689 | Hurricane Alicia | 9/24/2005 | 1606 | Hurricane Rita |
| 4/12/1991 | 900 | Severe Storms & Tornadoes | 8/18/2007 | 3277 | Hurricane Dean |
| 12/26/1991 | 930 | Severe Thunderstorms & Flood | 8/29/2008 | 3290 | Hurricane Gustav |
| 10/18/1994 | 1041 | Severe Thunderstorms & Flood | 9/10/2008 | 3294 | Hurricane Ike |
| 8/26/1998 | 1239 | Tropical Storm Charlie | 9/13/2008 | 1791 | Hurricane Ike |
| 9/23/1998 | 1245 | Hurricane Georges- Texas | 5/29/2015 | 4223 | Severe Storms & Tornadoes & Flooding & Straight-line Winds |
| 10/21/1998 | 1257 | Texas Flooding | 11/25/2015 | 4245 | Severe Storms & Tornadoes & Flooding & Straight-line Winds |
| 9/26/2002 | 1434 | Tropical Storm Fay | 6/11/2016 | 4272 | Severe Storms & Flooding |
| 11/5/2002 | 1439 | Severe Storms & Tornadoes & Flooding | 8/25/2017 | 4332 | Hurricane Harvey |

Source: <https://www.FEMA.gov>

NFIP Participation

The National Flood Insurance Program (NFIP) is a voluntary program that aims to reduce the impacts of flooding by incentivizing communities to adopt and enforce floodplain management regulations. The NFIP provides affordable flood insurance for property owners, renters, and businesses in participating communities. This reduces the socio-economic impacts of flooding on communities through risk reduction via flood insurance, and reduces the physical impacts of flooding through beneficial floodplain regulation.

NFIP Participants in Brazoria County:

- City of Alvin
- City of Angleton
- Village of Bailey’s Prairie
- Town of Bonney
- Brazoria County
- City of Brazoria
- City of Brookside Village
- City of Clute
- City of Manvel
- Town of Quintana
- City of Sweeny
- City West Columbia
- City of Hillcrest Village
- Town of Holiday Lakes
- City of Iowa Colony
- Village of Jones Creek
- City of Lake Jackson
- City of Danbury
- City of Liverpool
- City of Oyster Creek
- City of Richwood
- City of Surfside Beach
- City of Freeport

Each of the participating jurisdictions has a certified floodplain manager on staff, and/or function under the regulatory umbrella of Brazoria County. To remain NFIP compliant, the CFM's office conducts jurisdiction wide permitting of new development, permit review, flood code enforcement, document flood zones using GIS, educate the public, and provide public assistance. The County CFM regulates new development by determining if the property in question is in a flood hazard area designated by FEMA by the legal description. The next step is to determine the flood elevation for new structures based on the FEMA data.

In May 2005, Commissioners' Court required the elevation to be set at 2-feet above the FEMA elevation based on the large amount of development in the County and to comply with the Countywide Drainage Criteria for new subdivisions. If the property is not located in a flood hazard area, the requirement will be recommended to be 24-inches above existing grade.

To improve flood mitigation efforts and enhance their NFIP program, the participating jurisdictions will adopt and enforce stronger floodplain management regulations for new construction in Special Flood Hazard Areas (SFHAs).

The Port of Freeport, Alvin ISD, Brazoria ISD, Damon ISD, Danbury ISD, Sweeny ISD, Brazosport College and the Drainage Districts do not participate in the NFIP, because they do not regulate the floodplain in their planning area and are therefore not considered communities under the NFIP.

Repetitive Loss Properties

Repetitive loss properties (RL) are properties that have received a minimum of two insurance payments of \$1,000 or more from the NFIP within the last 10 years. Brazoria County has a total of 1,356 RL properties, and 376 severe repetitive loss properties totaling \$177,892,291.82 in insurance payouts.

An exhaustive and comprehensive list of all RL properties are listed in Appendix D.

| Jurisdiction | Residential RLPs | Non-residential RLPs | SRL Properties | Total RLPs |
|--------------------------------|------------------|----------------------|----------------|------------|
| Unincorporated Brazoria County | 738 | 24 | 76 | 762 |
| Alvin | 106 | 6 | 19 | 112 |
| Angleton | 83 | 9 | 22 | 92 |
| Bailey's Point | 9 | 0 | 0 | 9 |
| Brazoria | 24 | 0 | 2 | 24 |
| Brookside | 35 | 0 | 5 | 35 |
| Clute | 16 | 5 | 2 | 21 |
| Danbury | 9 | 0 | 0 | 9 |
| Freeport | 37 | 7 | 2 | 44 |
| Hillcrest Village | 6 | 0 | 1 | 6 |
| Holiday Lakes | 1 | 0 | 0 | 1 |
| Iowa Colony | 6 | 0 | 1 | 6 |
| Jones Creek | 16 | 0 | 2 | 16 |
| Lake Jackson | 15 | 3 | 0 | 18 |
| Liverpool | 4 | 0 | 0 | 4 |
| Manvel | 27 | 1 | 4 | 28 |
| Oyster Creek | 6 | 2 | 0 | 8 |
| Quintana | 1 | 0 | 0 | 1 |
| Richwood | 11 | 0 | 3 | 11 |
| Surfside | 123 | 16 | 8 | 139 |
| Sweeny | 6 | 1 | 3 | 7 |
| West Columbia | 14 | 0 | 2 | 14 |

Hazard Analysis & Vulnerability Identification

The hazard analysis uses historic hazard event data to determine the probability of an event occurring again within a given year. The analysis calculates the average number of events in each jurisdiction annually and then calculates the chance of the event occurring in a year.

The hazard analysis also provides hazard extent data for each participating jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history and an estimate of what the jurisdiction could experience in the future. Information from stakeholders, FEMA, NOAA, and the Department of Homeland Security (DHS) are the sources of data for the analysis.

To identify vulnerabilities for each jurisdiction, this plan used the following methods:

- FEMA's Hazus analysis software
- GIS analysis of critical facilities in the floodplain; and
- Stakeholder identified vulnerabilities.

Hazus was used to determine the economic loss and calculate the buildings stock that's at risk of flooding in Brazoria County. Shelter needs were also projected using this method. The complete HAZUS report is in Appendix C. H-GAC maintains a database of critical facilities in Brazoria County. Using GIS, this plan identifies any critical assets located within the 100-year and 500-year floodplain. Stakeholders then provided valuable insight into additional vulnerabilities within their communities. These findings are provided in condensed charts for each jurisdiction.

Brazoria County (All participating jurisdictions)

Identified Vulnerabilities:

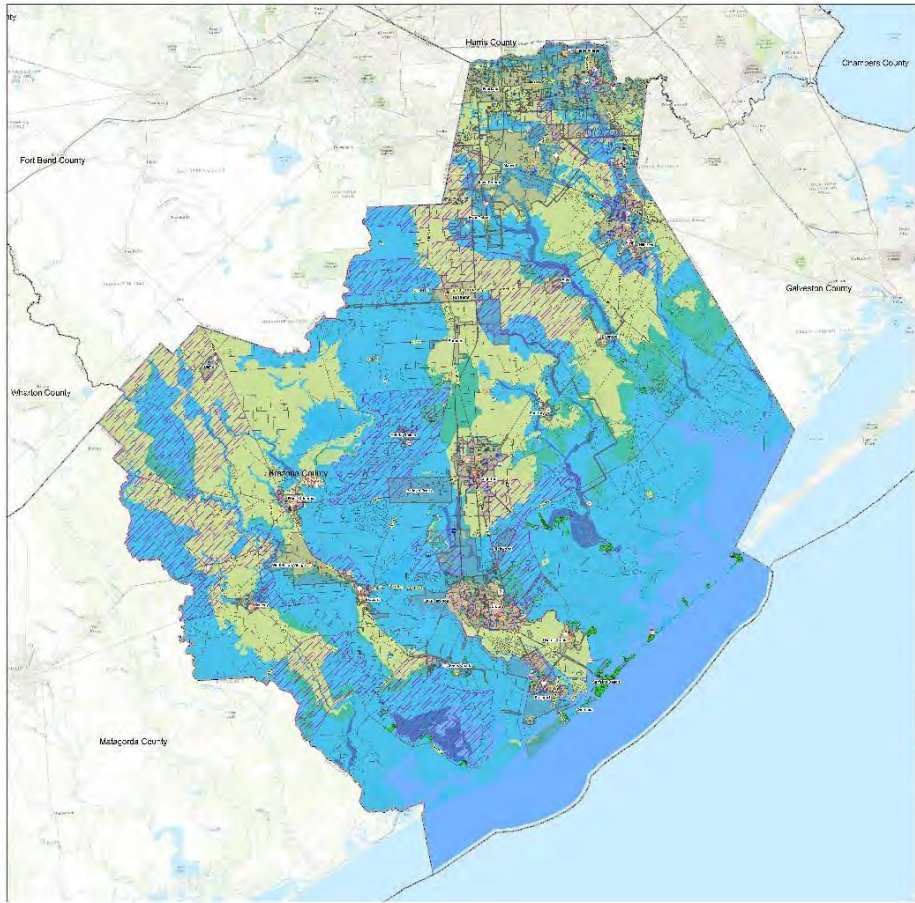
- Community members and city staff expressed the concern of major infrastructure, roads and bridges, acting as physical barriers throughout the county, in past major flood events this:
 - Prevented water from certain areas, but also allowed for increased floodwaters in other areas
 - Led to rescuers not being able to reach communities where the main highway was the only way for first responders to reach people in need
- Individuals who reside or work within the 100 year or 500 year floodplain
- Communities without emergency shelters, local hospitals, or fire stations- relying on the county or larger jurisdiction for emergency services/ response
- Local farmers and other business owners whose shops or farmland flood
- Industrial sites located throughout the county particularly along the coast

Identified Impacts:

- Major roadways blocked by floodwaters may create an increase of serious injuries or loss of life due to responders not being able to reach those injured or in danger
- Lack of shelters and emergency responders throughout the county may lead to an increase in response time which may lead to a loss of life or serious injury
- Economic and financial loss for cities and individuals including property loss and loss of economic activity from loss of major employers including industrial and farming activities

Floodplains: Brazoria County

Section VII, Item H.



Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools
- Roads
- County Boundary
- Cities

FEMA Floodplains NFHL 2015

Type

- Floodway
- 100YR
- 500YR
- Minimal
- Levcoo Zone

Map Sources:
 Facilities: Regional I and Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

Brazoria County (Unincorporated)

| | | | |
|--------------------------------|-------|--------------------------------|------|
| Planning Area (Sq. mi): | 1,475 | Occurrences since 2000: | 12 |
| Area Affected: | 61 % | Annual Event Average: | 1.42 |

Probability: Very Likely; 100 percent chance the event will occur in a year

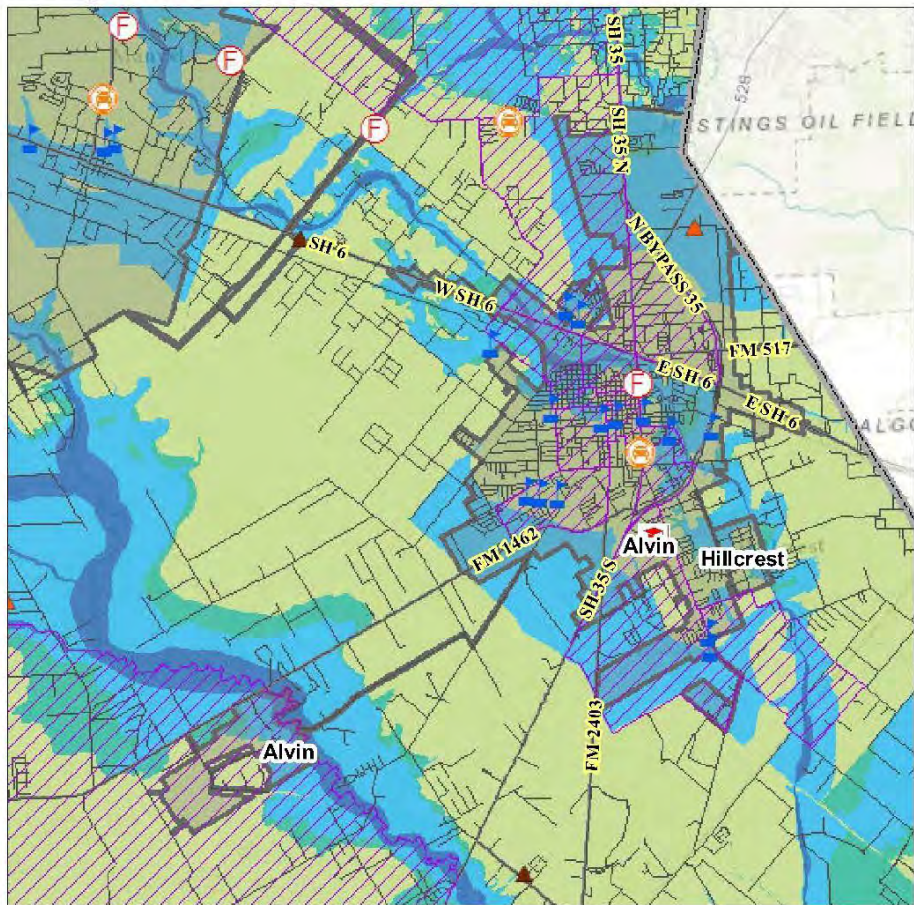
Extent: According to past events the county has experienced 5 feet of water; the county can experience 6 to 7 feet of water.

- Identified Vulnerabilities:**
- Critical facilities including: 3 fire station, 5 schools, 1 shelter, and 2 correctional facilities
 - Vulnerable populations concentrated near Brazoria National Wildlife Refuge

- Identified Impacts:**
- Vulnerable populations (defined in the Community Profile Section) include residents without cars, funds or other resources to evacuate in case of a flood event; significant injury, loss of life could occur because of the inability evacuate to dry land
 - Roadways during future events may become impassable throughout the county due to high flood waters making it difficult or impossible to reach critical facilities or those most in need.
 - More than 500 homes throughout the unincorporated areas and commercial establishments may see damage or complete destruction during future events

Floodplains: Alvin

Section VII, Item H.

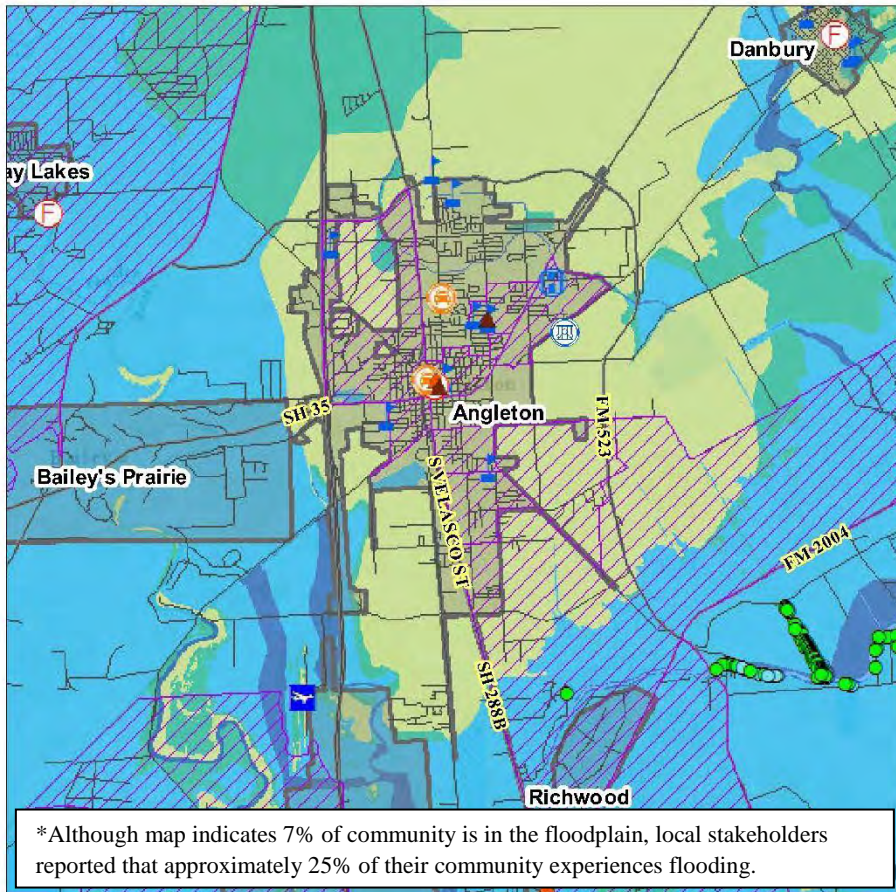


- Legend**
- Public Safety and Security**
- Type
- Disaster Recovery Center
 - Local Emergency Operation Center
- Utilities**
- Type
- Electric Substation
 - Natural Gas Receipt Delivery
 - Power Plant
 - Wastewater Treatment Plant
- Industrial**
- Type
- Brownfields
 - CERCLA(Superfund) National Priorities List
 - Hazardous Waste Treatment Facility
 - Solid Waste Landfill
 - Toxic Release Inventory Facility
 - College/Universities
 - Correctional Facilities
 - Airport
 - Police Stations
 - Hospitals
 - EMS
 - Fire Stations
 - High Schools
 - Schools
 - Roads
 - County Boundary
 - Cities
- FEMA Floodplains NFHL 2015**
- Type
- Floodway
 - 100YR
 - 500YR
 - Minimal
 - Levee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Alvin | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 25.6 | Occurrences since 2000: | 6 |
| Planning Area Affected: | 69 % | Annual Event Average: | .35 |
| Probability: Likely; 35 percent chance the event will occur in a year | | | |
| Extent: According to past events the county has experienced 5 feet of water; the jurisdiction can experience 7 to 8 feet of water. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Mustang Bayou runs along the edge of the city; several residential areas are within the 100-year floodplain along the Bayou particularly along W. Talmage Rd. and Bellaire Blvd. | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Injury and loss of life due to flooded homes or traveling on impassable roadways Residential and commercial property loss. Loss of homes and residents who may have to move due to damage to their home or business | | | |

Floodplains: Angleton



Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools

Roads

- County Boundary
- Cities

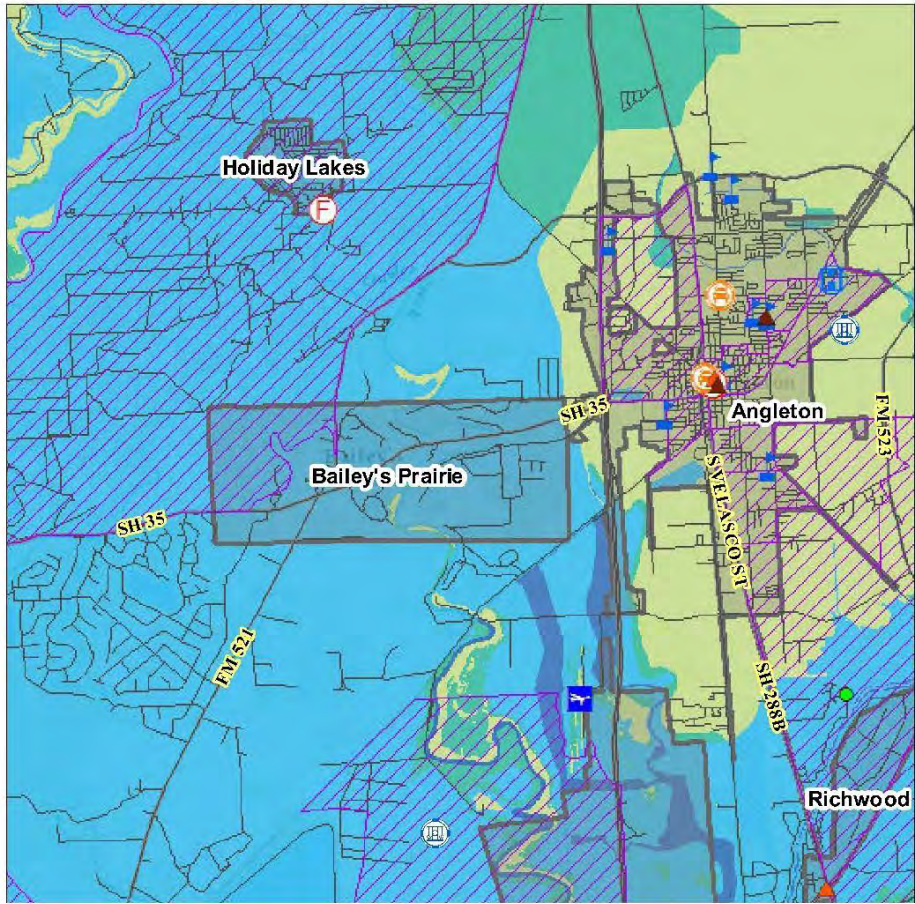
FEMA Floodplains NFHL 2015

Type

- Floodway
- 100YR
- 500YR
- Minimal
- Levee Zone

Map Sources:
 Facilities: Regional I and Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Angleton | | | |
|--|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 11.27 | Occurrences since 2000: | 8 |
| Planning Area Affected: | 25 % | Annual Event Average: | .47 |
| Probability: Likely; 47 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; the jurisdiction can experience 4 to 5 feet of water. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Residential neighborhoods in the north of the city are within the 100-year floodplain along North Valderas Street and North Plantation Drive Sheet flooding occurs throughout the center of the city with the up to 3 feet of water potentially accumulating near Cannan Drive and North Valderas Street. Sheet flooding could potentially affect the police departments, fire station, shelters, EOC and theater within the city | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Potential flooding within critical facilities may lead to first responders not being able to respond to the community's needs such as rescues or calls for help, because of damage sustained to communication systems or equipment within these facilities Residential and commercial property loss. Residents with property within or just outside of the 100 to 500-year floodplain may be more likely to see significant damage from flood events Significant damage to commercial and residential property may lead to residents moving away and a loss of economic activity throughout the jurisdiction | | | |



Legend

Public Safety and Security
 Type
 ■ Disaster Recovery Center
 ■ Local Emergency Operation Center

Utilities
 Type
 ■ Electric Substation
 ○ Natural Gas Receipt Delivery
 ■ Power Plant
 ○ Wastewater Treatments Plant

Industrial
 Type
 ■ Brownfields
 ■ CERCLA(Superfund) National Priorities List
 ■ Hazardous Waste Treatment Facility
 ○ Solid Waste Landfill
 ■ Toxic Release Inventory Facility
 ■ College Universities
 ■ Correctional Facilities
 ■ Airport
 ■ Police Stations
 ■ Hospitals
 ■ EMS
 ■ Fire Stations
 ■ High Schools
 ■ Schools

Roads
 ■ County Boundary
 ■ Cities

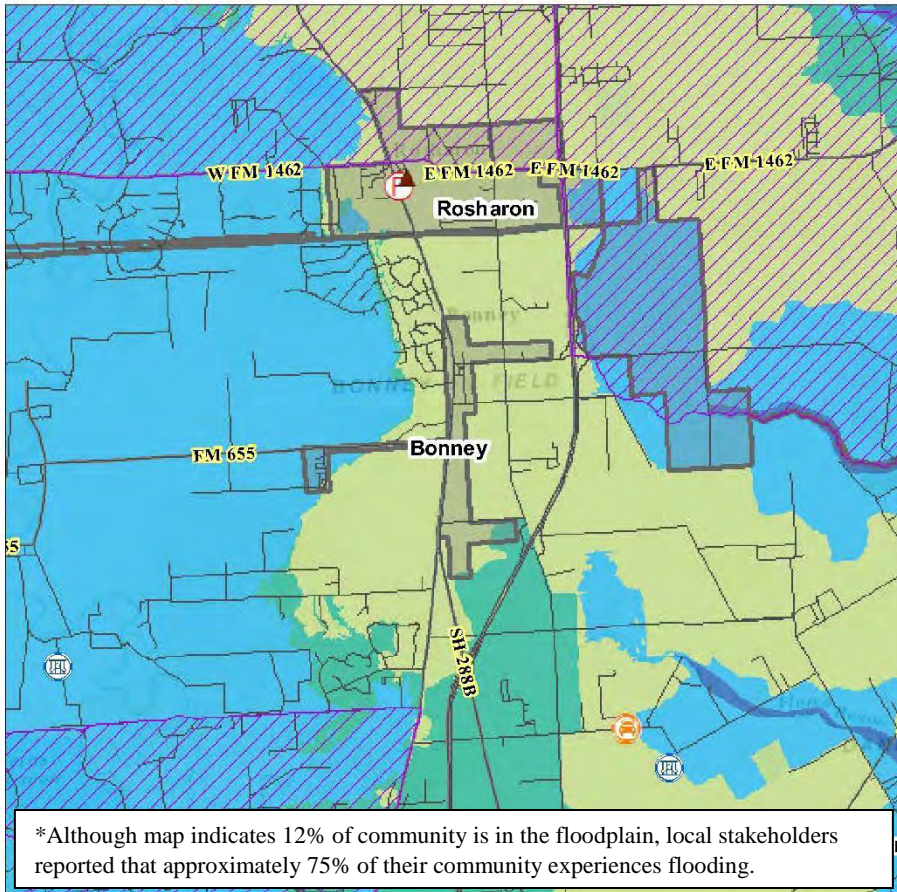
FEMA Floodplains NFHL 2015
 Type
 ■ Floodway
 ■ 100YR
 ■ 500YR
 ■ Minimal
 ■ Love's Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Bailey's Prairie | | | |
|---|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 7.7 | Occurrences since 2000: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; the jurisdiction can experience 4 to 5 feet of water. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> The entire city is within the 100-year floodplain; residential areas in the north along Highway 35 and the south towards 521 are most vulnerable to 3 feet of water 170 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> With the entire city within the 100 year-floodplain there is potentially a greater chance that commercial and residential structures throughout the city will flood leading to loss of life, significant injury, and cost of home and business repair With no police station EMS or fire station, the jurisdiction relies on Angleton's and Brazoria's first responders. If Highway 35 and 521 are impassable due to floodwaters first responders needing to come into the city will have a difficult time reaching residents or visitors within the city. Potentially leading to first responders, residents, and visitors sustaining injuries or a loss of life. | | | |

Floodplains: Bonney

Section VII, Item H.



Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools

Roads

- County Boundary
- Cities

FEMA Floodplains NFHL 2015

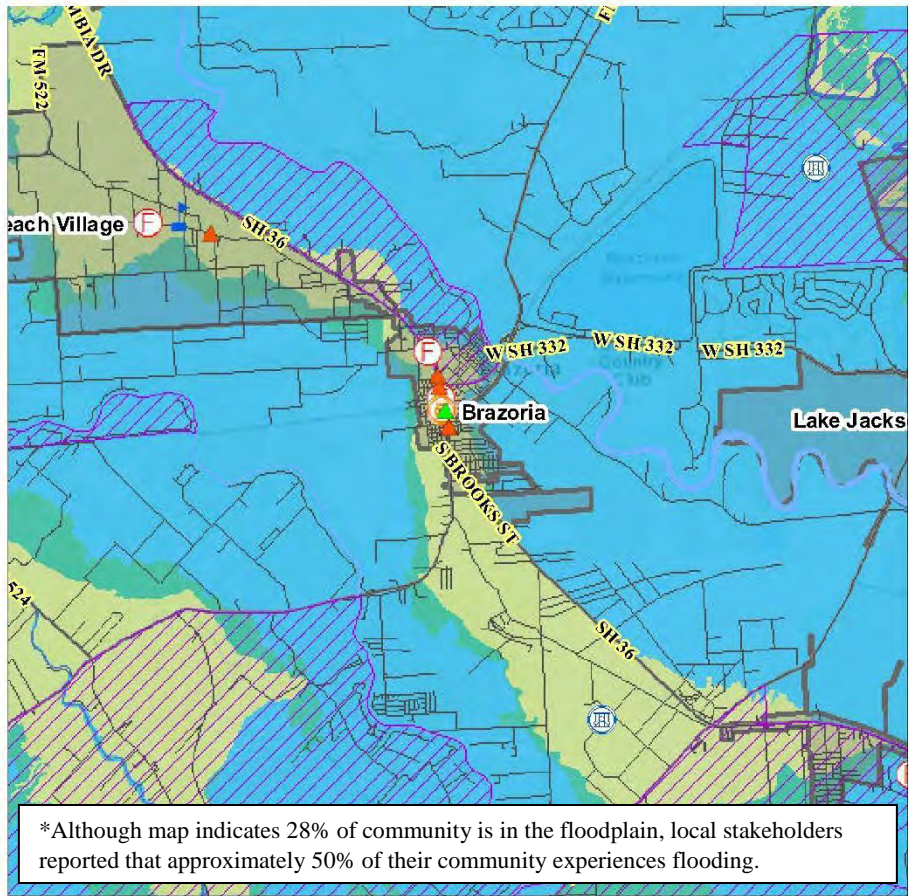
Type

- Floodway
- 100YR
- 500YR
- Minimal
- Lovee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Bonney | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 1.66 | Occurrences since 2000: | 5 |
| Area Affected: | 75 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; the jurisdiction can experience 4 to 5 feet of water. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> In the past, Highway 288 acted as a divider. Everything west of the highway was flooded with up to 3 feet of water; the jurisdiction is west of Highway 288. | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Residential and commercial property loss can occur throughout the city Reliance on neighboring jurisdictions and county first responders may lead to increased response time which may create a potential for serious injury or loss of life | | | |

Floodplains: Brazoria



Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools

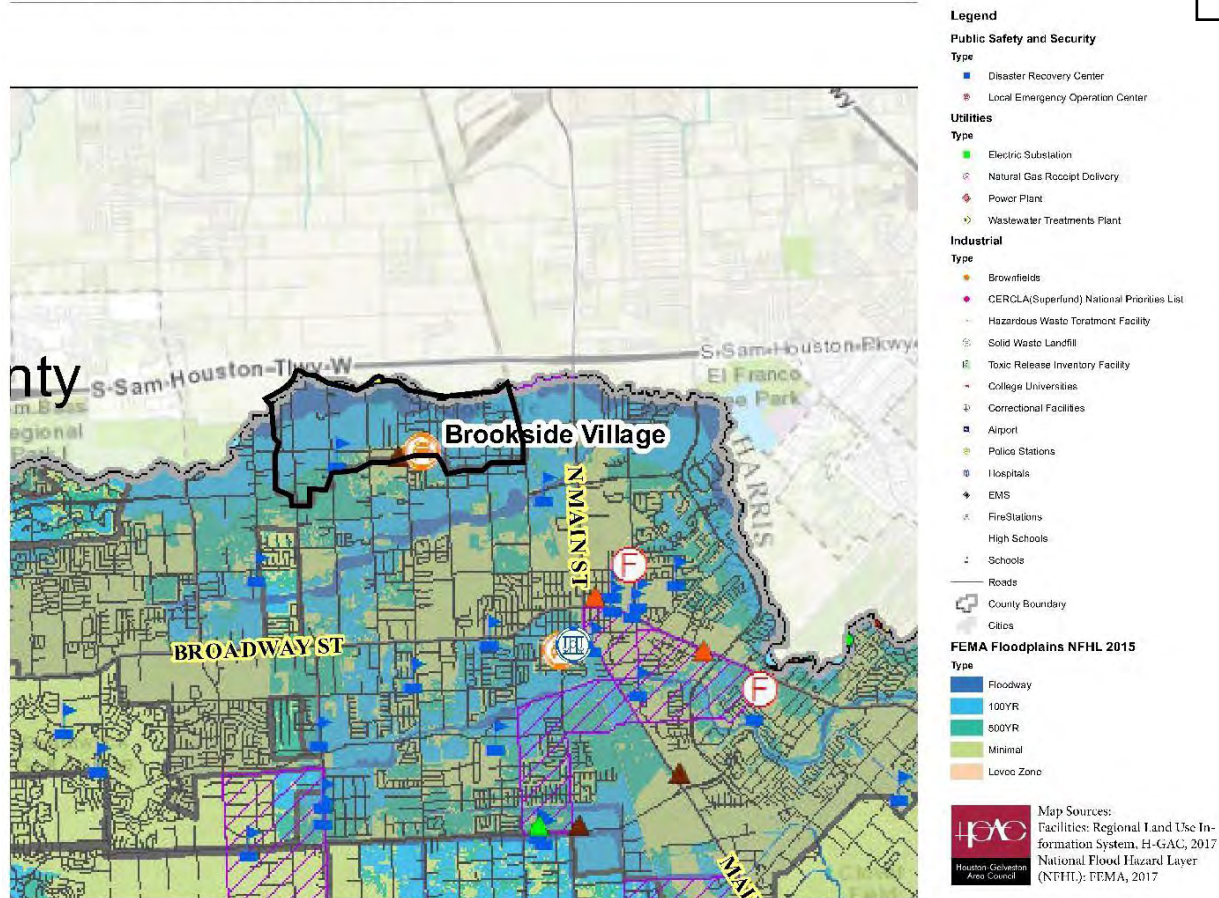
FEMA Floodplains NFHL 2015

Type

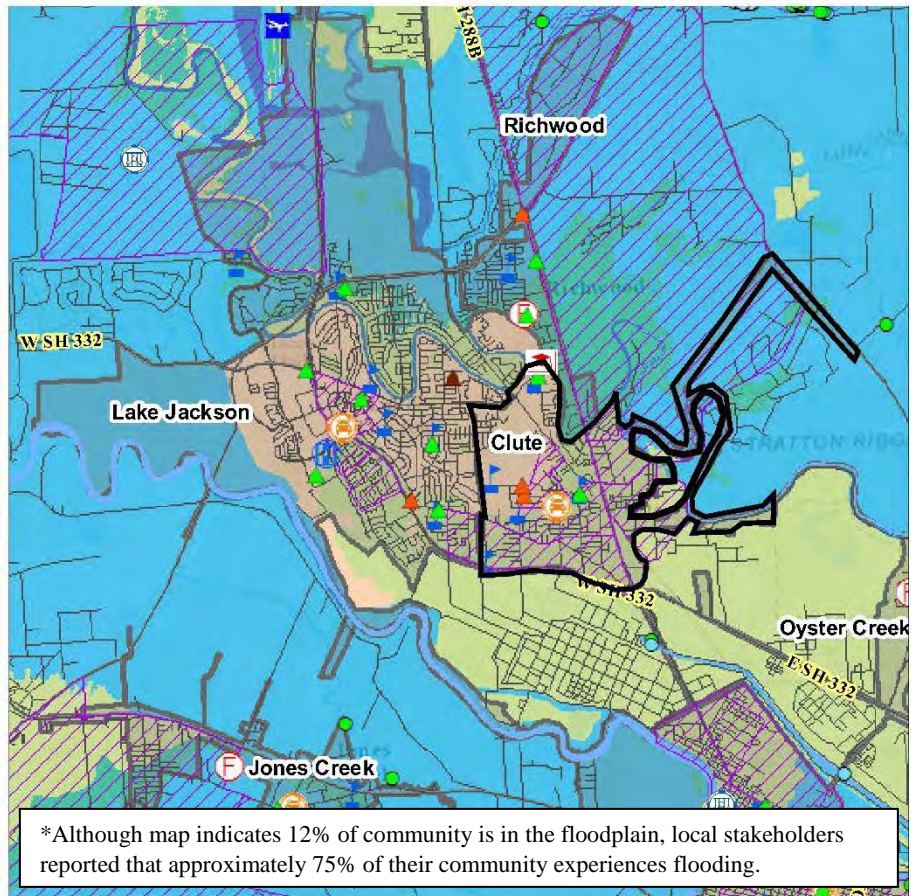
- Floodway
- 100YR
- 500YR
- Minimal
- Levee Zone

Map Sources:
 Facilities: Regional I and Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Brazoria | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 8 |
| Area Affected: | 50 % | Annual Event Average: | .47 |
| Probability: Likely; 47 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 4 feet of water; the jurisdiction can experience 6 to 7 feet of water. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Past flooding along the Brazos River in the north east of the city near Old Brazoria, potential for homes and businesses to be damaged near this area Wastewater treatment plant flooded due to the San Bernard | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Commercial and residential property loss due to flooding Financial loss for residents who lost their homes or sustained damage to their homes Financial loss for the city in terms of losing commercial/ retail areas A loss of the wastewater treatment plant may lead to a lack of clean water throughout city or sewer-water impacting water quality in local rivers and bayous | | | |



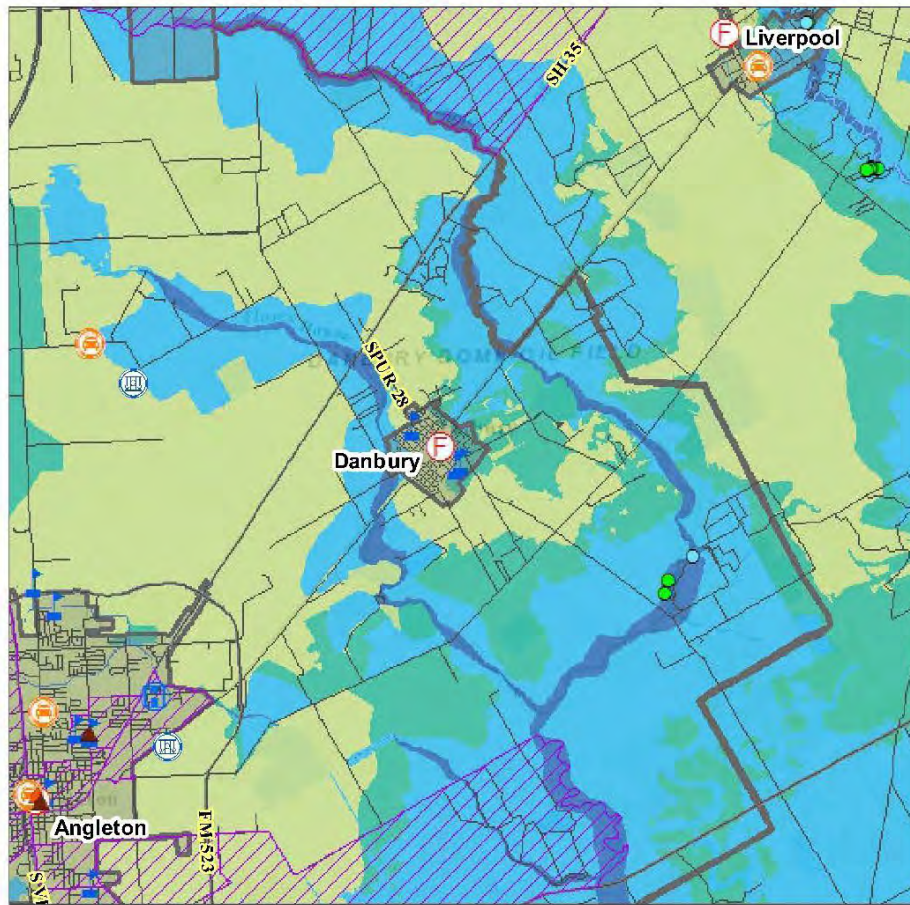
| Brookside Village | | | |
|---|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.085 | Occurrences since 2000: | 5 |
| Area Affected: | 99 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; the jurisdiction can experience 4 to 5 feet of water. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Past flooding has occurred in the north west of the city near Elen Lane and Rice Road, residential and commercial areas are the most vulnerable in these areas. | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Potential loss of life or serious injury could occur for those trapped on flooded roadways, or in homes and commercial areas Loss of commercial and residential property due to damage from floodwaters; this could lead to individuals displaced from their homes and a financial loss for the city due to the loss in taxes and/ or businesses throughout the jurisdiction | | | |



| Clute | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 5.6 | Occurrences since 2000: | 5 |
| Area Affected: | 75 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; the jurisdiction can experience 4 to 6 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Vulnerable populations are concentrated to the northeast and southwest of the city • The vulnerable population to the north east of the city is on the edge of oyster creek which has overflowed in the past. | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Vulnerable populations may have a significantly harder time trying to evacuate during flood events; they may also not have the resources to move away from the floodplain or obtain flood insurance. This may lead to an increase in serious injury or loss of life during events and a loss of residential and commercial property. | | | |

Floodplains: Danbury

Section VII, Item H.



Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools
- Roads
- County Boundary
- Cities

FEMA Floodplains NFHL 2015

Type

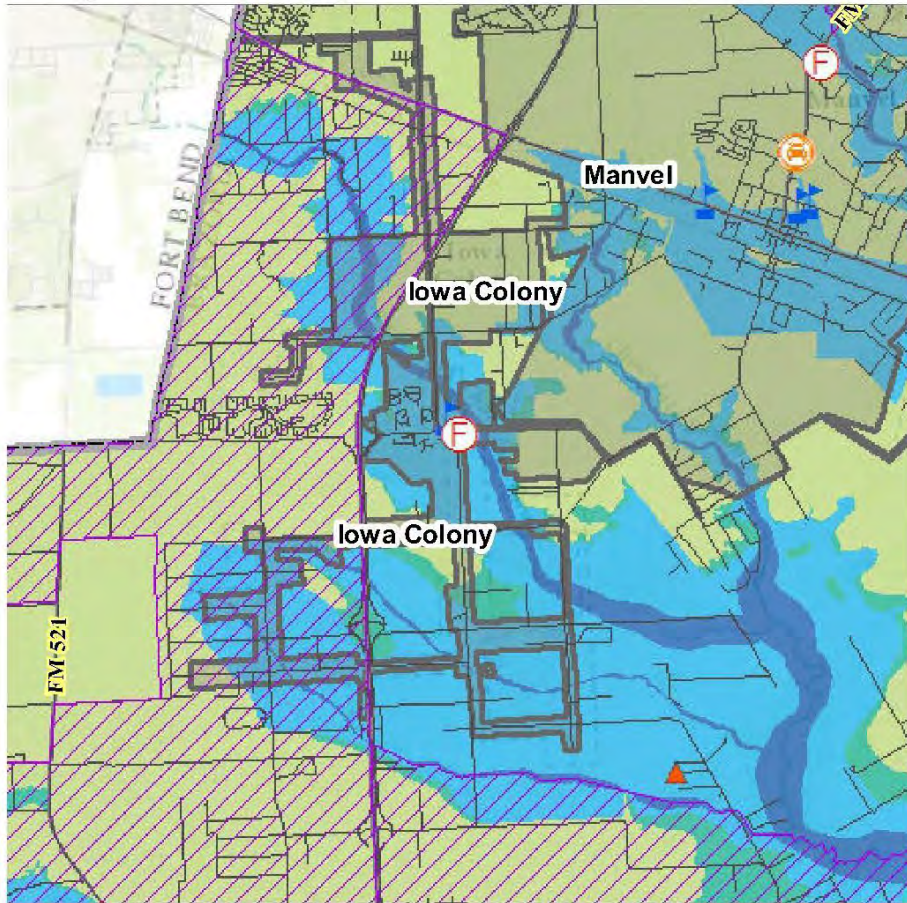
- Floodway
- 100YR
- 500YR
- Minimal
- Lovee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Danbury and Danbury ISD | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 1.0 | Occurrences since 2000: | 6 |
| Area Affected: | 62 % | Annual Event Average: | .35 |
| Probability: Likely; 35 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 2 feet of water; the jurisdiction can experience 3 to 4 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> The southeast of the city is within the 100-year flood plan and has a concentration of industry and residential areas In the north of the city the Danbury oil field and Fish Farms are also located in the 100-year floodplain | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Residential and commercial property loss due to floodwaters A potential for a domino effect; flooding could create a technical hazard because of the location of the oil and industrial sites leading to potential serious injury or loss of life Economic loss for the city if main industry and employment centers are flooded and damaged | | | |

Floodplains: Iowa Colony

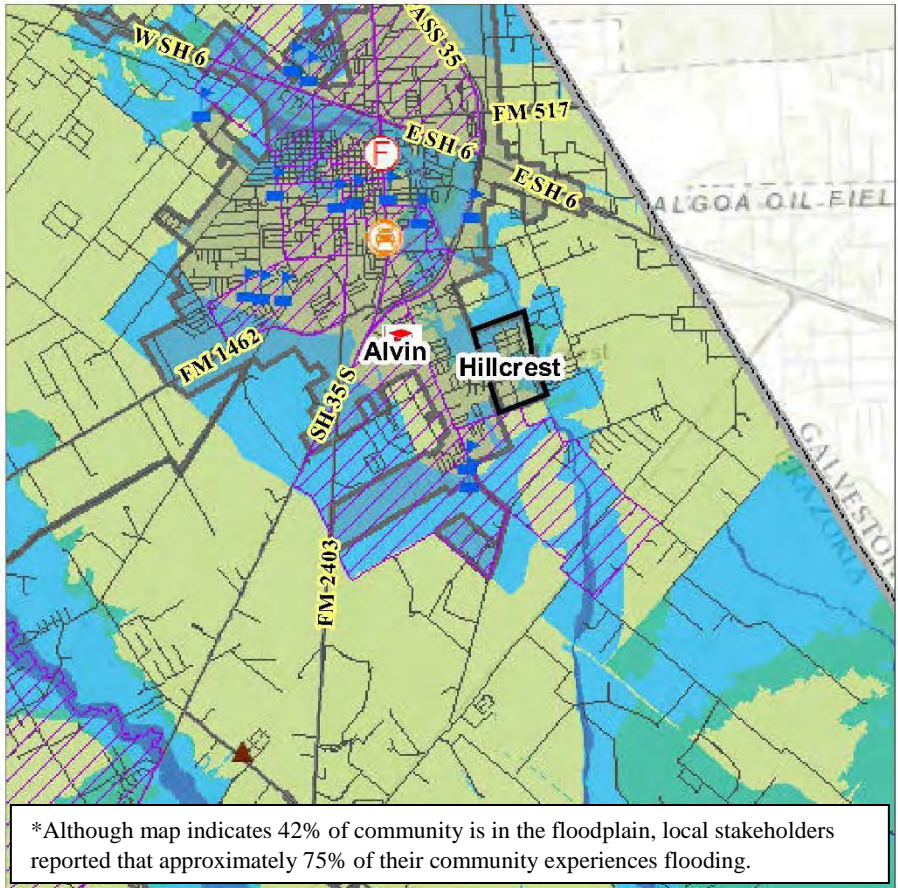
Section VII, Item H.



- Legend**
- Public Safety and Security**
- Type
- Disaster Recovery Center
 - Local Emergency Operation Center
- Utilities**
- Type
- Electric Substation
 - Natural Gas Receipt Delivery
 - Power Plant
 - Wastewater Treatment Plant
- Industrial**
- Type
- Brownfields
 - CERCLA(Superfund) National Priorities List
 - Hazardous Waste Treatment Facility
 - Solid Waste Landfill
 - Toxic Release Inventory Facility
 - College Universities
 - Correctional Facilities
 - Airport
 - Police Stations
 - Hospitals
 - EMS
 - Fire Stations
 - High Schools
 - Schools
 - Roads
 - County Boundary
 - Cities
- FEMA Floodplains NFHL 2015**
- Type
- Floodway
 - 100YR
 - 500YR
 - Minimal
 - Levee Zone

Map Sources:
 Facilities: Regional I and Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Iowa Colony | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 7.33 | Occurrences since 2000: | 7 |
| Area Affected: | 87 % | Annual Event Average: | .41 |
| Probability: Likely; 41 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; the jurisdiction can experience 4 to 5 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> 30 homes flooded throughout the city and City Hall flooded with 1.5 feet to 3 feet of water City Hall currently located within the 100-year floodplain. | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Residential and commercial property loss Residents displaced from their homes Delay in city services, because of the loss of City Hall | | | |



Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools
- Roads
- County Boundary
- Cities

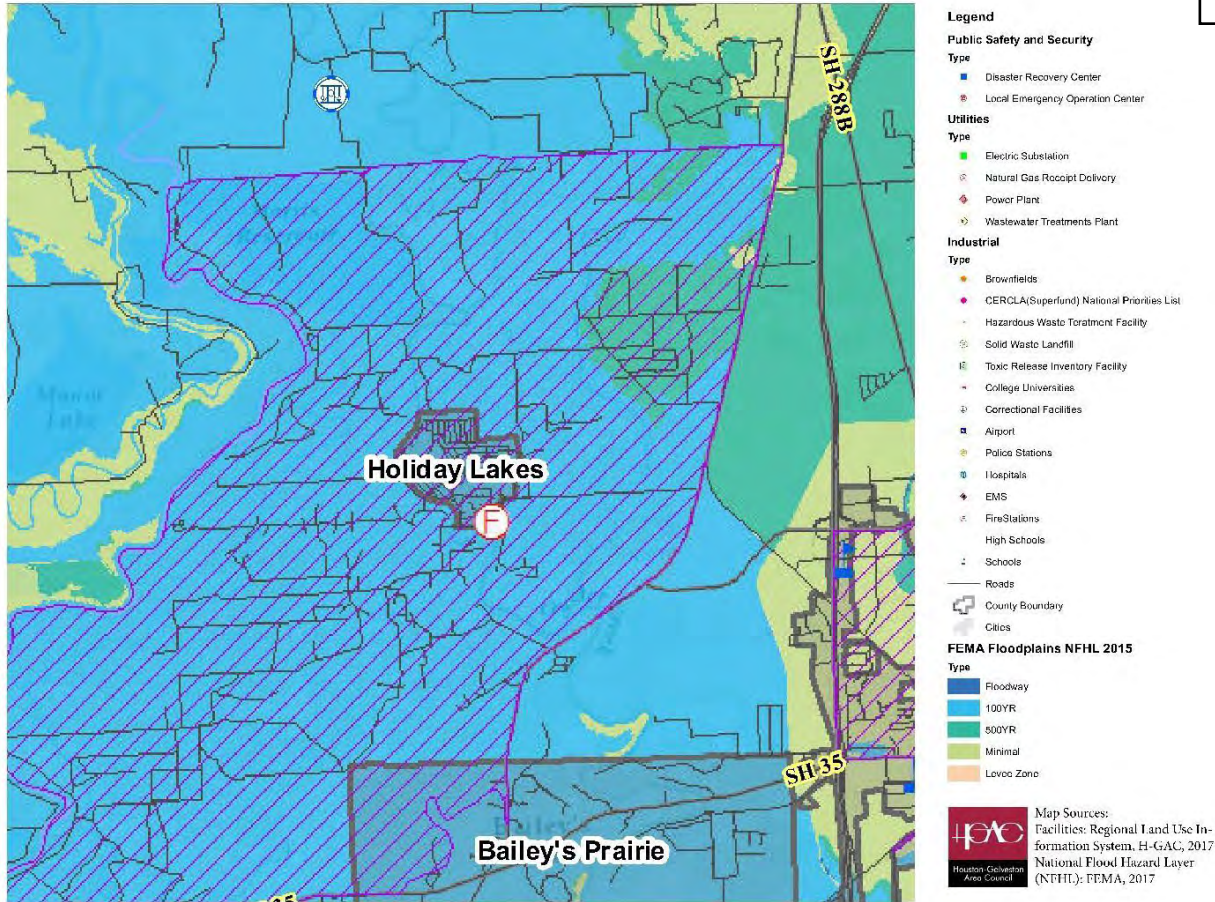
FEMA Floodplains NFHL 2015

Type

- Floodway
- 100YR
- 500YR
- Minimal
- Levee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

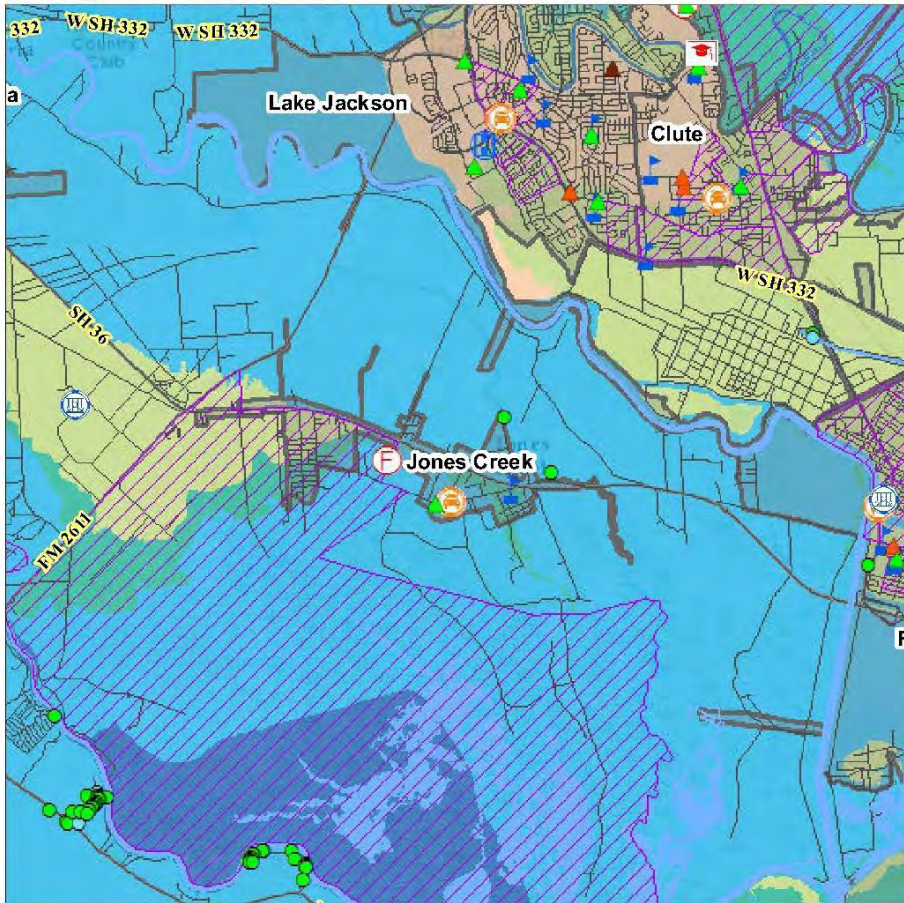
| Hillcrest Village | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 0.4 | Occurrences since 2000: | 5 |
| Area Affected: | 75 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 5 feet of water; the jurisdiction can experience 6 to 8 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> The most vulnerable population in the city is in the northeast. This population is within and just out of the 100-year floodplain in the city. | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Vulnerable populations may have a harder time evacuating during flooding events, potentially leading to an increase loss of life or serious injury Vulnerable populations may not have the resources to move away from the floodplain; this may lead to reoccurring injuries, property loss, and damage | | | |



| Holiday Lakes | | | |
|--|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 1 | Occurrences since 2000: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; the jurisdiction can experience 4 to 6 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Approximately 60 percent of the city’s residential areas are within the 100-year floodplain • The city is surrounded by the 100-year floodplain | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Loss of or significant damage to commercial and residential property due to flood damage • With the city surrounded by the 100-year flood plain and the city depending on the Angleton fire department there may be loss of life or serious injury due to a potential delay in response during large scale events | | | |

Floodplains: Jones Creek

Section VII, Item H.



Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College/Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools
- Roads
- County Boundary
- Cities

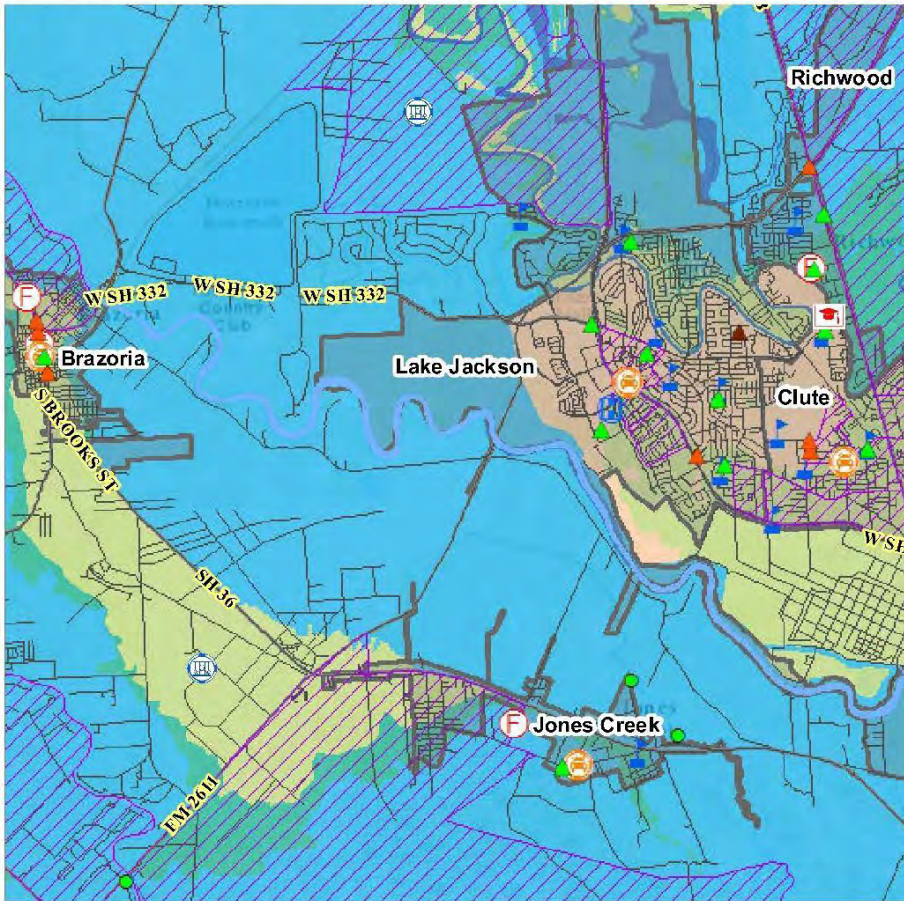
FEMA Floodplains NFHL 2015

Type

- Floodway
- 100YR
- 500YR
- Minimal
- Levoo Zone

Map Sources:
 Facilities: Regional I and Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Jones Creek | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 5 |
| Area Affected: | 86 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; the jurisdiction can experience 5 to 7 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Residential areas in the far east of the city are just outside of the 100-year floodplain. Highway 36, which has flooded in the past, runs directly through the city | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Residential and commercial property loss due to flood damage If a major roadway becomes impassable, serious injury or loss of life could occur because of residents not being able to evacuate or first responders unable to reach residents in homes | | | |



Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools

Roads

- County Boundary
- Cities

FEMA Floodplains NFHL 2015

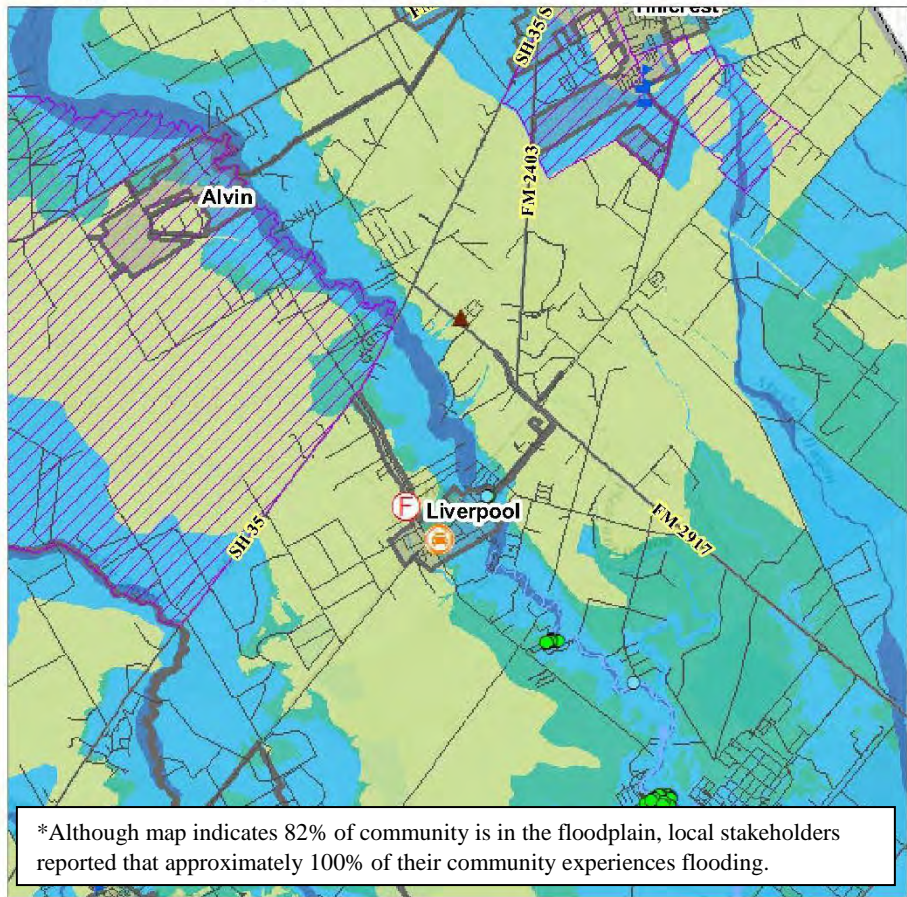
Type

- Floodway
- 100YR
- 500YR
- Minimal
- Levee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Lake Jackson | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 20.9 | Occurrences since 2000: | 6 |
| Area Affected: | 71 % | Annual Event Average: | .35 |
| Probability: Likely; 35 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced .5 feet of water; the jurisdiction can experience 1 to 2 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> The 100-year floodplain runs just east of the city Residential areas in the northeast of the city are within the 100-year floodplain | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Serious injury or loss of life with residents or visitors trying to evacuate from flooded homes and or neighborhoods Residential property loss throughout the east of the city Economic loss due to residents displaced from their homes | | | |

Floodplains: Liverpool



Legend

Public Safety and Security
Type
 ■ Disaster Recovery Center
 ■ Local Emergency Operation Center

Utilities
Type
 ■ Electric Substation
 ○ Natural Gas Receipt Delivery
 ■ Power Plant
 ○ Wastewater Treatment Plant

Industrial
Type
 ■ Brownfields
 ■ CERCLA(Superfund) National Priorities List
 ■ Hazardous Waste Treatment Facility
 ■ Solid Waste Landfill
 ■ Toxic Release Inventory Facility
 ■ College Universities
 ■ Correctional Facilities
 ■ Airport
 ■ Police Stations
 ■ Hospitals
 ■ EMS
 ■ Fire Stations
 ■ High Schools
 ■ Schools
 ■ Roads
 ■ County Boundary
 ■ Cities

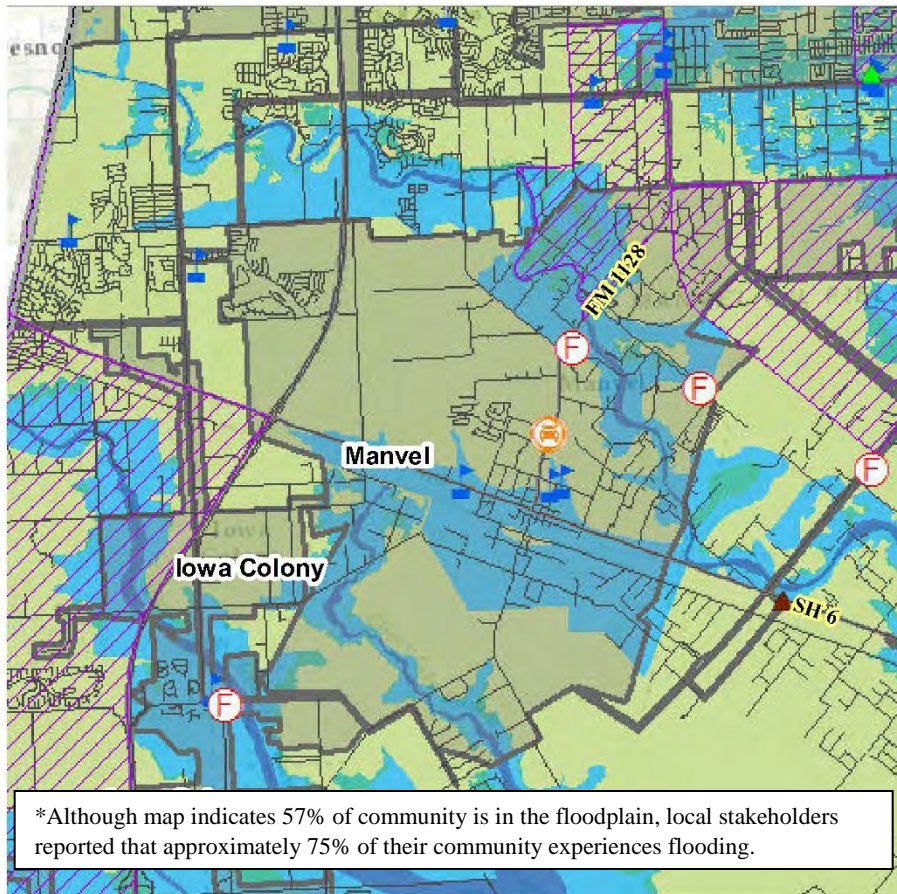
FEMA Floodplains NFHL 2015
Type
 ■ Floodway
 ■ 100YR
 ■ 500YR
 ■ Minimal
 ■ Levee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Liverpool | | | |
|--|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 1.1 | Occurrences since 2000: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3.5 feet of water; the jurisdiction can experience 5 to 7 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> The far east of the city along Chocolate Bayou is within the 100-year floodplain; residential areas are prone to flooding throughout this area | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Residential and commercial property loss throughout the east of the city Loss of life or serious injury for those trying to evacuate from their homes and neighborhoods | | | |

Floodplains: Manvel

Section VII, Item H.

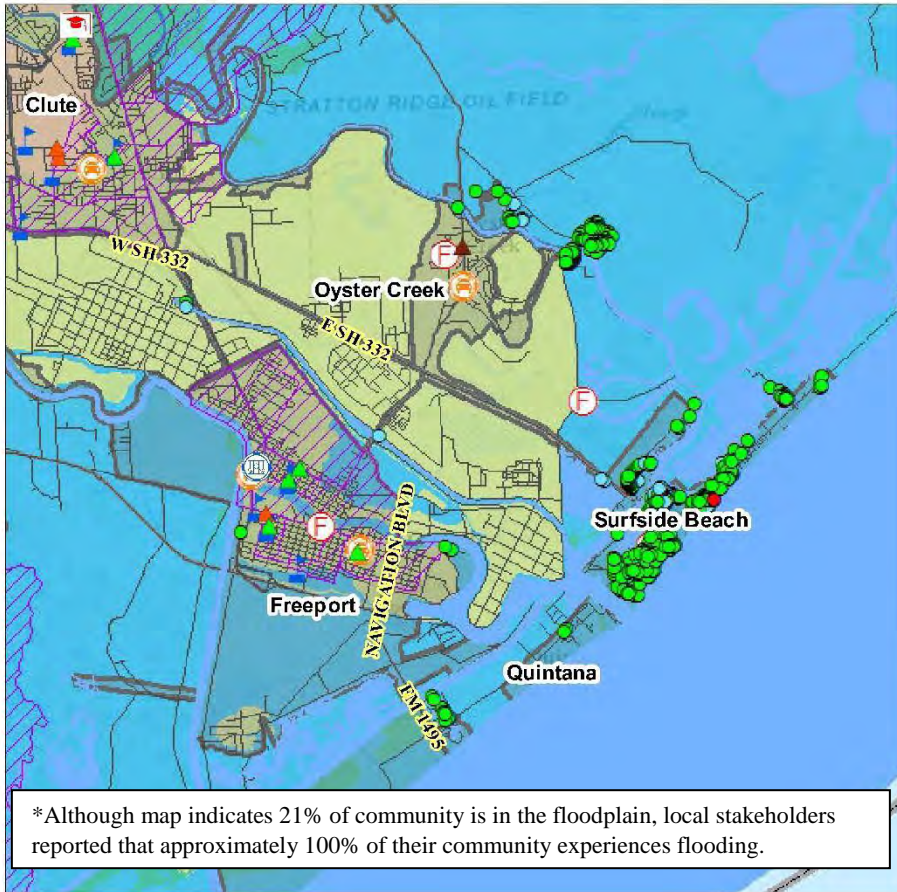


- Legend**
- Public Safety and Security**
- Type
- Disaster Recovery Center
 - Local Emergency Operation Center
- Utilities**
- Type
- Electric Substation
 - Natural Gas Receipt Delivery
 - Power Plant
 - Wastewater Treatment Plant
- Industrial**
- Type
- Brownfields
 - CERCLA(Superfund) National Priorities List
 - Hazardous Waste Treatment Facility
 - Solid Waste Landfill
 - Toxic Release Inventory Facility
 - College Universities
 - Correctional Facilities
 - Airport
 - Police Stations
 - Hospitals
 - EMS
 - Fire Stations
 - High Schools
 - Schools
- FEMA Floodplains NFHL 2015**
- Type
- Floodway
 - 100YR
 - 500YR
 - Minimal
 - Lowee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Manvel | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 23.6 | Occurrences since 2000: | 6 |
| Area Affected: | 75 % | Annual Event Average: | .35 |
| Probability: Likely; 35 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; the jurisdiction can experience 4 to 5 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Mustang Bayou runs through the east of the city; homes near Mustang Bayou are prone to flooding Commercial and residential areas along Bissell Road toward TX 288 are prone to sheet flooding | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Loss of commercial and residential properties throughout the city Serious injury or loss of life of those trying to evacuate their neighborhood or commercial areas Economic loss with residents displaced from their homes and businesses shut down throughout the city | | | |

Floodplains: Oyster Creek



*Although map indicates 21% of community is in the floodplain, local stakeholders reported that approximately 100% of their community experiences flooding.

Legend

Public Safety and Security
Type
 ■ Disaster Recovery Center
 ■ Local Emergency Operation Center

Utilities
Type
 ■ Electric Substation
 ○ Natural Gas Receipt Delivery
 ■ Power Plant
 ○ Wastewater Treatment Plant

Industrial
Type
 ■ Brownfields
 ■ CERCLA(Superfund) National Priorities List
 ■ Hazardous Waste Treatment Facility
 ■ Solid Waste Landfill
 ■ Toxic Release Inventory Facility
 ■ College Universities
 ■ Correctional Facilities
 ■ Airport
 ■ Police Stations
 ■ Hospitals
 ■ EMS
 ■ Fire Stations
 ■ High Schools
 ■ Schools

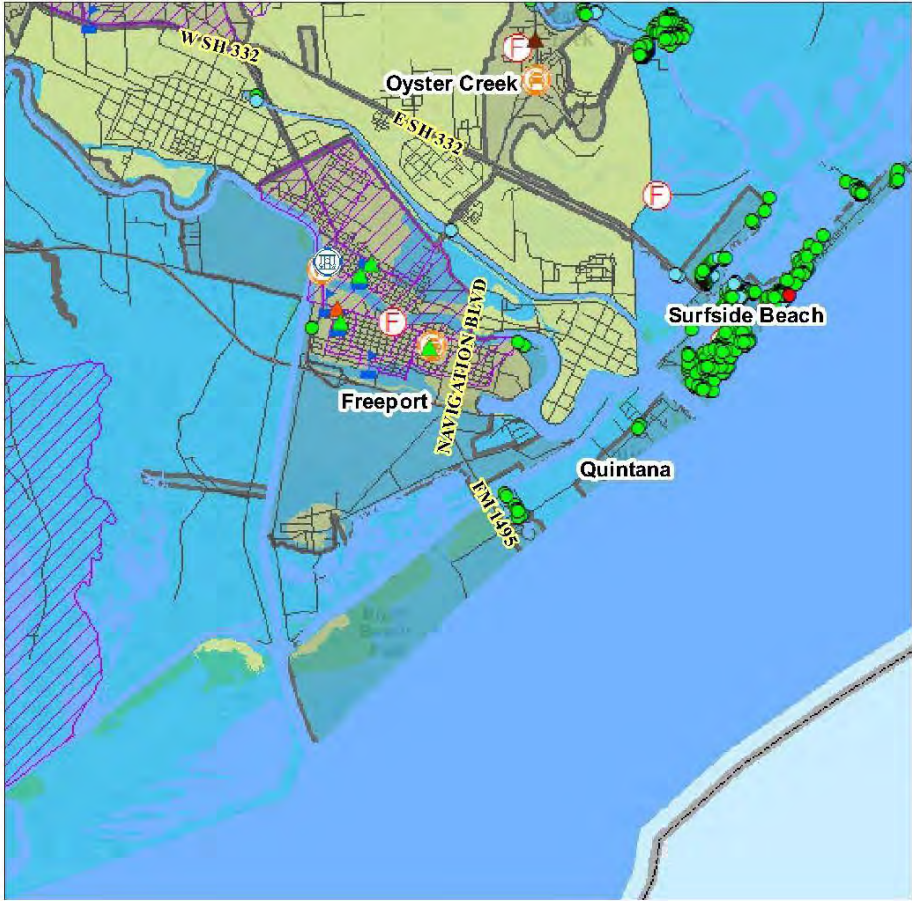
— Roads
 ■ County Boundary
 ■ Cities

FEMA Floodplains NFHL 2015
Type
 ■ Floodway
 ■ 100YR
 ■ 500YR
 ■ Minimal
 ■ Levoo Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Oyster Creek | | | |
|--|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; the jurisdiction can experience 4 to 5 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • The northeast of the city is adjacent to oyster creek and is within the 100-year floodplain • The city’s largest retail center is in this area as well as residential areas; these areas are prone to flooding. | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Commercial and residential property loss throughout the city, particularly in the northeast of the city • Economic loss for the city and local business that could be damaged during flooding • Financial loss for residents who were displaced because of the event and/ or whose homes were destroyed or damaged due to the event. | | | |

Floodplains: Quintana



Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools

Roads

County Boundary

Cities

FEMA Floodplains NFHL 2015

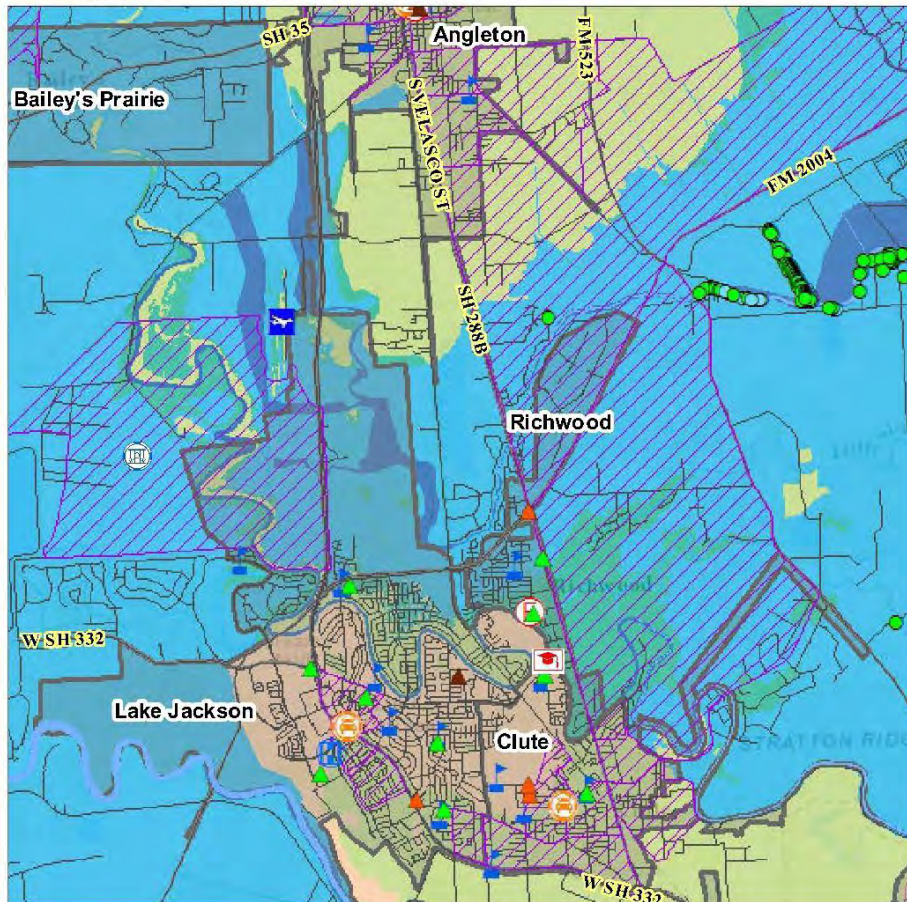
Type

- Floodway
- 100YR
- 500YR
- Minimal
- Levee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAG, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Quintana | | | |
|---|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 1.6 feet of water; the jurisdiction can experience 3 to 4 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> The entire city is within the 100-year floodplain The port facility to the northeast is considered a critical facility and is within the 100-year floodplain Residential and commercial areas throughout the city are prone to flooding | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Residential, commercial and public property loss due to flood events Loss of basic city services with the potential for the entire city to flood during events Economic loss for the city with a loss of public and commercial activity Financial loss for residents whose homes were destroyed or damaged | | | |

Floodplains: Richwood



Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools

Roads

- County Boundary
- Cities

FEMA Floodplains NFHL 2015

Type

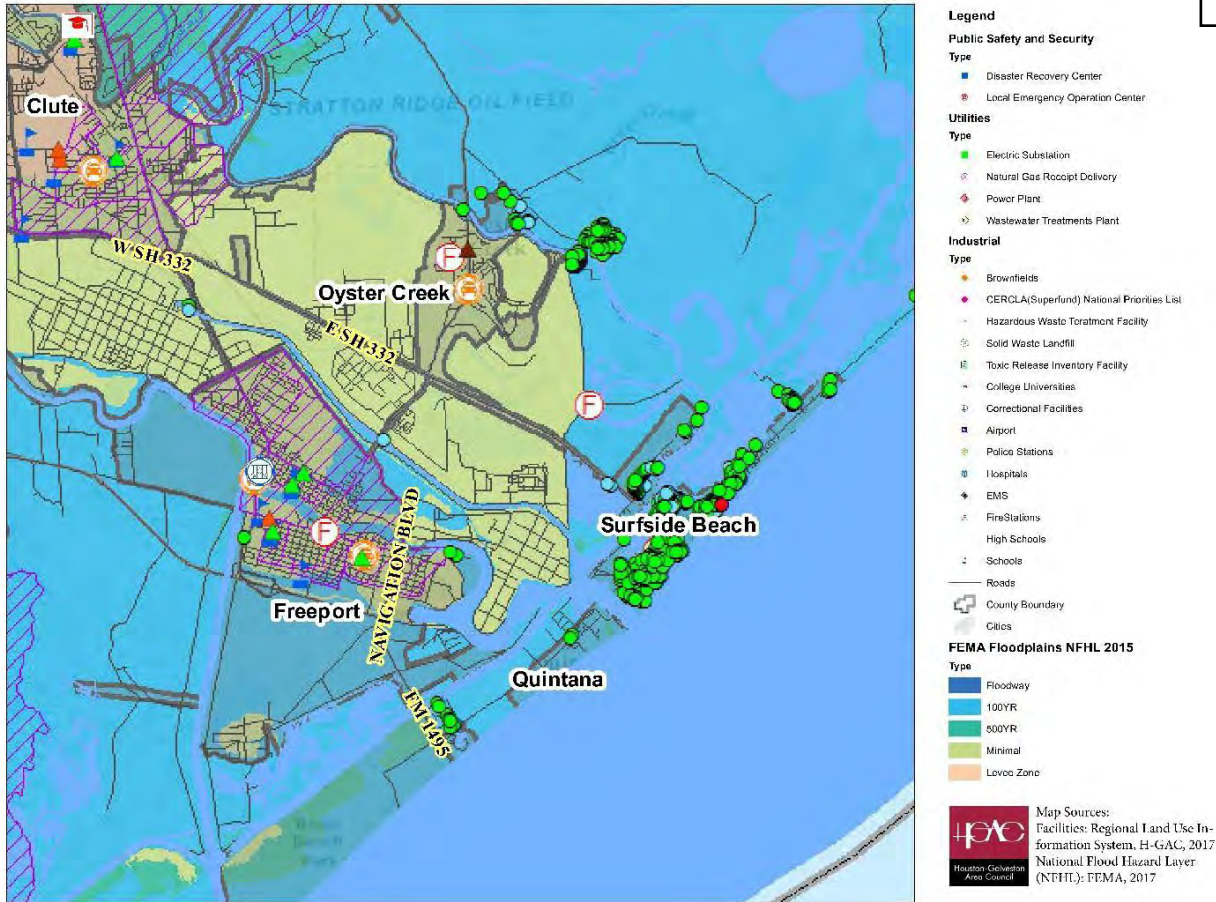
- Floodway
- 100YR
- 500YR
- Minimal
- Levee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Richwood | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 3.1 | Occurrences since 2000: | 5 |
| Area Affected: | 100% | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 5 feet of water; the jurisdiction can experience 6 to 7 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> 264 homes have flooded in the past from a single event; homes to the southwest of the city along Oyster Creek are prone to flooding Highway 2004 and Brazos Crossing neighborhood is prone to flooding | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Residential property loss throughout the southwest of the city Financial loss for residents displaced by the event | | | |

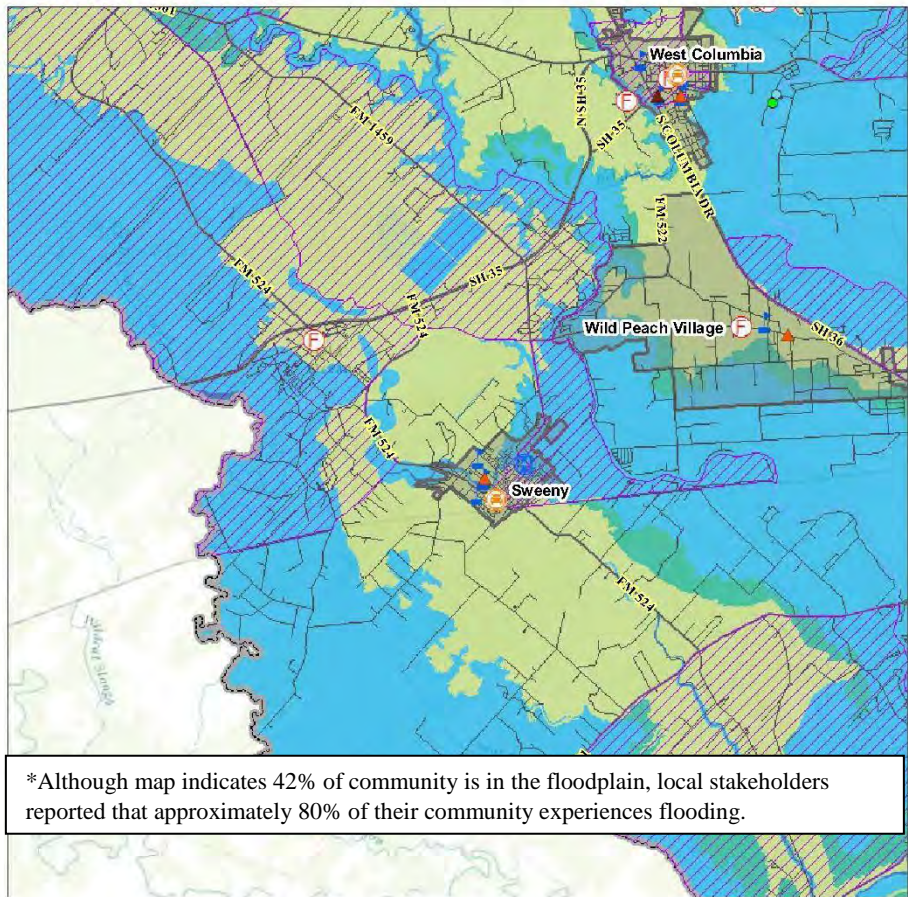
Floodplains: Surfside Beach

Section VII, Item H.



| Surfside Beach | | | |
|--|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.2 | Occurrences since 2000: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 1.7 feet of water; the jurisdiction can experience 3 to 4 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • The entire jurisdiction is located within the 100-year floodplain. • Toxic release site located in the center of town within the 100-year floodplain • Port facility and police station are located within the 100-year floodplain | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Loss of public, commercial, and residential property throughout the city • Financial and economic loss for residents and the city due to a lack of public services, commercial activity and damage to homes • Potential for a compounding hazard; if the toxic release site is flooded this may result in a technical hazard that leads to further injuries, loss of life or property damage | | | |

Floodplains: Sweeny



Legend

Public Safety and Security
 Type
 ■ Disaster Recovery Center
 ■ Local Emergency Operation Center

Utilities
 Type
 ● Electric Substation
 ○ Natural Gas Receipt Delivery
 ◆ Power Plant
 ◇ Wastewater Treatment Plant

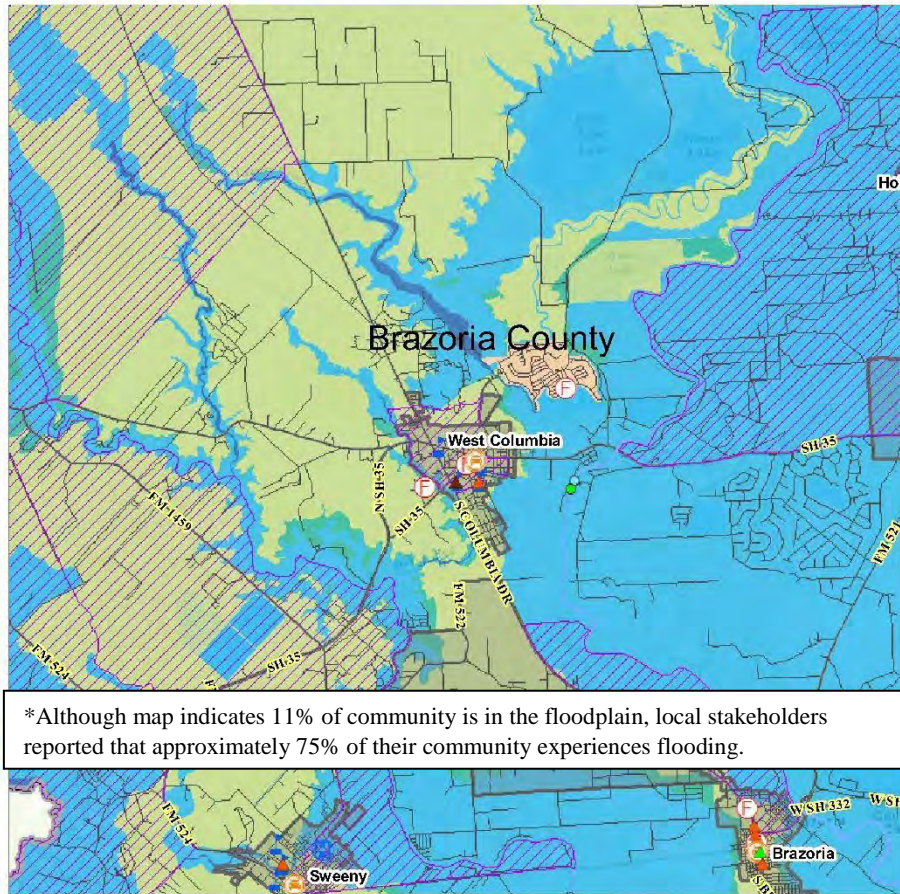
Industrial
 Type
 ● Brownfields
 ● CERCLA(Superfund) National Priorities List
 ● Hazardous Waste Treatment Facility
 ● Solid Waste Landfill
 ■ Toxic Release Inventory Facility
 ● College Universities
 ■ Correctional Facilities
 ■ Airport
 ● Police Stations
 ■ Hospitals
 ◆ EMS
 ● Fire Stations
 ● High Schools
 ■ Schools
 — Roads
 □ County Boundary
 □ Citia

FEMA Floodplains NFHL 2015
 Type
 ■ Floodway
 ■ 100YR
 ■ 500YR
 ■ Minimal
 ■ Levee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAG, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Sweeny and Sweeny ISD | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 6 |
| Area Affected: | 80 % | Annual Event Average: | .35 |
| Probability: Likely; 35 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 1 foot of water; the jurisdiction can experience 2 to 3 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Electric substation and hospital are in the AO flood zone; where sheet flooding could be expected • Roads throughout the city are prone to flooding; in past events road 524 was the only way out of the city | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Loss of power throughout the city potentially leading to loss of communication with residents needing assistance • Loss of available hospital beds or needed medical devices and medical help in the city- leading to serious injury or death and stress on neighboring jurisdictions first responders and hospital systems • Serious injury or loss of life due to residents and visitors unable to evacuate due to flooded major roadways | | | |

Floodplains: West Columbia



*Although map indicates 11% of community is in the floodplain, local stakeholders reported that approximately 75% of their community experiences flooding.

Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt/Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools
- Roads
- County Boundary
- Cities

FEMA Floodplains NFHL 2015

Type

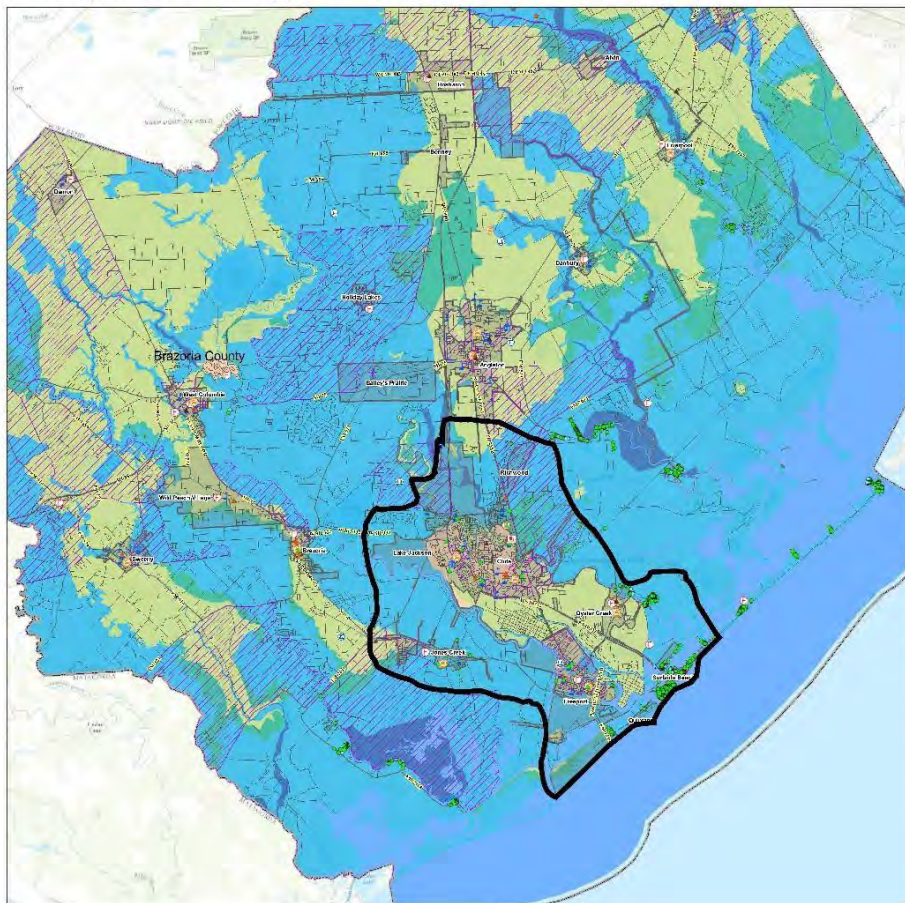
- Floodway
- 100YR
- 500YR
- Minimal
- Levee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| West Columbia | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.58 | Occurrences since 2000: | 6 |
| Area Affected: | 75 % | Annual Event Average: | .35 |
| Probability: Likely; 35 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; the jurisdiction can experience 4 to 5 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> 80 homes throughout the city flooded during past events, greatest damage seen along Bell Creek and along Humble Drive Wastewater treatment facility flooded in past events due to backup Police department and several lift stations flooded in the city due to the Brazos River | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Residential and commercial property loss throughout the city Serious injury or loss of life due to delayed response because of damage to police station Reduced water quality during and after event due to potential damage to waste water treatment facility | | | |

Floodplains: Brazosport ISD

Section VII, Item H.



Legend

Public Safety and Security

Type

- Disaster Recovery Center
- Local Emergency Operation Center

Utilities

Type

- Electric Substation
- Natural Gas Receipt Delivery
- Power Plant
- Wastewater Treatment Plant

Industrial

Type

- Brownfields
- CERCLA(Superfund) National Priorities List
- Hazardous Waste Treatment Facility
- Solid Waste Landfill
- Toxic Release Inventory Facility
- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- High Schools
- Schools
- Roads
- County Boundary
- Cities

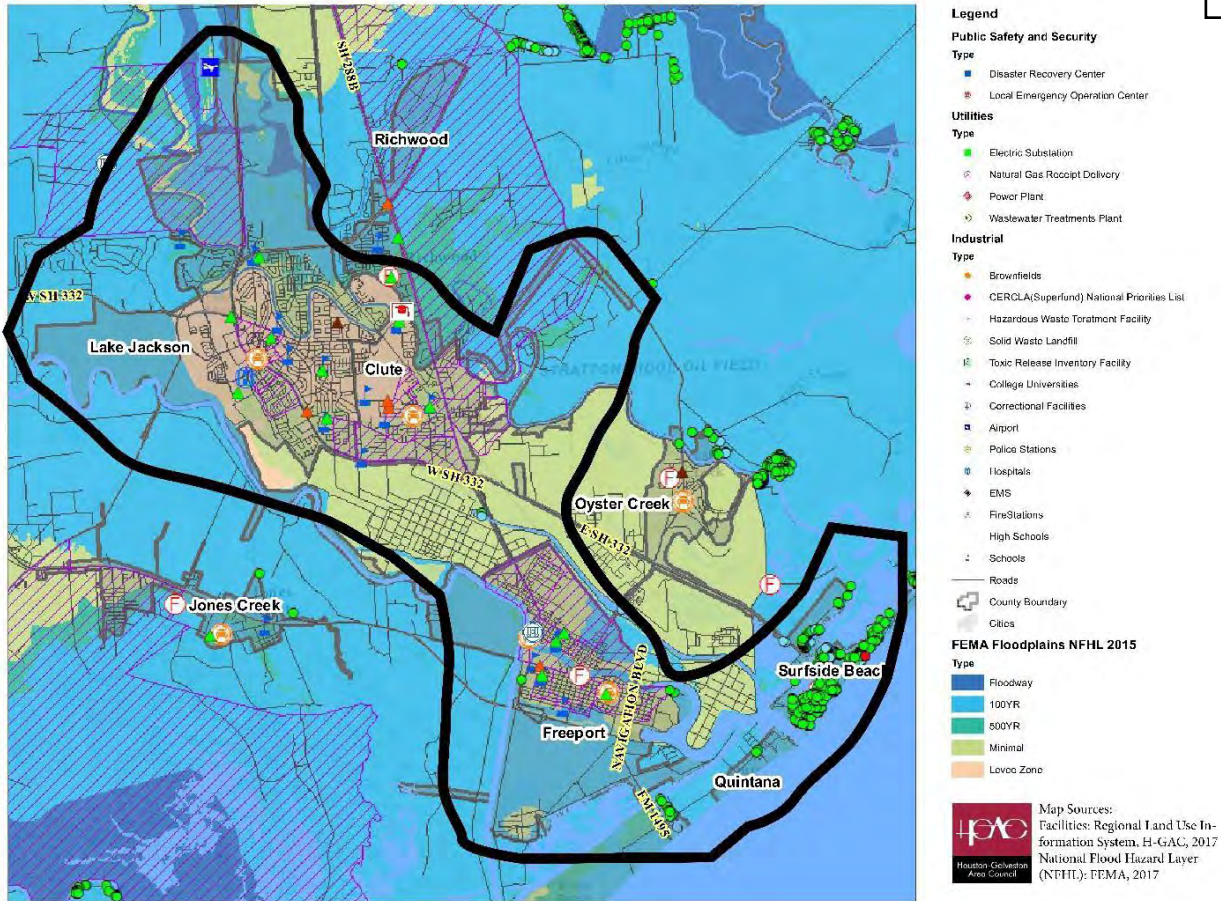
FEMA Floodplains NFHL 2015

Type

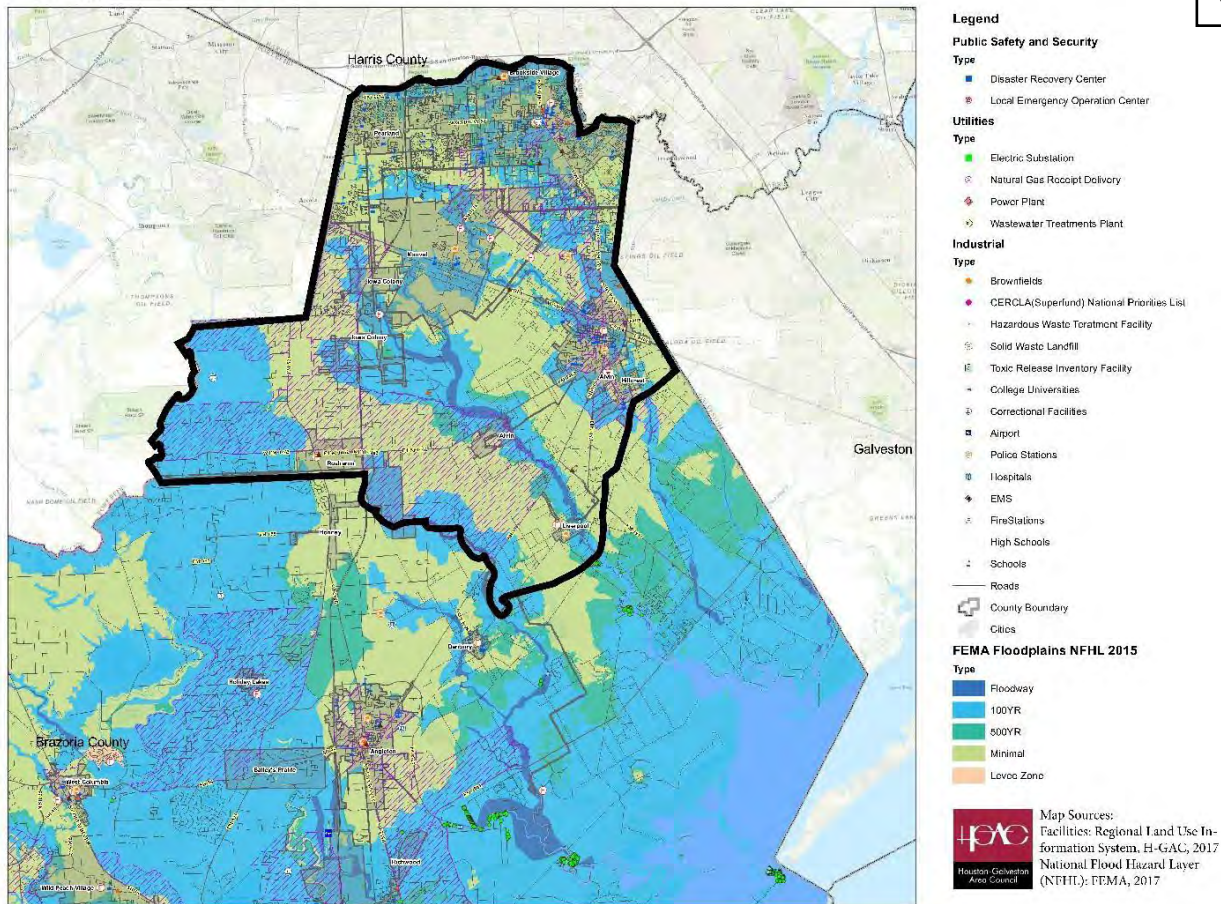
- Floodway
- 100YR
- 500YR
- Minimal
- Lowco Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Brazosport ISD | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 200 | Occurrences since 2000: | 0 |
| Area Affected: | 66 % | Annual Event Average: | 0 |
| Probability: Although there have been no reported events in the schools or administrative buildings, the school district has schools and buildings across the county. In considering this, the probability may be similar to Unincorporated Areas in the county: Very Likely; 100 percent chance the event will occur in a year | | | |
| Extent: All school buildings within the district were reopened 2 weeks after the most extensive flooding event in the county (flooding from Hurricane Harvey). Although there have been no recorded events in the district extent may be similar to the Unincorporated Areas in the county: According to past events the county has experienced 5 feet of water; the county can experience 6 to 7 feet of water. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> 19 schools- 10 elementary schools, 3 high schools, 5 middle schools, 1 alternative school 12,000 children 18 years and younger | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Serious injury or loss of life due to students and staff trying to evacuate from a potentially flooding building or trying to get to school after an event and debris is still on roadways Property and financial loss due to flood damage to schools or administrative buildings and schools closed for a prolonged period | | | |



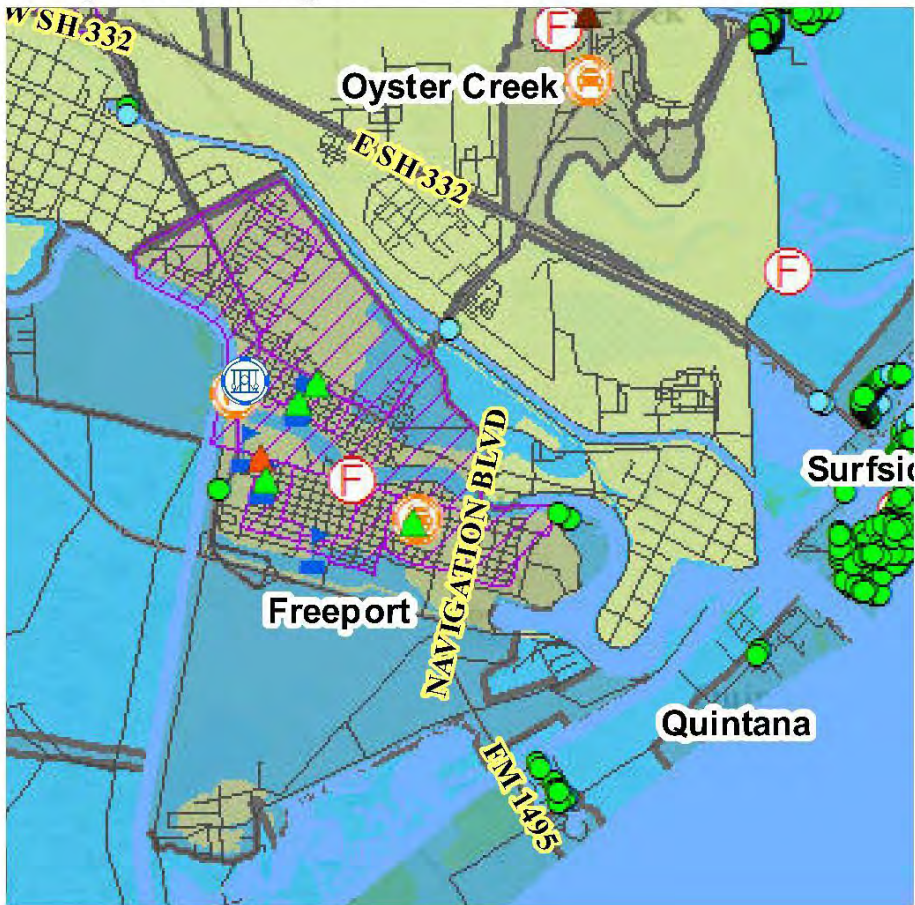
| Velasco Drainage District | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 236 | Occurrences since 2000: | 5 |
| Area Affected: | 69 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; The jurisdiction can experience 4 to 5 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Headquarters are directly adjacent to Oyster Creek in Clute, just outside the 100-year floodplain 14 pumps and levees | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Potential delay in service due to potential damage to administrative buildings Pump failure could result in a levee or dam failure leading to property loss, loss of life, and an increase in needed shelters | | | |



| Alvin ISD | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 252 | Occurrences since 2000: | 0 |
| Area Affected: | 39 % | Annual Event Average: | 0 |
| Probability: Although there have been no reported events in the schools or administrative buildings, the school district has schools and buildings across the county. In considering this the probability may be similar to Unincorporated Areas in the county: Very Likely; 100 percent chance the event will occur in a year | | | |
| Extent: All school buildings within the district were reopened less than 2 weeks after the most extensive flooding event in the county (flooding from Hurricane Harvey). Although there have been no recorded events in the district extent may be similar to the Unincorporated Areas in the county: According to past events the county has experienced 5 feet of water; the county can experience 6 to 7 feet of water. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 31 schools- 17 elementary schools, 3 high schools, 6 middle schools, 1 alternative school • 22,000 children 18 years and younger | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Serious injury or loss of life due to students and staff trying to evacuate from a potentially flooding building or trying to get to school after an event and debris is still on roadways • Property and financial loss due to flood damage to schools or administrative buildings and schools closed for a prolonged period | | | |

Floodplains: Port Freeport

Section VII, Item H.



Legend

Public Safety and Security
 Type
 ■ Disaster Recovery Center
 ■ Local Emergency Operation Center

Utilities
 Type
 ■ Electric Substation
 ■ Natural Gas Receipt Delivery
 ■ Power Plant
 ■ Wastewater Treatment Plant

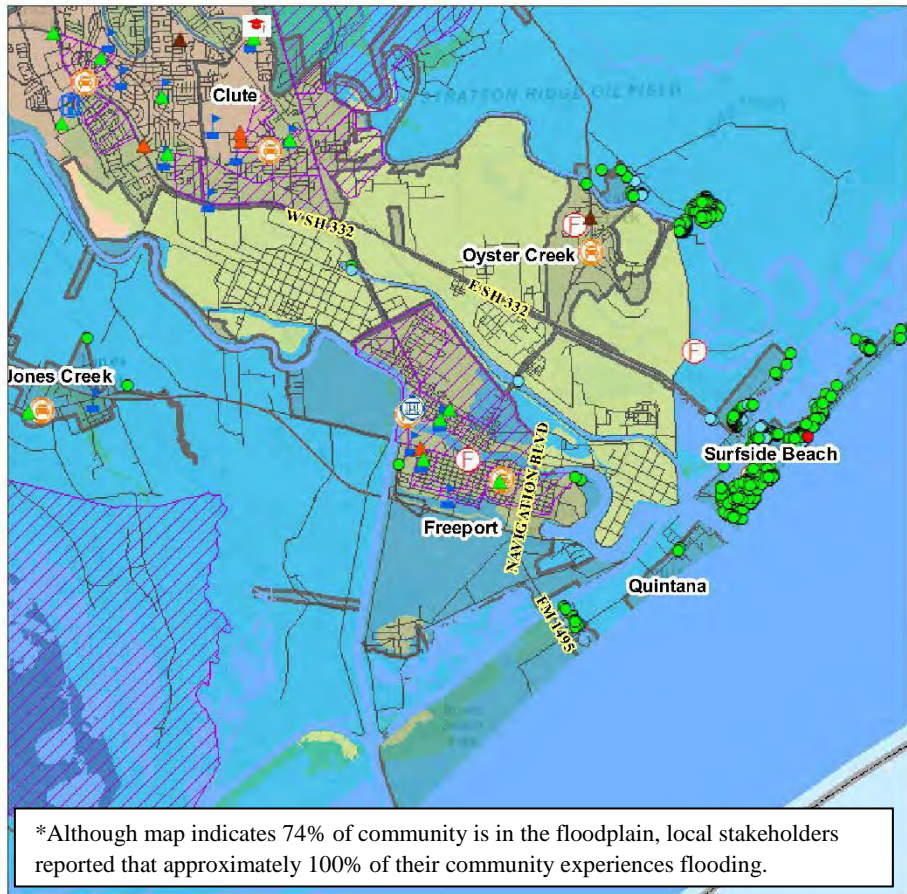
Industrial
 Type
 ■ Brownfields
 ■ CERCLA(Superfund) National Priorities List
 ■ Hazardous Waste Treatment Facility
 ■ Solid Waste Landfill
 ■ Toxic Release Inventory Facility
 ■ College Universities
 ■ Correctional Facilities
 ■ Airport
 ■ Police Stations
 ■ Hospitals
 ■ EMS
 ■ Fire Stations
 ■ High Schools
 ■ Schools

FEMA Floodplains NFHL 2015
 Type
 ■ Floodway
 ■ 100YR
 ■ 500YR
 ■ Minimal
 ■ Lowco Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAC, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

| Port Freeport | | | |
|--|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; The jurisdiction can experience 4 to 5 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Brazos Harbor wraps around the south and east of the city. The port is in the floodplain | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Potential for a flood hazard to turn into a technical hazard which may lead to an increase in potential injuries or loss of life Financial loss for residents who may lose their jobs and economic loss for the city and state with one of the main ports down for a prolonged time | | | |

Floodplains: Freeport



- Legend**
- Public Safety and Security**
- Type
- Disaster Recovery Center
 - Local Emergency Operation Center
- Utilities**
- Type
- Electric Substation
 - Natural Gas Receipt Delivery
 - Power Plant
 - Wastewater Treatment Plant
- Industrial**
- Type
- Brownfields
 - CERCLA(Superfund) National Priorities List
 - Hazardous Waste Treatment Facility
 - Solid Waste Landfill
 - Toxic Release Inventory Facility
 - College Universities
 - Correctional Facilities
 - Airport
 - Police Stations
 - Hospitals
 - EMS
 - Fire Stations
 - High Schools
 - Schools
- Roads
- County Boundary
- Cities
- FEMA Floodplains NFHL 2015**
- Type
- Floodway
 - 100YR
 - 500YR
 - Minimal
 - Levee Zone

Map Sources:
 Facilities: Regional Land Use Information System, H-GAG, 2017
 National Flood Hazard Layer (NFHL): FEMA, 2017

*Although map indicates 74% of community is in the floodplain, local stakeholders reported that approximately 100% of their community experiences flooding.

| Freeport | | | |
|---|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .29 |
| Probability: Likely; 29 percent chance the event will occur in a year | | | |
| Extent: According to past events the jurisdiction has experienced 3 feet of water; The jurisdiction can experience 4 to 5 feet of water | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Brazos Harbor wraps around the northeast of the city. The largest industrial site in the city is in the floodplain | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Commercial and residential property loss due to potential flood damage Economic loss from the harbor being potentially closed due to flooding Delay in city services due to potential impassable roadways from debris | | | |

Part 6.2: Wildfire

6.2 Wildfire

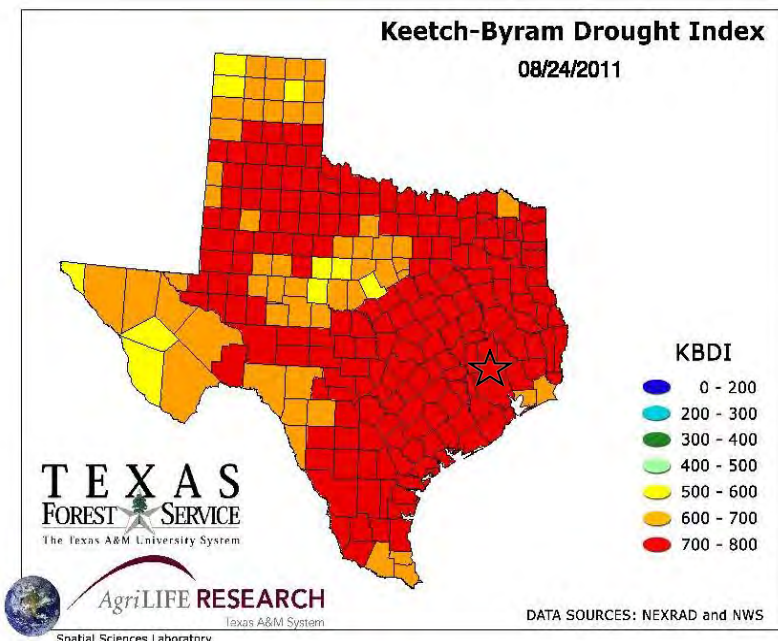
A combination of the Keetch-Byram Drought Index (KBDI) and the Texas Wildfire Risk Assessment are used to assess the risk of wildfire. KBDI is an index that measures the daily water balance, precipitation, and moisture in the soil to determine the potential for wildfires. KBDI ranges from 0 to 800 units. Zero represents fully saturated soil or no indication of drought. A measurement of 800 is the maximum measurement for drought and indicates no moisture is present in the soil. In August 2011, the maximum KBDI value recorded in Brazoria County was 792. The minimum KBDI value, 41, was recorded in September of 2017. KBDI conditions can change rapidly based on short-term weather conditions, so the most extreme values should be considered when addressing wildfire risk.

The Texas Wildfire Risk Assessment uses a variety of factors, such as fuels, vegetation, weather, and topography, to determine the fire potential of a specific land area. Particularly vulnerable are the Wildland Urban Interface (WUI) areas. These areas occur at the intersection of development and wildland. With continued population growth throughout the county, the WUI zones will become more abundant. Because most wildfires are caused by human activities, the intersection of WUI and drought are particularly dangerous.

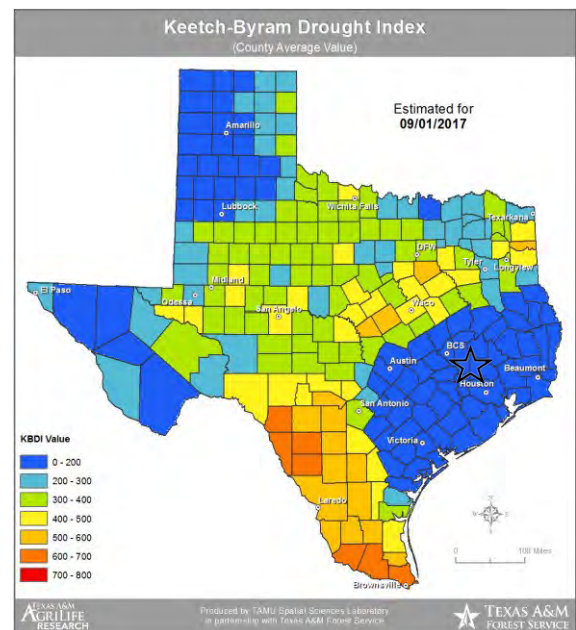
Wildland Fire Assessment System (WFAS) KBDI Value Scale:

| KBDI Value | Score | Description |
|------------|-----------|---|
| 0 - 200 | 0 - 200 | Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. Typical of early spring following winter precipitation. |
| 200 - 300 | 200 - 400 | Fuels are beginning to dry and contribute to wildfire intensity. Heavier fuels will still not readily ignite and burn. This is often seen in late spring or early summer. |
| 300 - 400 | 400 - 600 | Lower litter and duff layers contribute to fire intensity and will burn actively. Wildfire intensity begins to increase significantly. Larger fuels could burn or smolder for several days. This is often seen in late summer and early fall. |
| 400 - 500 | 600 - 800 | Often associated with more severe drought with increased wildfire occurrence. Intense, deep-burning fires with extreme intensities can be expected. Live fuels can also be expected to burn actively at these levels. |
| 500 - 600 | | |
| 600 - 700 | | |
| 700 - 800 | | |

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



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



Historic Occurrence

The Texas A&M Forest Service tracks wildfire events, acres destroyed, and the initial ignition cause of the fire. Below is the historic data associated with any burns that caused recorded damage.

| Date | Acres Burned | Cause | Jurisdiction | Date (Cont.) | Acres Burned (Cont.) | Cause (Cont.) | Jurisdiction (Cont.) |
|------------|--------------|----------------|--------------------------------|--------------|----------------------|----------------|--------------------------------|
| 5/24/2006 | 560 | Equipment use | Unincorporated | 4/25/2010 | 1 | Equipment use | Manvel |
| 2/16/2007 | 1 | Debris burning | Unincorporated | 5/17/2010 | 1 | Debris burning | Unincorporated |
| 10/27/2007 | 3 | Smoking | Surfside Beach | 5/20/2010 | 1 | Debris burning | Unincorporated |
| 12/25/2007 | 1.5 | Miscellaneous | Unincorporated | 5/23/2010 | 1 | Debris burning | Unincorporated |
| 12/31/2007 | 1 | Miscellaneous | Unincorporated | 6/15/2010 | 1 | Debris burning | Unincorporated |
| 1/1/2008 | 0.5 | Debris burning | Unincorporated | 7/4/2010 | 0 | Campfire | Surfside Beach |
| 1/4/2008 | 0.5 | Debris burning | Unincorporated | 8/5/2010 | 1 | Equipment use | Manvel |
| 1/6/2008 | 1 | Miscellaneous | Unincorporated | 8/8/2010 | 2 | Debris burning | Unincorporated |
| 1/9/2008 | 100 | Debris burning | Unincorporated | 8/11/2010 | 4 | Debris burning | Unincorporated |
| 1/11/2008 | 0 | Debris burning | Unincorporated | 10/2/2010 | 1 | Equipment use | Unincorporated |
| 1/13/2008 | 0.5 | Debris burning | Clute | 10/17/2010 | 2 | Debris burning | Unincorporated |
| 1/14/2008 | 1 | Debris burning | Unincorporated | 10/28/2010 | 1 | Debris burning | Unincorporated |
| 1/22/2008 | 0 | Debris burning | Unincorporated | 12/6/2010 | 150 | Miscellaneous | Unincorporated |
| 1/28/2008 | 0 | Debris burning | Surfside Beach | 12/12/2010 | 2 | Debris burning | Unincorporated |
| 2/5/2008 | 5 | Debris burning | Manvel | 12/23/2010 | 3 | Debris burning | Unincorporated |
| 2/8/2008 | 4 | Debris burning | Unincorporated Brazoria County | 12/26/2010 | 0.25 | Incendiary | Unincorporated |
| 3/8/2008 | 1 | Miscellaneous | Unincorporated | 12/27/2010 | 100 | Miscellaneous | Unincorporated |
| 4/9/2008 | 1 | Debris burning | Unincorporated | 12/31/2010 | 0.5 | Debris burning | Freeport |
| 5/9/2008 | 1 | Debris burning | Manvel | 12/31/2010 | 0 | Debris burning | Unincorporated |
| 5/26/2008 | 1 | Debris burning | Unincorporated | 1/6/2011 | 1 | Miscellaneous | Unincorporated |
| 6/1/2008 | 1 | Debris burning | Iowa Colony | 1/19/2011 | 1.5 | Miscellaneous | Bonney |
| 7/1/2008 | 2 | Incendiary | Manvel | 2/2/2011 | 1 | Miscellaneous | Unincorporated |
| 7/1/2008 | 1 | Equipment use | Unincorporated | 2/8/2011 | 0.5 | Debris burning | Unincorporated |
| 7/8/2008 | 10 | Debris burning | Manvel | 2/13/2011 | 5 | Children | Manvel |
| 7/13/2008 | 2 | Equipment use | Iowa Colony | 2/13/2011 | 0 | Children | Manvel |
| 7/29/2008 | 1 | Debris burning | Manvel | 2/14/2011 | 30 | Debris burning | Unincorporated Brazoria County |
| 8/10/2008 | 1 | Debris burning | Unincorporated | 2/15/2011 | 20 | Debris burning | Unincorporated |
| 8/15/2008 | 1 | Debris burning | Unincorporated | 2/18/2011 | 1 | Debris burning | Unincorporated |
| 9/6/2008 | 1 | Equipment use | Manvel | 2/19/2011 | 2 | Debris burning | Unincorporated |
| 9/11/2008 | 1 | Miscellaneous | Unincorporated | 2/24/2011 | 10 | Debris burning | Unincorporated |
| 9/18/2008 | 1 | Debris burning | Alvin | 2/28/2011 | 3 | Equipment use | Unincorporated |
| 9/21/2008 | 1 | Power Lines | Unincorporated | 3/6/2011 | 2 | Debris burning | Unincorporated |
| 9/22/2008 | 1 | Debris burning | Unincorporated | 3/6/2011 | 5 | Debris burning | Unincorporated |
| 9/24/2008 | 1 | Debris burning | Manvel | 3/7/2011 | 10 | Debris burning | Manvel |
| 10/2/2008 | 2 | Debris burning | Manvel | 3/18/2011 | 1 | Debris burning | Unincorporated |
| 10/2/2008 | 0 | Miscellaneous | Unincorporated | 3/24/2011 | 0.5 | Smoking | Freeport |
| 10/3/2008 | 1 | Power Lines | Manvel | 4/1/2011 | 0.5 | Miscellaneous | Surfside Beach |

| | | | | | | | |
|------------|-----|----------------|----------------|-----------|------|----------------|--------------------------------|
| 10/4/2008 | 2 | Debris burning | Unincorporated | 4/5/2011 | 0.25 | Miscellaneous | Unincorporated |
| 10/4/2008 | 1 | Debris burning | Unincorporated | 4/13/2011 | 1 | Equipment use | Manvel |
| 10/6/2008 | 2 | Debris burning | Unincorporated | 4/15/2011 | 1 | Campfire | Surfside Beach |
| 10/11/2008 | 1 | Debris burning | Unincorporated | 4/16/2011 | 2 | Debris burning | Unincorporated |
| 10/11/2008 | 1 | Debris burning | Unincorporated | 4/22/2011 | 1 | Campfire | Surfside Beach |
| 10/13/2008 | 1 | Miscellaneous | Unincorporated | 4/27/2011 | 15 | Miscellaneous | Unincorporated |
| 10/14/2008 | 1 | Debris burning | Unincorporated | 5/1/2011 | 1 | Incendiary | Unincorporated |
| 10/19/2008 | 1 | Debris burning | Unincorporated | 5/4/2011 | 1 | Power Lines | Unincorporated |
| 10/20/2008 | 2 | Debris burning | Manvel | 5/7/2011 | 1 | Smoking | Unincorporated |
| 10/28/2008 | 1 | Debris burning | Unincorporated | 5/11/2011 | 0.5 | Debris burning | Unincorporated |
| 10/29/2008 | 1 | Debris burning | Unincorporated | 5/22/2011 | 2 | Debris burning | Unincorporated |
| 11/7/2008 | 1 | Debris burning | Bonney | 5/30/2011 | 2 | Miscellaneous | Unincorporated |
| 11/10/2008 | 1 | Debris burning | Unincorporated | 5/31/2011 | 2 | Debris burning | Unincorporated |
| 11/21/2008 | 1 | Debris burning | Unincorporated | 6/4/2011 | 5 | Debris burning | Freeport |
| 11/27/2008 | 1 | Debris burning | Unincorporated | 6/12/2011 | 1 | Equipment use | Unincorporated Brazoria County |
| 11/29/2008 | 1 | Debris burning | Unincorporated | 6/18/2011 | 11 | Lightning | Freeport |
| 11/29/2008 | 2 | Debris burning | Unincorporated | 6/18/2011 | 1 | Children | Unincorporated |
| 12/3/2008 | 1 | Debris burning | Unincorporated | 6/20/2011 | 5 | Miscellaneous | Unincorporated |
| 12/8/2008 | 2 | Debris burning | Unincorporated | 7/1/2011 | 5 | Debris burning | Unincorporated |
| 12/8/2008 | 1 | Miscellaneous | Unincorporated | 7/1/2011 | 3 | Debris burning | Unincorporated |
| 12/12/2008 | 1 | Debris burning | Unincorporated | 7/4/2011 | 1 | Debris burning | Unincorporated |
| 12/12/2008 | 1 | Debris burning | Unincorporated | 7/12/2011 | 20 | Railroads | Unincorporated |
| 12/12/2008 | 1 | Debris burning | Unincorporated | 7/14/2011 | 1 | Debris burning | Unincorporated |
| 12/12/2008 | 1 | Debris burning | Unincorporated | 7/23/2011 | 1 | Smoking | Freeport |
| 12/14/2008 | 1 | Smoking | Unincorporated | 7/30/2011 | 1 | Power Lines | Unincorporated |
| 12/31/2008 | 1 | Debris burning | Unincorporated | 8/18/2011 | 1 | Miscellaneous | Unincorporated |
| 12/31/2008 | 1 | Debris burning | Unincorporated | 8/21/2011 | 5 | Smoking | Unincorporated |
| 12/31/2008 | 1 | Debris burning | Unincorporated | 8/24/2011 | 1 | Miscellaneous | Unincorporated |
| 1/1/2009 | 2 | Railroads | Angleton | 8/28/2011 | 1 | Miscellaneous | Unincorporated |
| 1/8/2009 | 2 | Debris burning | Unincorporated | 9/2/2011 | 1 | Miscellaneous | Manvel |
| 1/9/2009 | 1 | Debris burning | Unincorporated | 9/3/2011 | 1 | Power Lines | Manvel |
| 1/9/2009 | 1 | Debris burning | Unincorporated | 9/3/2011 | 0.5 | Power Lines | Manvel |
| 1/11/2009 | 2 | Debris burning | Unincorporated | 9/3/2011 | 0.5 | Power Lines | Manvel |
| 1/16/2009 | 6 | Lightning | Freeport | 9/3/2011 | 0.5 | Power Lines | Manvel |
| 1/18/2009 | 150 | Miscellaneous | Unincorporated | 9/3/2011 | 0.5 | Power Lines | Manvel |
| 1/19/2009 | 10 | Lightning | Freeport | 9/3/2011 | 0.2 | Power Lines | Unincorporated |
| 1/19/2009 | 0 | Miscellaneous | Unincorporated | 9/3/2011 | 0.2 | Power Lines | Unincorporated |
| 1/19/2009 | 1 | Miscellaneous | Unincorporated | 9/5/2011 | 10 | Equipment use | Bonney |
| 1/19/2009 | 1 | Debris burning | Unincorporated | 9/5/2011 | 15 | Miscellaneous | Unincorporated |
| 1/19/2009 | 2 | Debris burning | Unincorporated | 9/6/2011 | 0.25 | Equipment use | Manvel |
| 1/19/2009 | 1 | Debris burning | Unincorporated | 9/6/2011 | 1 | Miscellaneous | Unincorporated |
| 1/20/2009 | 2 | Lightning | Freeport | 9/6/2011 | 5 | Miscellaneous | Unincorporated |
| 1/20/2009 | 60 | Debris burning | Unincorporated | 9/8/2011 | 1.25 | Miscellaneous | Unincorporated |

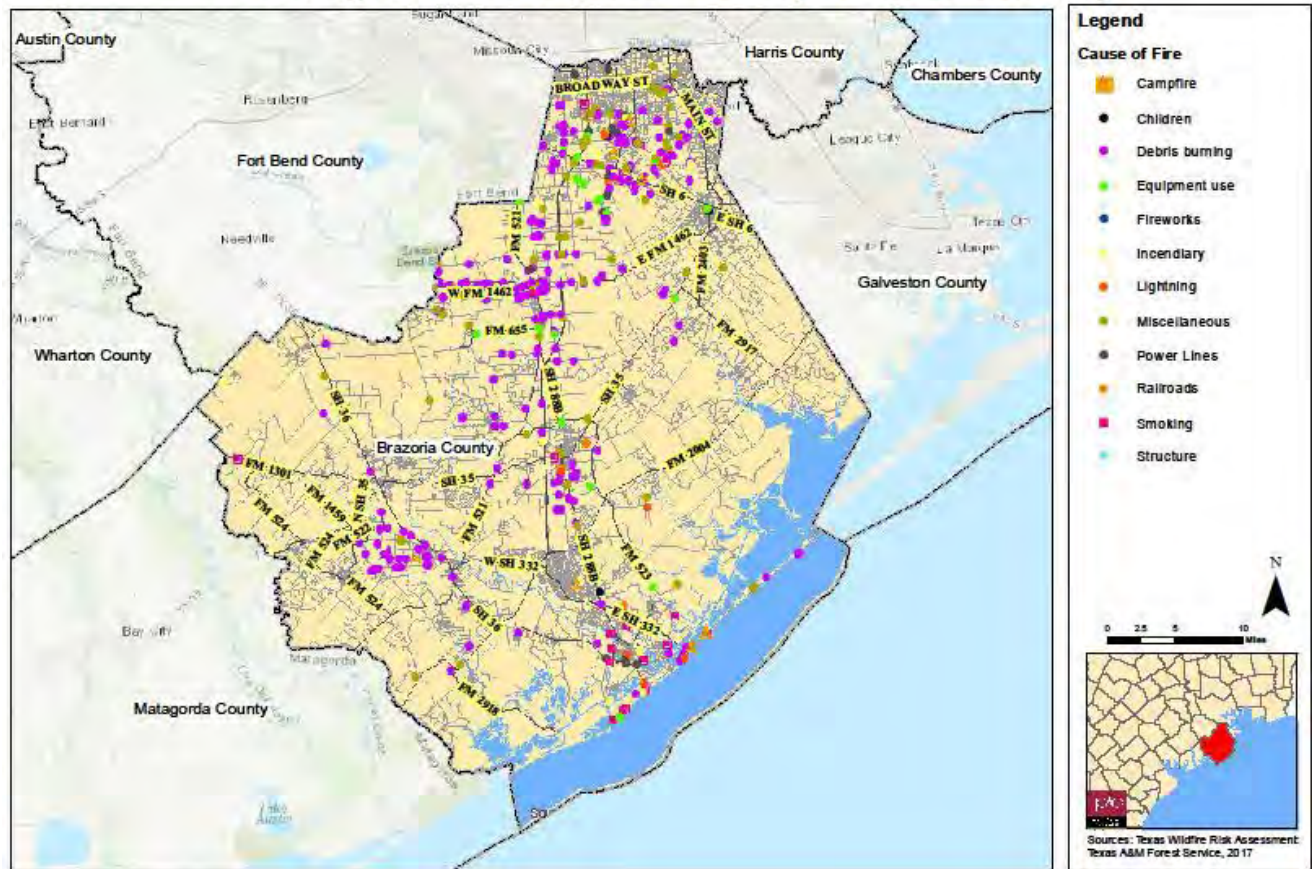
| | | | | | | | |
|-----------|-----|----------------|--------------------------------|------------|------|----------------|--------------------------------|
| 1/20/2009 | 60 | Debris burning | Unincorporated | 9/9/2011 | 0.5 | Equipment use | Manvel |
| 1/20/2009 | 60 | Miscellaneous | Unincorporated | 9/10/2011 | 0.75 | Equipment use | Unincorporated |
| 1/20/2009 | 60 | Debris burning | Unincorporated | 9/12/2011 | 0.25 | Smoking | Freeport |
| 1/20/2009 | 40 | Miscellaneous | Unincorporated Brazoria County | 9/13/2011 | 0.5 | Miscellaneous | Manvel |
| 1/20/2009 | 40 | Miscellaneous | Unincorporated | 9/13/2011 | 150 | Debris burning | Unincorporated |
| 1/22/2009 | 1 | Miscellaneous | Angleton | 9/13/2011 | 300 | Miscellaneous | Unincorporated Brazoria County |
| 1/22/2009 | 1 | Debris burning | Unincorporated | 9/14/2011 | 1 | Power Lines | Unincorporated |
| 1/23/2009 | 1 | Debris burning | Angleton | 9/26/2011 | 4 | Debris burning | Unincorporated |
| 1/23/2009 | 2 | Debris burning | Unincorporated | 10/12/2011 | 1 | Debris burning | Unincorporated |
| 1/24/2009 | 1 | Debris burning | Iowa Colony | 11/2/2011 | 1 | Debris burning | Unincorporated |
| 1/24/2009 | 1 | Debris burning | Unincorporated | 11/16/2011 | 1 | Debris burning | Unincorporated |
| 1/24/2009 | 2 | Debris burning | Unincorporated | 11/27/2011 | 0.5 | Debris burning | Angleton |
| 1/24/2009 | 1 | Debris burning | Unincorporated | 12/4/2011 | 1 | Debris burning | Unincorporated |
| 1/25/2009 | 1 | Debris burning | Angleton | 12/13/2011 | 1 | Debris burning | Unincorporated |
| 1/25/2009 | 1 | Debris burning | Unincorporated | 1/2/2012 | 2 | Debris burning | Unincorporated |
| 1/26/2009 | 2 | Debris burning | Unincorporated | 1/16/2012 | 0 | Debris burning | Unincorporated |
| 1/28/2009 | 5 | Miscellaneous | Bonney | 1/29/2012 | 0 | Debris burning | Unincorporated |
| 1/29/2009 | 1 | Miscellaneous | Alvin | 2/7/2012 | 0 | Debris burning | Unincorporated |
| 1/29/2009 | 6 | Incendiary | Angleton | 2/24/2012 | 0 | Debris burning | Unincorporated |
| 1/29/2009 | 2 | Miscellaneous | Angleton | 3/3/2012 | 0 | Debris burning | Unincorporated |
| 1/29/2009 | 1 | Debris burning | Unincorporated | 3/16/2012 | 1 | Debris burning | Unincorporated |
| 1/30/2009 | 1 | Miscellaneous | Unincorporated | 3/18/2012 | 10 | Debris burning | Unincorporated |
| 1/31/2009 | 1 | Children | Clute | 3/18/2012 | 0 | Debris burning | Unincorporated |
| 1/31/2009 | 2 | Debris burning | Unincorporated | 3/28/2012 | 0 | Debris burning | Unincorporated |
| 1/31/2009 | 1 | Equipment use | Unincorporated | 4/13/2012 | 0 | Debris burning | Unincorporated |
| 2/1/2009 | 2 | Debris burning | Unincorporated | 5/2/2012 | 0 | Debris burning | Unincorporated |
| 2/1/2009 | 2 | Equipment use | Unincorporated | 5/7/2012 | 1 | Incendiary | Freeport |
| 2/2/2009 | 1 | Debris burning | Manvel | 5/7/2012 | 2 | Power Lines | Freeport |
| 2/3/2009 | 1 | Debris burning | Alvin | 6/8/2012 | 0 | Smoking | Manvel |
| 2/3/2009 | 100 | Debris burning | Jones Creek | 6/9/2012 | 0.25 | Miscellaneous | Unincorporated |
| 2/3/2009 | 1 | Debris burning | Unincorporated | 6/15/2012 | 0 | Debris burning | Alvin |
| 2/3/2009 | 10 | Miscellaneous | Unincorporated | 6/22/2012 | 0 | Debris burning | Unincorporated |
| 2/3/2009 | 5 | Debris burning | Unincorporated | 6/26/2012 | 1 | Miscellaneous | Manvel |
| 2/3/2009 | 1 | Debris burning | Unincorporated | 6/28/2012 | 1 | Miscellaneous | Angleton |
| 2/3/2009 | 1 | Debris burning | Unincorporated | 7/16/2012 | 0 | Debris burning | Unincorporated |
| 2/4/2009 | 1 | Debris burning | Unincorporated | 7/28/2012 | 0 | Debris burning | Unincorporated |
| 2/6/2009 | 1 | Debris burning | Unincorporated | 8/1/2012 | 0 | Debris burning | Unincorporated |
| 2/7/2009 | 2 | Debris burning | Bailey's Prairie | 8/3/2012 | 1 | Miscellaneous | Angleton |
| 2/7/2009 | 2 | Debris burning | Brazoria | 8/11/2012 | 0 | Debris burning | Unincorporated |
| 2/7/2009 | 175 | Miscellaneous | Unincorporated | 8/12/2012 | 0.25 | Debris burning | Unincorporated |
| 2/7/2009 | 175 | Miscellaneous | Unincorporated | 8/12/2012 | 0.25 | Debris burning | Unincorporated |
| 2/7/2009 | 1 | Debris burning | Unincorporated | 8/14/2012 | 0 | Debris burning | Unincorporated |

| | | | | | | | |
|-----------|-----|----------------|----------------|------------|------|----------------|----------------|
| 2/9/2009 | 2 | Debris burning | Manvel | 8/18/2012 | 100 | Lightning | Unincorporated |
| 2/12/2009 | 2 | Debris burning | Angleton | 8/22/2012 | 1 | Debris burning | Angleton |
| 2/12/2009 | 7 | Smoking | Unincorporated | 8/22/2012 | 0.25 | Smoking | Freeport |
| 2/13/2009 | 1 | Debris burning | Unincorporated | 8/29/2012 | 0.1 | Smoking | Angleton |
| 2/13/2009 | 1 | Debris burning | Unincorporated | 8/29/2012 | 0 | Debris burning | Unincorporated |
| 2/19/2009 | 1 | Debris burning | Unincorporated | 8/30/2012 | 2 | Debris burning | Unincorporated |
| 2/21/2009 | 1 | Debris burning | Surfside Beach | 9/5/2012 | 0.1 | Power Lines | Freeport |
| 2/21/2009 | 1 | Debris burning | Unincorporated | 9/9/2012 | 0.5 | Miscellaneous | Unincorporated |
| 2/22/2009 | 1 | Debris burning | Unincorporated | 9/10/2012 | 0 | Debris burning | Unincorporated |
| 2/26/2009 | 1 | Debris burning | Unincorporated | 9/16/2012 | 1 | Debris burning | Unincorporated |
| 2/28/2009 | 1 | Debris burning | Unincorporated | 9/21/2012 | 0 | Debris burning | Unincorporated |
| 3/1/2009 | 1 | Campfire | Clute | 9/23/2012 | 0.5 | Lightning | Angleton |
| 3/2/2009 | 1 | Debris burning | Unincorporated | 9/26/2012 | 2 | Debris burning | Angleton |
| 3/3/2009 | 1 | Miscellaneous | Iowa Colony | 9/28/2012 | 0 | Lightning | Surfside Beach |
| 3/3/2009 | 1 | Smoking | Unincorporated | 10/20/2012 | 0.25 | Miscellaneous | Unincorporated |
| 3/4/2009 | 2 | Debris burning | Unincorporated | 10/25/2012 | 0.25 | Railroads | Unincorporated |
| 3/4/2009 | 1 | Debris burning | Unincorporated | 10/29/2012 | 1 | Equipment use | Unincorporated |
| 3/6/2009 | 2 | Debris burning | Unincorporated | 10/29/2012 | 1 | Debris burning | Unincorporated |
| 3/6/2009 | 1 | Debris burning | Unincorporated | 10/30/2012 | 1 | Debris burning | Unincorporated |
| 3/8/2009 | 1 | Miscellaneous | Unincorporated | 11/17/2012 | 0.25 | Debris burning | Unincorporated |
| 3/9/2009 | 1 | Miscellaneous | Manvel | 11/18/2012 | 0 | Debris burning | Unincorporated |
| 3/9/2009 | 1 | Smoking | Unincorporated | 11/19/2012 | 20 | Debris burning | Unincorporated |
| 3/9/2009 | 1 | Debris burning | Unincorporated | 11/20/2012 | 0 | Debris burning | Unincorporated |
| 3/11/2009 | 2 | Smoking | Unincorporated | 11/21/2012 | 0 | Debris burning | Unincorporated |
| 3/16/2009 | 1 | Debris burning | Unincorporated | 11/25/2012 | 0 | Debris burning | Unincorporated |
| 3/17/2009 | 4 | Debris burning | Unincorporated | 11/29/2012 | 0.25 | Debris burning | Manvel |
| 3/19/2009 | 1 | Debris burning | Unincorporated | 12/15/2012 | 1 | Debris burning | Unincorporated |
| 3/19/2009 | 1 | Equipment use | Unincorporated | 12/28/2012 | 0 | Debris burning | Unincorporated |
| 3/19/2009 | 30 | Debris burning | Unincorporated | 1/24/2013 | 1 | Debris burning | Unincorporated |
| 3/21/2009 | 1 | Debris burning | Unincorporated | 1/25/2013 | 1 | Debris burning | Unincorporated |
| 3/25/2009 | 2 | Debris burning | Unincorporated | 2/1/2013 | 0 | Incendiary | Unincorporated |
| 3/26/2009 | 1 | Debris burning | Bonney | 2/3/2013 | 1 | Debris burning | Manvel |
| 3/31/2009 | 1 | Debris burning | Unincorporated | 3/7/2013 | 1 | Debris burning | Unincorporated |
| 4/3/2009 | 3 | Debris burning | Unincorporated | 3/12/2013 | 1 | Railroads | Manvel |
| 4/5/2009 | 2 | Debris burning | Unincorporated | 3/13/2013 | 1 | Debris burning | Manvel |
| 4/10/2009 | 1 | Debris burning | Unincorporated | 3/21/2013 | 1 | Incendiary | Unincorporated |
| 4/11/2009 | 3 | Debris burning | Unincorporated | 3/23/2013 | 1 | Debris burning | Manvel |
| 4/12/2009 | 1 | Debris burning | Unincorporated | 3/26/2013 | 0.1 | Power Lines | Freeport |
| 4/18/2009 | 1 | Debris burning | Unincorporated | 4/13/2013 | 0.1 | Incendiary | Freeport |
| 4/22/2009 | 0.5 | Miscellaneous | Manvel | 5/5/2013 | 1 | Campfire | Freeport |
| 4/28/2009 | 4 | Debris burning | Unincorporated | 5/14/2013 | 0 | Children | Alvin |
| 5/8/2009 | 2 | Debris burning | Unincorporated | 5/31/2013 | 0.25 | Debris burning | Unincorporated |
| 5/9/2009 | 1 | Debris burning | Iowa Colony | 6/3/2013 | 0.1 | Miscellaneous | Alvin |

| | | | | | | | |
|-----------|-----|----------------|----------------|------------|-------|----------------|-----------------------------------|
| 5/9/2009 | 1 | Debris burning | Unincorporated | 6/3/2013 | 0.1 | Equipment use | Alvin |
| 5/9/2009 | 1 | Miscellaneous | Unincorporated | 6/6/2013 | 1 | Lightning | Manvel |
| 5/12/2009 | 0.5 | Debris burning | Manvel | 6/6/2013 | 1 | Lightning | Manvel |
| 5/12/2009 | 0.1 | Miscellaneous | Manvel | 6/16/2013 | 1 | Incendiary | Manvel |
| 5/15/2009 | 0.1 | Miscellaneous | Manvel | 6/17/2013 | 1 | Debris burning | Unincorporated |
| 5/18/2009 | 0.8 | Miscellaneous | Unincorporated | 6/19/2013 | 0.5 | Smoking | Freeport |
| 5/18/2009 | 2 | Debris burning | Unincorporated | 6/22/2013 | 1 | Debris burning | Manvel |
| 5/20/2009 | 3 | Debris burning | Unincorporated | 7/1/2013 | 0 | Debris burning | Unincorporated Brazoria County |
| 5/21/2009 | 1 | Debris burning | Unincorporated | 7/4/2013 | 0.5 | Smoking | Freeport |
| 5/22/2009 | 2 | Debris burning | Unincorporated | 7/4/2013 | 1 | Miscellaneous | Manvel |
| 5/23/2009 | 1 | Debris burning | Unincorporated | 7/5/2013 | 2 | Debris burning | Manvel |
| 5/29/2009 | 1 | Debris burning | Unincorporated | 7/5/2013 | 1 | Debris burning | Unincorporated |
| 5/31/2009 | 1 | Debris burning | Unincorporated | 7/9/2013 | 0.1 | Miscellaneous | Unincorporated |
| 6/11/2009 | 1 | Debris burning | Unincorporated | 7/14/2013 | 1 | Debris burning | Unincorporated |
| 6/16/2009 | 1 | Debris burning | Unincorporated | 7/18/2013 | 1 | Campfire | Unincorporated |
| 6/18/2009 | 5 | Miscellaneous | Alvin | 7/27/2013 | 1 | Campfire | Manvel |
| 6/18/2009 | 1 | Debris burning | Unincorporated | 8/14/2013 | 20 | Incendiary | Unincorporated |
| 6/18/2009 | 1 | Miscellaneous | Unincorporated | 8/21/2013 | 1 | Campfire | Manvel |
| 6/20/2009 | 20 | Miscellaneous | Unincorporated | 8/23/2013 | 1 | Debris burning | Manvel |
| 6/24/2009 | 2 | Debris burning | Alvin | 8/25/2013 | 1 | Debris burning | Manvel |
| 6/24/2009 | 0.5 | Children | Manvel | 9/9/2013 | 1 | Campfire | Manvel |
| 6/30/2009 | 1 | Lightning | Unincorporated | 9/13/2013 | 1 | Debris burning | Manvel |
| 7/1/2009 | 1 | Debris burning | Unincorporated | 10/8/2013 | 1 | Campfire | Unincorporated |
| 7/1/2009 | 1 | Debris burning | Unincorporated | 10/25/2013 | 1 | Debris burning | Manvel |
| 7/4/2009 | 2 | Debris burning | Unincorporated | 11/16/2013 | 1 | Smoking | Freeport |
| 7/5/2009 | 1 | Power Lines | Manvel | 11/17/2013 | 1 | Smoking | Freeport |
| 7/5/2009 | 1 | Miscellaneous | Surfside Beach | 11/18/2013 | 2 | Smoking | Freeport |
| 7/8/2009 | 1 | Miscellaneous | Unincorporated | 11/21/2013 | 1 | Equipment use | Freeport |
| 7/10/2009 | 2 | Debris burning | Unincorporated | 12/23/2013 | 1 | Equipment use | Freeport |
| 7/12/2009 | 1 | Miscellaneous | Unincorporated | 1/22/2014 | 2 | Debris burning | Freeport |
| 7/13/2009 | 1 | Debris burning | Unincorporated | 2/8/2014 | 1 | Debris burning | Manvel |
| 7/13/2009 | 1 | Debris burning | Unincorporated | 2/9/2014 | 1 | Incendiary | Manvel |
| 7/17/2009 | 2 | Debris burning | Unincorporated | 2/15/2014 | 2 | Debris burning | Unincorporated |
| 7/31/2009 | 2 | Debris burning | Unincorporated | 2/21/2014 | 1 | Miscellaneous | Manvel |
| 8/1/2009 | 1 | Debris burning | Unincorporated | 2/21/2014 | 67.25 | Equipment use | Unincorporated |
| 8/11/2009 | 0.5 | Smoking | Unincorporated | 3/8/2014 | 1 | Debris burning | Manvel |
| 8/15/2009 | 1 | Miscellaneous | Manvel | 4/10/2014 | 1 | Incendiary | Unincorporated |
| 8/15/2009 | 1 | Miscellaneous | Unincorporated | 4/14/2014 | 1 | Debris burning | Unincorporated |
| 8/19/2009 | 5 | Debris burning | Unincorporated | 4/24/2014 | 1 | Debris burning | Manvel |
| 8/28/2009 | 5 | Debris burning | Unincorporated | 4/30/2014 | 1 | Debris burning | Manvel |
| 9/5/2009 | 2 | Debris burning | Unincorporated | 6/6/2014 | 1 | Incendiary | Manvel |
| 9/28/2009 | 2 | Debris burning | Unincorporated | 6/6/2014 | 1 | Miscellaneous | Manvel |
| 10/3/2009 | 1 | Debris burning | Unincorporated | 7/2/2014 | 1 | Debris burning | Unincorporated |

| | | | | | | | |
|------------|-----|----------------|----------------|------------|------|----------------|----------------|
| 11/16/2009 | 2 | Debris burning | Brazoria | 8/6/2014 | 0.25 | Power Lines | Freeport |
| 1/9/2010 | 1 | Debris burning | Manvel | 9/1/2014 | 1 | Debris burning | Manvel |
| 1/12/2010 | 6 | Debris burning | Manvel | 9/1/2014 | 1 | Power Lines | Unincorporated |
| 3/25/2010 | 0.5 | Debris burning | Surfside Beach | 11/1/2014 | 0.1 | Smoking | Unincorporated |
| 3/26/2010 | 1 | Debris burning | Manvel | 11/10/2014 | 1 | Debris burning | Manvel |
| 4/4/2010 | 1 | Power Lines | Unincorporated | 11/10/2014 | 1 | Debris burning | Unincorporated |
| 4/7/2010 | 1 | Debris burning | Unincorporated | 11/18/2014 | 1 | Power Lines | Manvel |
| 4/8/2010 | 3 | Debris burning | Unincorporated | 11/26/2014 | 1 | Debris burning | Manvel |
| 4/23/2010 | 1 | Debris burning | Unincorporated | 7/31/2015 | 0.5 | Power Lines | Freeport |

Fire Ignition Point (2000 - 2015) : Brazoria County



Brazoria County Wildfire Disaster Declarations

| Year | Title | Disaster Number |
|------|-------------------------|-----------------|
| 1999 | Extreme Fire Hazard | 3142 |
| 2006 | Extreme Wildfire Threat | 1624 |

<https://www.FEMA.gov/>

Hazard Analysis & Vulnerability Identification

The hazard analysis uses historic hazard event data to determine the probability of an event occurring again within a given year. The analysis calculates the average number of events in each jurisdiction annually and then calculates the percent chance of the event occurring within a year.

The hazard analysis also provides hazard extent data for each participating jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history. The extent data also includes an estimate of what the jurisdiction could experience in the future. Information from stakeholders, Texas Forest Service, FEMA, and NOAA are the sources of data for the analysis.

To identify vulnerabilities for each jurisdiction, this plan used the following methods:

- American Community Survey (5-year, 2016) data on residential structures
- GIS analysis of residential structures within 500 to 800 KBDI zones; and
- Stakeholder identified vulnerabilities

Brazoria County (All Participating Jurisdictions)

Identified Vulnerabilities:

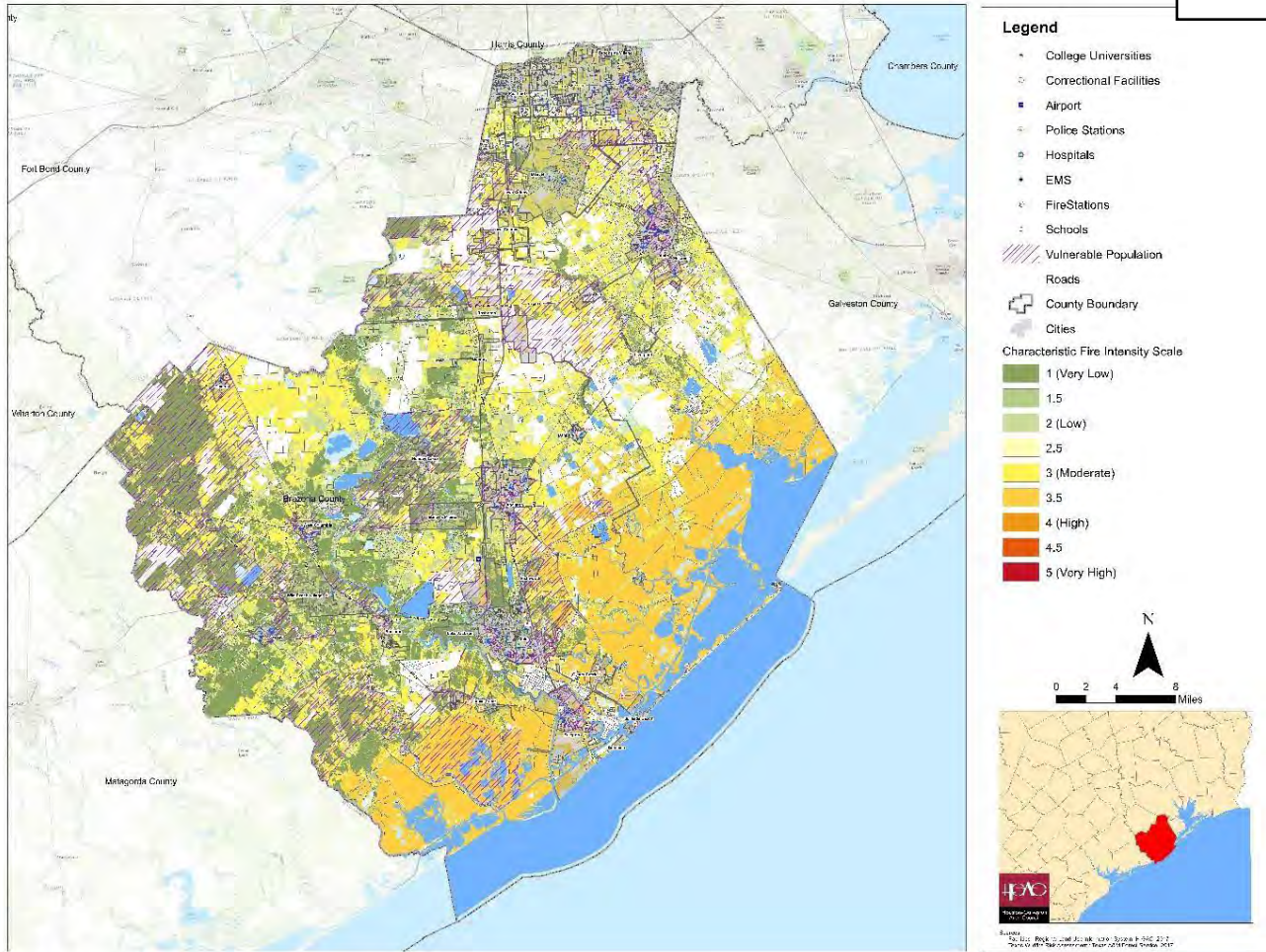
- Agriculture is a major source of revenue for the county and farmers throughout the participating jurisdictions
- Industrial sites are located throughout the county including chemical plants
- A significant proportion of individuals throughout the county are under the age of 18 or above the age of 65 years old

Identified Impacts:

- Loss of agriculture land throughout the county (631,021 acres) may lead to an economic loss for the county of approximately 118,236,00 dollars in revenue and a loss for local farmers throughout the county as well
- If an industrial or chemical site catches fire this may lead to a technical hazard leading to an increase in property loss, serious injuries or loss of life
- Residential and commercial property loss throughout the county (identified by local jurisdictions below) may lead to a financial loss for residents and jurisdictions
- Significant injury or loss of life particularly for children and older individuals (identified by local jurisdiction below)

Wildfire Risk Assessment: Brazoria County

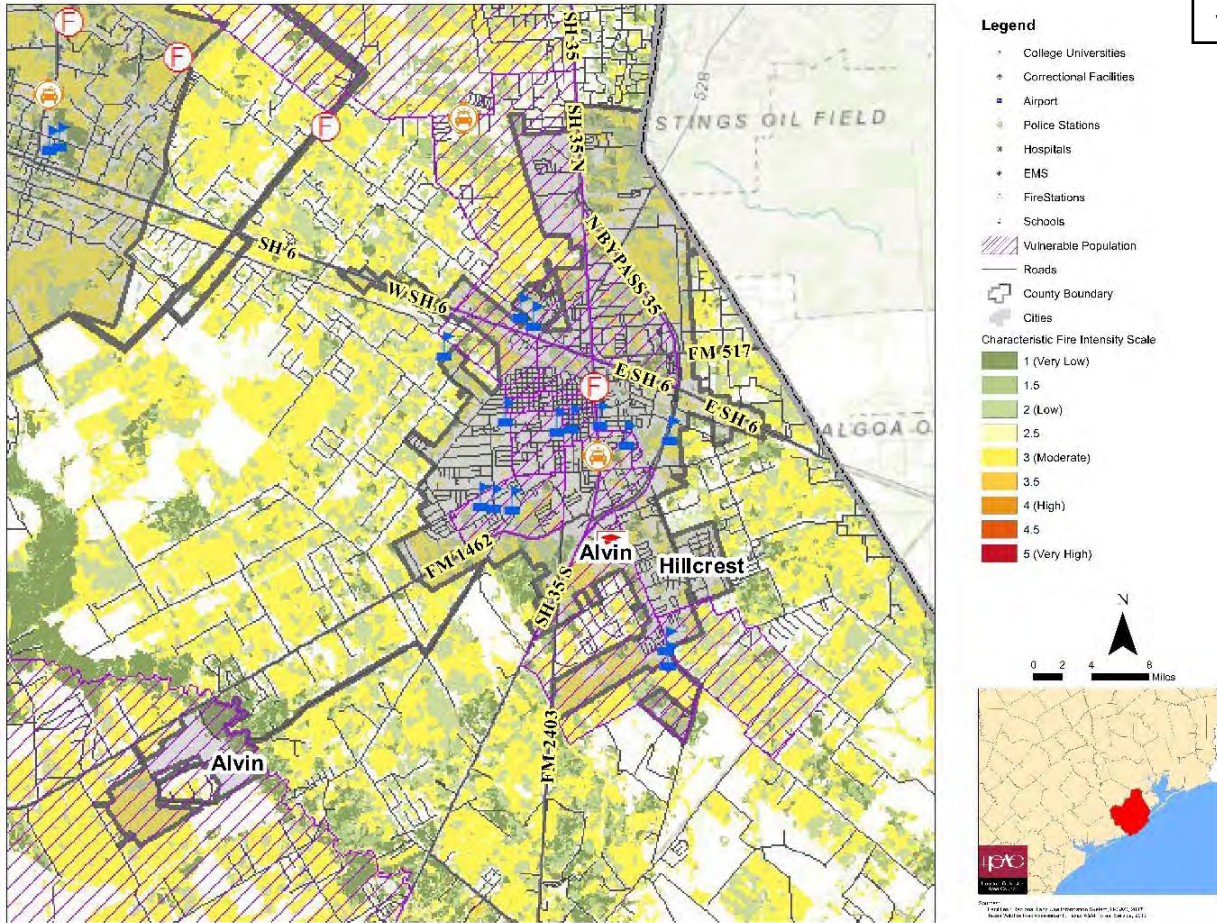
Section VII, Item H.



| Brazoria County (Unincorporated Area) | | | |
|---|-------|--------------------------------|------------------|
| Planning Area (Sq. mi): | 1,475 | Occurrences since 2005: | 286 |
| Area Affected: | 22 % | Annual Event Average: | 24 events a year |
| Probability: Very Likely; 100 percent chance event will occur in a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 560-acre fire. The unincorporated areas can expect a 600-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 19,898 residential structures at risk • Reliance on neighboring jurisdictions' and county healthcare and first responder's systems | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Residential and commercial property loss throughout the county • Increased response times which may lead to greater injuries, loss of life, or property loss | | | |

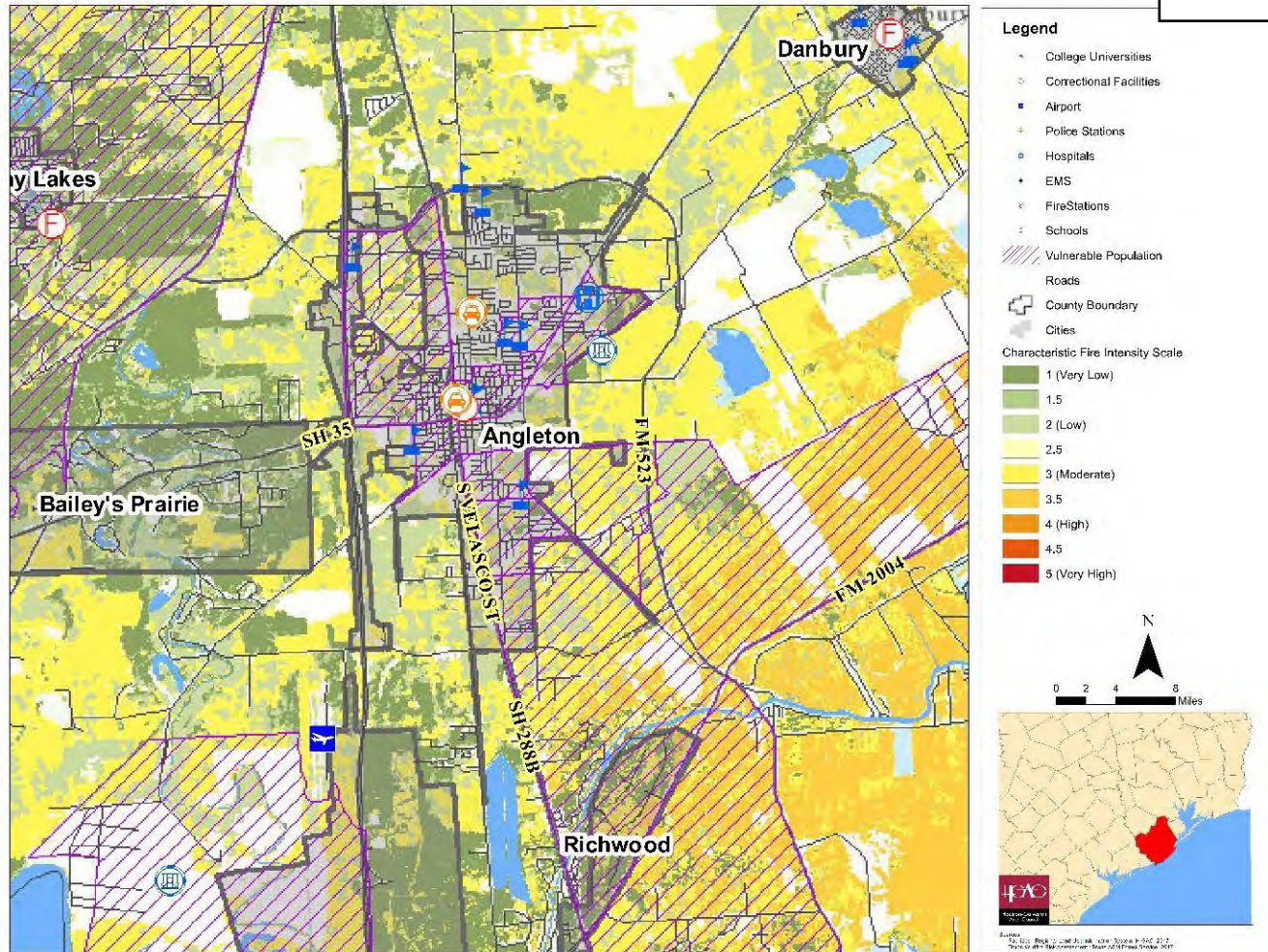
Wildfire Risk Assessment: Alvin

Section VII, Item H.



| Alvin | | | |
|---|------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 25.6 | Occurrences since 2005: | 9 |
| Area Affected: | 4 % | Annual Event Average: | .75 events a year |
| Probability: Very Likely; 75 percent chance event will occur in a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 5-acre fire. The jurisdiction can expect a 6 to 8-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 1,431 residential structures at risk • 29 percent of population are individuals 18 years and younger (7,370 children) • 13 percent of population are individuals 65 and older (3,264 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 42 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

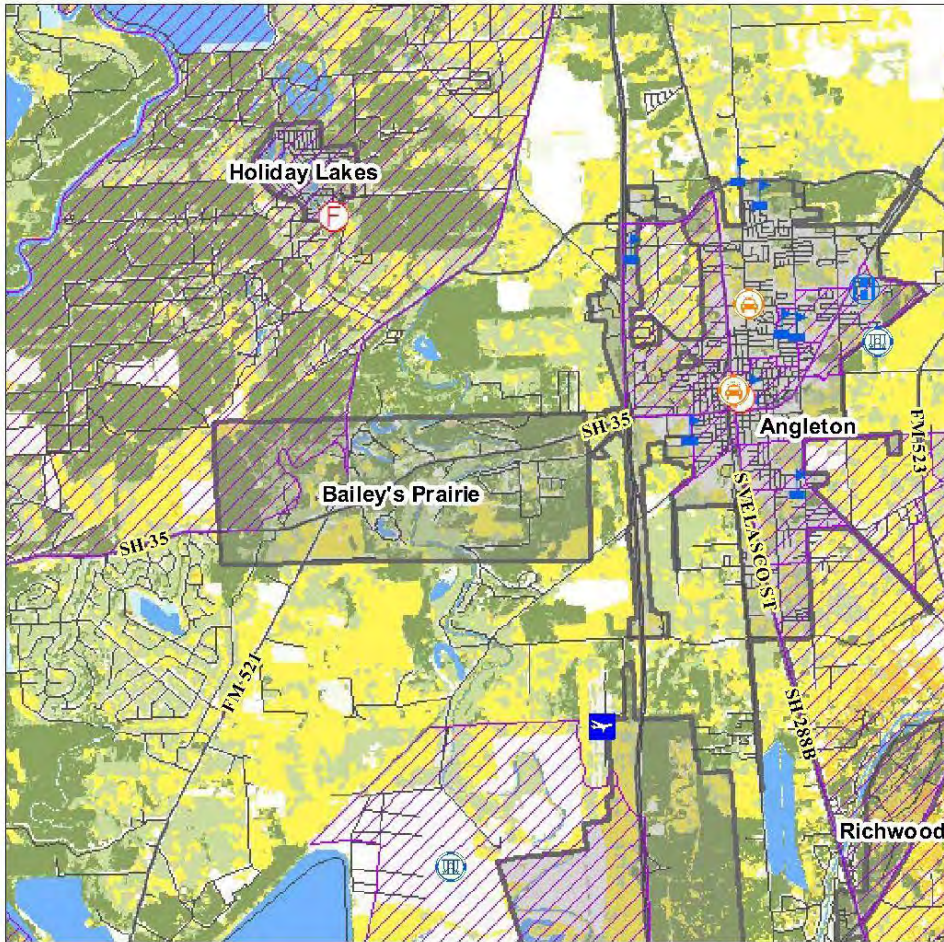
Wildfire Risk Assessment: Angleton



| Angleton | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 11.27 | Occurrences since 2005: | 14 |
| Area Affected: | 9 % | Annual Event Average: | 1.2 events a year |
| Probability: Very Likely; 100 percent chance event will occur in a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 6-acre fire. The jurisdiction can expect an 8 to 10-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 803 residential structures at risk • 30 percent of population are individuals 18 years and younger (5,793 children) • 13 percent of population are individuals 65 and older (2,540 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 43 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

Wildfire Risk Assessment: Bailey's Prairie

Section VII, Item H.



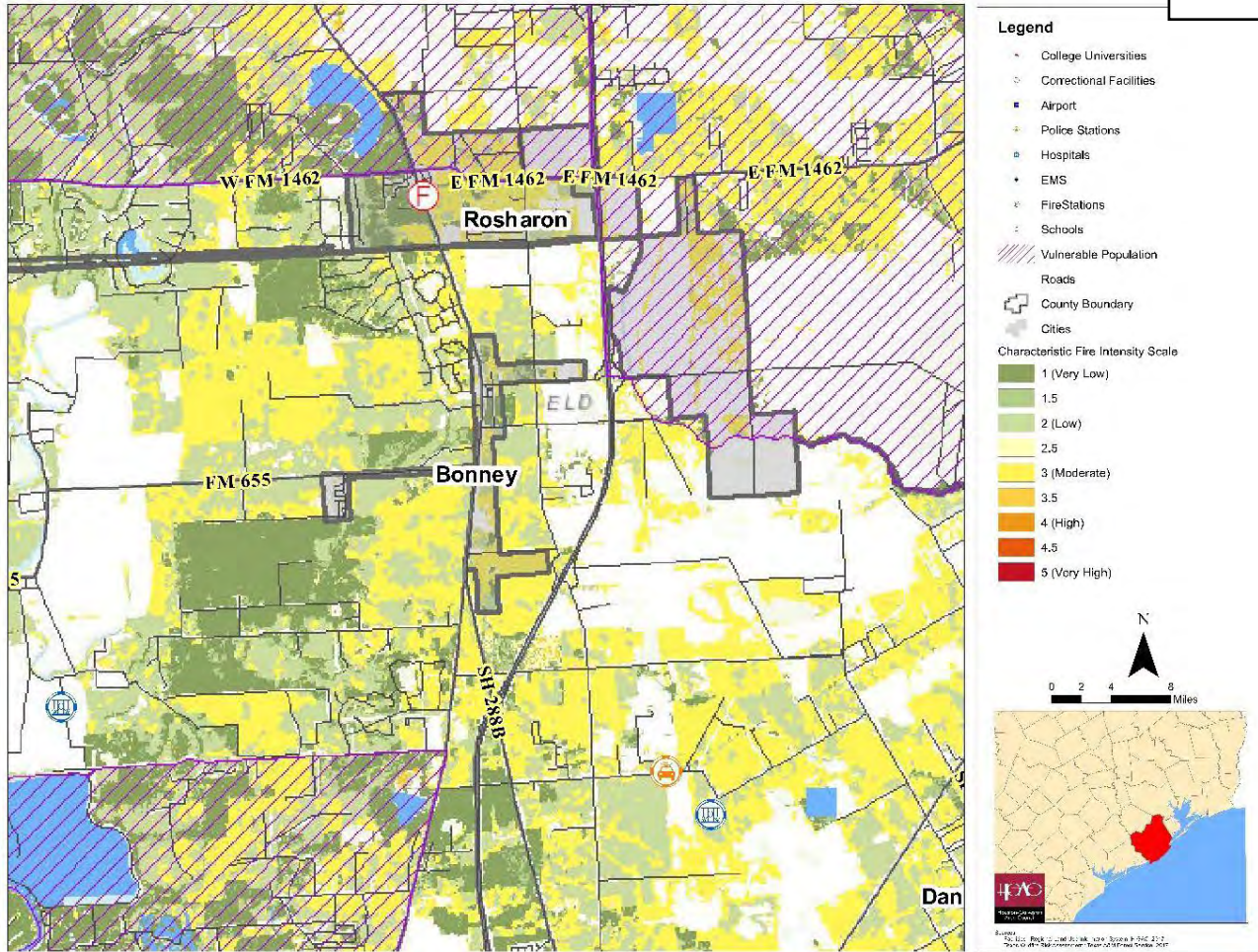
- Legend**
- College Universities
 - Correctional Facilities
 - Airport
 - Police Stations
 - Hospitals
 - EMS
 - Fire Stations
 - Schools
 - ▨ Vulnerable Population
 - Roads
 - County Boundary
 - Cities
- Characteristic Fire Intensity Scale**
- 1 (Very Low)
 - 1.5
 - 2 (Low)
 - 2.5
 - 3 (Moderate)
 - 3.5
 - 4 (High)
 - 4.5
 - 5 (Very High)



| Bailey's Prairie | | | |
|---|------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 7.7 | Occurrences since 2005: | 1 |
| Area Affected: | 22 % | Annual Event Average: | .08 events a year |
| Probability: Unlikely; 8.3 percent chance to occur within a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 2-acre fire. The jurisdiction can expect a 4 to 6-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 170 residential structures at risk • 26 percent of population are individuals 18 years and younger (215 children) • 14 percent of population are individuals 65 and older (114 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 40 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

Wildfire Risk Assessment: Bonney

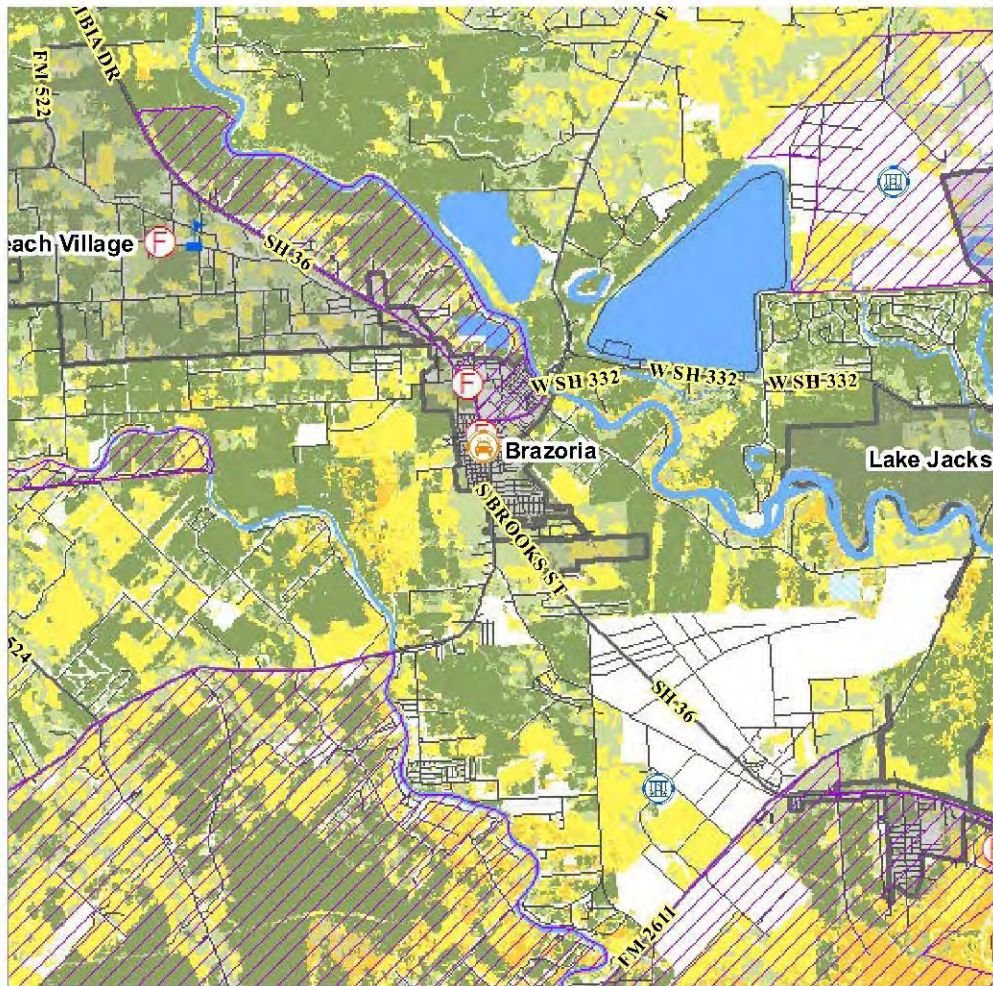
Section VII, Item H.



| Bonney | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 1.66 | Occurrences since 2005: | 5 |
| Area Affected: | 18 % | Annual Event Average: | .42 |
| Probability: Likely; 41 percent chance to occur within a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 10-acre fire. The jurisdiction can expect a 12 to 14-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 22 residential structures at risk • 35 percent of population are individuals 18 years and younger (104 children) • 3 percent of population are individuals 65 and older (8 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 42 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

Wildfire Risk Assessment: Brazoria

Section VII, Item H.



Legend

- College Universities
- Correctional Facilities
- Airport
- Police Stations
- Hospitals
- EMS
- Fire Stations
- Schools
- Vulnerable Population
- Roads
- County Boundary
- Cities

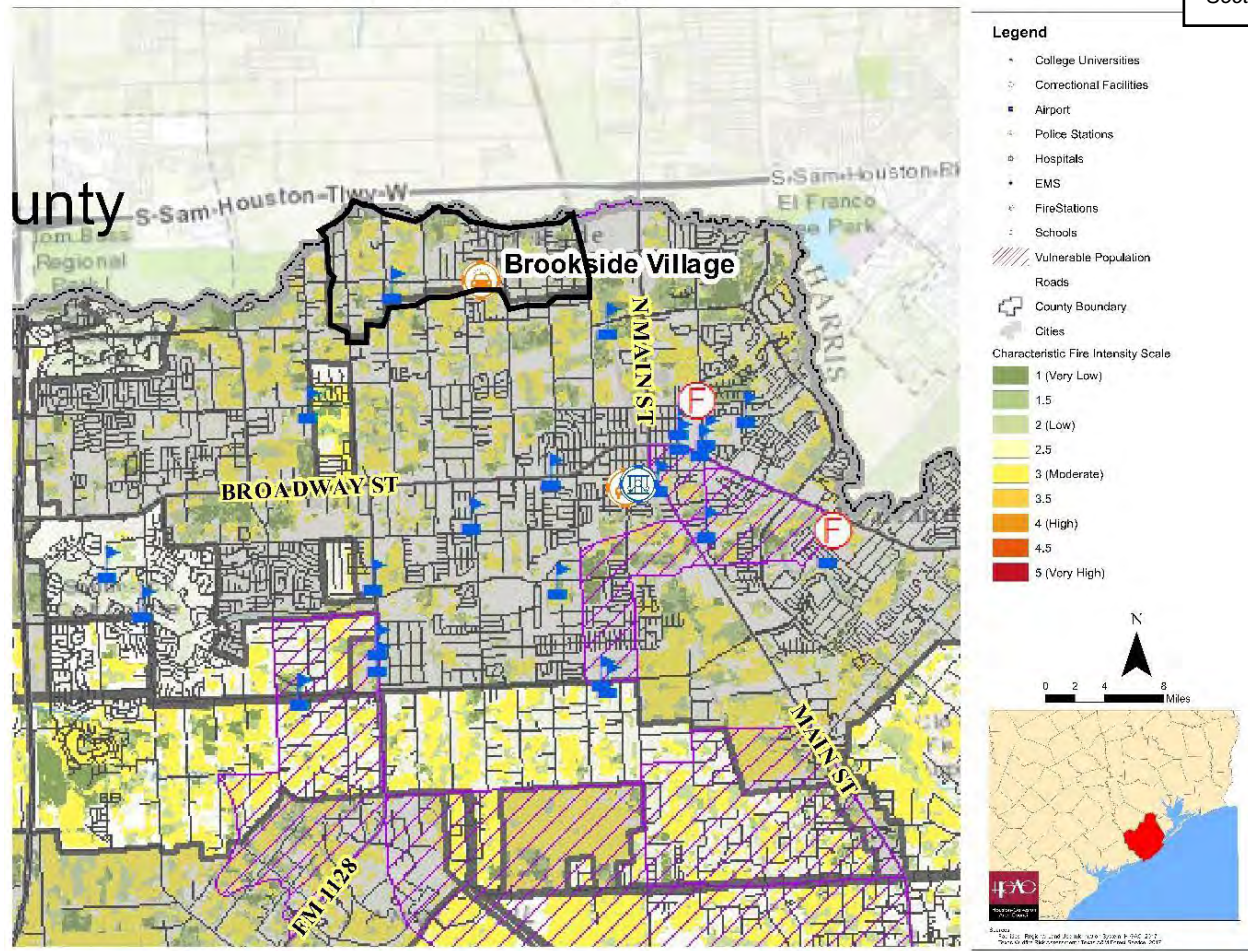
Characteristic Fire Intensity Scale

- 1 (Very Low)
- 1.5
- 2 (Low)
- 2.5
- 3 (Moderate)
- 3.5
- 4 (High)
- 4.5
- 5 (Very High)

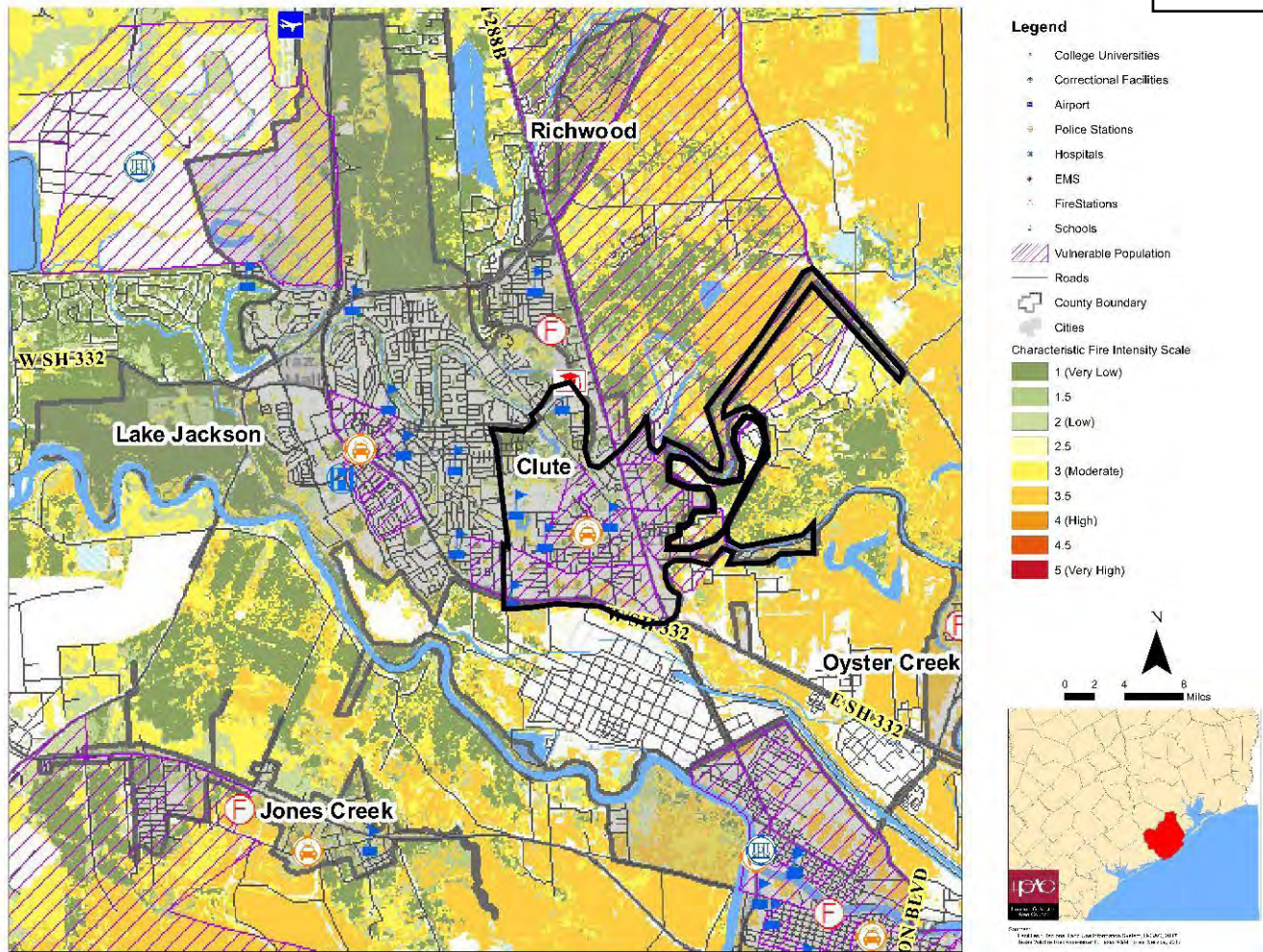
Scale: 0 2 4 8 Miles

IPC
Texas 6.3.17
Source: The map data is derived from the Texas Department of Transportation (TxDOT) GIS data. The map is for informational purposes only and does not constitute a warranty or any other form of assurance.

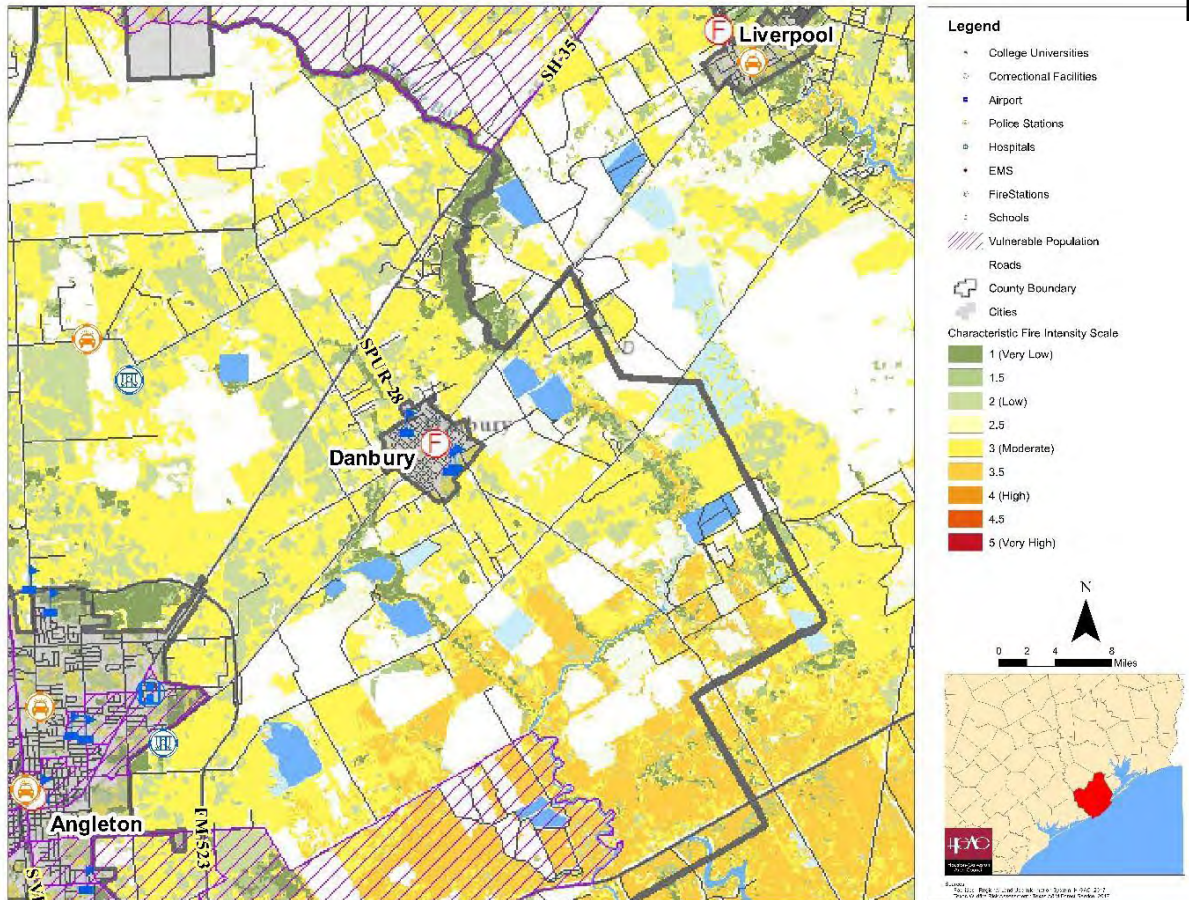
| Brazoria | | | |
|---|-----|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2005: | 2 |
| Area Affected: | 5 % | Annual Event Average: | .17 |
| Probability: Unlikely; 17 percent chance to occur within a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 2-acre fire. The jurisdiction can expect a 4 to 6-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 282 residential structures at risk • 28 percent of population are individuals 18 years and younger (872 children) • 14 percent of population are individuals 65 and older (429 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 42 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |



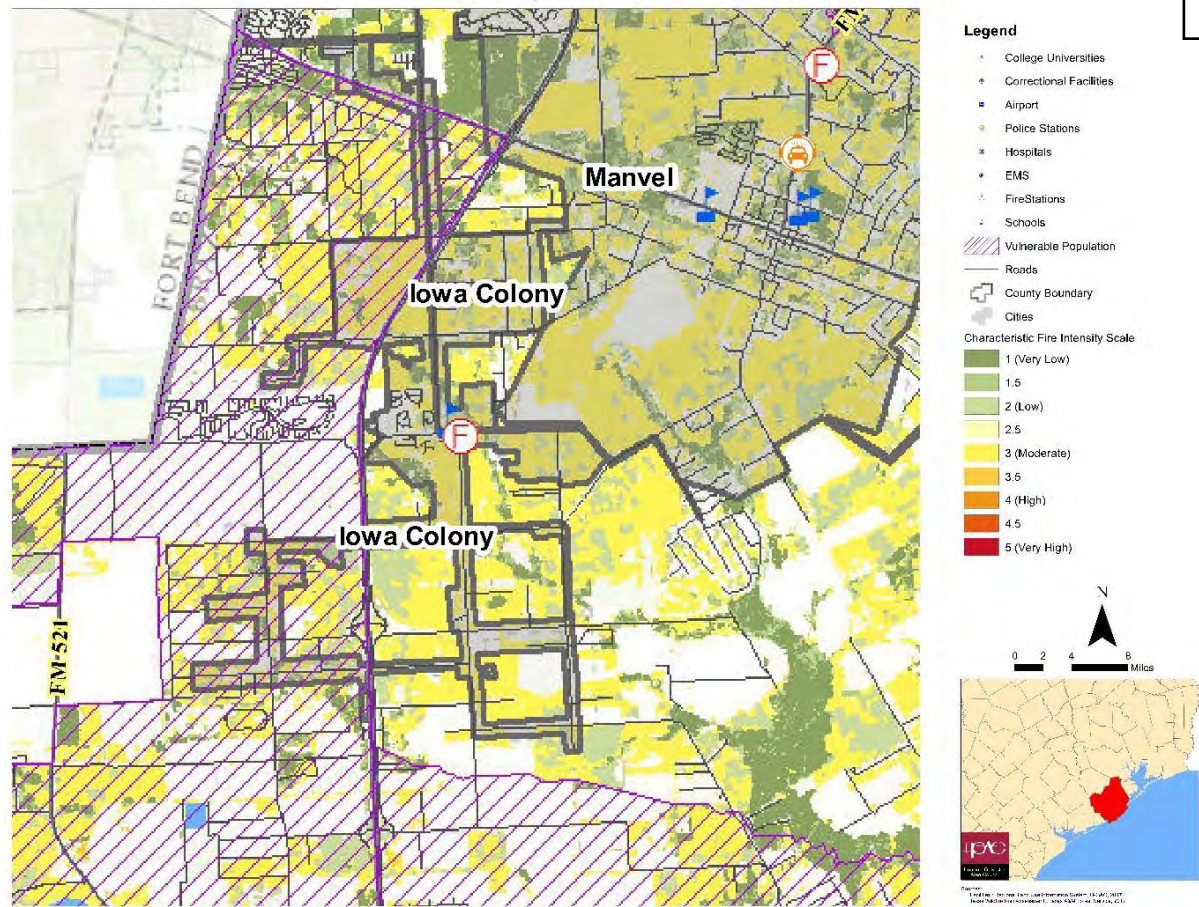
| Brookside Village | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.085 | Occurrences since 2000: | 0 |
| Area Affected: | 7 % | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Manvel perhaps the jurisdiction has a similar likelihood that the event will occur. Manvel’s probability is: Unlikely; 5.83 percent chance event will occur in each year. | | | |
| Extent: Similarly, Manvel’s extent is: The largest wildfire in the past 12 years has been a 10-acre fire. The jurisdiction can expect a 12 to 14-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 122 residential structures at risk • 25 percent of population are individuals 18 years and younger (419 children) • 15 percent of population are individuals 65 and older (259 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 40 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |



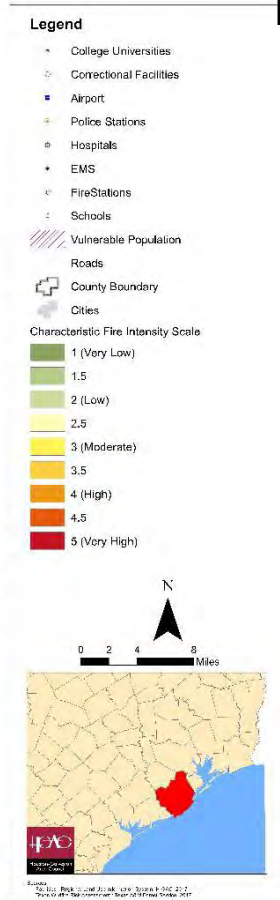
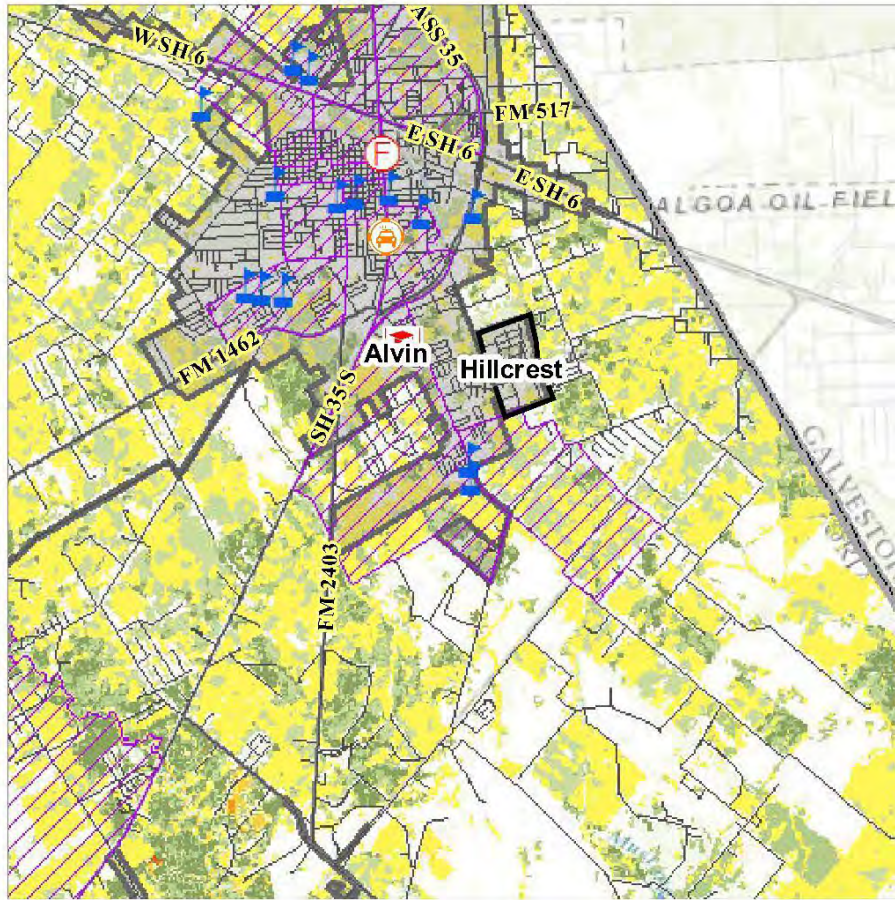
| Clute | | | |
|--|-----|--------------------------------|-----|
| Planning Area (Sq. mi): | 5.6 | Occurrences since 2000: | 3 |
| Area Affected: | 9% | Annual Event Average: | .25 |
| Probability: Likely; 25 percent chance to occur within a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 1-acre fire. The jurisdiction can expect a 2 to 4-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 775 residential structures at risk • 35 percent of population are individuals 18 years and younger (104 children) • 3 percent of population are individuals 65 and older (8 older individuals) | | | |
| Identified Impacts | | | |
| <ul style="list-style-type: none"> • 38 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |



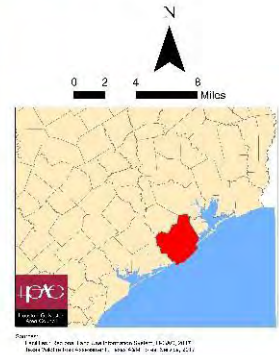
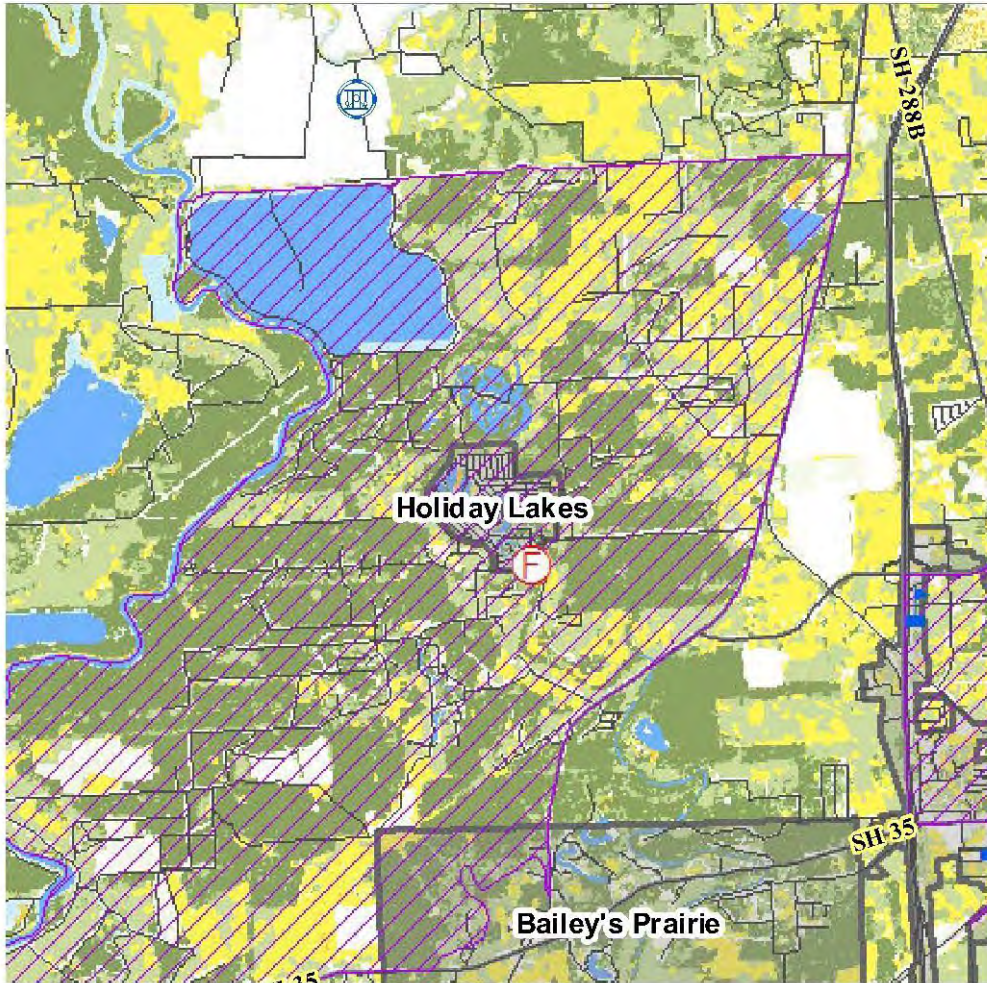
| Danbury and Danbury ISD | | | |
|--|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 1.0 | Occurrences since 2005: | 0 |
| Area Affected: | 40% | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Angleton. Perhaps Danbury has a similar likelihood that the event will occur. Angleton’s probability is: Highly Likely; 100 percent chance event will occur in each year. | | | |
| Extent: Similarly, Angleton’s extent is: The largest wildfire in the past 12 years has been a 6-acre fire. The jurisdiction can expect an 8 to 10-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 92 residential structures at risk • 28 percent of population are individuals 18 years and younger (414 children) • 8 percent of population are individuals 65 and older (120 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 36 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |



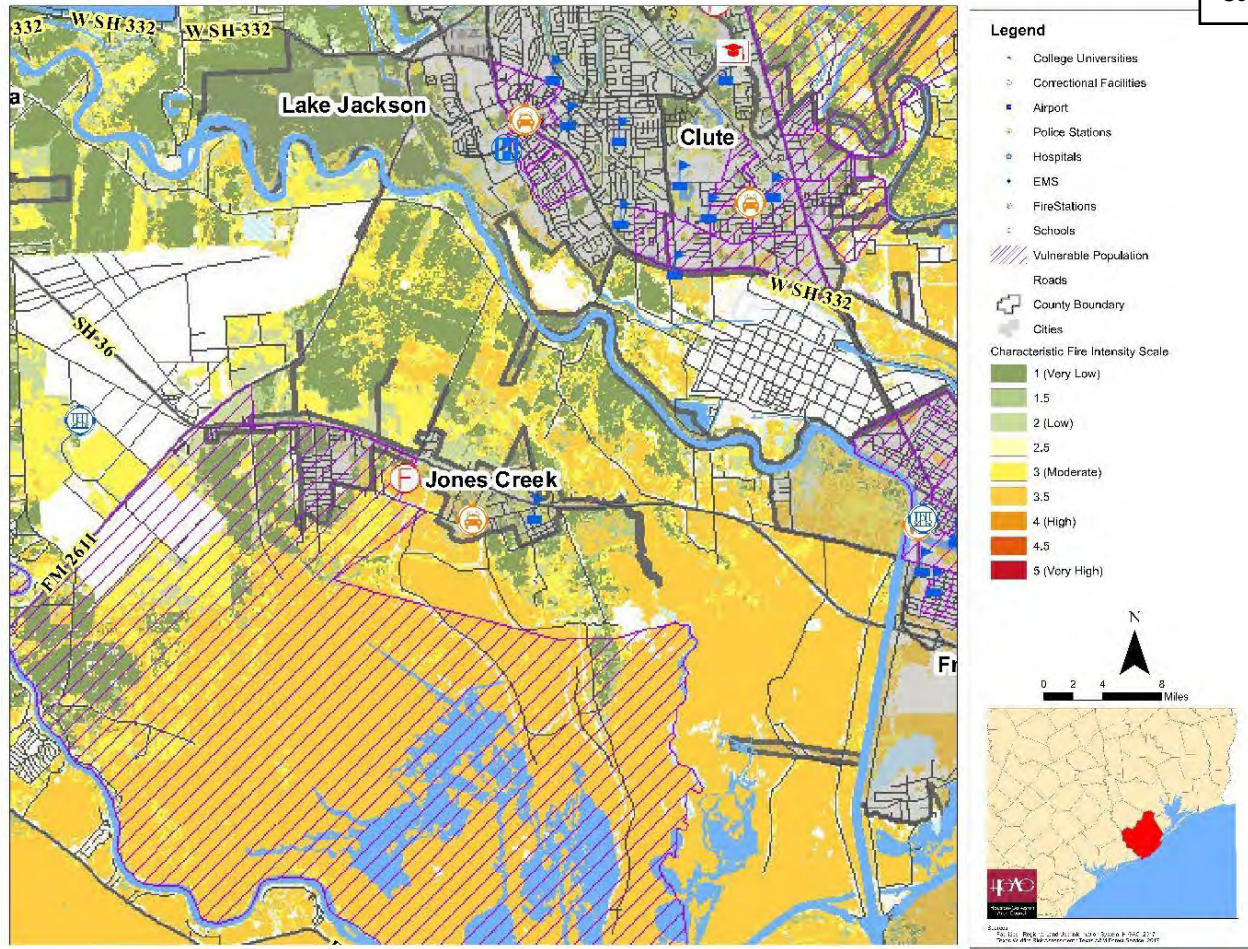
| Iowa Colony | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 7.33 | Occurrences since 2005: | 5 |
| Area Affected: | 64 % | Annual Event Average: | .42 |
| Probability: Likely; 42 percent chance to occur within a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 2-acre fire. The jurisdiction can expect a 4 to 6-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 88 residential structures at risk • 21 percent of population are individuals 18 years and younger (104 children) • 14 percent of population are individuals 65 and older (185 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 42 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |



| Hillcrest Village | | | |
|--|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 0.4 | Occurrences since 2005: | 0 |
| Area Affected: | 8 % | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Alvin. Perhaps Hillcrest Village has a similar likelihood that the event will occur. Alvin’s probability is: Likely; 75 percent chance event will occur within a year. | | | |
| Extent: Similarly, Alvin’s extent is: The largest wildfire in the past 12 years has been a 5-acre fire. The jurisdiction can expect a 6 to 8-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 53 residential structures at risk • 16 percent of population are individuals 18 years and younger (129 children) • 39 percent of population are individuals 65 and older (325 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 42 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

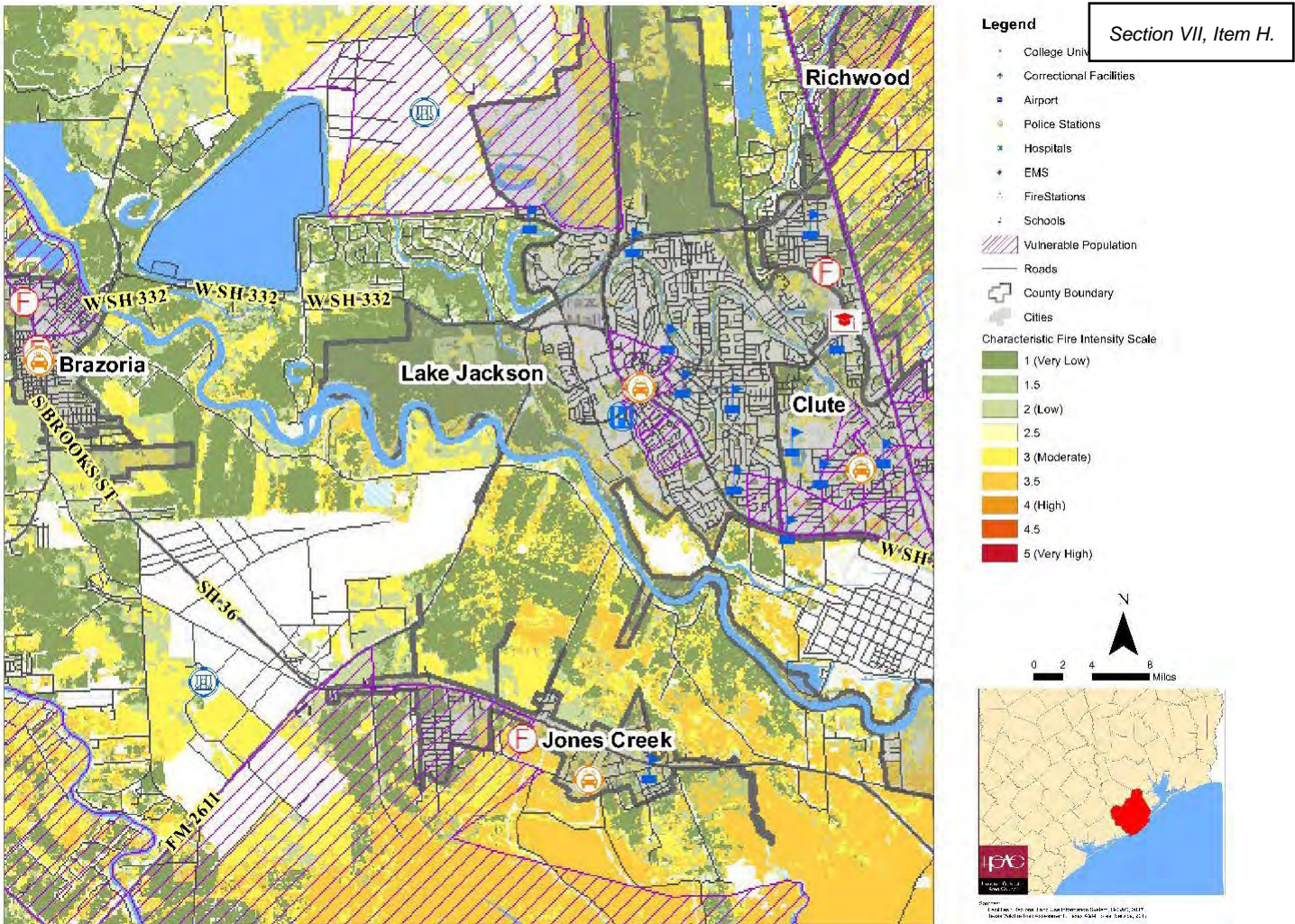


| Holiday Lakes | | | |
|--|-----|--------------------------------|-----|
| Planning Area (Sq. mi): | 1 | Occurrences since 2005: | 1 |
| Area Affected: | 3 % | Annual Event Average: | .08 |
| Probability: Unlikely; 8.3 percent chance to occur within a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 1-acre fire. The jurisdiction can expect a 2 to 4-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 84 residential structures at risk • 39 percent of population are individuals 18 years and younger (401 children) • 7 percent of population are individuals 65 and older (71 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 46 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |



| Jones Creek | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2005: | 1 |
| Area Affected: | 10 % | Annual Event Average: | .08 |
| Probability: Unlikely; 8.3 percent chance to occur within a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 100-acre fire. The jurisdiction can expect a 120 to 140-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 130 residential structures at risk • 28 percent of population are individuals 18 years and younger (604 children) • 14 percent of population are individuals 65 and older (307 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 42 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

Wildfire Risk Assessment: Lake Jackson



Lake Jackson

| | | | |
|--------------------------------|------|--------------------------------|---|
| Planning Area (Sq. mi): | 20.9 | Occurrences since 2000: | 0 |
| Area Affected: | 6% | Annual Event Average: | 0 |

Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Jones Creek. Perhaps Lake Jackson has a similar likelihood that the event will occur. Jones Creek's probability is: Unlikely; 8.3 percent chance to occur within a year

Extent: Similarly, Jones Creek's extent is: The largest wildfire in the past 12 years has been a 100-acre fire. The jurisdiction can expect a 120 to 140-acre fire.

Identified Vulnerabilities:

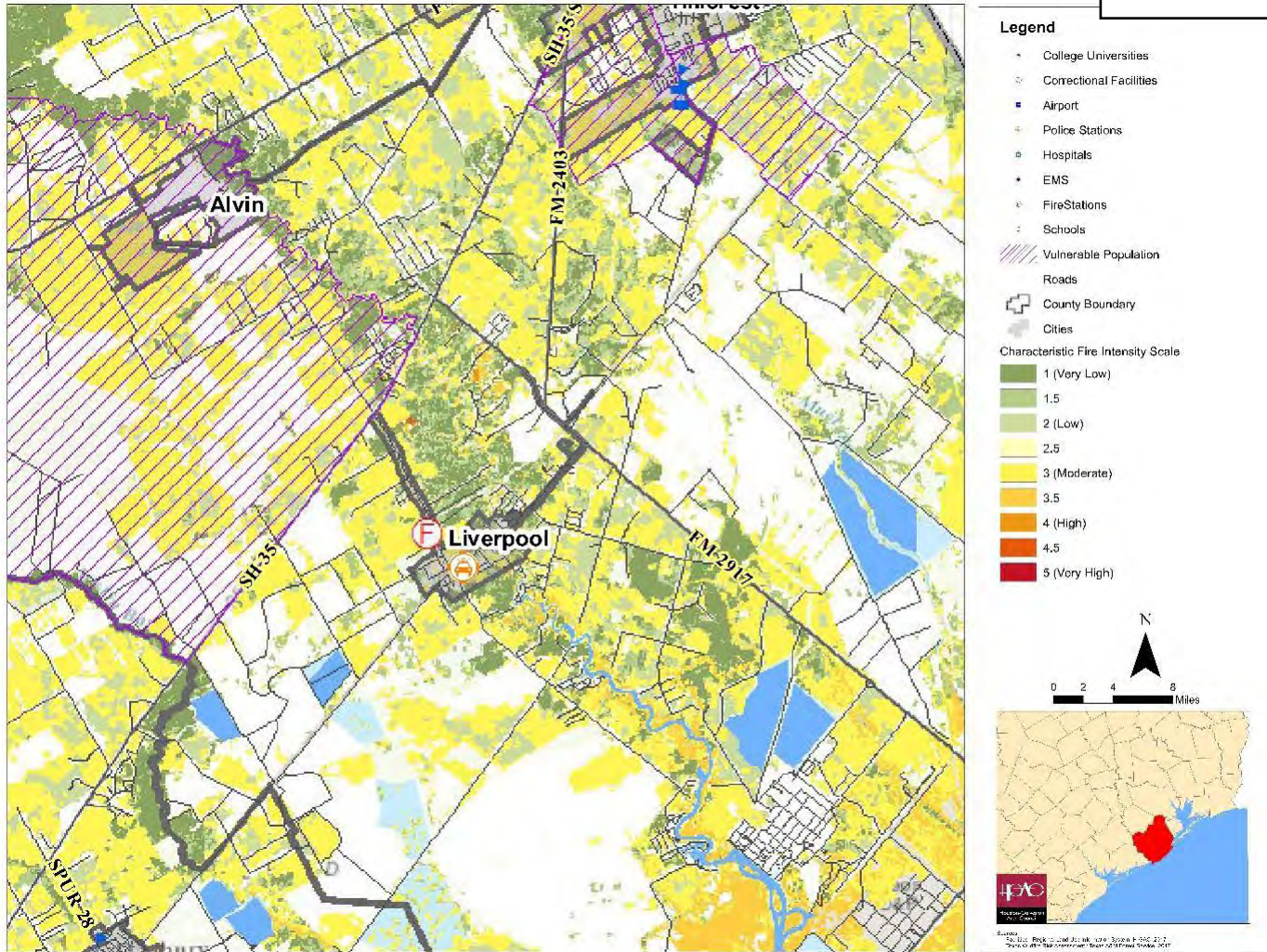
- 11,729 residential structures
- 35 percent of population are individuals 18 years and younger (7,372 children)
- 14 percent of population are individuals 65 and older (3,700 older individuals)

Identified Impacts:

- 49 percent of the total population may face serious illness or health conditions due to poor air quality
- Residential and commercial property loss throughout the jurisdiction

Wildfire Risk Assessment: Liverpool

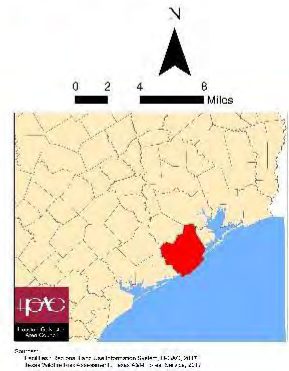
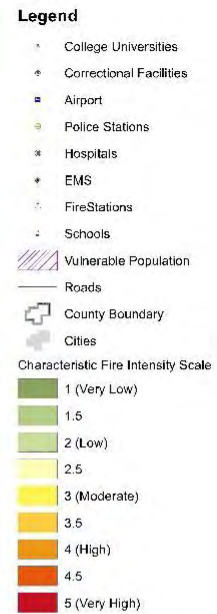
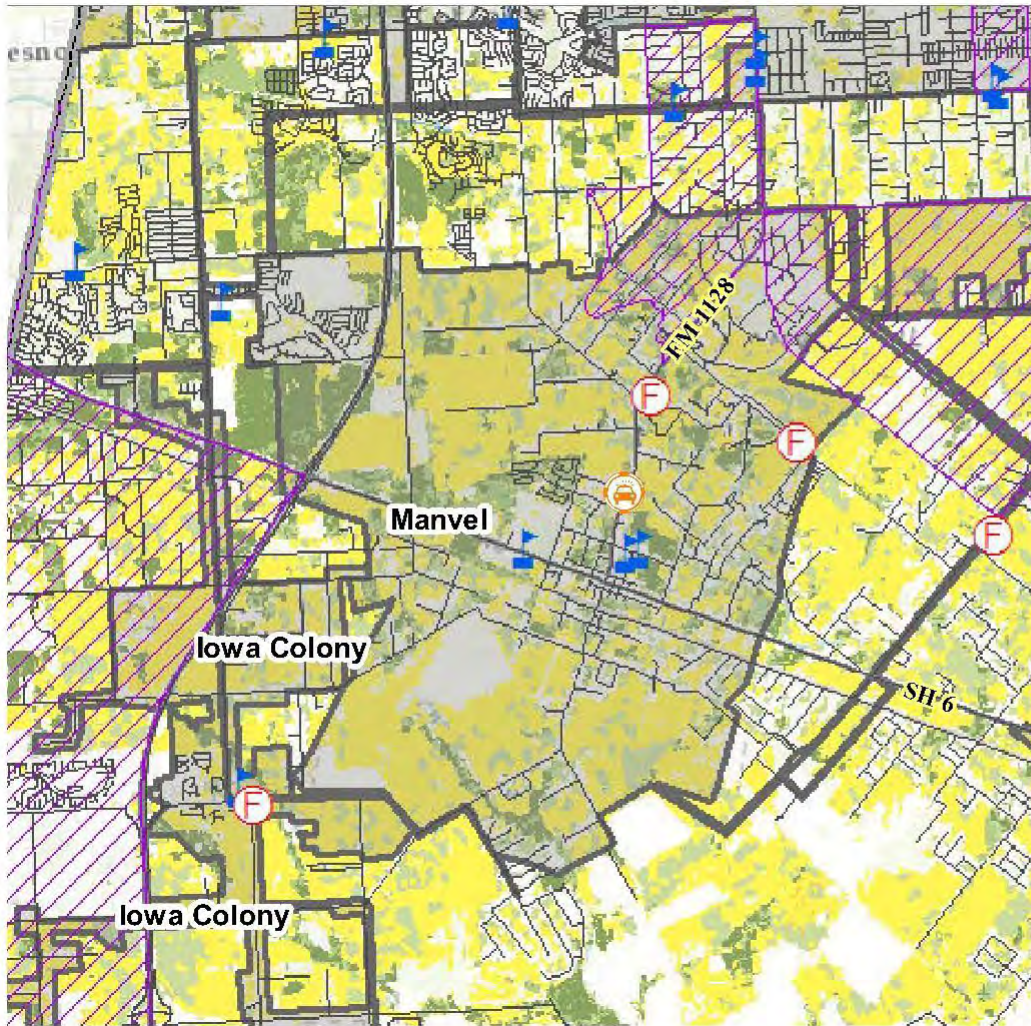
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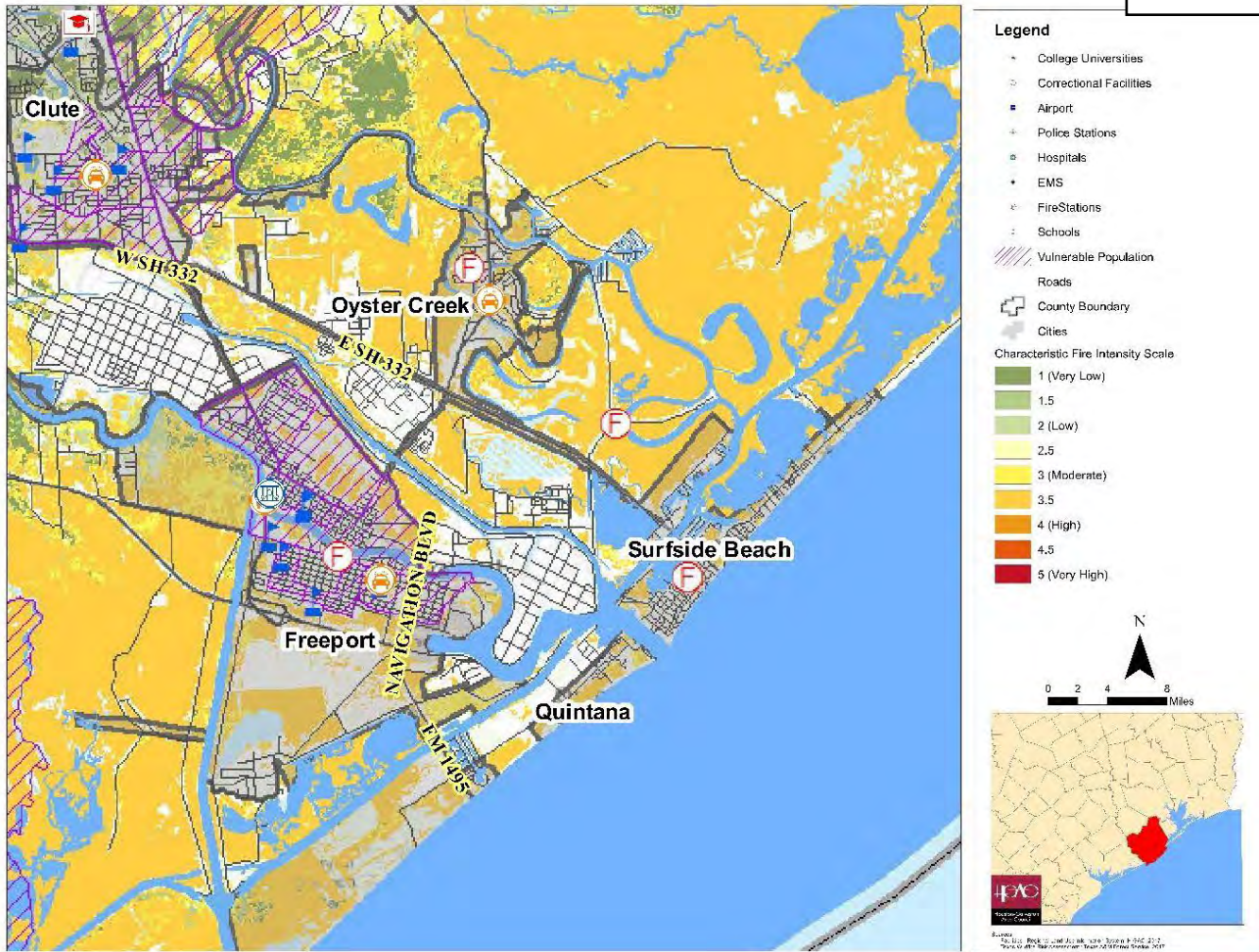
| Liverpool | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 1.1 | Occurrences since 2000: | 0 |
| Area Affected: | 19 % | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Alvin. Perhaps Liverpool has a similar likelihood that the event will occur. Alvin’s probability is: Likely; 75 percent chance event will occur in a given year. | | | |
| Extent: Similarly, Alvin’s extent is: The largest wildfire in the past 12 years has been a 5-acre fire. The jurisdiction can expect a 6 to 8-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 37 residential structures at risk • 28 percent of population are individuals 18 years and younger (121 children) • 14 percent of population are individuals 65 and older (61 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 42 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

Wildfire Risk Assessment: Manvel

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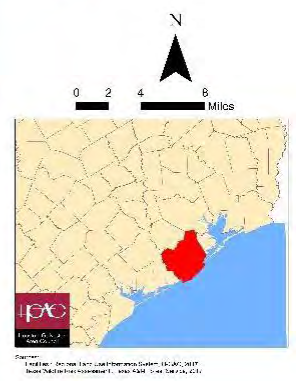
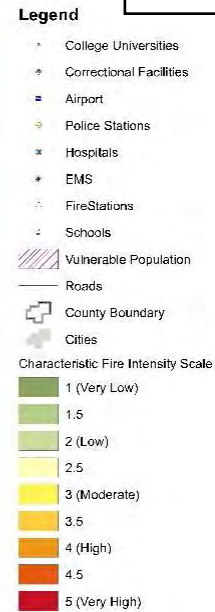
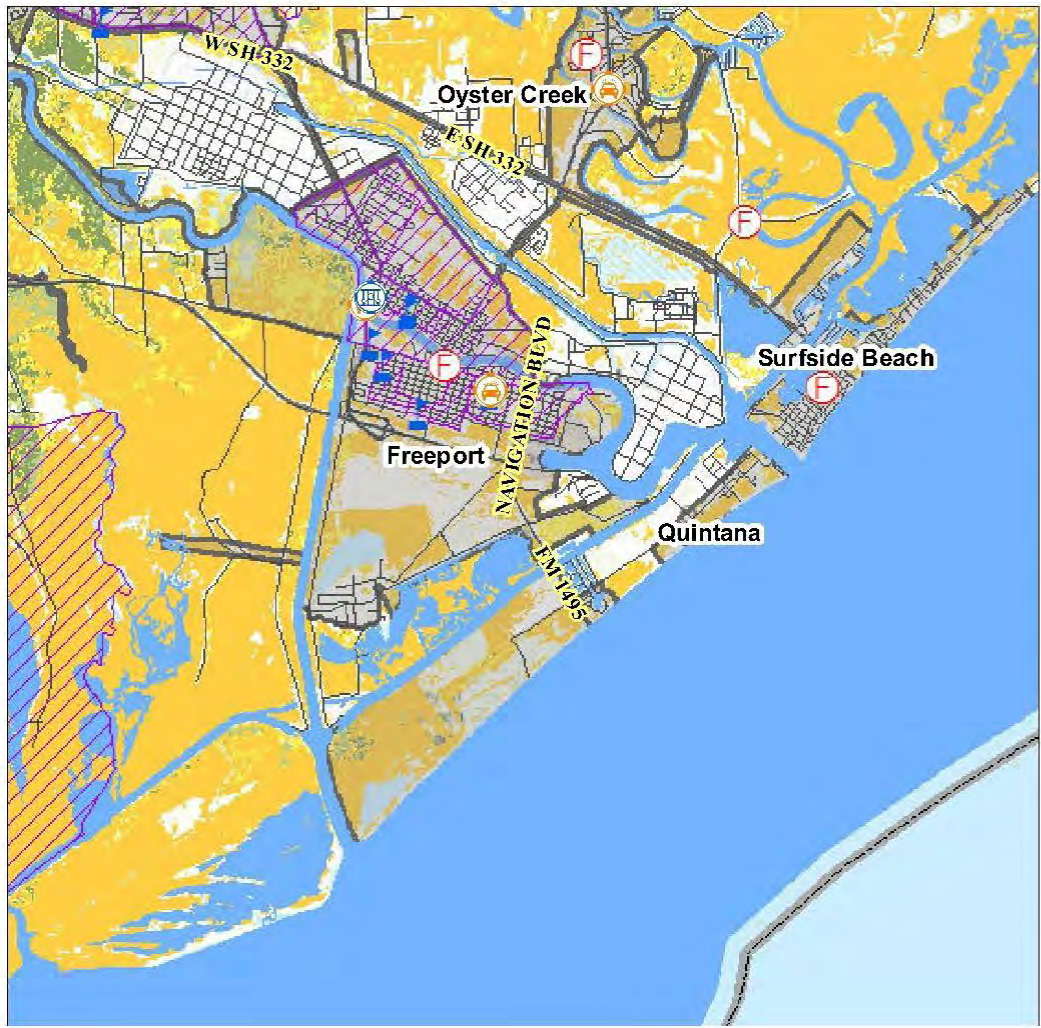
| Manvel | | | |
|---|------|--------------------------------|------|
| Planning Area (Sq. mi): | 23.6 | Occurrences since 2005: | 70 |
| Area Affected: | 41 % | Annual Event Average: | 5.83 |
| Probability: Unlikely; 5.83 percent chance to occur within a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 10-acre fire. The jurisdiction can expect a 12 to 14-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 443 residential structures at risk • 31 percent of population are individuals 18 years and younger (2,265 children) • 10 percent of population are individuals 65 and older (740 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 41 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |



| Oyster Creek | | | |
|--|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 2 | Occurrences since 2005: | 0 |
| Area Affected: | 78% | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Freeport. Oyster Creek has a similar likelihood that the event will occur. Freeport’s probability is: Highly Likely; 100 percent chance to occur within a year | | | |
| Extent: Similarly, Freeport’s extent is: The largest wildfire in the past 12 years has been a 10-acre fire. The jurisdiction can expect a 12 to 14-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 78 residential structures at risk • 35 percent of population are individuals 18 years and younger (439 children) • 14 percent of population are individuals 65 and older (307 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 49 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

Wildfire Risk Assessment: Quintana

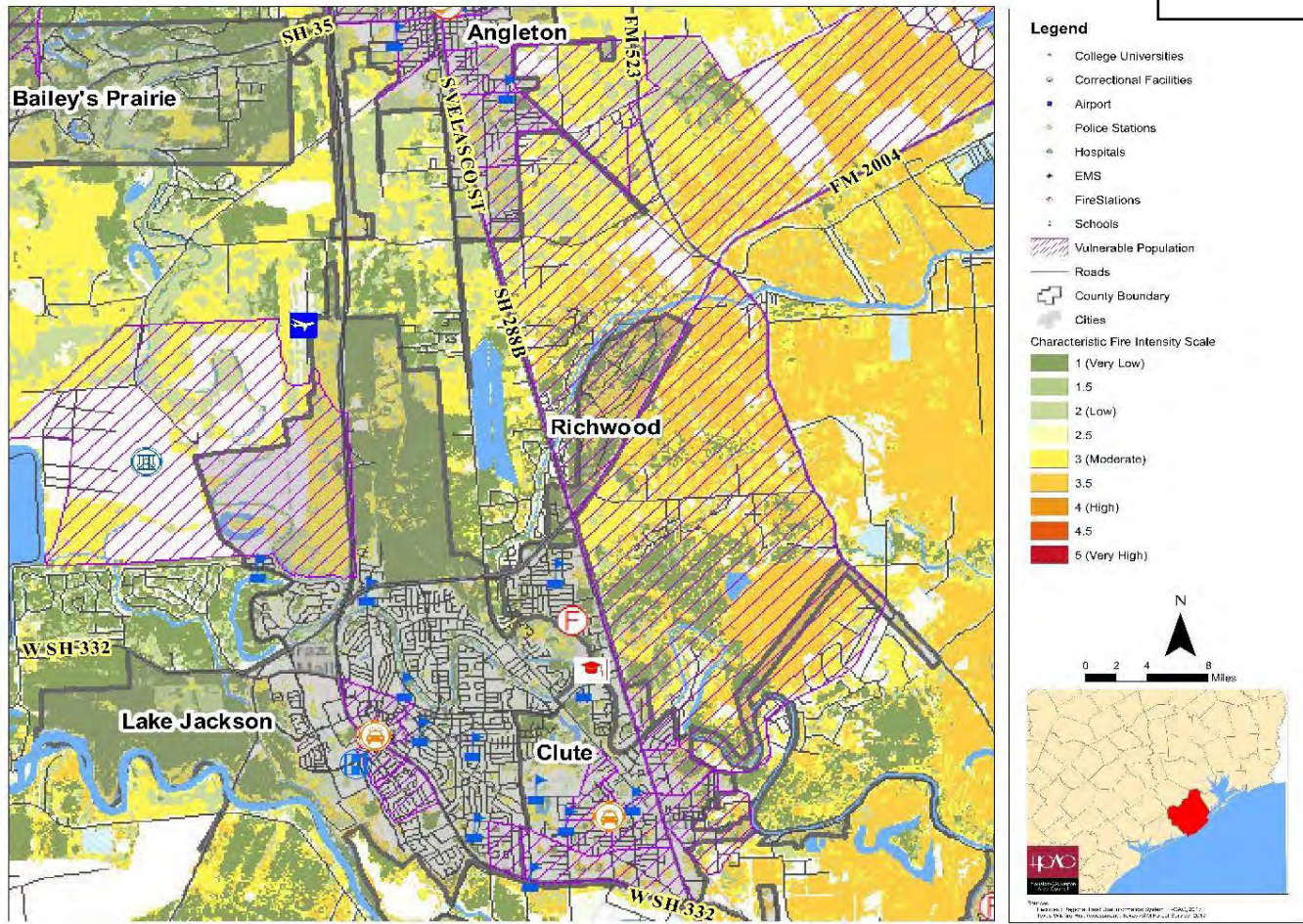
Section VII, Item H.



| Quintana | | | |
|---|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 0 |
| Area Affected: | 74% | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Surfside Beach. Perhaps Quintana has a similar likelihood that the event will occur. Surfside Beach’s probability is: Unlikely; 8.3 percent chance to occur within a year. | | | |
| Extent: Similarly, Surfside Beach’s extent is: The largest wildfire in the past 12 years has been a 1-acre fire. The jurisdiction can expect a 2 to 4-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 5 residential structures at risk • 16 percent of population are individuals 18 years and younger (6 children) • 3 percent of population are individuals 65 and older (1 older individual) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 19 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

Wildfire Risk Assessment: Richwood

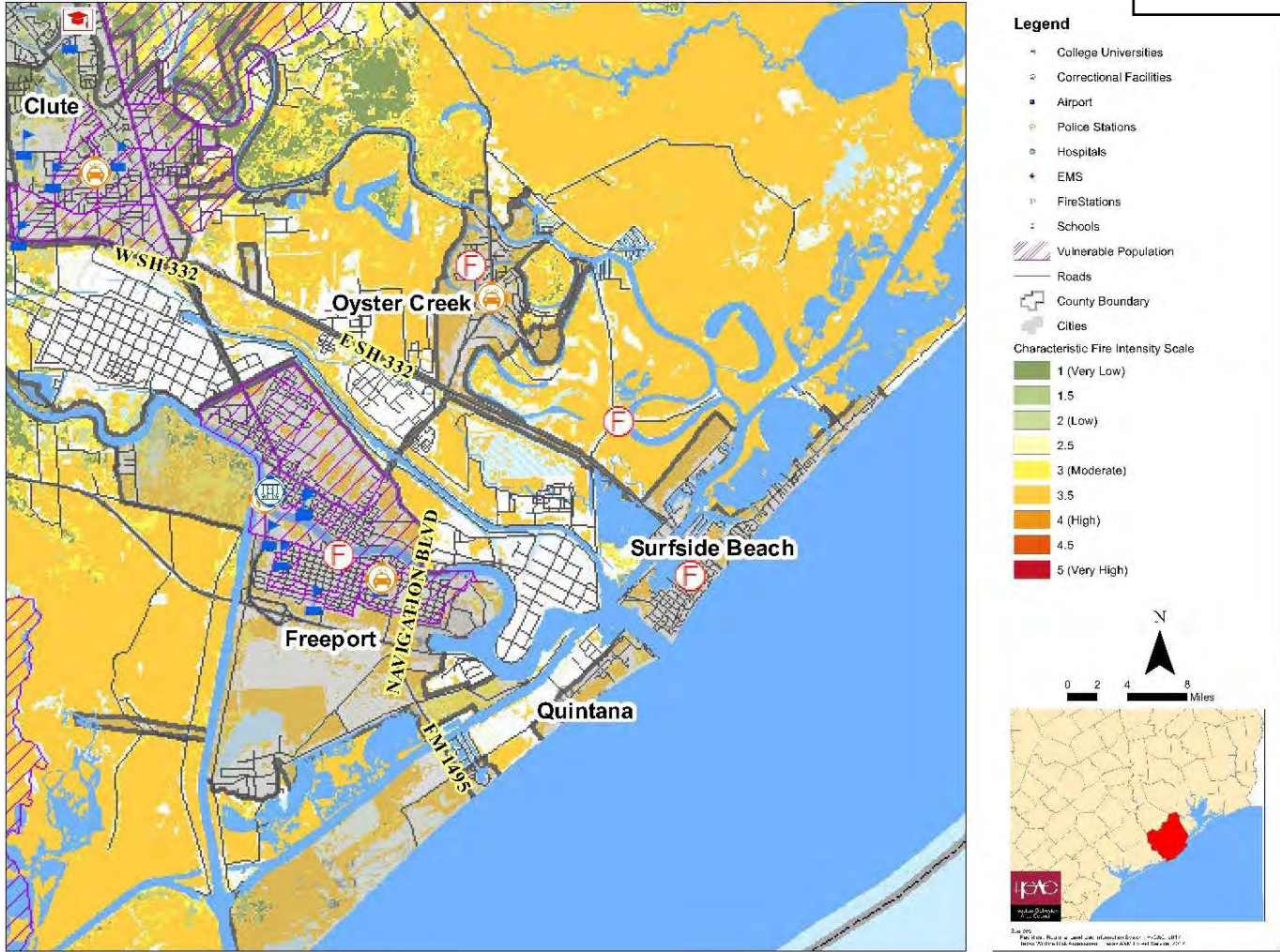
Section VII, Item H.



| Richwood | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 3.1 | Occurrences since 2000: | 0 |
| Area Affected: | 59 % | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Clute. Perhaps Richwood has a similar likelihood that the event will occur. Clute’s probability is: Unlikely; 8.3 percent chance to occur within a year. | | | |
| Extent: Similarly, Clute’s extent is: The largest wildfire in the past 12 years has been a 1-acre fire. The jurisdiction can expect a 2 to 4-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 246 residential structures at risk • 26 percent of population are individuals 18 years and younger (987 children) • 19 percent of population are individuals 65 and older (101older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 45 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

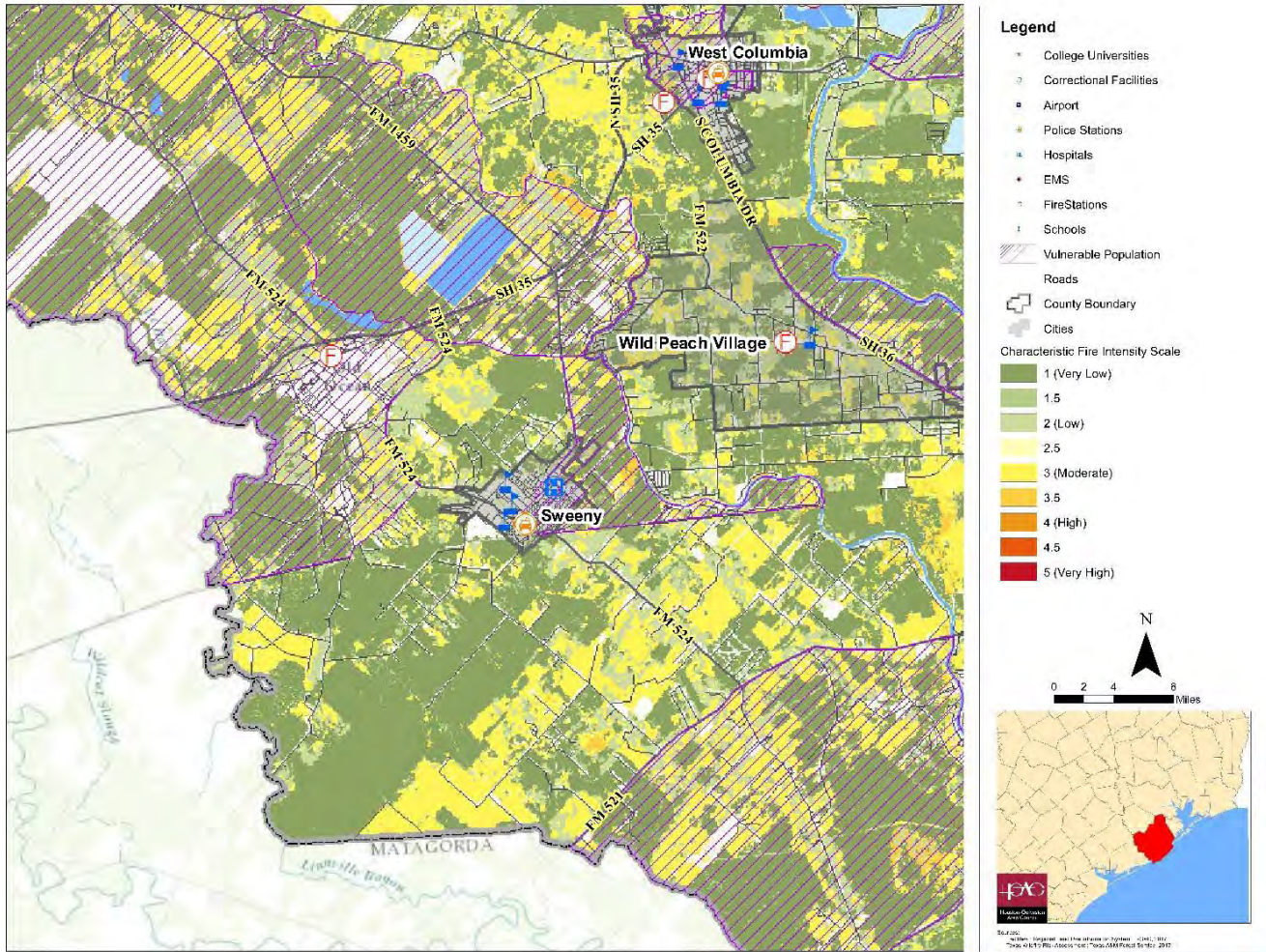
Wildfire Risk Assessment: Surfside Beach

Section VII, Item H.

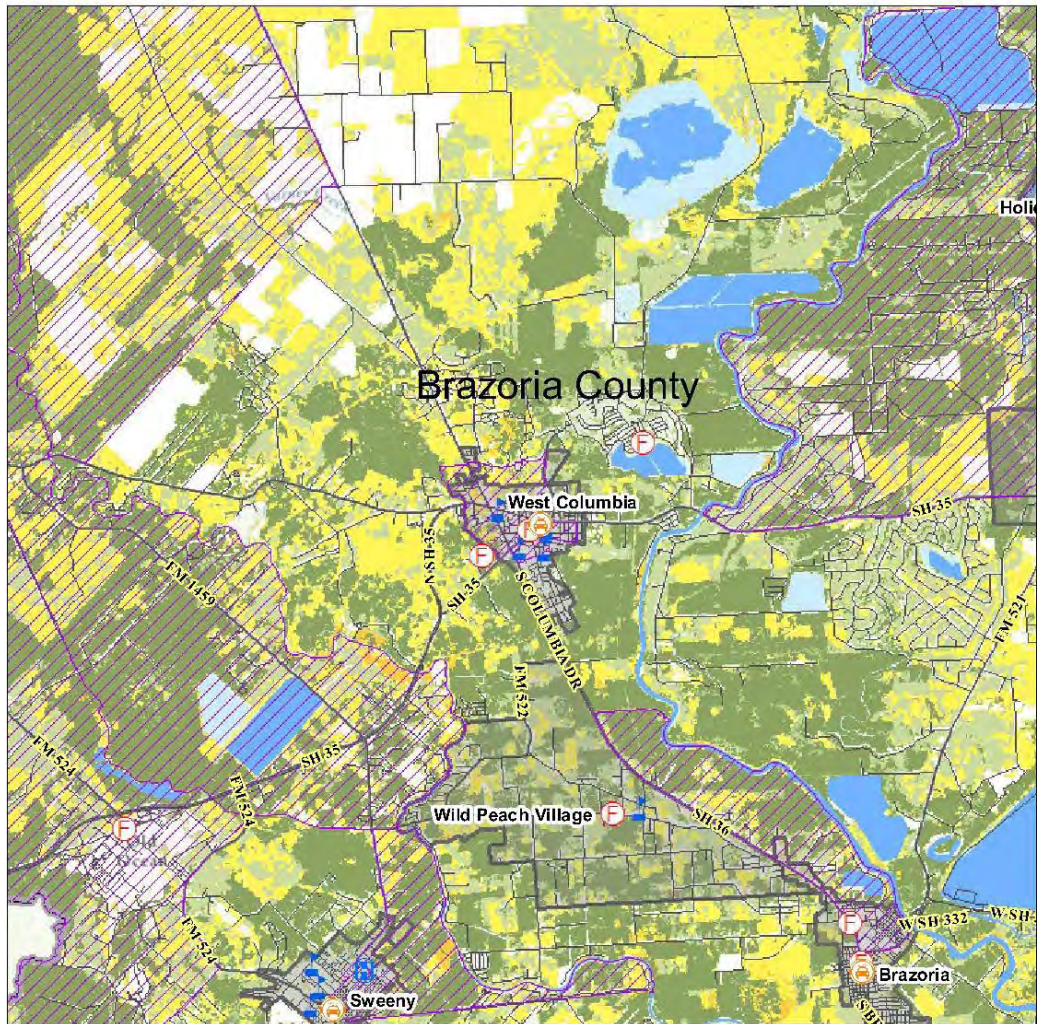


| Surfside Beach | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.2 | Occurrences since 2005: | 10 |
| Area Affected: | 60 % | Annual Event Average: | .83 |
| Probability: Unlikely; 8.3 percent chance to occur within a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 1-acre fire. The jurisdiction can expect a 2 to 4-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 205 residential structures at risk • 16 percent of population are individuals 18 years and younger (84 children) • 19 percent of population are individuals 65 and older (101) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 35 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

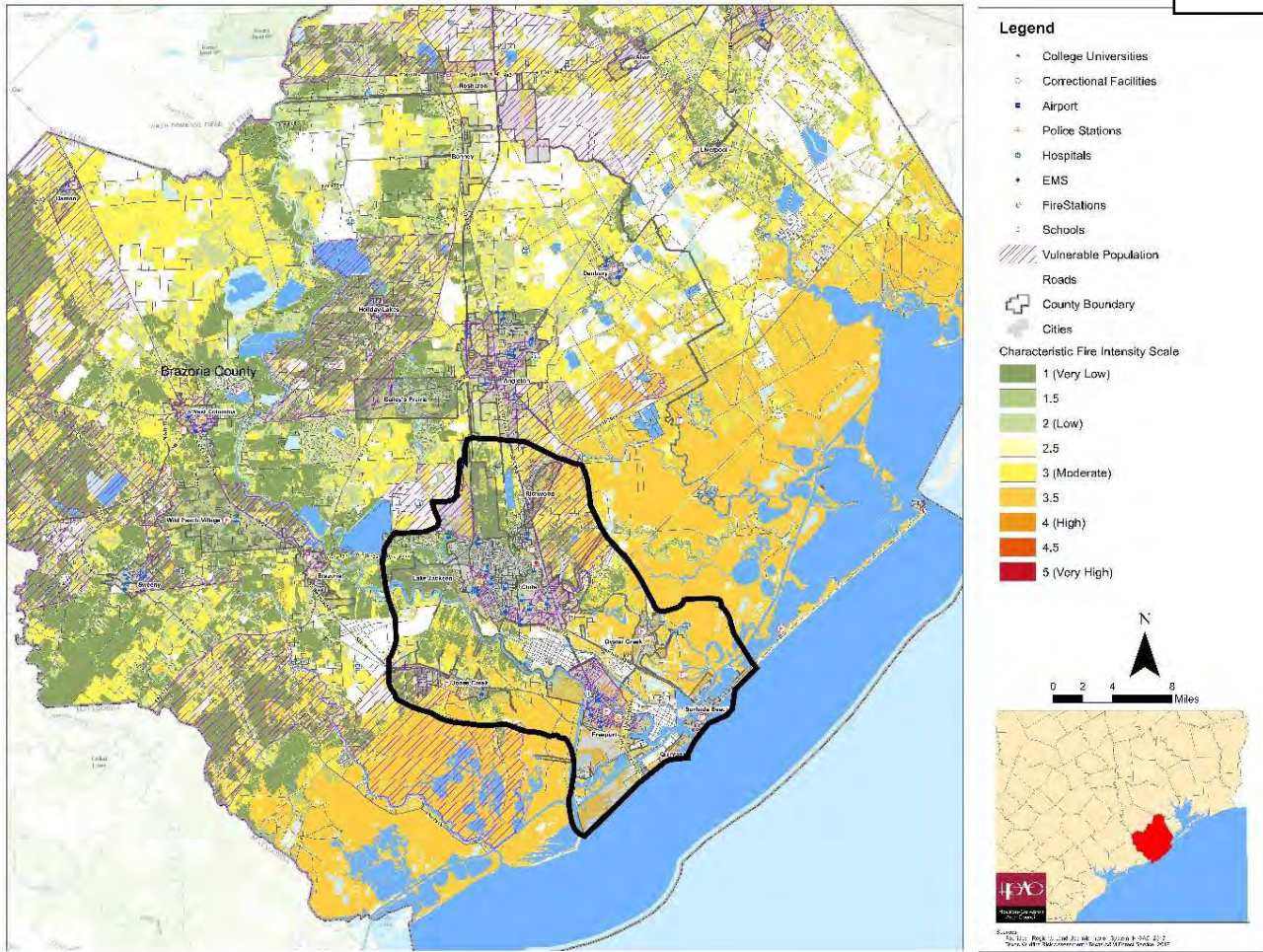
Wildfire Risk Assessment: Sweeny



| Sweeny and Sweeny ISD | | | |
|---|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 0 |
| Area Affected: | 3 % | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Brazoria. Sweeny has a similar likelihood that the event will occur. Brazoria’s probability is: Unlikely; 17 percent chance to occur within a year. | | | |
| Extent: Similarly, Brazoria’s extent is: The largest wildfire in the past 12 years has been a 2-acre fire. The jurisdiction can expect a 4 to 6-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 251 structures at risk • 28 percent of population are individuals 18 years and younger (1,058 children) • 18 percent of population are individuals 65 and older (686 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 46 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |



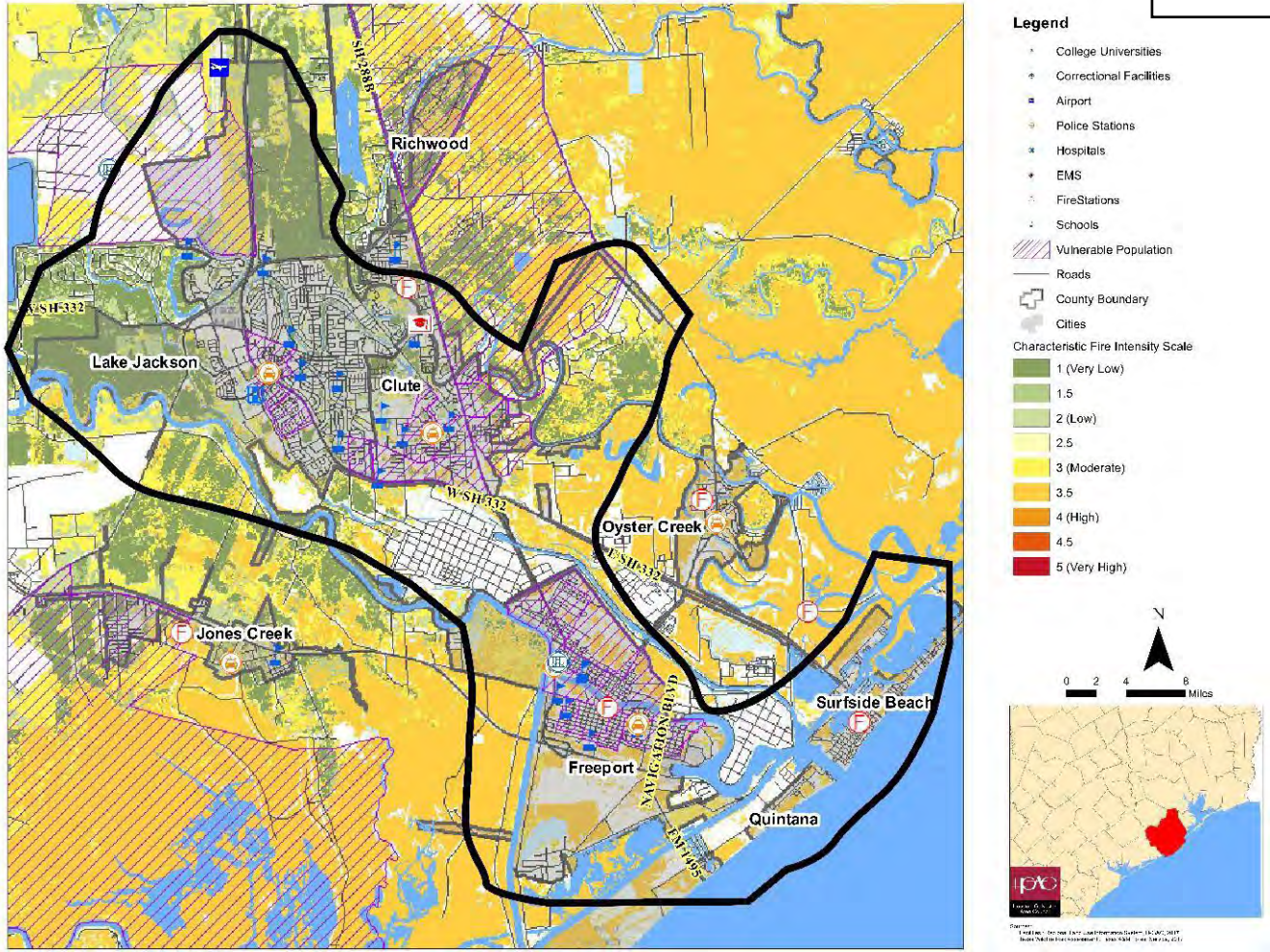
| West Columbia | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.58 | Occurrences since 2000: | 0 |
| Area Affected: | 8 % | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Brazoria. West Columbia has a similar likelihood that the event will occur. Brazoria's probability is: Unlikely; 8.3 percent chance to occur within a year. | | | |
| Extent: Similarly, Brazoria's extent is: The largest wildfire in the past 12 years has been a 2-acre fire. The jurisdiction can expect a 4 to 6-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 246 residential structures at risk • 29 percent of population are individuals 18 years and younger (1,120 children) • 12 percent of population are individuals 65 and older (482 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 41 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |



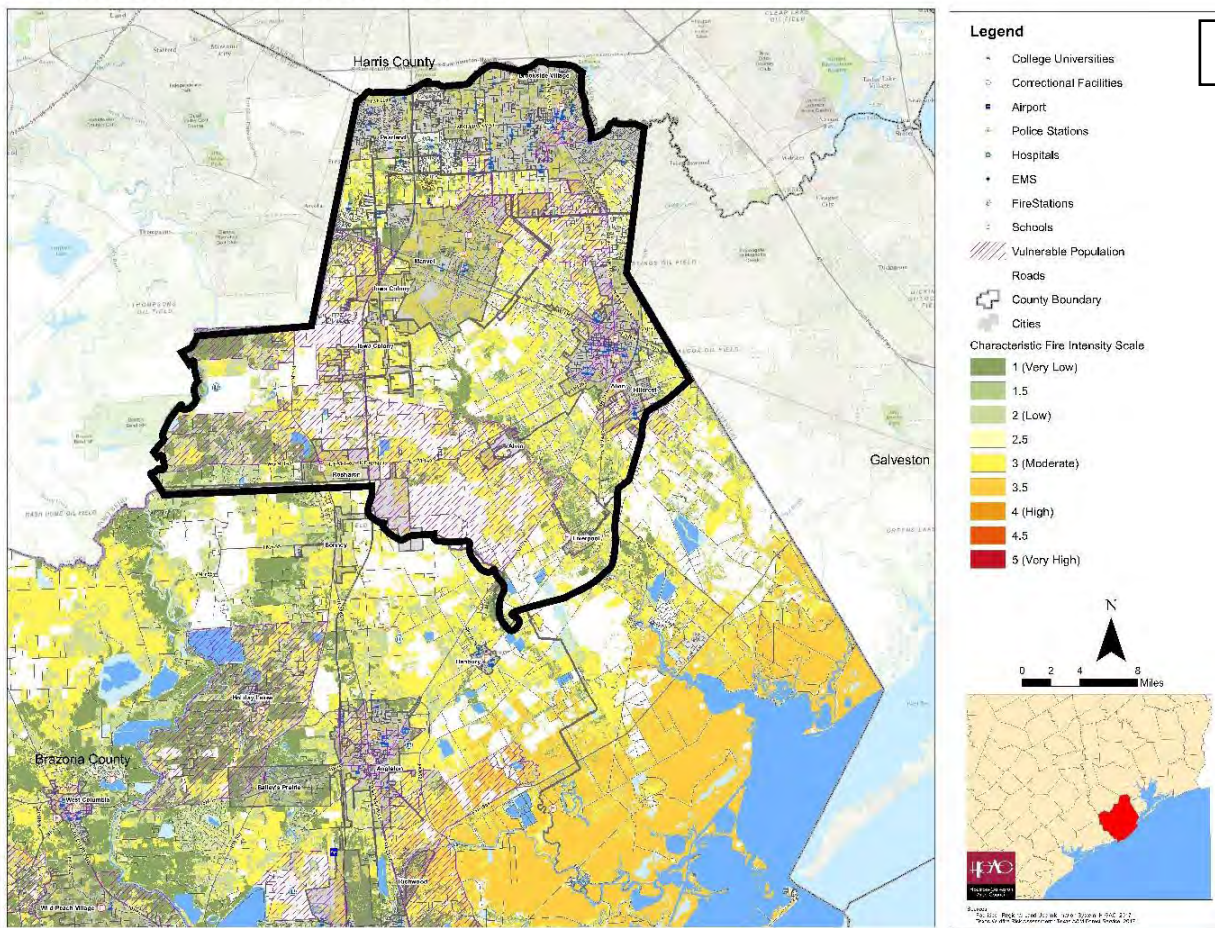
| Brazosport ISD | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 200 | Occurrences since 2000: | 0 |
| Area Affected: | 46 % | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is throughout Brazoria County. The ISD has a similar likelihood that the event will occur as unincorporated areas of the county. Brazoria County unincorporated area's probability is: Very Likely; 100 percent chance event will occur in a year. | | | |
| Extent: The ISD areas can expect a 75-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 12,000 students 18 years and younger • 19 schools- 10 elementary schools, 3 high schools, 5 middle schools, 1 alternative school | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 100 percent of the total identified population may face serious illness or health conditions due to poor air quality • If administration or schools need to close due to fire damage or poor air quality this may lead to a financial loss for families needing to take off work or find childcare for their children. • Academic/ educational loss for children missing school and potentially falling behind in course work | | | |

Wildfire Risk Assessment: Velasco Drainage District

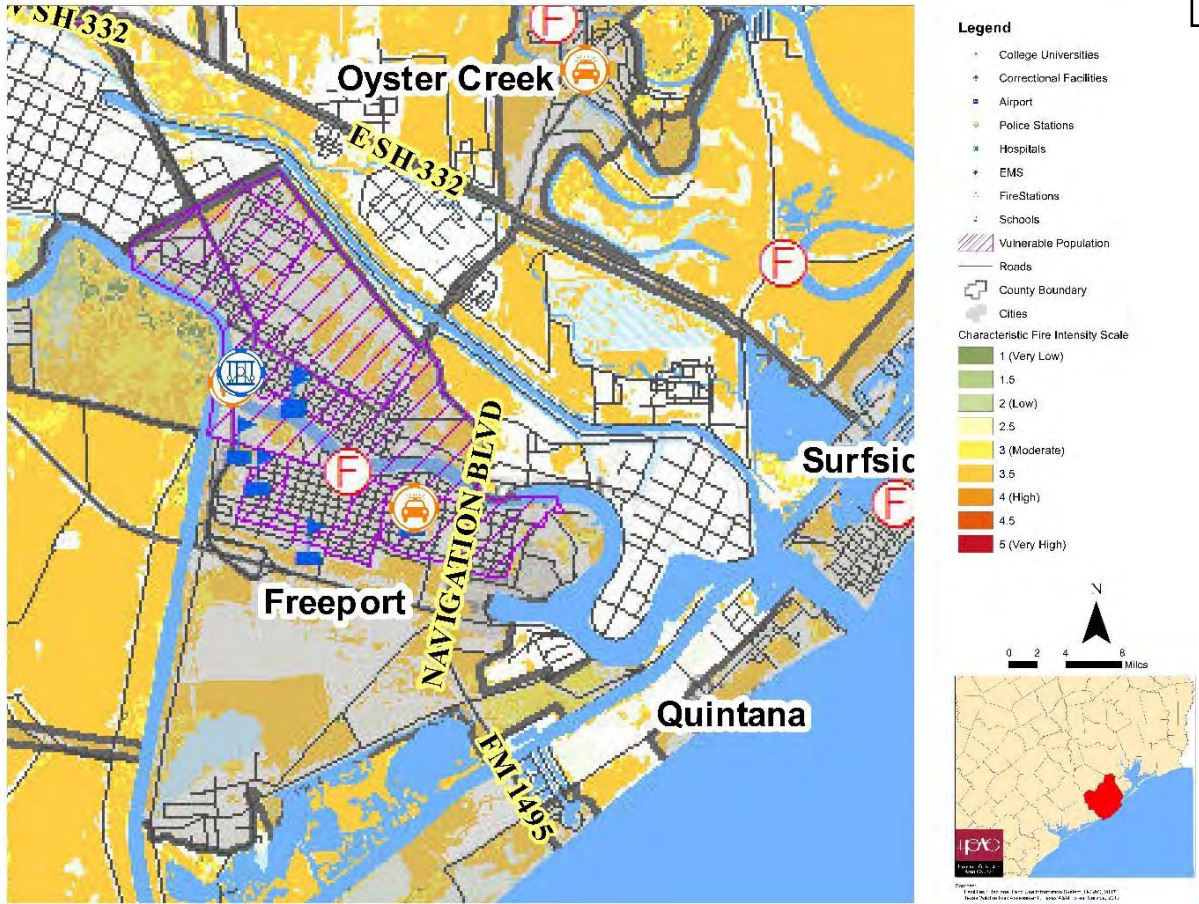
Section VII, Item H.



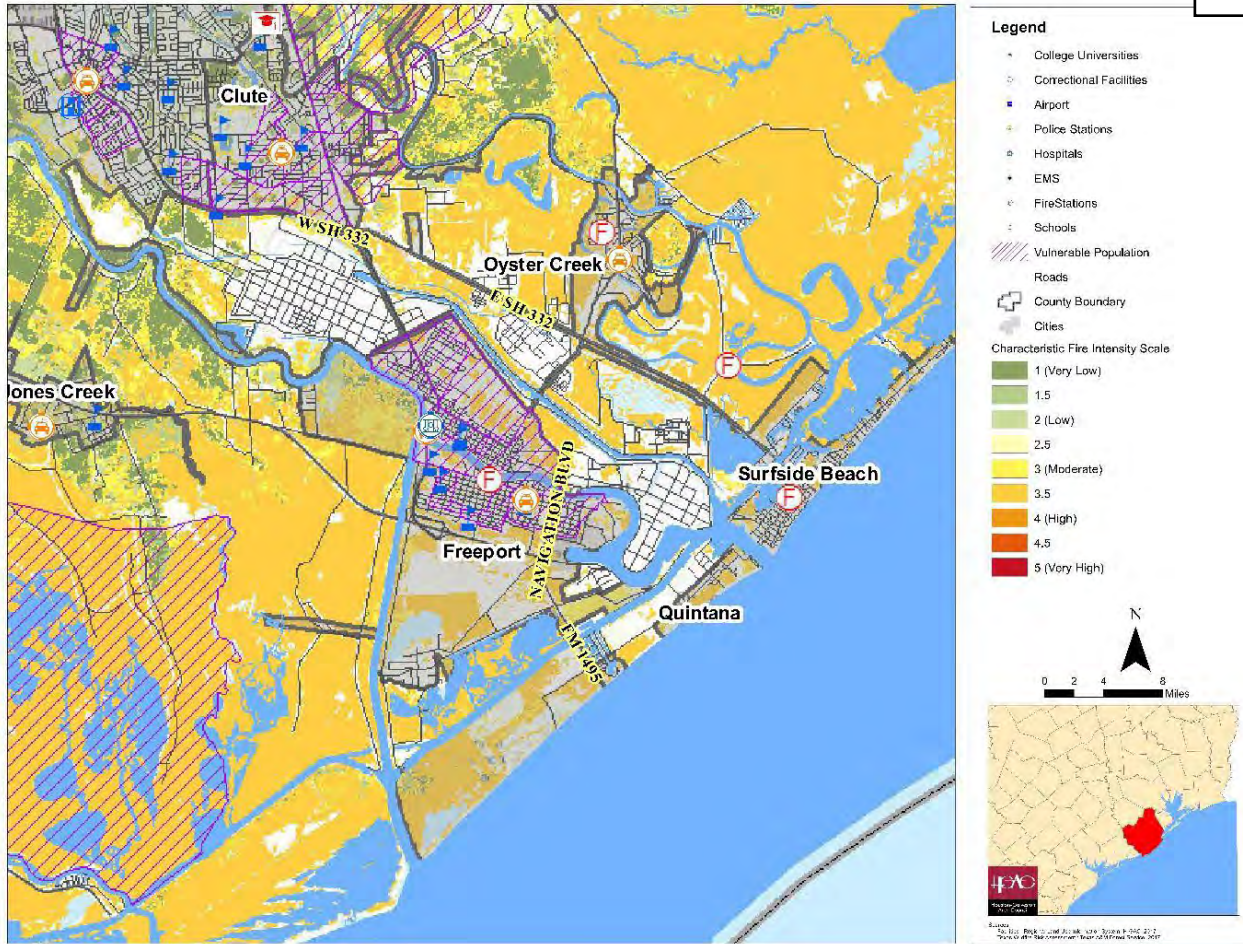
| Velasco Drainage District | | | |
|--|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 236 | Occurrences since 2000: | 0 |
| Area Affected: | 37% | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is throughout Brazoria County. Perhaps the District has a similar likelihood that the event will occur as unincorporated areas of the county. Brazoria County unincorporated area's probability is: Very Likely; 100 percent chance event will occur in a year. | | | |
| Extent: Similarly, Brazoria County unincorporated area's extent is: The largest wildfire in the past 12 years has been a 560-acre fire. The unincorporated areas can expect a 600-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Administrative building • 14 pump stations and levees | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • If the district's infrastructure becomes damaged this may lead to a decrease in service or slower services, in extreme circumstances this may lead to a decrease in agriculture production • Financial cost of repairing administration building, pumps and levees damaged | | | |



| Alvin ISD | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 252 | Occurrences since 2000: | 0 |
| Area Affected: | 23 % | Annual Event Average: | 0 |
| <p>Probability: Although the jurisdiction has no recorded events, the jurisdiction is throughout Brazoria County. Perhaps the ISD has a similar likelihood that the event will occur as unincorporated areas of the county. Brazoria County unincorporated area’s probability is: Very Likely; 100 percent chance event will occur in a year.</p> | | | |
| <p>Extent: The ISD area can expect a 103-acre fire.</p> | | | |
| <p>Identified Vulnerabilities:</p> <ul style="list-style-type: none"> • 31 schools- 17 elementary schools, 3 high schools, 6 middle schools, 1 alternative school • 22,000 children 18 years and younger | | | |
| <p>Identified Impacts:</p> <ul style="list-style-type: none"> • 100 percent of the total identified population may face serious illness or health conditions due to poor air quality • If administration or schools need to close due to fire damage or poor air quality this may lead to a : <ul style="list-style-type: none"> ○ financial loss for families needing to take off work or find childcare for their children ○ Academic/ educational loss for children missing several days of school and potentially falling behind in course work | | | |



| Port Freeport | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 26 |
| Area Affected: | 12 % | Annual Event Average: | 2.2 |
| Probability: Highly Likely; 100 percent chance to occur within a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 10-acre fire. The jurisdiction can expect a 12 to 14-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Port facilities, equipment, and administrative buildings | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • If a wildfire spreads throughout the port facilities this could endanger employees and may create a loss of life and serious injury • The port is one of 18 ports in Texas, if the port had to close due to a fire this may have an impact on the local and state economy; leading to a potential loss of \$226.6 million dollars per day | | | |



| Freeport | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 26 |
| Area Affected: | 31 % | Annual Event Average: | 2.2 |
| Probability: Highly Likely; 100 percent chance to occur within a year | | | |
| Extent: The largest wildfire in the past 12 years has been a 10-acre fire. The jurisdiction can expect a 12 to 14-acre fire. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 697 residential structures at risk • 29 percent of population are individuals 18 years and younger (1,120 children) • 12 percent of population are individuals 65 and older (482 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 45 percent of the total population may face serious illness or health conditions due to poor air quality • Residential and commercial property loss throughout the jurisdiction | | | |

Part 6.3: Hurricanes & Tropical Storms

6.3 Hurricanes and Tropical Storms

The Saffir-Simpson Scale ranks hurricanes that are formed in the Atlantic Ocean and Northern Pacific Ocean east of the international date line. The scale considers winds and the amount of damages that could be sustained by the storm. Category 1 is the lowest category of storm, while Category 5 is the strongest level storm. Tropical storms are tropical cyclones that have winds between 39 to 73 mph. While tropical cyclone winds do not reach the wind speeds for the Saffir- Simpson scale, according to the Beaufort Wind Scale, tropical storms are capable of producing winds that could break or uproot trees or create considerable structural damage.

| Category | Sustained Winds | Types of Damage Due to Hurricane Winds |
|--------------|--|--|
| 1 | 74-95 mph 64-82 kt. 119-153 km/h | Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days. |
| 2 | 96-110mph 83-95 kt. 154-177 km/h | Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks. |
| 3 (Major) | 111-129 mph 96-112 kt. 178-208 km/h | Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes. |
| 4 (Major) | 130-156 mph 113-136 kt. 209-251 km/h | Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months |
| 5 (Major) | 157 mph min. 137 kt. min. 252 km/h | Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months. |

Historic Occurrence

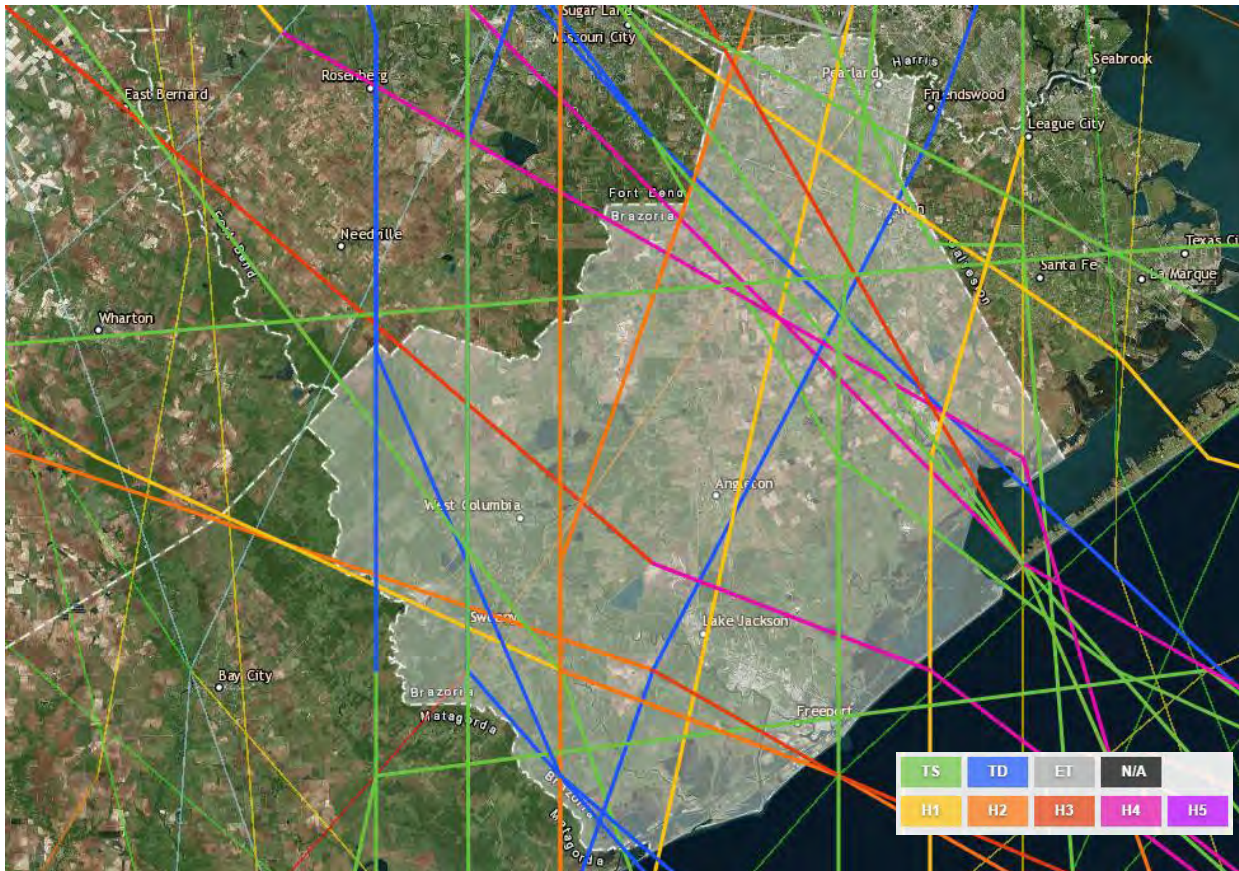
Based on recorded data, twelve hurricanes and tropical storms have direct paths over Brazoria County. Hurricanes and tropical storms since 2000 are included in the list below, and their monetary impact is also noted. There were no reported injuries or deaths from these events or crop damage.

| Date | Event Type | Property Damage (2015 Dollars) | Notes |
|-----------|---------------------|--------------------------------|---|
| 6/5/2001 | Tropical Storm | \$22,200,000 | None |
| 9/5/2002 | Tropical Storm | \$0 | None |
| 7/14/2003 | Hurricane (Typhoon) | \$1,270,000 | Hurricane Claudette. In Brazoria County, 2 single family homes were destroyed, 10 received major damage, and 39 received minor damage. 2 businesses were destroyed and 9 received major damage totaling \$655,000. The highest recorded tide level, 6.99 feet above mean low water, occurred in Freeport at the Brazos River levee. |
| 8/30/2003 | Tropical Storm | \$30,000 | Tropical Storm Grace became the second tropical cyclone in less than two months to make landfall around Port O'Connor. There was no damage due to Grace's winds. Total rainfall amounts included 5.57 inches in Freeport |
| 9/1/2003 | Tropical Storm | \$8,000 | This flash flood event was from the remnants of Tropical Storm Grace. Rainfall totals from the 1st and 2nd were 4.75 inches in Freeport. |

| | | | |
|-----------|---------------------|-----------------|--|
| 8/29/2005 | Storm Surge/Tide | \$40,000 | Minor coastal flooding from swells created by Hurricane Katrina caused a bulkhead to break in Surfside. Washed out some roads and broke a few sewer lines. |
| 9/23/2005 | Hurricane (Typhoon) | \$500,000 | None |
| 9/12/2008 | Storm Surge/Tide | \$1,000,000,000 | Significant damage occurred due to surge along gulf facing sections including Quintana and Surfside areas. Surge estimates of 7 to 10 feet were obtained from high water marks. |
| 9/12/2008 | Hurricane (Typhoon) | \$700,000,000 | Ike produced damage due to high storm surge and high winds over the region. Brazoria County was located to the left of the landfall where winds and surge were not quite as high, but still enough to produce significant damage. Storm surge estimates were 7 to 10 feet with wind gusts to hurricane force. |
| 6/15/2015 | Tropical Storm | \$0 | Surge flooded impacted Surfside beaches, the Treasure Island subdivision and San Luis Pass Park. In the village of Surfside Beach, Seashell, Surf and Beach Roads were closed due to high water form storm surge. All countywide beach access roads were closed. Storm surge flooding was two feet deep in the Treasure Island subdivision. Heavy rain caused the flooding of Chocolate and Halls Bayous. There were trees downed by winds that were blocking roads in the town of Angleton. |
| 6/21/2017 | Tropical Storm | \$0 | There was minor coastal flooding around Surfside and Blue Water Highway with minimal impact. |
| 8/25/2017 | Tropical Storm | \$2,000,000,000 | Slow moving Tropical Storm Harvey produced torrential rains and catastrophic flooding. Several tornadoes touched down. Major to record flooding occurred along the Brazos and San Bernard Rivers and several other creeks and tributaries including Oyster Creek. |

NCDC: <https://www.ncdc.noaa.gov/stormevents/>

NOAA: Historical Hurricane Tracks in Brazoria County Map (1871 -Present)



Source: NOAA <https://coast.noaa.gov/hurricanes/>

Hazard Analysis & Vulnerability Identification

The hazard analysis uses historic hazard event data to determine the probability of an event occurring within a given year. The analysis calculates the average number of events in each jurisdiction annually and then calculates the percent chance of the event occurring within a year.

The hazard analysis also provides hazard extent data for each participating jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history. Information from stakeholders, FEMA, NOAA, and the Department of Homeland Security (DHS) are the sources of data for the analysis.

To identify vulnerabilities for each jurisdiction, this plan used the following methods:

- FEMA's Hazus analysis software
- Stakeholder identified vulnerabilities
- American Community Survey (ACS, 5-year, 2016) Data on building stock and residents

Hazus was used to determine the economic loss and calculate the building stock at risk of hurricane damage in Brazoria County. The complete Hazus report is in Appendix C. Stakeholders provided valuable insight into additional vulnerabilities within their communities. These findings are provided in condensed charts for each jurisdiction.

Brazoria County (All participating jurisdictions)

Identified Vulnerabilities:

While participating jurisdictions identified flooding as one of the main effects of hurricanes, flooding is addressed in the first section. In this section vulnerabilities from hurricane winds are addressed. High winds can tear down powerlines, trees, barns, fences, and multitude of other debris can be blown into roadways and homes during the event.

Additionally, residences and commercial buildings could be damaged or destroyed due to events; older residential neighborhoods and structures without a permanent foundation were identified as one of the main vulnerabilities throughout the county. While current building codes address the vulnerability of wind damage to structures, older buildings (particularly residential buildings) were built when less stringent building codes were in place; therefore, older residential building and residences without a permanent foundation are a focus in this section.

- According to Hazus 4,086 commercial residential buildings are at risk
- According to Hazus 90,641 residential buildings are at risk
- According to Hazus 26,654 individuals will be displaced from their homes
- Based on the Hazus reports residential buildings in comparison to commercial buildings are most at risk of the effects of hurricanes throughout the county

Brazoria County (All participating jurisdictions)

Identified Impacts:

- Downed powerlines could impact communication and daily active leading to a financial loss for the county, cities and individuals, and could impede first responders from reaching those in need or residents evacuating
- Strong winds could prevent first responders from traveling to assist individuals, because of unsafe driving conditions such as debris hitting emergency vehicles
- Critical facilities could sustain wind damage, potentially delaying first responders reaching those in need and city services after the event
- Economic and financial loss for cities and individuals including property loss:
 - According to Hazus there could be a potential of \$ 29,401,709 in residential loss or 87 percent of total loss
 - According to Hazus there could be a potential of \$2,672,546 in commercial property loss or 8 percent of total loss

Brazoria County (Unincorporated)

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1,475 | Occurrences since 1871: | 26 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |

Probability: Unlikely; 17 percent chance to occur a year

Extent: The strongest hurricane in the past was a category 5 hurricane; the unincorporated areas can expect to see a category 5 hurricane in the future

Identified Vulnerabilities:

- Vulnerable populations are concentrated near the coast near the San Bernard Wildlife Refuge
- Critical facilities including: 3 fire station, 5 schools, 1 shelter, and 2 correctional facilities

Identified Impacts:

- Vulnerable populations located near the coast could sustain greater injury or loss of life due to the lack of resources to evacuate or to contact responders when they need help
- Critical facilities and equipment could be damaged with windows broken or roofs blown off or destroyed by high winds
- First responders could be delayed, this may increase serious injury or loss of life throughout the county

| Alvin | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 25.6 | Occurrences since 2000: | 4 |
| Area Affected: | 100% | Annual Event Average: | .24 |
| Probability: Unlikely; 24 percent chance occurring within a given year | | | |
| Extent: According to past events, the strongest tornado was an F0; the jurisdiction can see a EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 6,275 Residential buildings built before 1980 (65.8% of housing stock) • 1,334 Mobile Homes (14% of housing stock) • 42 Boats/ RVs/ Vans acting as main housing (.4 % of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Almost 85 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Angleton | | | |
|---|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 11.27 | Occurrences since 1871: | 7 |
| Area Affected: | 100 % | Annual Event Average: | .048 events a year |
| Probability: Unlikely; 4.8 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 1 hurricane; the jurisdiction can expect to see a category 3 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 6,426 Residential buildings built before 1980 (80 % of housing stock) • 685 Mobile Homes (8.5 % of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Almost 90 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

Bailey's Prairie

| | | | |
|--------------------------------|------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 7.7 | Occurrences since 1871: | 4 |
| Area Affected: | 100% | Annual Event Average: | .027 events a year |

Probability: Unlikely; 2.7 percent chance to occur within a year

Extent: The strongest hurricane in the past was a category 3 hurricane; the jurisdiction can expect to see a category 3 to 5 hurricane in the future

- Identified Vulnerabilities:**
- 82 Residential buildings built before 1980 (80.5% of housing stock)
 - 22 Mobile Homes (19.5% of housing stock)

- Identified Impacts:**
- 100 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction.

Bonney

| | | | |
|--------------------------------|------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 1.66 | Occurrences since 1871: | 5 |
| Area Affected: | 100% | Annual Event Average: | .034 events a year |

Probability: Unlikely; 3.4 percent chance to occur within a year

Extent: The strongest hurricane in the past was a category 5 hurricane; the jurisdiction can expect to see a category 3 to 5 hurricane in the future

- Identified Vulnerabilities:**
- 107 Residential buildings built before 1980 (73.1% of housing stock)
 - 30 Mobile Homes (20.5% of housing stock)
 - 4 Boats/ RVs/ Vans acting as main housing (2.7% of housing stock)

- Identified Impacts:**
- 96 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction.

| Brazoria | | | |
|--|------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 1871: | 8 |
| Area Affected: | 100% | Annual Event Average: | .055 events a year |
| Probability: Unlikely; 5.5 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 3 hurricane; the jurisdiction can expect to see a category 3 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 1,129 Residential buildings built before 1980 (80% of housing stock) • 144 Mobile Homes (10.2% of housing stock) • 14 Boats/ RVs/ Van acting as main housing (1% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 91 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Brookside Village | | | |
|---|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 2.085 | Occurrences since 1871: | 5 |
| Area Affected: | 100% | Annual Event Average: | .034 events a year |
| Probability: Unlikely; 3.4 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 1 hurricane; the jurisdiction can expect to see a category 2 to 4 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 480 Residential buildings built before 1980 (79.1% of housing stock) • 7 Mobile Homes (1.2% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Almost 81 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Clute | | | |
|--|------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 5.6 | Occurrences since 1871: | 7 |
| Area Affected: | 100% | Annual Event Average: | .048 events a year |
| Probability: Unlikely; 4.8 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 5 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 3,347 Residential buildings built before 1980 (64.8% of housing stock) • 312 Mobile Homes (6% of housing stock) • 26 Boats/ RVs/ Vans acting as main housing (.5% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Approximately 71 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Danbury and Danbury ISD | | | |
|---|------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 1.0 | Occurrences since 1871: | 4 |
| Area Affected: | 100% | Annual Event Average: | .027 events a year |
| Probability: Unlikely; 2.7 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 5 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 500 Residential buildings built before 1980 (86.2% of housing stock) • 4 Mobile Homes (.7% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Almost 87 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Iowa Colony | | | |
|---|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 7.33 | Occurrences since 1871: | 6 |
| Area Affected: | 100 % | Annual Event Average: | .041 events a year |
| Probability: Unlikely; 4.1 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 3 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 263 Residential buildings built before 1980 (60% of housing stock) • 122 Mobile Homes (27.9% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Almost 83 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Hillcrest Village | | | |
|---|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 0.4 | Occurrences since 1871: | 9 |
| Area Affected: | 100 % | Annual Event Average: | .062 events a year |
| Probability: Unlikely; 6.2 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 3 hurricane; the jurisdiction can expect to see a category 3 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 289 Residential buildings built before 1980 (82.9% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Almost 83 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Holiday Lakes | | | |
|---|------|--------------------------------|------|
| Planning Area (Sq. mi): | 1 | Occurrences since 1871: | 4 |
| Area Affected: | 100% | Annual Event Average: | .027 |
| Probability: Unlikely; 2.7 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 3 hurricane; the jurisdiction can expect to see a category 3 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 271 Residential buildings built before 1980 (64.8% of housing stock) • 216 Mobile Homes (51.8% of housing stock) • 5 Boats/ RVs/ Van acting as main housing (1.2% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 100 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Jones Creek | | | |
|--|------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 1871: | 7 |
| Area Affected: | 100% | Annual Event Average: | .048 events a year |
| Probability: Unlikely; 4.8 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 3 hurricane; the jurisdiction can expect to see a category 3 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 3,347 Residential buildings built before 1980 (64.8% of housing stock) • 165 Mobile Homes (19.1% of housing stock) • 4 Boats/ RVs/ Van acting as main housing (.5% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • About 85 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Lake Jackson | | | |
|--|------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 20.9 | Occurrences since 1871: | 7 |
| Area Affected: | 100% | Annual Event Average: | .048 events a year |
| Probability: Unlikely; 4.8 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 5 hurricane; the jurisdiction can expect to see a category 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 8,272 Residential buildings built before 1980 (70.1% of housing stock) • 6 Mobile Homes (.1% of housing stock) • 9 Boats/ RVs/ Vans acting as main housing (.1% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • About 71 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Liverpool | | | |
|---|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 1.1 | Occurrences since 1871: | 9 |
| Area Affected: | 100 % | Annual Event Average: | .062 events a year |
| Probability: Unlikely; 6.2 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 5 hurricane; the jurisdiction can expect to see a category 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 177 Residential buildings built before 1980 (72.2% of housing stock) • 37 Mobile Homes (15.1% of housing stock) | | | |
| Identified Impacts | | | |
| <ul style="list-style-type: none"> • Approximately, 87 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Manvel | | | |
|---|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 23.6 | Occurrences since 1871: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .027 events a year |
| Probability: Unlikely; 2.7 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 3 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 971 Residential buildings built before 1980 (32.8% of housing stock) • 329 Mobile Homes (11.1% of housing stock) • 77 Boats/ RVs/ Van acting as main housing (2.6% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 100 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Oyster Creek | | | |
|---|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 2 | Occurrences since 1871: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .034 events a year |
| Probability: Unlikely; 3.4 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 5 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 356 Residential buildings built before 1980 (68.6% of housing stock) • 231 Mobile Homes (44.5% of housing stock) • 23 Boats/ RVs/ Vans acting as main housing (4.4% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 100 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Quintana | | | |
|---|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 2 | Occurrences since 1871: | 6 |
| Area Affected: | 100 % | Annual Event Average: | .041 events a year |
| Probability: Unlikely; 4.1 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 5 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 554 Residential buildings built before 1980 (83.9% of housing stock) • 59 Mobile Homes (8.9% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • About 94 percent of the housing stock was either built before 1980 or does not have a permanent foundation this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Richwood | | | |
|--|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 3.1 | Occurrences since 1871: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .021 events a year |
| Probability: Unlikely; 2.1 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 1 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 356 Residential buildings built before 1980 (68.6% of housing stock) • 231 Mobile Homes (44.5% of housing stock) • 23 Boats/ RVs/ Vans acting as main housing (4.4% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 100 percent of the housing stock was either built before 1980 or does not have a permanent foundation this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Surfside Beach | | | |
|--|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 2.2 | Occurrences since 1871: | 6 |
| Area Affected: | 100 % | Annual Event Average: | .041 events a year |
| Probability: Unlikely; 4.1 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 5 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> 739 Residential buildings built before 1980 (72.2% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> 72 percent of the housing stock was either built before 1980; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Sweeny and Sweeny ISD | | | |
|--|-------|--------------------------------|------|
| Planning Area (Sq. mi): | 2 | Occurrences since 1871: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .034 |
| Probability: Unlikely; 3.4 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 3 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> 1,220 Residential buildings built before 1980 (73% of housing stock) 127 Mobile Homes (7.6% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> 100 percent of the housing stock was either built before 1980 or does not have a permanent foundation this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| West Columbia | | | |
|--|------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 2.58 | Occurrences since 1871: | 4 |
| Area Affected: | 100% | Annual Event Average: | .027 events a year |
| Probability: Unlikely; 2.7 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 3 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 1,447 Residential buildings built before 1980 (88.3% of housing stock) • 38 Mobile Homes (2.3% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • About 93 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Brazosport ISD | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 200 | Occurrences since 1871: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events in the ISD, the ISD is throughout the county. Consequently, the ISD's probability may be like unincorporated areas of Brazoria County. Brazoria County's unincorporated area's probability is: Unlikely; 17 percent chance to occur a year | | | |
| Extent: Similarly, Brazoria County's unincorporated area's extent is: The strongest hurricane in the past was a category 5 hurricane; the unincorporated areas can expect to see a category 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 12,000 students • 19 schools- 10 elementary schools, 3 high schools, 5 middle schools, 1 alternative school | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Serious injury or loss of life if an event occurs during school hours or during extracurricular activities • Financial loss for the school district if any of the schools or administrative buildings are damaged due to the event • If administration or schools need to close due to flood damage or flooding throughout the community this may lead to a: <ul style="list-style-type: none"> ○ financial loss for families needing to take off work or find childcare for their children ○ Academic/ educational loss for children missing several days of school and potentially falling behind in course work | | | |

| Velasco Drainage District | | | |
|---|------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 236 | Occurrences since 1871: | 5 |
| Area Affected: | 100% | Annual Event Average: | .034 events a year |
| Probability: Unlikely; 3.4 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 5 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Administrative building just outside of the 100-year floodplain and along the coast. | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial loss for the port, local are, and the state if the port must close for a prolonged time | | | |

| Alvin ISD | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 256 | Occurrences since 1871: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events in the ISD, the ISD is throughout the county. Consequently, the ISD’s probability may be like unincorporated areas of Brazoria County. Brazoria County’s unincorporated area’s probability is: Unlikely; 17 percent chance to occur a year | | | |
| Extent: Similarly, Brazoria County’s unincorporated area’s extent is: The strongest hurricane in the past was a category 5 hurricane; the unincorporated areas can expect to see a category 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 31 schools- 17 elementary schools, 3 high schools, 6 middle schools, 1 alternative school • 22,000 children 18 years and younger, adds an additional 1,000 students per year | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Serious injury or loss of life if an event occurs during school hours or during extracurricular activities • Financial loss for the school district if any of the schools or administrative buildings are damaged due to the event. • If administration or schools need to close due to flood damage or flooding throughout the community this may lead to a: <ul style="list-style-type: none"> ○ financial loss for families needing to take off work or find childcare for their children ○ Academic/ educational loss for children missing several days of school and potentially falling behind in course work | | | |

| Port Freeport | | | |
|---|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 1871: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .034 events a year |
| Probability: Unlikely; 3.4 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 3 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Port facilities, equipment, and administrative buildings | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Serious injury or loss of life if an event occurs while staff or visitors are at the port • Financial loss for the port if damage occurs and needs repair or replacement • Economic loss for the surrounding cities and state if the port is closed for a prolonged time. | | | |

| Freeport | | | |
|--|-------|--------------------------------|--------------------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 1871: | 5 |
| Area Affected: | 100 % | Annual Event Average: | .034 events a year |
| Probability: Unlikely; 3.4 percent chance to occur within a year | | | |
| Extent: The strongest hurricane in the past was a category 3 hurricane; the jurisdiction can expect to see a category 4 to 5 hurricane in the future | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 4,004 Residential buildings built before 1980 (86.2% of housing stock) • 229 Mobile Homes (4.9% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • About 91 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

Part 6.4: Drought

6.4 Drought

The Palmers Hydrological Drought Severity Index (PHDI) is the typical way extent of drought is observed throughout the United States. This regional index considers dry and wet spells over an extended period to calculate the range in the Index. The greater the number the more extreme the drought in a specific area.

Drought has particularly adverse effects on agriculture which is major industry in Brazoria County. The most extreme conditions occurred in 2011. The county's PHDI rating was < -4.0 (Extreme Drought) from March 2011 through January 2012. There were periods of severe drought preceding and following this period from August 2010 through October 2014. The agricultural losses are estimated at \$5.2 billion, though specific numbers by county are not available for this event.

| Palmer's Drought Severity Index | |
|---|-----------------------|
| < -4.0 | Extreme Drought |
| -3.99 to -3.0 | Severe Drought |
| -2.99 to -2.0 | Moderate Drought |
| -1.99 to -1.0 | Mild Drought |
| -0.99 to -0.5 | Incipient Drought |
| -0.49 to 0.49 | Near Normal |
| 0.5 to 0.99 | Incipient Moist Spell |
| 1.0 to 1.99 | Moist Spell |
| 2.0 to 2.99 | Unusual Moist Spell |
| 3.0 to 3.99 | Very Moist Spell |
| > 4.0 | Extreme Moist Spell |
| Source: https://www.ncdc.noaa.gov/ | |

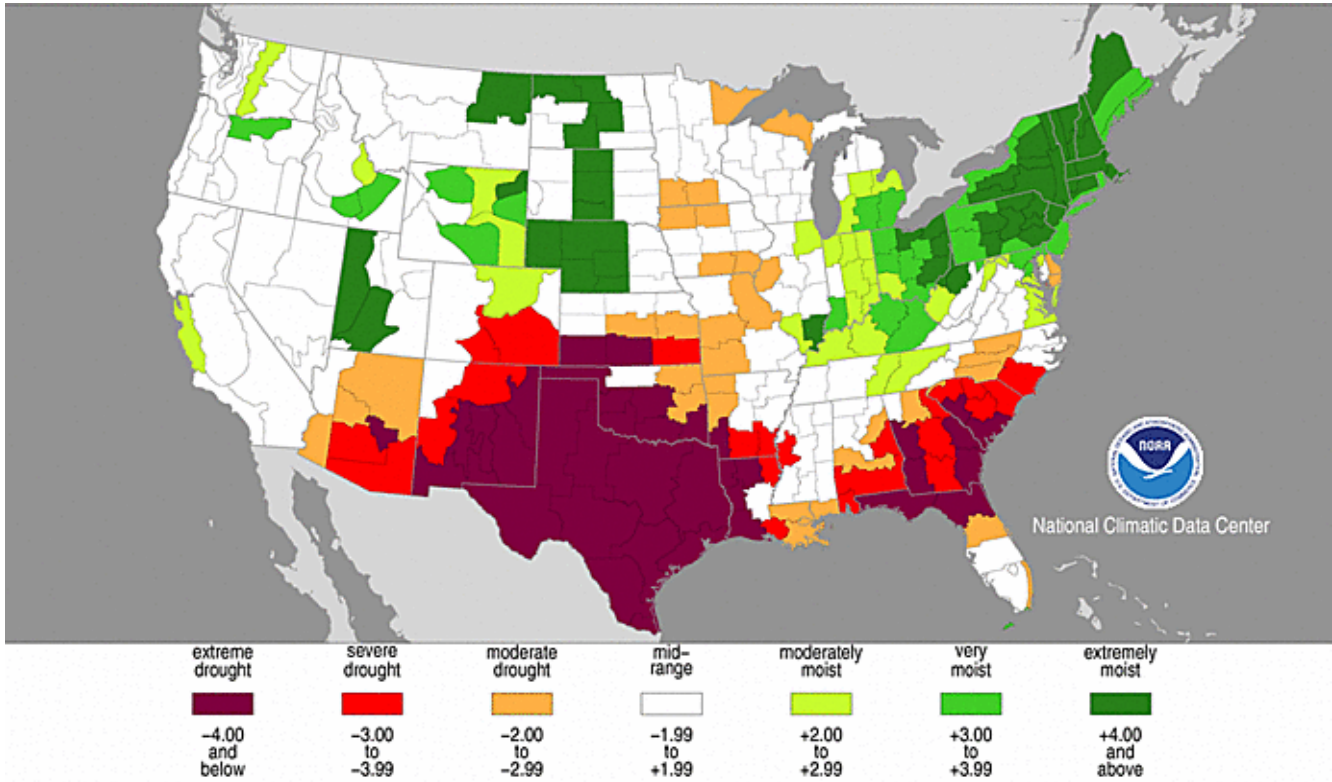
Historic Occurrence

In Brazoria County's recent history, there have been two major droughts. Zero injuries, deaths, crop or property damage was reported during these events in the county. This information is listed below at the county level. There is no county-level data available for property and agricultural losses for the most recent and most extreme drought event.

| Date | Notes |
|-----------|--|
| 8/1/2000 | Severe drought continued across southeast Texas through the month of August. Rainfall for the month of August averaged only 30 to 50 percent of normal across southeast Texas. Several cities were placed under water rationing with large crop losses were noted across the area. Wildfires became increasingly common, especially toward the end of the month. Drought losses in dollars will be computed at the end of the summer growing season. |
| 9/1/2000 | Severe drought continued across southeast Texas through September 2000. The combination of excessive heat and dryness caused many wildfires to burn during the first week of the month. Water rationing continued during the first half of the month in several small communities. Water line breaks and small grass fires were a common problem across southeast Texas, especially at the beginning of the month. By the end of September, damage estimates for the season to cotton, wheat, and forage crops and increased irrigation reached \$102.3 million for southeast Texas. |
| 10/1/2011 | No notes were recorded for this event from the NCDC. However, the map directly below demonstrates the extent of the drought in 2011. Additionally, 5.2 billion dollars in agriculture loss throughout the state of Texas was reported during this event. (http://twri.tamu.edu/publications/txh2o/fall-2011/timeline-of-droughts-in-texas/) |

Source: <https://www.ncdc.noaa.gov/>

Palmer's Drought Severity Index: October 2011



Maps source: <https://www.ncdc.noaa.gov/>

Hazard Analysis & Vulnerability Identification

The hazard analysis uses historic hazard event data to determine the probability of an event occurring again within the next five years. The analysis calculates the average number of events in each jurisdiction annually and then calculates the percentage of that event occurring within a year.

The hazard analysis also provides hazard extent data for each participating jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history. Information from stakeholders, USDA, CDC, and NOAA are the sources of data for the analysis.

To identify vulnerabilities for each jurisdiction, this plan used the following methods:

- GIS analysis of vulnerable populations
- USDA livestock production projections; and
- Stakeholder identified vulnerabilities

| All Participating Jurisdictions | | | |
|--|---|-------------------------------|-----|
| Area Impacted: | Drought is not contained to a boundary and is measured by region through the Palmers Drought Severity Index. Consequently, it can arise equally in all participating jurisdictions and in the unincorporated areas of the county. | Occurrences since 2000 | 3 |
| | | Annual Event Average | .18 |
| Probability: Likely; 18 % chance that an event will occur within a year | | | |
| Extent: As shown above through the Palmers Drought Severity Index maps, drought can vary greatly in terms of extent and duration. Based on the historical events in the county, all participating jurisdictions can expect moist to extreme drought throughout the planning area. The planning area can expect to see extreme drought in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Drought can greatly affect agriculture production. While Brazoria County has a diverse economy, agriculture remains a prominent part of the economy. For example, Brazoria County ranks fourth in Texas for rice production. In addition, the county has hay, cattle, soybean crops with crops representing 61% of production and cattle 39 %. In total, agriculture represents 118.2 million dollars for the county annually. | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> The potential loss of crops and the loss of revenue for local farmers and the entire county may impact economic standing and mental wellbeing of farmers and those taking a financial loss from the occurrence. | | | |

Part 6.5: Lightning

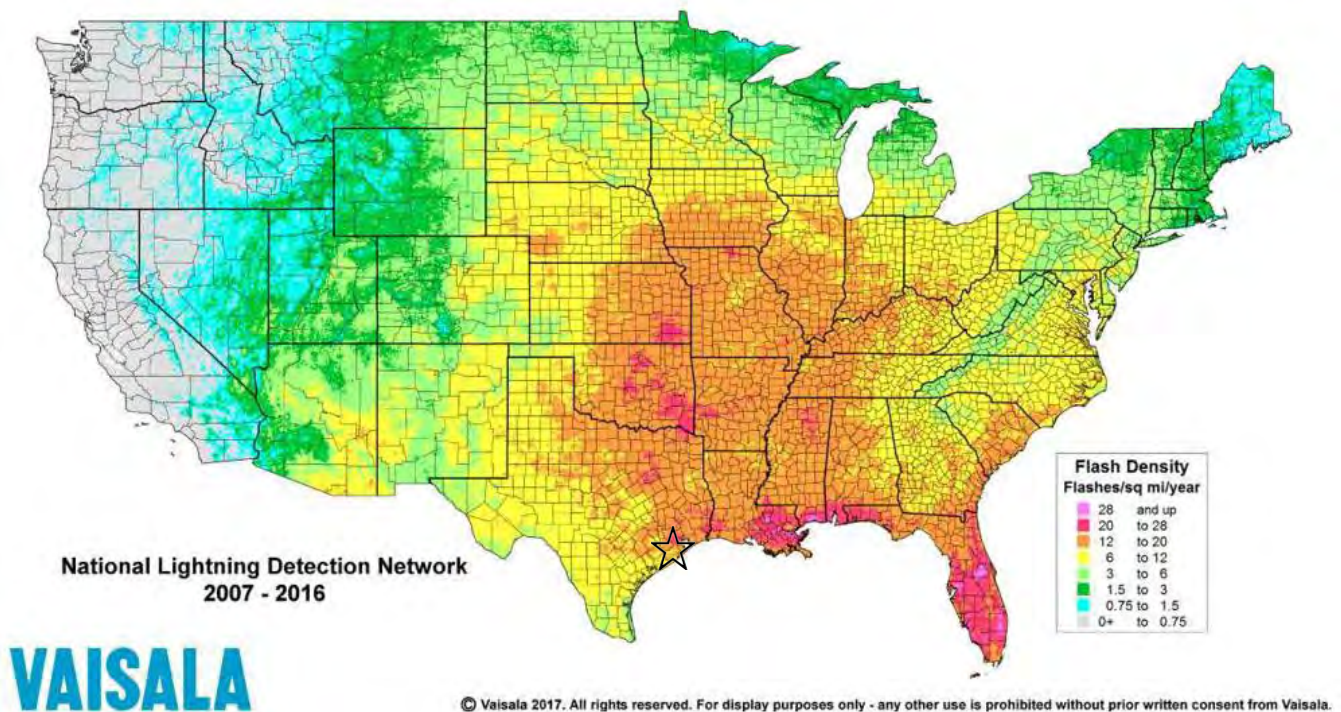
6.5 Lightning

There are two typical ways the magnitude of lightning is measured. The first is through the Lightning Activity Levels (LAL) grid. The National Oceanic and Atmospheric Administration (NOAA) considers how many cloud-to-ground strikes occur over a given period as well as rainfall to measure the amount of lightning activity occurring.

| LAL | Cloud & Storm Development | Lightning Strikes/15 per minute |
|-----|---|---------------------------------|
| 1 | No thunderstorms | None |
| 2 | Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 clouds to ground strikes in a five-minute period. | 1 to 8 |
| 3 | Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 clouds to ground strikes in a 5-minute period. | 9 to 15 |
| 4 | Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 clouds to ground strikes in a 5-minute period. | 16 to 25 |
| 5 | Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 clouds to ground strikes in a 5-minute period. | Greater than 25 |
| 6 | Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag Warning. | Greater than 25 |

Source: <https://www.ncdc.noaa.gov/>

The second method is through the National Lightning Detection Network by Vaisala. This Network works by recording when lightning strikes the ground, considering the location, time, and polarity of the strike. According to this Network, Brazoria County is rated 12-20 flashes per square mile per year.



Historic Occurrences

There have been 2 deaths in the county due to lightning in the past 17 years; one death was reported in Angleton on August 24th, 2000. Another death was reported in Danbury on October 7th, 2007. Three injuries were reported from lightning since 2000; two injuries were reported in Quintana in 2006 and one injury was reported in Danbury on June 25th, 2007.

| Jurisdiction | Date | Property Damage | Notes |
|----------------|-----------|-----------------|--|
| Angleton | 8/24/2000 | \$0 | Lightning struck and killed 31-year-old man on motorcycle. |
| Quintana | 6/30/2006 | \$0 | Two victims sought shelter under a cabana on Surfside Beach when lightning struck. Both went to the hospital, but were released with minor injuries. |
| Unincorporated | 4/25/2007 | \$50,000 | Lightning strike to residential home caused home fire. |
| Lake Jackson | 6/5/2007 | \$30,000 | Lightning struck a home on the 200 block of Peppermint Drive causing a fire. |
| Unincorporated | 6/15/2007 | \$210,000 | Home was destroyed by fire caused by a lightning strike. |
| Danbury | 6/25/2007 | \$0 | Lightning strike at a Brazoria County golf course, seriously injuring one golfer. |
| Danbury | 10/7/2007 | \$0 | A 30-year-old male was killed by a lightning strike while standing underneath a tree. |
| Manvel | 4/17/2014 | \$1,000 | A lightning strike caused a grass fire on a golf course. |
| Iowa Colony | 4/17/2014 | \$1,000 | A lightning strike set a palm tree on fire. |
| Iowa Colony | 4/17/2014 | \$15,000 | A lightning strike caused a fire at a two-story residential home. |
| Manvel | 4/17/2014 | \$15,000 | A lightning strike set fire to a structure in Manvel. |
| Lake Jackson | 4/14/2015 | \$5,000 | A lightning strike caused damage to a structure. |
| Freeport | 5/21/2016 | \$3,000 | Lightning that struck a power pole in Freeport caused power outages throughout the city. |

Hazard Analysis & Vulnerability Identification

The hazard analysis uses historic hazard event data to determine the probability of an event occurring again within a given year. The analysis calculates the average number of events in each jurisdiction annually and then calculates the percent chance of the event occurring within a year.

The hazard analysis also provides hazard extent data for each participating jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history. Information from stakeholders, Texas Forest Service, and NOAA are the sources of data.

To identify vulnerabilities for each jurisdiction, this plan used the following methods:

- American Community Survey (ACS 5-year 2016) Data on structures
- GIS analysis of structures and critical facilities exposed to lightning damage; and
- Stakeholder identified vulnerabilities

Extent

The magnitude of lightning was not recorded for each historical event; not all participating jurisdictions have a history of all lightning strikes that may have occurred in their jurisdiction; and lightning flashes per event for each jurisdiction was not found. Due to these data limitations and considering that lightning is not contained to a particular geographic area or jurisdiction, extent for the entire county was estimated; NOAA's Severe Weather Data Inventory does provide a history of flashes per event on the county level. According to the Data Inventory, the entire planning area saw approximately a range of lightning flashes per event between an average of 12 to 61 flashes per event from 2000 to 2017.

Brazoria County (All Jurisdictions)

Identified Vulnerabilities:

As described in the hazard identification section, lightning can strike anywhere, but is more likely to strike tall trees and structures, and in open fields. As noted in the historical occurrences above, lightning can cause serious injury to residents and property in these places. Lightning can also cause wildfires that could destroy or damage residential, commercial, public property or agricultural lands. Additionally, lightning could hit a structure directly and cause a structural fire. In considering this, vulnerabilities throughout the county include:

- Agricultural and parkland areas throughout the county including the Brazoria National Wildlife Refuge, Justin Hurst Wildlife and San Bernard National Wildlife Refuge
- Residential buildings throughout the county (identified below by jurisdiction)
- Communication towers (no data was found for the exact number of towers throughout the county)
- Critical facilities throughout the county (identified below by jurisdiction)

Identified Impacts:

- Residential, commercial, and public property loss throughout the county due to wildfires or structural fires started by lightning
- In total, 631,021 acres in total throughout the county in farmland at risk if a lightning strike causes a wildfire (accounting for 118,236,00 dollars in revenue). Leading to financial and economic loss for individual farmers and the county
- Lightning striking a communication tower may lead to a loss of communication for a particular jurisdiction or for a large portion of the county. This could lead to an inability to reach people in need.
- In the instance that lightning does strike a critical facility without a generator or the generator does not work, critical facilities could lose power. This may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lightning is accompanied by flooding or other hazardous events

Brazoria County (Unincorporated)

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1,475 | Occurrences since 2000: | 2 |
| Area Affected: | 100 % | Annual Event Average: | .12 events a year |

Probability: Unlikely; 12 percent chance event occurs within a year

Extent: According to past events there have been .12 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event.

Identified Vulnerabilities:

- Critical facilities including: 3 fire station, 5 schools, 1 shelter, 2 correctional facilities

Identified Impacts:

- 11 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lightning is accompanied by flooding or other hazardous events.

| Alvin | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 25.6 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 14 schools, 5 electrical substations, 4 fire stations, 2 EMS, 1 wastewater treatment plant, 2 shelters, 6 police stations, and 1 emergency operation center • 1,431 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 29 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Angleton | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 11.27 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .05 events a year |
| Probability: Unlikely; 5 percent chance of the event occurring within a year | | | |
| Extent: According to past events there have been .05 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 3 correctional facilities, 1 electrical substation, 1 EMS, 2 fire stations, 9 schools, 3 shelters, 9 police stations, and 2 hospitals • 803 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 29 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Bailey's Prairie | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 7.7 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA's data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 170 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Relying on first responders in neighboring jurisdictions may lead to a delayed response time which could increase the loss of life, serious injuries, or structures damaged • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Bonney | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 1.66 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA's data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 22 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Relying on first responders in neighboring jurisdictions may lead to a delayed response time which could increase the loss of life, serious injuries, or structures damaged • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Brazoria | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 correctional facility, 1 electrical substation, 1 EMS, 4 fire stations, 9 schools, 6 shelters, 2 police stations, 2 hospitals, 6 shelters, and 2 emergency operation centers • 282 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 36 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Brookside Village | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.085 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 1 police station • 122 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 1 critical facility could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Clute | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 5.6 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 EMS, 1 electrical substation, 1 fire station, 5 schools, 5 shelters, 2 police stations, 2 hospitals, 1 emergency operation center, and 1 wastewater treatment • 775 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 19 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Lightning striking a wastewater treatment facility without a generator could impede water quality throughout the area • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Danbury and Danbury ISD | | | |
|--|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 1.0 | Occurrences since 2000: | 2 |
| Area Affected: | 100 % | Annual Event Average: | .12 |
| Probability: Unlikely; 12 percent chance event occurs within a year | | | |
| Extent: According to past events there have been .12 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 electrical substation, 1 EMS, 1 fire station, 3 schools, and 1 police station • 92 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 7 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Iowa Colony | | | |
|--|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 7.33 | Occurrences since 2000: | 2 |
| Area Affected: | 100 % | Annual Event Average: | .12 |
| Probability: Unlikely; 12 percent chance event occurs within a year | | | |
| Extent: According to past events there have been .12 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 EMS and 1 school • 88 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 2 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Hillcrest Village | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 0.4 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. . According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 53 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Relying on first responders in neighboring jurisdictions may lead to a delayed response time which could increase the loss of life, serious injuries, or structures damaged • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Holiday Lakes | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 1 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 84 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Relying on first responders in neighboring jurisdictions may lead to a delayed response time which could increase the loss of life, serious injuries, or structures damaged • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Jones Creek | | | |
|---|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 school and 1 shelter • 130 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 2 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lightning is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

Lake Jackson

| | | | |
|--------------------------------|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 20.9 | Occurrences since 2000: | 2 |
| Area Affected: | 100 % | Annual Event Average: | .12 |

Probability: Unlikely; 12 percent chance event occurs within a year

Extent: According to past events there have been .12 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event.

Identified Vulnerabilities:

- Critical facilities including: 1 dam, 1 electrical substation, 2 EMS, 2 fire stations, 1 hospital, 2 police stations, 7 schools, 9 shelters, and 1 wastewater treatment facility

Identified Impacts:

- 2 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events.
- Lightning striking a wastewater treatment facility without a generator could impede water quality throughout the area
- Lightning striking an electrical substation could allow for
- Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock

Liverpool

| | | | |
|--------------------------------|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 1.1 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |

Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year.

Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event.

Identified Vulnerabilities:

- Critical facilities including: 1 fire station and 2 police stations
- 37 residential structures at risk

Identified Impacts:

- 3 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events.
- Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock

| Manvel | | | |
|---|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 23.6 | Occurrences since 2000: | 2 |
| Area Affected: | 100 % | Annual Event Average: | .12 |
| Probability: Unlikely; 12 percent chance event occurs within a year | | | |
| Extent: According to past events there have been .12 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 EMS, 2 fire stations, 3 police stations, 4 schools, and 1 shelter • 443 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 11 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Oyster Creek | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 fire station, 1 police station, 1 power plant, and 1 shelter • 78 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 4 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Quintana | | | |
|--|-------|--------------------------------|------|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 1 |
| Area Affected: | 100 % | Annual Event Average: | .059 |
| Probability: Unlikely; 5 percent chance of the event occurring within a year | | | |
| Extent: According to past events there have been .05 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 5 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Relying on first responders in neighboring jurisdictions may lead to a delayed response time which could increase the loss of life, serious injuries, or structures damaged • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Richwood | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 3.1 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 police station, 1 school, and 1 shelter • 246 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 3 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Surfside Beach | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.2 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 fire station, and 1 police station • 205 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 2 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Sweeny and Sweeny ISD | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 electrical substation, 1 EMS, 2 fire stations, 1 hospital, 2 emergency operations centers, 3 police stations, 2 schools, 1 shelter, 3 schools, 2 power plants • 251 structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 4 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| West Columbia | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.58 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. . According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 electrical substation, 1 EMS, 1 fire station, 3 schools, 3 shelters, 4 police stations, and 1 powerplant • 246 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 4 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lighting is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

| Brazosport ISD | | | |
|---|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 200 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The ISD has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 19 schools- 10 elementary schools, 3 high schools, 5 middle schools, 1 alternative school • 12,000 children 18 years and younger | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Serious injury or loss of life due to students and staff outside or trying to get inside during an event • Property and financial loss due to a lightning strike hitting a building or hitting equipment or trees on school property | | | |

| Velasco Drainage District | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 236 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: The jurisdiction has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to NOAA’s data inventory, the jurisdiction could see 12 to 61 flashes per event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Administrative buildings and equipment | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • If lightning strikes the administrative building or equipment this may lead to a loss or reduction in service, in extreme cases this may impact proper drainage throughout the planning areas and could lead to a decrease in agriculture production. | | | |

| Alvin ISD | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 252 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The ISD has no recorded lightning strikes. However, lightning strikes have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to Vaisala, the jurisdiction could see 6 to 20 strikes per square mile per year. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 31 schools- 17 elementary schools, 3 high schools, 6 middle schools, 1 alternative school • 22,000 children 18 years and younger | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Serious injury or loss of life due to students and staff outside or trying to get inside during an event • Property and financial loss due to a lightning strike hitting a building or hitting equipment or trees on school property • Financial loss for families if parents/ guardians need to take off work/ find childcare during a school closure | | | |

| Port Freeport | | | |
|---|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: The jurisdiction has 3 recorded lightning strikes. These have been recorded in other areas of the county and are not geographically based. Therefore, probability may be similar to surrounding jurisdictions: Unlikely; 12 percent chance event occurs within a year. | | | |
| Extent: According to past events there have been 0 events recorded per year. According to Vaisala, the jurisdiction could see 6 to 20 strikes per square mile per year. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Tall cranes, metal warehouses, stack metal cargo containers, and maritime vessels are all a potential target for lightning strikes | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Damage to administrative building, port facilities and equipment could have a financial impact on the port and an economic loss for the county, state and federal levels. (\$157.3 billion economic potential) Serious injury or loss of life for staff or visitors at the port during an event The port is one of 18 ports in Texas, if the port had to close due to a fire this may have an impact on the local and state economy; leading to a potential loss of \$226.6 million dollars per day | | | |

Damage to administrative building, port facilities and equipment could have an economic impact at a local, state, and federal level (\$157.3 billion in total national economic output).

- Negative impact to local, state, and federal tax revenues (\$5.3 billion in local and state tax revenues nationally and \$5.4 billion in federal tax revenues nationally)
- Increase in unemployment rate (266,300 jobs supported nationally).
- Decrease in consumer spending at a local, state, and national level (\$22.5 billion in labor income nationally).
- Serious injury or loss of life for staff and/or Port users at the port during an event (8,600 individual entries/week).
- Port Freeport is ranked number 6th in chemical exports in the US, so a port closure would have a large impact on the gasoline, LNG, and other chemical supply chains.
- Port Freeport is ranked number 11th in foreign tonnage, so a port closure could have a negative impact on foreign affairs.

| Freeport | | | |
|---|-------|--------------------------------|------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 1 |
| Area Affected: | 100 % | Annual Event Average: | .059 |
| Probability: Unlikely; 6 percent chance of the event occurring within a year | | | |
| Extent: According to past events there have been .05 events recorded per year. According to Vaisala, the jurisdiction could see 6 to 20 strikes per square mile per year. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 correctional facility, 5 electrical substation, 2 EMS, 3 fire stations, 6 schools, 5 shelters, 8 police stations, 1 emergency operations center, 2 wastewater treatment plants, and 1 power plant • 697 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 4 critical facilities could lose power or catch on fire if lightning strikes; this may slow down first responders and allow for greater loss of life, injury, or property damage particularly when lightning is accompanied by flooding or other hazardous events. • Damage to homes caused by lightning may lead to a financial loss for residents and/ or injury or loss of life in a house fire or electrical shock | | | |

Part 6.6: Heat Events

6.6 Heat Event

Heat Events are defined by NOAA as a period of heat resulting from the combination of elevated temperatures and relative humidity. A Heat Event occurs whenever heat index values meet or exceed locally/regionally established advisory thresholds. Fatalities or major impacts on human health occurring when ambient weather conditions meet heat advisory criteria are reported using the Heat Event (NCDC).

NOAA's National Weather Service Heat Index

| | | Temperature °F (°C) | | | | | | | | | | | | | | | |
|-----------------------|-----|---------------------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | 80(27) | 82(28) | 84(29) | 86(30) | 88(31) | 90(32) | 92(34) | 94(34) | 96(36) | 98(37) | 100(38) | 102(39) | 104(40) | 106(41) | 108(43) | 110(47) |
| Relative Humidity (%) | 40 | 80(27) | 81(27) | 83(28) | 85(29) | 88(31) | 91(33) | 94(34) | 97(36) | 101(38) | 105(41) | 109(43) | 114(46) | 119(48) | 124(51) | 130(54) | 136(58) |
| | 45 | 80(27) | 82(28) | 84(29) | 87(31) | 89(32) | 93(34) | 96(36) | 100(38) | 104(40) | 109(43) | 114(46) | 119(48) | 124(51) | 130(50) | 137(58) | |
| | 50 | 80(27) | 83(28) | 85(29) | 88(31) | 91(33) | 95(35) | 99(37) | 103(39) | 108(42) | 113(45) | 118(48) | 124(51) | 131(55) | 137(58) | | |
| | 55 | 80(27) | 84(29) | 86(30) | 89(32) | 93(34) | 97(36) | 101(38) | 106(41) | 112(44) | 117(47) | 124(51) | 130(54) | 137(58) | | | |
| | 60 | 82(28) | 84(29) | 88(31) | 91(33) | 95(35) | 100(38) | 105(41) | 110(43) | 116(47) | 123(51) | 129(54) | 137(58) | | | | |
| | 65 | 82(28) | 85(29) | 89(32) | 93(34) | 98(37) | 103(39) | 108(43) | 114(46) | 121(49) | 128(53) | 136(58) | | | | | |
| | 70 | 82(28) | 86(30) | 90(32) | 95(35) | 100(38) | 105(41) | 112(46) | 119(48) | 126(52) | 134(57) | | | | | | |
| | 75 | 84(29) | 88(31) | 92(33) | 97(36) | 103(39) | 109(43) | 116(47) | 124(51) | 132(56) | | | | | | | |
| | 80 | 84(29) | 89(32) | 94(34) | 100(38) | 106(41) | 113(45) | 121(49) | 129(54) | | | | | | | | |
| | 85 | 84(29) | 90(32) | 96(36) | 102(39) | 110(43) | 117(47) | 126(52) | 135(57) | | | | | | | | |
| | 90 | 86(30) | 91(33) | 98(37) | 105(41) | 113(45) | 122(50) | 131(55) | | | | | | | | | |
| | 95 | 86(30) | 93(34) | 100(38) | 108(42) | 117(47) | 127(53) | | | | | | | | | | |
| | 100 | 87(31) | 95(35) | 103(39) | 112(44) | 121(49) | 132(56) | | | | | | | | | | |

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

| | | | |
|---------|-----------------|--------|----------------|
| Caution | Extreme Caution | Danger | Extreme Danger |
|---------|-----------------|--------|----------------|

Historic Occurrences

June to August are the months that Brazoria County could experience the most severe heat, with average temperatures between 90 and 100 degrees. According to NOAA's database, zero deaths, injuries, crop or property damage were reported from 2000 to 2017 due to Heat Events.

| Date | Event | Jurisdiction | Notes |
|-----------|------------|--------------|---|
| 7/6/2000 | Heat Event | County wide | Excessive heat impacted southeast Texas for much of the month of July. High temperatures ranged from 98 to 105 degrees daily over all but the immediate coast during a 2-week period. Only traces of rainfall were observed during this period. |
| 8/29/2000 | Heat Event | County wide | Excessive heat occurred over southeast Texas during the last 3 days of August. |
| 9/1/2000 | Heat Event | County wide | A record setting heat wave continued over southeast Texas through the first week of September 2000. A heat wave with temperatures of this duration and magnitude is unprecedented for southeast Texas. |
| 6/24/2009 | Heat Event | County wide | Hot, humid conditions led to heat indices above 105 degrees for several days in late June. |

Source: <https://www.ncdc.noaa.gov>

Hazard Analysis & Vulnerability Identification

The hazard analysis uses historic hazard event data to determine the probability of an event occurring again within a given year.

The hazard analysis also provides hazard extent data for each participating jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history. Additionally, extent estimates the worst event the jurisdiction could experience in the future. Information from stakeholders, USDA, CDC, and NOAA are the sources of data for the analysis.

To identify vulnerabilities for each jurisdiction, this plan used the following methods:

- American Community Survey (ACS, 2016, 5-year) Data on residents
- GIS analysis of vulnerable populations
- USDA production projections; and
- Stakeholder identified vulnerabilities

| All Participating Jurisdictions | | |
|--|--------------------------------|-----|
| Area Affected: Heat events are not contained to a specific boundary and past events are measured by county; this event can arise in all participating jurisdictions equally. | Occurrences since 1990: | 4 |
| | Annual Event Average: | .15 |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | |
| Although the probability based on past occurrences appears low, participating jurisdictions at the public meeting voiced that all jurisdictions experience high temperatures and humidity particularly during summer months. | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit. | | |
| Vulnerabilities: While heat events have the potential to damage buildings and crops, vulnerable populations are most at risk in the county during these events. According to the Centers for Disease Control and Prevention (CDC), adults over 65 years of age, infants, children, individuals with chronic illnesses, low-income, outdoor workers, and athletes are the most vulnerable populations to heat related illnesses. The data available on these specified populations suggests that approximately 48% of the population in Brazoria County is vulnerable to heat related illnesses. | | |
| Impacts: <ul style="list-style-type: none"> • 631,021 acres in total throughout the county in farmland (accounting for 118,236,00 dollars in revenue) may be impacted resulting in financial loss for farmers and the county as a whole • Serious illness or loss of life throughout the county | | |

Brazoria County (Unincorporated)

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1,475 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

Identified Vulnerabilities:

- Critical facilities including: 3 fire station, 5 schools, and 1 shelter

Identified Impacts:

- Potential lack of shelters throughout the unincorporated areas could lead to an increase of serious illness or loss of life or stress on other shelters and critical facilities throughout the other areas in the county

Alvin

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 25.6 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

Identified Vulnerabilities:

- 29 percent of population are individuals 18 years and younger (7,370 children)
- 13 percent of population are individuals 65 and older (3,264 older individuals)

Identified Impacts:

- 42 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

| Angleton | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 11.27 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 30 percent of population are individuals 18 years and younger (5,793 children) • 13 percent of population are individuals 65 and older (2,540 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 43 percent of the total population may face serious illness or health conditions due to high temperatures and humidity | | | |

| Bailey's Prairie | | | |
|--|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 7.7 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 26 percent of population are individuals 18 years and younger (215 children) • 14 percent of population are individuals 65 and older (114 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 42 percent of the total population may face serious illness or health conditions due to high temperatures and humidity | | | |

| Bonney | | | |
|--|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1.66 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 35 percent of population are individuals 18 years and younger (104 children) • 3 percent of population are individuals 65 and older (8 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 38 percent of the total population may face serious illness or health conditions due to high temperatures and humidity | | | |

| Brazoria | | | |
|--|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 28 percent of population are individuals 18 years and younger (872 children) • 14 percent of population are individuals 65 and older (429 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 42 percent of the total population may face serious illness or health conditions due to high temperatures and humidity | | | |

Brookside Village

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.085 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 25 percent of population are individuals 18 years and younger (419 children)
 - 15 percent of population are individuals 65 and older (259 older individuals)

- Identified Impacts:**
- 40 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

Clute

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 5.6 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 35 percent of population are individuals 18 years and younger (104 children)
 - 3 percent of population are individuals 65 and older (8 older individuals)

- Identified Impacts:**
- 38 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

Danbury and Danbury ISD

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1.0 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 28 percent of population are individuals 18 years and younger (414 children)
 - 8 percent of population are individuals 65 and older (120 older individuals)

- Identified Impacts:**
- 36 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

Iowa Colony

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 7.33 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 21 percent of population are individuals 18 years and younger (104 children)
 - 14 percent of population are individuals 65 and older (185 older individuals)

- Identified Impacts:**
- 35 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

| Hillcrest Village | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 0.4 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 16 percent of population are individuals 18 years and younger (129 children) • 39 percent of population are individuals 65 and older (325 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 55 percent of the total population may face serious illness or health conditions due to high temperatures and humidity | | | |

| Holiday Lakes | | | |
|--|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 39 percent of population are individuals 18 years and younger (401 children) • 7 percent of population are individuals 65 and older (71 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 46 percent of the total population may face serious illness or health conditions due to high temperatures and humidity | | | |

Jones Creek

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 28 percent of population are individuals 18 years and younger (604 children)
 - 14 percent of population are individuals 65 and older (307 older individuals)

- Identified Impacts:**
- 42 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

Lake Jackson

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 20.9 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit.

- Identified Vulnerabilities:**
- 35 percent of population are individuals 18 years and younger (7,372 children)
 - 14 percent of population are individuals 65 and older (3,700 older individuals)

- Identified Impacts:**
- 49 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

Liverpool

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1.1 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 28 percent of population are individuals 18 years and younger (121 children)
 - 14 percent of population are individuals 65 and older (61 older individuals)

- Identified Impacts:**
- 42 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

Manvel

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 23.6 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 31 percent of population are individuals 18 years and younger (2,265 children)
 - 10 percent of population are individuals 65 and older (740 older individuals)

- Identified Impacts:**
- 41 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

Oyster Creek

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 35 percent of population are individuals 18 years and younger (439 children)
 - 14 percent of population are individuals 65 and older (307 older individuals)

- Identified Impacts:**
- 49 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

Quintana

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 16 percent of population are individuals 18 years and younger (6 children)
 - 3 percent of population are individuals 65 and older (1 older individual)

- Identified Impacts:**
- 19 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

Richwood

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 3.1 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 26 percent of population are individuals 18 years and younger (987 children)
 - 9 percent of population are individuals 65 and older (101 older individuals)

- Identified Impacts:**
- 35 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

Surfside Beach

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.2 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 16 percent of population are individuals 18 years and younger (84 children)
 - 19 percent of population are individuals 65 and older (101)

- Identified Impacts:**
- 35 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

Sweeny and Sweeny ISD

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 28 percent of population are individuals 18 years and younger (1,058 children)
 - 18 percent of population are individuals 65 and older (686 older individuals)

- Identified Impacts:**
- 46 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

West Columbia

| | | | |
|--------------------------------|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.58 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |

Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year.

Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit

- Identified Vulnerabilities:**
- 29 percent of population are individuals 18 years and younger (1,120 children)
 - 12 percent of population are individuals 65 and older (482 older individuals)

- Identified Impacts:**
- 41 percent of the total population may face serious illness or health conditions due to high temperatures and humidity

| Brazosport ISD | | | |
|--|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 200 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 12,000 students 18 years and younger, while school is out for summer typically for the hottest months of the year, students in summer school or participating in school events such as athletic events would be vulnerable | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Students under age 18 and staff over the age of 65 may face serious illness or health conditions due to high temperatures and humidity when participating in summer school activities | | | |

| Velasco Drainage District | | | |
|--|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 236 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Administrative building and 14 pump stations and levees | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • A heat event may lead to damage to levees or pumps throughout the district. This may result in financial loss for the district in time and funds needed to fix a broken structure or equipment | | | |

| Alvin ISD | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 252 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 22,000 students 18 years and younger | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Students under age 18 and staff over the age of 65 may face serious illness or health conditions due to high temperatures and humidity when participating in summer school activities | | | |

| Port Freeport | | | |
|--|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Over 20 staff and numerous visitors throughout the port | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • With large metal structures throughout the port visitors and staff may be more likely to experience heat related illness. | | | |

| Freeport | | | |
|--|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; .75 events to occur in the next 5 years. A 14 percent chance of the event happening in the next year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 40 percent of population are individuals 18 years and younger (4,861 children) • 7 percent of population are individuals 65 and older (836 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 47 percent of the total population may face serious illness or health conditions due to high temperatures and humidity | | | |

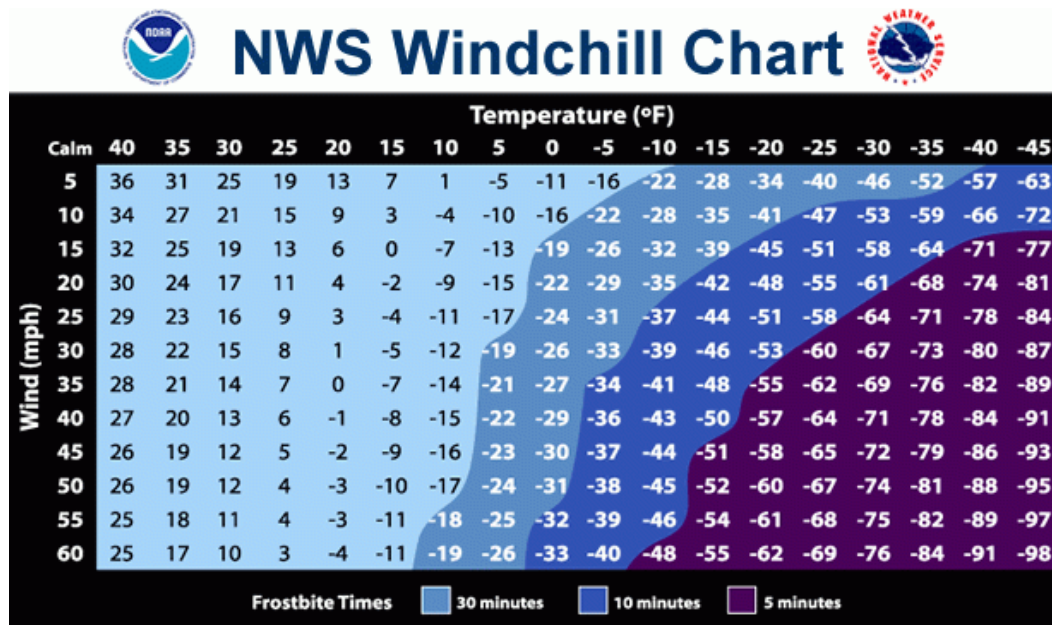
Part 6.7: Winter Weather

6.7 Winter Weather

The two main charts used to measure the magnitude of winter storms is the Sperry-Piltz Ice Accumulation (SPIA) Index Parameters and the National Weather Service's Windchill Chart. The SPIA chart measures the extent of ice in a region considering wind speed and the depth of ice on surfaces. The NWS Windchill Chart considers wind speed and temperatures to determine the amount of time frostbite may occur.

| ICE DAMAGE INDEX | * AVERAGE NWS ICE AMOUNT (in inches) <small>* Revised-October, 2011</small> | WIND (mph) | DAMAGE AND IMPACT DESCRIPTIONS |
|------------------|--|------------|--|
| 0 | < 0.25 | < 15 | Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages. |
| 1 | 0.10 – 0.25 | 15 - 25 | Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous. |
| | 0.25 – 0.50 | > 15 | |
| 2 | 0.10 – 0.25 | 25 - 35 | Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation. |
| | 0.25 – 0.50 | 15 - 25 | |
| | 0.50 – 0.75 | < 15 | |
| 3 | 0.10 – 0.25 | >= 35 | Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is extensive. Outages lasting 1 – 5 days. |
| | 0.25 – 0.50 | 25 - 35 | |
| | 0.50 – 0.75 | 15 - 25 | |
| | 0.75 – 1.00 | < 15 | |
| 4 | 0.25 – 0.50 | >= 35 | Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days. |
| | 0.50 – 0.75 | 25 - 35 | |
| | 0.75 – 1.00 | 15 - 25 | |
| | 1.00 – 1.50 | < 15 | |
| 5 | 0.50 – 0.75 | >= 35 | Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed. |
| | 0.75 – 1.00 | >= 25 | |
| | 1.00 – 1.50 | >= 15 | |
| | > 1.50 | Any | |

Source: <http://www.spia-index.com/>



Source: http://www.nws.noaa.gov/om/cold/wind_chill.shtml

The national weather service and NOAA also have a variety of watches and warnings for freeze, frost, wind, and ice events; these have been organized in a chart below.

| Watch/ Warning/ Advisory | Description |
|--------------------------|--|
| Winter Storm Watch | Issued when there is the potential for significant and hazardous winter weather within 48 hours. It is possible hazardous weather may occur. Significant and hazardous winter weather is defined as: 5 inches or more of snow/sleet within a 12-hour period or 7 inches or more of snow/sleet within a 24-hour period. And/ or enough ice accumulation to cause damage to trees or powerlines and/or a life threatening or damaging combination of snow and/or ice accumulation with wind. |
| Winter Storm Warning | Issued when a significant combination of hazardous winter weather is occurring or imminent. Significant and hazardous winter weather is defined as above. |
| Ice Storm Warning | ¼ inch or more of ice accumulation. |
| Winter Weather Advisory | Issued for any amount of freezing rain, or when 2 to 4 inches of snow (alone or in combination with sleet and freezing rain) is expected to cause a significant inconvenience, but not serious enough to warrant a warning. |
| Freeze Watch | Issued when there is a potential for significant, widespread freezing temperatures within the next 24-36 hours. |
| Freeze Warning | Issued when significant, widespread freezing temperatures are expected. |
| Frost Advisory | Issued when the minimum temperature is forecast to be 33 to 36 degrees on clear and calm nights during the growing season. |
| Wind Chill Advisory | Issued when wind chills of -5F to -19F are expected east of the Blue Ridge Mountains and when wind chills of -10 to -24F are expected along and west of the Blue Ridge Mountains and in Frederick and Carroll Counties in Maryland. |
| Wind Chill Warning | Issued when wind chills of -20F or lower are expected east of the Blue Ridge Mountains, and when wind chills of -25F or lower are expected along and west of the Blue Ridge Mountains and in Frederick and Carroll Counties in Maryland. |

Source: [www.weather.gov/lwx/WarningsDefined#Winter Storm Watch](http://www.weather.gov/lwx/WarningsDefined#Winter%20Storm%20Watch)

Historic Occurrences

There have been no occurrences where deaths, injuries, or property or crop damage was reported.

| Jurisdiction | Date | Event | Notes |
|------------------------|-----------|----------------|---|
| Brazoria County | 2/3/2011 | Ice Storm | A period of freezing rain and freezing drizzle led to icy roads, especially bridges and overpasses, and numerous accidents. Between one and two tenths of an inch of ice accumulated. |
| Brazoria County | 1/28/2014 | Winter Weather | Light snow was observed just to the west of the Pearland area. No accumulation was reported. |
| Brazoria County | 12/8/2017 | Heavy Snow | 1 to 3 inches of snow were measured around Pearland, Alvin and the Lake Jackson area. |
| Brazoria County | 2/15/2021 | Freeze | Winter storm Uri was a major freeze event that enveloped the entire county for multiple days. |

Source: <https://www.ncdc.noaa.gov/stormevents/>

Hazard Analysis & Vulnerability Identification

The hazard analysis uses historic hazard event data to determine the probability of an event occurring again within a given year.

The hazard analysis also provides hazard extent data for each participating jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history. Additionally, extent information provides an estimate of the worst event the jurisdiction could experience in the future. Information from stakeholders, Centers for Disease Control and Prevention (CDC), and NOAA are the sources of data for the analysis.

To identify vulnerabilities for each jurisdiction, this plan used the following methods:

- American Community Survey (ACS, 5-year, 2016) data on residents
- GIS analysis of vulnerable populations
- Stakeholder identified vulnerabilities

According to the CDC, adults over 65 years of age and children are the most vulnerable populations to winter weather related illnesses. The data available on these populations suggests that approximately 48% of the population in Brazoria County is vulnerable to winter weather.

| All Participating Jurisdictions | | |
|--|--------------------------------|-----|
| Area Affected: Like heat events winter weather does not have a geographic boundary. This hazard can affect all planning areas equally. | Occurrences since 2000: | 3 |
| | Annual Event Average: | .18 |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | |
| Identified Vulnerabilities: From the public meeting participating jurisdictions identified icy roads as a main vulnerability; icy road conditions create dangerous roadways that make people unable to drive to work school etc. at most a few days a year during the winter. Additionally, according to the CDC, adults over 65 years of age and children are the most vulnerable populations to winter weather related illnesses. The data available on these populations suggests that approximately 48% of the population in Brazoria County is vulnerable to winter weather. | | |
| Identified Impacts: <ul style="list-style-type: none"> • Power outages caused by frozen limbs that fall and damage powerlines has a far-reaching impact on the jurisdictions participating in this plan. It can cause loss of life, loss of wages for closed businesses, and can cause students to miss school. • Frozen falling limbs can also cause harm to individuals and costly damage to homes, vehicles, and other property. • Icy roadways may lead to accidents with severe injury or loss of life and monetary loss for residents • Extreme and/or prolonged freezing temperatures can cause damage to levee and dam pumps throughout the county. This may result in expensive financial repairs. | | |

| Brazoria County (Unincorporated) | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1,475 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 3 fire station, 5 schools, 1 shelter, 2 correctional facilities • All county-owned roadways | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Ice on power lines may lead to power outages throughout the unincorporated areas leading to the 1 shelter being overwhelmed with individuals • Icy roadways may lead to accidents with serious injury or loss of life and financial loss for residents | | | |

| Alvin | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 25.6 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 29 percent of population are individuals 18 years and younger (7,370 children) • 13 percent of population are individuals 65 and older (3,264 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 42 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Angleton | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 11.27 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance of the event occurring within a year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 30 percent of population are individuals 18 years and younger (5,793 children) • 13 percent of population are individuals 65 and older (2,540 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 43 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Bailey's Prairie | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 7.7 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 26 percent of population are individuals 18 years and younger (215 children) • 14 percent of population are individuals 65 and older (114 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 50 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Bonney | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1.66 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 35 percent of population are individuals 18 years and younger (104 children) • 3 percent of population are individuals 65 and older (8 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 38 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Brazoria | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 28 percent of population are individuals 18 years and younger (872 children) • 14 percent of population are individuals 65 and older (429 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 32 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Brookside Village | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.085 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 25 percent of population are individuals 18 years and younger (419 children) • 15 percent of population are individuals 65 and older (259 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 40 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Clute | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 5.6 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 35 percent of population are individuals 18 years and younger (104 children) • 3 percent of population are individuals 65 and older (8 older individuals) | | | |
| Identified Impacts | | | |
| <ul style="list-style-type: none"> • 38 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Danbury and Danbury ISD | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1.0 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 28 percent of population are individuals 18 years and younger (414 children) • 8 percent of population are individuals 65 and older (120 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 36 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Iowa Colony | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 7.33 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance of the event happening within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 21 percent of population are individuals 18 years and younger (104 children) • 14 percent of population are individuals 65 and older (185 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 35 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Hillcrest Village | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 0.4 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 16 percent of population are individuals 18 years and younger (129 children) • 39 percent of population are individuals 65 and older (325 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 55 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Holiday Lakes | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 39 percent of population are individuals 18 years and younger (401 children) • 7 percent of population are individuals 65 and older (71 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 46 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Jones Creek | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 28 percent of population are individuals 18 years and younger (604 children) • 14 percent of population are individuals 65 and older (307 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 52 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Lake Jackson | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 20.9 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 35 percent of population are individuals 18 years and younger (7,372 children) • 14 percent of population are individuals 65 and older (3700 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 49 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Liverpool | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 1.1 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 28 percent of population are individuals 18 years and younger (121 children) • 14 percent of population are individuals 65 and older (61 older individuals). | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 52 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Manvel | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 23.6 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 31 percent of population are individuals 18 years and younger (2,265 children) • 10 percent of population are individuals 65 and older (740 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 41 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Oyster Creek | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 35 percent of population are individuals 18 years and younger (439 children) • 14 percent of population are individuals 65 and older (307 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 49 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Quintana | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 16 percent of population are individuals 18 years and younger (6 children) • 3 percent of population are individuals 65 and older (1 older individual) | | | |
| Identified Impacts: | | | |
| 19 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Richwood | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 3.1 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 26 percent of population are individuals 18 years and younger (987 children) • 9 percent of population are individuals 65 and older (342 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 35 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Surfside Beach | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.2 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 16 percent of population are individuals 18 years and younger (84 children) • 19 percent of population are individuals 65 and older (101 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 35 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Sweeny and Sweeny ISD | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 28 percent of population are individuals 18 years and younger (1,058 children) • 18 percent of population are individuals 65 and older (686 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 46 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| West Columbia | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.58 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 29 percent of population are individuals 18 years and younger (1,120 children) • 12 percent of population are individuals 65 and older (482 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 41 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

| Brazosport ISD | | | |
|--|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 200 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 12,000 children 18 years and younger • Traveling on icy roads to school | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 100 percent of the identified population may face serious illness or health conditions due to low temperatures • School closures may lead to: <ul style="list-style-type: none"> ○ A financial loss for families needing to find childcare or take off work ○ Students falling behind in course work ○ A potential increase in car crashes/ injuries if school closes during the middle of the day and parents are traveling on icy roads to pick up their students | | | |

| Velasco Drainage District | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 236 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Administrative building and 14 pump stations and levees | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • An event may lead to damage to levees or pumps throughout the district. This may result in financial loss for the district in time and funds needed to fix a broken structure or equipment, which could lead to a delay in service for the county | | | |

| Alvin ISD | | | |
|--|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 252 | Occurrences since 2000: | 4 |
| Area Affected: | 100 % | Annual Event Average: | .15 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Based on past occurrences recorded above, the highest temperature recorded for the planning area is 105 degrees. The planning area can see temperatures from 110 degrees Fahrenheit to 120 degrees Fahrenheit | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 22,000 students 18 years and younger • Traveling on icy roads to school | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 100 percent of the identified population may face serious illness or health conditions due to low temperatures • School closures may lead to: <ul style="list-style-type: none"> ○ A financial loss for families needing to find childcare or take off work ○ Students falling behind in course work | | | |
| A potential increase in car crashes/ injuries if school closes during the middle of the day and parents are traveling on icy roads to pick up their students | | | |

| Port Freeport | | | |
|--|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Over 20 staff and numerous visitors throughout the port | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Ice or cold conditions may lead to the port closing for a period leading to a potential economic loss for the surrounding areas and state • If staff or visitors are present during icy conditions they may fall on ice leading to injury | | | |

| Freeport | | | |
|---|-------|--------------------------------|-------------------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 3 |
| Area Affected: | 100 % | Annual Event Average: | .18 events a year |
| Probability: Unlikely; 18 percent chance to occur within a given year. | | | |
| Extent: Past events described above demonstrate that the county has experienced a winter weather advisory and an ice damage index of 1; all participating jurisdiction could potentially see a winter storm warning and an Ice Damage Index of 2 | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 40 percent of population are individuals 18 years and younger (4,861 children) • 7 percent of population are individuals 65 and older (836 older individuals) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 47 percent of the total population may face serious illness or health conditions due to low temperatures | | | |

Part 6.8: Hail

6.8 Hail

NOAA's National Centers for Environmental Information (NCEI) intensity scale for hail is the typical way to measure the extent for hail storms. This scale considers the size of an individual piece of hail. A hail storm is considered severe if hail reaches one inch in diameter or roughly the size of a quarter.

| Size | Hail Diameter (Inches) | Description |
|------|------------------------|-------------------------------|
| H0 | 1/4 | Pea Size |
| H1 | 1/2 | Small Marble Size |
| H2 | 3/4 | Penny or Large Marble Size |
| H3 | 7/8 | Nickel Size |
| H4 | 1 | Quarter Size |
| H5 | 1 1/4 | Half Dollar Size |
| H6 | 1 1/2 | Walnut or Ping Pong Ball Size |
| H7 | 1 3/4 | Golfball Size |
| H8 | 2 | Hen Egg Size |
| H9 | 2 1/2 | Tennis Ball Size |
| H10 | 2 3/4 | Baseball Size |
| H11 | 3 | Teacup Size |
| H12 | 4 | Grapefruit Size |
| H13 | 4 1/2 | Softball Size |

Source: <https://www.ncei.noaa.gov/>

Historic Occurrences

Since 2000, Brazoria County experienced 47 hail events. Twenty-eight were considered severe (quarter sized and above). Baseball sized hail or size H10 is the largest size hail the County experienced.

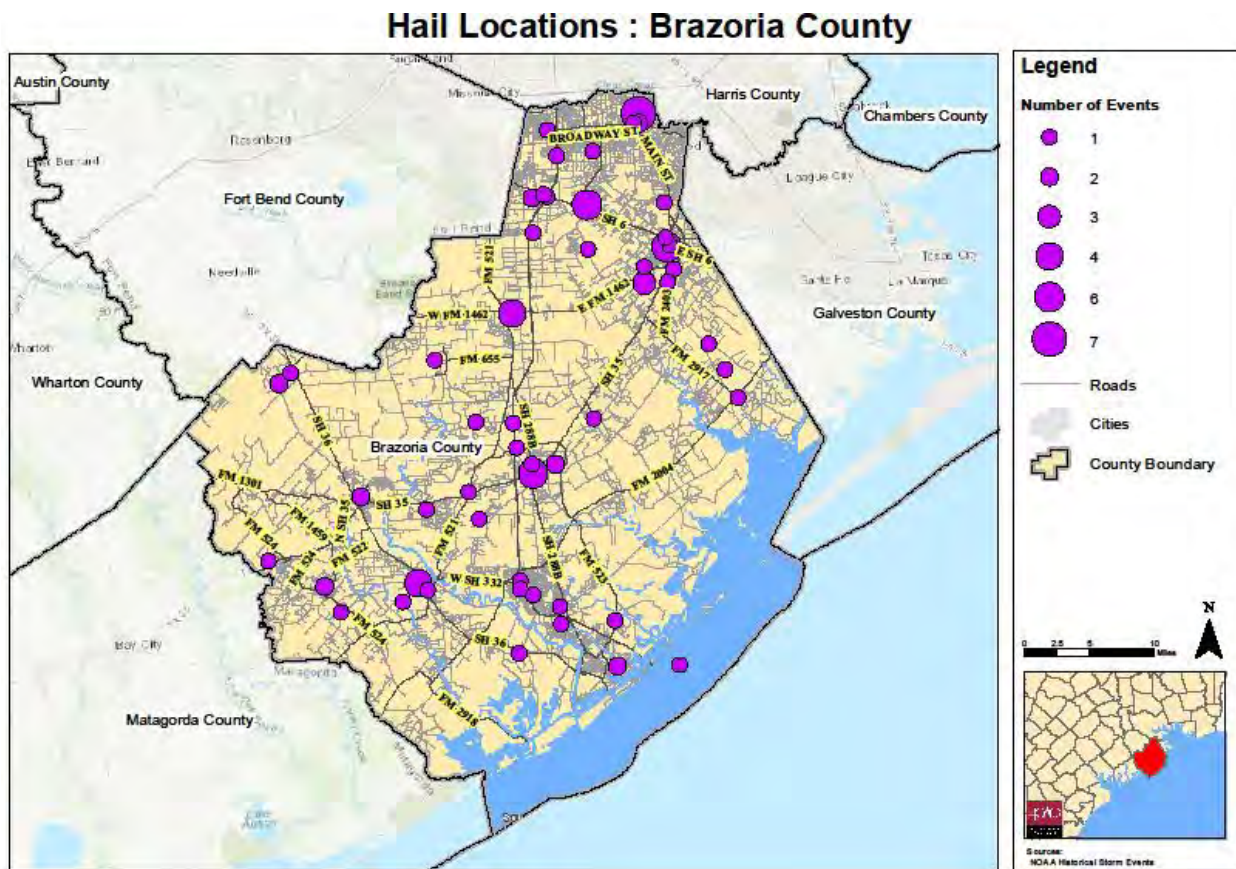
| Jurisdiction | Date | Magnitude | Property Damage | Notes |
|----------------|------------|-----------|-----------------|--|
| Clute | 4/2/2000 | 1.75 | \$50,000 | |
| Alvin | 5/2/2000 | 0.88 | \$15,000 | |
| Manvel | 5/2/2000 | 0.88 | \$15,000 | |
| Manvel | 4/16/2001 | 0.75 | \$10,000 | |
| Manvel | 9/21/2001 | 0.75 | \$2,000 | Dime size hail at State Highway 288 and County Road 58. |
| Unincorporated | 3/30/2002 | 1 | \$10,000 | Quarter sized hail occurred at FM 762 and Meyer Field |
| Lake Jackson | 4/8/2002 | 0.75 | \$5,000 | Lake Jackson and Richwood Village received 3/4 inch |
| Brazoria | 4/8/2002 | 1 | \$10,000 | Sheriff reported quarter sized Hail at CR 521 in Brazoria. |
| Alvin | 5/30/2002 | 1.75 | \$15,000 | CR 435 just south of FM 1462. |
| Sweeny | 8/27/2002 | 0.75 | \$10,000 | Dime size hail. |
| Iowa Colony | 12/30/2002 | 0.75 | \$5,000 | 3/4-inch hail. |
| Danbury | 8/11/2003 | 0.75 | \$3,000 | |
| Alvin | 6/5/2004 | 0.75 | \$7,000 | |
| Sweeny | 6/14/2004 | 0.75 | \$10,000 | |
| Freeport | 7/29/2005 | 1 | \$9,000 | |
| Unincorporated | 4/21/2006 | 0.75 | \$2,000 | |
| Unincorporated | 4/21/2006 | 0.75 | \$2,000 | |
| Unincorporated | 5/14/2006 | 1 | \$8,000 | Quarter size hail near FM 521. |
| Unincorporated | 5/14/2006 | 0.75 | \$3,000 | |

| | | | | |
|-------------------------|------------|------|-----------|---|
| Alvin | 10/12/2006 | 0.75 | \$0 | Penny-sized hail between Angleton and Alvin. |
| Bailey's Prairie | 3/12/2007 | 2.5 | \$35,000 | Quarter to tennis ball size hail between Lake Jackson and Sweeny. |
| Brazoria | 3/12/2007 | 2.25 | \$200,000 | Residence and 2 cars damaged by near Tennis ball-size hail. Roof damage to a city facility. 43 vehicles damaged. Damage reported to two other businesses and few homes in Brazoria. |
| Angleton | 3/14/2007 | 0.75 | \$5,000 | Penny size hail. |
| Bailey's Prairie | 6/3/2009 | 1.75 | \$2,000 | Golfball sized hail was observed near Baileys Prairie. |
| Iowa Colony | 6/6/2011 | 1.75 | \$0 | Golf ball size hail fell near the intersection of State Highway 288 and State Highway 6. |
| Alvin | 4/4/2012 | 1 | \$1,000 | Quarter sized hail reported in Alvin. |
| Alvin | 4/4/2012 | 2.75 | \$5,000 | Baseball sized hail reported along Community Drive in Alvin. |
| Alvin | 4/4/2012 | 1.75 | \$4,000 | Golfball sized hail reported at a gas station in Alvin. |
| Alvin | 4/4/2012 | 1.75 | \$4,000 | Golfball sized hail reported at Alvin Community College. |
| Lake Jackson | 4/4/2012 | 1 | \$1,000 | Quarter sized hail reported in Lake Jackson. |
| Brazoria | 4/4/2012 | 1.75 | \$1,000 | Golfball sized hail reported by television viewers in Brazoria. |
| Unincorporated | 4/20/2012 | 1 | \$0 | Quarter sized hail reported. |
| Manvel | 3/31/2013 | 0.75 | \$0 | The penny size hail was reported in the town of Manvel. |
| Iowa Colony | 4/2/2013 | 1 | \$0 | A severe thunderstorm produced quarter sized hail along Highway 6 between Fresno and Manvel. |
| Iowa Colony | 6/8/2013 | 0.75 | \$0 | The hail was reported at the intersection of Highway 288 and FM Road 101. |
| Angleton | 4/17/2015 | 2.5 | \$15,000 | Egg to tennis ball sized hail was reported in Angleton. |
| Oyster Creek | 4/17/2015 | 1 | \$0 | Quarter sized hail was reported at Landers Road. |
| Angleton | 4/17/2015 | 1 | \$0 | There were multiple reports of quarter sized hail in and around the Angleton area. |
| Lake Jackson | 4/17/2015 | 1.5 | \$2,000 | Ping pong sized hail was observed in the Lake Jackson area. |
| Unincorporated | 4/17/2015 | 2 | \$0 | Two-inch hail observed to the west of Danbury along SH 288. |
| Angleton | 4/17/2015 | 1 | \$0 | Quarter sized hail was observed in the Angleton area. |
| Iowa Colony | 4/17/2015 | 1 | \$0 | Quarter sized hail was observed south of Iowa Colony. |
| Iowa Colony | 4/19/2015 | 0.88 | \$0 | Nickel sized hail was reported near the intersection of FM 521 and FM 2234. |
| Iowa Colony | 4/19/2015 | 1 | \$0 | Quarter sized hail was reported near the intersection of FM 518 and Kirby Drive. |
| Manvel | 5/26/2015 | 0.75 | \$0 | Dime size hail was reported between Manvel and Pearland. |
| Unincorporated | 5/13/2016 | 1 | \$0 | Quarter size hail was reported about two miles southeast of Sweeny. |
| Jones Creek | 5/21/2016 | 1.5 | \$2,000 | Ping pong ball size hail was observed in Jones Creek from this severe thunderstorm. |

Source: <https://www.ncdc.noaa.gov/stormevents/>

Hail Location Map: Brazoria

Location and quantity of hail events that have occurred throughout the County from 2002 to present.



Hazard Analysis & Vulnerability Identification

The hazard analysis uses historic hazard event data to determine the probability of an event occurring again within a given year.

The hazard analysis also provides hazard extent data for each participating jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history. Information from stakeholders, ACS, and NOAA are the sources of data for the analysis.

To identify vulnerabilities for each jurisdiction, this plan used the following methods:

- American Community Survey (ACS, 2016, 5-year) data on residential buildings
- GIS analysis of structures and critical facilities exposed to hail damage; and
- Stakeholder identified vulnerabilities

Brazoria County (All participating jurisdictions)

Identified Vulnerabilities:

- During the county-wide public meeting attendees described critical facilities including emergency response vehicles (fire trucks, ambulances etc.) as vulnerabilities throughout the county.
 - Uncovered parking lots may lead to damaged vehicles
 - Facility’s generators located outside may be damaged.
 - Damage to critical facilities, including roof damage or window damage, may occur as well.
- Identified vulnerable populations throughout the county, identified in the county profile, may be more vulnerable financially if they sustain damage to a personal vehicle, property

Identified Impacts:

- Strong winds or hail could prevent first responders from traveling to assist individuals, because of unsafe driving conditions such as debris hitting emergency vehicles
- Critical facilities could sustain hail damage- windows of response vehicles broken, potentially delaying first responders reaching those in need and city services during and after the event
- Financial loss for individuals whose vehicles or homes are damaged by hail-including cost to repair hail damage and potential financial loss from potential loss of a job because of the lack of transportation to and from their job
- Financial loss for jurisdictions that need to replace damaged buildings or infrastructure, including damaged roofs or equipment

| Brazoria County (Unincorporated) | | | |
|---|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 1,475 | Occurrences since 2000: | 8 |
| Area Affected: | 100 % | Annual Event Average: | .47 |
| Probability: Likely; 47 percent chance event will occur in a year | | | |
| Extent: According to past events, the jurisdiction has recorded 2-inch hail (H8); the jurisdiction could see H9 to H10 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 3 fire station, 5 schools, 1 shelter, and 2 correctional facilities | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury | | | |

| Alvin | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 25.6 | Occurrences since 2000: | 8 |
| Area Affected: | 100% | Annual Event Average: | .47 |
| Probability: Likely; 47 percent chance event will occur in a year | | | |
| Extent: According to past events, the jurisdiction has recorded 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 14 schools, 5 electrical substations, 4 fire stations, 2 EMS, 1 wastewater treatment plant, 2 shelters, 6 police stations, and 1 emergency operation center • 1,431 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Angleton | | | |
|---|-------|--------------------------------|------|
| Planning Area (Sq. mi): | 11.27 | Occurrences since 2000: | 4 |
| Area Affected: | 100% | Annual Event Average: | .235 |
| Probability: Likely; 23.5 percent chance event will occur in a year | | | |
| Extent: According to past events, the jurisdiction has recorded 2.5-inch hail (H9); the jurisdiction could see H10 to H11 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 3 correctional facilities, 1 electrical substation, 1 EMS, 2 fire stations, 9 schools, 3 shelters, 9 police stations, and 2 hospitals • 803 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Bailey's Prairie | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 7.7 | Occurrences since 2000: | 2 |
| Area Affected: | 100% | Annual Event Average: | .12 |
| Probability: Unlikely; 12 percent chance event will occur in a year | | | |
| Damage: According to past events, the jurisdiction has recorded 2.5-inch hail (H9); the jurisdiction could see H10 to H11 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 170 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Bonney | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 1.66 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year. | | | |
| Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 22 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Brazoria | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 3 |
| Area Affected: | 100% | Annual Event Average: | .18 |
| Probability: Unlikely; 12 percent chance event will occur in a year | | | |
| Extent: According to past events, the jurisdiction has recorded 2.5-inch hail (H9); the jurisdiction could see H10 to H11 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 correctional facility, 1 electrical substation, 1 EMS, 4 fire stations, 9 schools, 6 shelters, 2 police stations, 2 hospitals, 6 shelters, and 2 emergency operation centers • 282 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Brookside Village | | | |
|---|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.085 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year. | | | |
| Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 1 police station • 122 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Clute | | | |
|---|-------|--------------------------------|------|
| Planning Area (Sq. mi): | 5.6 | Occurrences since 2000: | 1 |
| Area Affected: | 100 % | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance event will occur in a year | | | |
| Extent: According to past events, the jurisdiction has recorded 1.75-inch hail (H7); the jurisdiction could see H8 to H9 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 EMS, 1 electrical substation, 1 fire station, 5 schools, 5 shelters, 2 police stations, 2 hospitals, 1 emergency operation center, and 1 wastewater treatment • 775 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Danbury and Danbury ISD | | | |
|---|------|--------------------------------|------|
| Planning Area (Sq. mi): | 1.0 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance event will occur in a year | | | |
| Extent: According to past events, the jurisdiction has recorded .75-inch hail (H2); the jurisdiction could see H3 to H4 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 electrical substation, 1 EMS, 1 fire station, 3 schools, and 1 police station • 92 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Iowa Colony | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 7.33 | Occurrences since 2000: | 7 |
| Area Affected: | 100% | Annual Event Average: | .41 |
| Probability: Likely; 41 percent chance event will occur in a year | | | |
| Greatest Extent of Damage: According to past events, the jurisdiction has recorded 1-inch hail (H4); the jurisdiction could see H5 to H6 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 EMS and 1 school • 88 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Hillcrest Village | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 0.4 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| <p>Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year.</p> | | | |
| <p>Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future.</p> | | | |
| <p>Identified Vulnerabilities:</p> <ul style="list-style-type: none"> • 53 residential structures at risk | | | |
| <p>Identified Impacts:</p> <ul style="list-style-type: none"> • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Holiday Lakes | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 1 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| <p>Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year.</p> | | | |
| <p>Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future.</p> | | | |
| <p>Identified Vulnerabilities:</p> <ul style="list-style-type: none"> • 84 residential structures at risk | | | |
| <p>Identified Impacts:</p> <ul style="list-style-type: none"> • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Jones Creek | | | |
|---|------|--------------------------------|------|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance event will occur in a year | | | |
| Extent: According to past events, the jurisdiction has recorded 1.5-inch hail (H6); the jurisdiction could see H7 to H8 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 school and 1 shelter • 130 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Lake Jackson | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 20.9 | Occurrences since 2000: | 3 |
| Area Affected: | 100% | Annual Event Average: | .18 |
| Probability: Unlikely; 18 percent chance event will occur in a year | | | |
| Extent: According to past events, the jurisdiction has recorded 2.5-inch hail (H6); the jurisdiction could see H7 to H8 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 dam, 1 electrical substation, 2 EMS, 2 fire stations, 1 hospital, 2 police stations, 7 schools, 9 shelters, and 1 wastewater treatment facility | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Liverpool | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 1.1 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year. | | | |
| Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 fire station and 2 police stations • 37 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Manvel | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 23.6 | Occurrences since 2000: | 5 |
| Area Affected: | 100% | Annual Event Average: | .29 |
| Probability: Unlikely; 2.9 percent chance event will occur in a year | | | |
| Extent: According to past events, the jurisdiction has recorded .75-inch hail (H2); the jurisdiction could see H3 to H4 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 EMS, 2 fire stations, 3 police stations, 4 schools, and 1 shelter • 443 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Oyster Creek | | | |
|---|------|--------------------------------|------|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 6 percent chance event will occur in a year | | | |
| Extent: According to past events, the jurisdiction has recorded 1-inch hail (H4); the jurisdiction could see H5 to H6 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 fire station, 1 police station, 1 power plant, and 1 shelter • 78 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Quintana | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year. | | | |
| Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 5 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Richwood | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 3.1 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year. | | | |
| Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 police station, 1 school, and 1 shelter • 246 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Surfside Beach | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.2 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year. | | | |
| Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 fire station, and 1 police station | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

| Sweeny and Sweeny ISD | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .06 |
| Probability: Unlikely; 6 percent chance event will occur in a year | | | |
| Extent: According to past events, the jurisdiction has recorded .75-inch hail (H2); the jurisdiction could see H3 to H4 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Critical facilities including: 1 electrical substation, 1 EMS, 2 fire stations, 1 hospital, 2 emergency operations centers, 3 police stations, 2 schools, 1 shelter, 3 schools, 2 power plants | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Damage to critical facilities and equipment including uncovered emergency vehicles may impede response time and lead to increase loss of life or serious injury | | | |

| West Columbia | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.58 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year. | | | |
| Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> 246 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Financial loss for individuals whose homes or cars are damaged due to the event Economic loss for the city due to public facilities that may be damaged | | | |

| Brazosport ISD | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 200 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year. | | | |
| Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 19 schools- 10 elementary schools, 3 high schools, 5 middle schools, 1 alternative school • 12,000 children 18 years and younger | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Serious injury could occur if students or staff are outside during event • Financial loss for the school district if buildings are damaged due to hail • 100 percent of the identified population may face serious illness or health conditions due to low temperatures • School closures may lead to: <ul style="list-style-type: none"> ○ A financial loss for families needing to find childcare or take off work ○ Students falling behind in course work • A potential increase in car crashes/ injuries if school closes during the middle of the day and parents are traveling to pick up their students during a hail event | | | |

| Velasco Drainage District | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 236 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year. | | | |
| Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 14 pump stations and administrative building | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • If pump stations are damaged due to hail or administrative building is damaged, there could be a delay in service and a financial loss for the District | | | |

| Alvin ISD | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 252 | Occurrences since 2000: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| Probability: Although there have been no recorded events, hail is not contained to a specific area; the probability of hail can be similar to neighboring jurisdictions. Considering surrounding jurisdictions, the probability is: Likely; 47 percent chance event will occur in a year. | | | |
| Extent: In considering surrounding jurisdictions the extent is: the largest hail recorded is 2.75-inch hail (H10); the jurisdiction could see H11 to H12 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 31 schools- 17 elementary schools, 3 high schools, 6 middle schools, 1 alternative school • 22,000 children 18 years and younger | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Serious injury could occur if students or staff are outside during event • Financial loss for the school district if buildings are damaged due to hail • School closures may lead to: <ul style="list-style-type: none"> ○ A financial loss for families needing to find childcare or take off work ○ Students falling behind in course work • A potential increase in car crashes/ injuries if school closes during the middle of the day and parents are traveling to pick up their students during a hail event | | | |

| Port Freeport | | | |
|--|------|--------------------------------|------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Although there have been no recorded events, Port Freeport is near the City of Freeport. The likelihood of the event happening in the Port maybe similar to the city. Freeport’s probability is: Unlikely; 5.9 percent chance event will occur in a year. | | | |
| Extent: Similarly, the City of Freeport’s extent is: According to past events, the jurisdiction has recorded 1-inch hail (H2); the jurisdiction could see H3 to H4 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Port facilities, equipment, and administrative buildings | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Serious injury or loss of life if an event occurs while staff or visitors are at the port • Financial loss for the port if damage occurs and economic loss for the surrounding cities and state if the port is closed for a prolonged time. | | | |

| Freeport | | | |
|---|------|--------------------------------|------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance event will occur in a year. | | | |
| Extent: According to past events, the jurisdiction has recorded 1-inch hail (H2); the jurisdiction could see H3 to H4 hail in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 correctional facility, 5 electrical substations, 2 EMS, 3 fire stations, 6 schools, 5 shelters, 8 police stations, 1 emergency operations center, 2 wastewater treatment plants, and 1 power plant • 697 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial loss for individuals whose homes or cars are damaged due to the event • Economic loss for the city due to public facilities that may be damaged | | | |

Part 6.9: Tornado

6.9 Tornado

Before 2007, tornadoes were ranked through the Fujita Scale. The Enhanced Fujita Scale replaced the Fujita Scale in 2007 and is a set of wind estimates (not measurements) based on damage. The higher the number the more intense the tornado. Both the Fujita Scale and the Enhanced Fujita Scale are below.

| Fujita Scale | | Enhanced Fujita Scale | | | Typical Damage |
|--------------|------------------------|-----------------------|-----------|---------------------|---|
| Scale | Fastest 1/4 mile (mph) | 3 second gust (mph) | EF Number | 3 Second Gust (mph) | |
| F0 | 40-72 | 45-78 | 0 | 65-85 | Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. |
| F1 | 73-112 | 79-117 | 1 | 86-109 | Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken. |
| F2 | 113-157 | 118-161 | 2 | 110-137 | Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground. |
| F3 | 158-207 | 162-209 | 3 | 138-167 | 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. |
| F4 | 208-260 | 210-261 | 4 | 168-199 | Devastating damage. Whole frame houses Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated. |
| F5 | 261-318 | 262-317 | 5 | 200-234 | Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly more than 109 yards; high-rise buildings have significant structural deformation; incredible phenomena will occur. |

Source: <http://www.spc.noaa.gov/>

Historic Occurrence

There has been no crop damage or deaths reported due to tornadoes in the county. There have been six injuries reported over the last 17 years due to tornadoes. One injury was reported in the City of Brazoria in 2003. Three injuries were reported in Manvel and two injuries were reported in unincorporated Brazoria County in 2015.

| Jurisdiction | Date | Event Type | Magnitude | Property Damage | Notes |
|-----------------------|------------|--------------|-----------|-----------------|---|
| Unincorporated | 5/2/2000 | Tornado | F0 | \$25,000 | Barn damaged at FM 521 and FM 1462. |
| Angleton | 9/14/2000 | Funnel Cloud | | \$0 | Numerous funnel clouds sighted. |
| Angleton | 9/14/2000 | Funnel Cloud | | \$0 | Numerous funnel clouds sighted. |
| Quintana | 5/7/2001 | Funnel Cloud | | \$0 | |
| Freeport | 5/7/2001 | Funnel Cloud | | \$0 | |
| Angleton | 5/31/2001 | Funnel Cloud | | \$0 | |
| Manvel | 6/5/2001 | Tornado | F0 | \$40,000 | A tornado touched down near Highway 6 and County Road 99, downing trees and damaging one home. |
| Liverpool | 6/5/2001 | Funnel Cloud | | \$0 | |
| Alvin | 8/30/2001 | Tornado | F0 | \$45,000 | Fire Department reported a tornado near FM 2351 and County Road 129. Damage included a few metal roofs torn off buildings and trees down. |
| Brazoria | 8/30/2001 | Tornado | F0 | \$5,000 | tornado touched down 2.5 miles southeast of Wild Peach Village. |
| Unincorporated | 9/4/2001 | Funnel Cloud | | \$0 | A waterspout moved over land as a funnel near Chocolate Bayou and dissipated near Liverpool. |
| Brazoria | 12/12/2001 | Tornado | F1 | \$200,000 | Several homes in the Lazy Oak Ranch Subdivision on CR 461A had roof damage. A machine shop on CR 461 sustained heavy damage, along with the cars and boats in its parking lot. Numerous trees were down from the San Bernard River to the Lazy Oak subdivision. |
| Brazoria | 12/12/2001 | Tornado | F0 | \$200,000 | There was roof and structural damage to homes and businesses, in a 10-block area, along TX Highway 36 in Brazoria. A 175-foot internet tower was blown down, signs were bent over, and minor roof damage to Brazoria Elementary school. |
| Lake Jackson | 9/6/2002 | Tornado | F0 | \$5,000 | Tornado sighted west Lake Jackson and CR 332 |
| West Columbia | 9/7/2002 | Tornado | F0 | \$25,000 | Downed trees in West Columbia along Hwy 36. |
| Iowa Colony | 10/9/2003 | Tornado | F0 | \$2,000 | Tornado caused damage to a barn. |
| Brazoria | 11/17/2003 | Tornado | F0 | \$75,000 | Tornado touch down in downtown Brazoria. Roof damage to several buildings along Highway 36 with tree damage in Old Town Brazoria. A semi-trailer was lifted and over-turned on its side at intersection of Road 332 and Highway 36. |
| Unincorporated | 6/30/2004 | Funnel Cloud | | \$0 | Several reports of funnel cloud off FM 521. |
| Oyster Creek | 5/14/2006 | Tornado | F0 | \$5,000 | Tornado sighted by restaurant customers near FM 523 caused minimal damage. |
| Oyster Creek | 4/25/2007 | Tornado | EF0 | \$0 | CR 459 and FM 227 in the community of Demi-John. |
| Alvin | 5/11/2007 | Funnel Cloud | | \$0 | |
| Angleton | 7/1/2007 | Funnel Cloud | | \$0 | |
| Clute | 7/27/2007 | Funnel Cloud | | \$0 | |
| Unincorporated | 7/10/2008 | Funnel Cloud | | \$0 | Sighted near the intersection of FM 521 and CR 32. |
| Unincorporated | 1/9/2012 | Tornado | EF0 | \$15,000 | Damaged a barn and a shed near the Brazos Bend State Park. |
| Unincorporated | 1/9/2012 | Tornado | EF0 | \$20,000 | This EF-0 tornado destroyed a shed and blew off the top of a rice dryer. |

| | | | | | |
|-----------------------|------------|--------------|-----|-------------|---|
| Bonney | 1/9/2012 | Tornado | EF0 | \$10,000 | This EF-0 tornado rolled over two semi-tractor trailers on Highway 288 near the intersection of Highway 288 and South County Road 48. |
| Unincorporated | 9/12/2012 | Funnel Cloud | | \$0 | At the Brazoria National Wildlife Refuge near the intersection of FM 2004 and FM 523. |
| Alvin | 9/12/2012 | Funnel Cloud | | \$0 | Intersection of Highway 6 and Highway 35. |
| Alvin | 5/28/2014 | Funnel Cloud | | \$0 | Three were reported off of Highway 6 west of the town of Alvin. |
| Angleton | 7/6/2014 | Funnel Cloud | | \$0 | State Highway 35 just to the west of Angleton. |
| Angleton | 7/6/2014 | Funnel Cloud | | \$0 | Just to the north of Angleton. |
| Unincorporated | 7/24/2014 | Funnel Cloud | | \$0 | A funnel cloud was sighted to the east of Danbury. |
| Bonney | 7/24/2014 | Funnel Cloud | | \$0 | Spotted just outside the town of Bonney. |
| Unincorporated | 4/26/2015 | Funnel Cloud | | \$0 | A funnel cloud was sighted in Damon. |
| Unincorporated | 5/5/2015 | Funnel Cloud | | \$0 | Two funnel clouds were sighted. |
| Unincorporated | 5/17/2015 | Funnel Cloud | | \$0 | Near the intersection of FM 2004 and FM 2917. |
| Jones Creek | 10/31/2015 | Tornado | EF1 | \$50,000 | One mile southwest south of Jones Creek where it uprooted several large trees. The tornado then crossed Highway 36 and severely damaged a mobile home just north of the roadway. Estimated peak wind speed was 90 mph. |
| Lake Jackson | 10/31/2015 | Tornado | EF0 | \$50,000 | Tracked from a subdivision south of the Brazos Mall knocking down fences and shallow rooted trees. It then continued into a subdivision to the northeast of the mall uprooting several large trees. Estimated peak wind speed was 85 mph. |
| Unincorporated | 10/31/2015 | Tornado | EF0 | \$50,000 | In a field south of Liverpool and damaged a cattle handling area. The tornado tracked into the town of Liverpool and produced minor damage to trees and structures. The tornado lifted north of town. The estimated peak wind was 80 mph. |
| Angleton | 10/31/2015 | Tornado | EF0 | \$200,000 | Severely damaged a farm house and barn then flipped three trailers over at an RV park before weakening. Estimated peak wind was 90 mph. |
| Manvel | 10/31/2015 | Tornado | EF1 | \$50,000 | Tracked along Wink Road. The tornado injured 3 people as it destroyed one mobile home and damaged several other mobile homes. The estimated peak wind was 100 mph. |
| Unincorporated | 10/31/2015 | Tornado | EF1 | \$200,000 | Damaged 15 to 20 trailers and overturned 1 trailer. An elderly couple sustained injuries in the overturned trailer. The estimated peak wind was 90 mph. |
| Unincorporated | 10/31/2015 | Tornado | EF2 | \$2,000,000 | Down just east of Clover Field Airport. Expanded in size and weakened in intensity as it approached FM 518 over the last half of its track. There was extensive tree damage along the entire track. Estimated peak wind was 115 mph. |
| Unincorporated | 10/31/2015 | Tornado | EF2 | \$2,000,000 | East of Clover Field Airport. This tornado expanded in size and weakened in intensity as it approached FM 518 over the last half of its track. There was extensive tree damage along the entire track. Estimated peak wind was 115 mph. |
| Sweeny | 2/14/2017 | Tornado | EF0 | \$100,000 | Along CR 321 and intersection of FM 524 and CR 321. Damage was mainly to trees and power lines. Estimated peak winds were 75 mph. |
| Unincorporated | 3/5/2017 | Tornado | EF0 | \$0 | Touched down around FM 2611 and CR 659. |
| Unincorporated | 5/22/2017 | Tornado | EF0 | \$200,000 | Damaged a porch roof in the back of a home, destroyed a pump house and damaged a trailer, and knocked over several trees. |
| Liverpool | 5/22/2017 | Funnel Cloud | | \$0 | Funnel cloud was sighted in the Liverpool area. |

| | | | | | |
|-------------------------|-----------|--------------|-----|-----------|---|
| Unincorporated | 8/25/2017 | Tornado | EF0 | \$30,000 | Touched down near HWY 36 with numerous trees snapped or downed. Barn also damaged. |
| Bailey's Prairie | 8/25/2017 | Tornado | EF0 | \$100,000 | East of West Columbia damaging trees, roofs, and outbuildings off of highway 35. A barn and several outbuildings were also destroyed on the east side of the Brazos River. Property was flooded. |
| Oyster Creek | 8/25/2017 | Funnel Cloud | | \$0 | |
| Danbury | 8/25/2017 | Tornado | EF0 | \$100,000 | Damaged a barn along with several trees off of County Road 207. Crossed Hwy 35. Snapped and/or downed several trees along County Rd 45 before lifting at the Crocodile Encounter on County Rd 48. |
| Liverpool | 8/25/2017 | Tornado | EF0 | \$50,000 | West of Liverpool. 4 power poles downed on highway 35 along with trees near the Gulf Coast Speedway. Damaged some barns and outbuildings as well as trees on County Road 511. |
| Iowa Colony | 8/25/2017 | Tornado | EF0 | \$500,000 | It struck a new subdivision along county road 56 and highway 288. Roofs and fences were damaged and several trees snapped and/or downed. |

Source: <https://www.ncdc.noaa.gov/stormevents/>

Hazard Analysis & Vulnerability Identification

The hazard analysis uses historic hazard event data to determine the probability of an event occurring again within a given year. The analysis calculates the average number of events in each jurisdiction annually and then calculates the percent chance of the event occurring within a year.

The hazard analysis also provides hazard extent data for each participating jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history. Information from stakeholders and NOAA are the sources of data for the analysis.

To identify vulnerabilities for each jurisdiction, this plan used the following methods:

- American Community Survey (5-year, 2016)
- GIS analysis of structures exposed to tornado damage; and
- Stakeholder identified vulnerabilities.

Brazoria County (All participating jurisdictions)

Identified Vulnerabilities:

Similar to the hurricane section, this section identifies vulnerabilities from high winds. High winds can tear down powerlines, trees, barns, fences, and multitude of other debris can be blown into roadways and homes during the event.

Additionally, residences and commercial buildings could be damaged or destroyed due to wind events; older residential neighborhoods and structures without a permanent foundation were identified as one of the main vulnerabilities throughout the county. While current building codes address the vulnerability of wind damage to structures, older buildings (particularly residential buildings) were built when less stringent building codes were in place; therefore, older residential building and residences without a permanent foundation are a focus in this section.

Identified Impacts:

- Downed powerlines could impact communication and daily active leading to a financial loss for the county, cities and individuals, and could impede first responders from reaching those in need or residents evacuating
- Strong winds could prevent first responders from traveling to assist individuals, because of unsafe driving conditions such as debris hitting emergency vehicles
- Critical facilities could sustain wind damage, potentially delaying first responders reaching those in need and city services during and after the event
- Economic and financial loss for cities and individuals including property loss

| Brazoria County (Unincorporated) | | | |
|---|-------|--------------------------------|------|
| Planning Area (Sq. mi): | 1,475 | Occurrences since 2000: | 18 |
| Area Affected: | 100% | Annual Event Average: | 1.06 |
| Probability: Highly Likely; 100 percent chance of event occurring in each year | | | |
| Extent: According to past events, the strongest tornado was an EF1; the jurisdiction can see an EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 3 fire station, 5 schools, 1 shelter, 2 correctional facilities | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Critical facilities and equipment could be damaged with windows broken or roofs blown off or destroyed by high winds • First responders could be delayed, this may increase serious injury or loss of life throughout the county | | | |

| Alvin | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 25.6 | Occurrences since 2000: | 4 |
| Area Affected: | 100% | Annual Event Average: | .24 |
| Probability: Likely; 24 percent chance occurring within a given year | | | |
| Extent: According to past events, the strongest tornado was an F0 (EF0); the jurisdiction can see a EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 6,275 Residential buildings built before 1980 (65.8% of housing stock) • 1,334 Mobile Homes (14% of housing stock) • 42 Boats/ RVs/ Vans acting as main housing (.4 % of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Almost 81 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Angleton | | | |
|---|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 11.27 | Occurrences since 2000: | 7 |
| Area Affected: | 100% | Annual Event Average: | .41 |
| Probability: Likely; 41 percent chance of event occurring in each year | | | |
| Extent: According to past events, the strongest tornado was an EF0; the jurisdiction can see a EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 6,426 Residential buildings built before 1980 (80 % of housing stock) • 685 Mobile Homes (8.5 % of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Almost 90 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Bailey's Prairie | | | |
|---|------|--------------------------------|------|
| Planning Area (Sq. mi): | 7.7 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance of event occurring in a year | | | |
| Extent: According to past events, the strongest tornado was an EF0; the jurisdiction can see a EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 82 Residential buildings built before 1980 (85.5% of housing stock) • 22 Mobile Homes (22.9% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 100 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Bonney | | | |
|--|------|--------------------------------|------|
| Planning Area (Sq. mi): | 1.66 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance of event occurring in a year | | | |
| Extent: According to past events, the strongest tornado was a funnel cloud; the jurisdiction can see a EF0 to EF1 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 107 Residential buildings built before 1980 (73.1% of housing stock) • 30 Mobile Homes (20.5% of housing stock) • 4 Boats/ RVs/ Vans acting as main housing (2.7% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 96 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Brazoria | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 4 |
| Area Affected: | 100% | Annual Event Average: | .24 |
| Probability: Likely; 24 percent chance occurring within a given year | | | |
| Extent: According to past events, the strongest tornado was an F1(EF1); the jurisdiction can see a EF2 to EF3 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 1,129 Residential buildings built before 1980 (80% of housing stock) • 144 Mobile Homes (10.2% of housing stock) • 14 Boats/ RVs/ Vans acting as main housing (1% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 91 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Brookside Village | | | |
|---|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.085 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Manvel perhaps the jurisdiction has a similar likelihood that the event will occur Manvel’s probability is: Unlikely; 12 percent chance event will occur in each year. | | | |
| Extent: Similarly, Manvel’s extent is: According to past events, the strongest tornado was an EF0; the jurisdiction can see a EF2 to EF3 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 480 Residential buildings built before 1980 (79.1% of housing stock) • 7 Mobile Homes (1.2% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Almost 81 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Clute | | | |
|--|------|--------------------------------|------|
| Planning Area (Sq. mi): | 5.6 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance of event occurring in a year | | | |
| Extent: According to past events, the strongest event was a funnel cloud; the jurisdiction can see a EF10 to EF1 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 3,347 Residential buildings built before 1980 (64.8% of housing stock) • 312 Mobile Homes (6% of housing stock) • 26 Boats/ RVs/ Vans acting as main housing (.5% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Approximately 71 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Danbury and Danbury ISD | | | |
|---|------|--------------------------------|------|
| Planning Area (Sq. mi): | 1.0 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance of event occurring in a year | | | |
| Extent: According to past events, the strongest tornado was an EF0; the jurisdiction can see a EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 500 Residential buildings built before 1980 (86.2% of housing stock) • 4 Mobile Homes (.7% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Almost 87 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Iowa Colony | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 7.33 | Occurrences since 2000: | 2 |
| Area Affected: | 100% | Annual Event Average: | .12 |
| Probability: Unlikely; 12 percent chance of event occurring in a year | | | |
| Extent: According to past events, the strongest tornado was an EF0; the jurisdiction can see a EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities and Impacts: | | | |
| <ul style="list-style-type: none"> • 263 Residential buildings built before 1980 (60% of housing stock) • 122 Mobile Homes (27.9% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Almost 88 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Hillcrest Village | | | |
|---|------|--------------------------------|----------|
| Planning Area (Sq. mi): | 0.4 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| <p>Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Alvin. Perhaps Hillcrest Village has a similar likelihood that the event will occur. Alvin’s probability is: Likely; 24 percent chance event will occur in each year.</p> | | | |
| <p>Extent: Similarly, Alvin’s extent is: According to past events, the strongest tornado was an F0 (EF0); the jurisdiction can see a EF1 to EF2 in the future.</p> | | | |
| <p>Identified Vulnerabilities:</p> <ul style="list-style-type: none"> • 289 Residential buildings built before 1980 (82.9% of housing stock) | | | |
| <p>Identified Impacts:</p> <ul style="list-style-type: none"> • Almost 83 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Holiday Lakes | | | |
|---|------|--------------------------------|----------|
| Planning Area (Sq. mi): | 1 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| <p>Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Bailey’s Prairie. Perhaps Holiday Lakes has a similar likelihood that the event will occur. Bailey’s Prairie extent is: Unlikely; 5.9 percent chance of event occurring in a year</p> | | | |
| <p>Extent: Similarly, Holiday Lake’s extent is: According to past events, the strongest tornado was an EF0; the jurisdiction can see a EF1 to EF2 in the future.</p> | | | |
| <p>Identified Vulnerabilities:</p> <ul style="list-style-type: none"> • 3,347 Residential buildings built before 1980 (64.8% of housing stock) • 216 Mobile Homes (51.8% of housing stock) • 5 Boats/ RVs/ Vans acting as main housing (1.2% of housing stock) | | | |
| <p>Identified Impacts:</p> <ul style="list-style-type: none"> • 100 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Jones Creek | | | |
|--|------|--------------------------------|------|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance of event occurring in a year | | | |
| Extent: According to past events, the strongest tornado was an EF1; the jurisdiction can see a EF2 to EF3 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 3,347 Residential buildings built before 1980 (64.8% of housing stock) • 165 Mobile Homes (19.1% of housing stock) • 4 Boats/ RVs/ Van acting as main housing (.5% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • About 85 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Lake Jackson | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 20.9 | Occurrences since 2000: | 2 |
| Area Affected: | 100% | Annual Event Average: | .12 |
| Probability: Unlikely; 12 percent chance event will occur in each year | | | |
| Extent: According to past events, the strongest tornado was an EF0; the jurisdiction can see a EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 8,272 Residential buildings built before 1980 (70.1% of housing stock) • 6 Mobile Homes (.1% of housing stock) • 9 Boats/ RVs/ Vans acting as main housing (.1% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • About 71 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Liverpool | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 1.1 | Occurrences since 2000: | 3 |
| Area Affected: | 100% | Annual Event Average: | .18 |
| Probability: Unlikely; 18 percent chance event will occur in each year | | | |
| Extent: According to past events, the strongest tornado was an EF0; the jurisdiction can see a EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 177 Residential buildings built before 1980 (72.2% of housing stock) • 37 Mobile Homes (15.1% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Approximately, 87 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Manvel | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 23.6 | Occurrences since 2000: | 2 |
| Area Affected: | 100% | Annual Event Average: | .12 |
| Probability: Unlikely; 12 percent chance event will occur in each year | | | |
| Extent: According to past events, the strongest tornado was an EF0; the jurisdiction can see a EF2 to EF3 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 971 Residential buildings built before 1980 (32.8% of housing stock) • 329 Mobile Homes (11.1% of housing stock) • 77 Boats/ RVs/ Van acting as main housing (2.6% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 100 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Oyster Creek | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 3 |
| Area Affected: | 100% | Annual Event Average: | .18 |
| Probability: Unlikely; 18 percent chance event will occur in each year | | | |
| Extent: According to past events, the strongest tornado was an EF0; the jurisdiction can see a EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 356 Residential buildings built before 1980 (68.6% of housing stock) • 231 Mobile Homes (44.5% of housing stock) • 23 Boats/ RVs/ Vans acting as main housing (4.4% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 100 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Quintana | | | |
|---|------|--------------------------------|------|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance of event occurring in a year | | | |
| Extent: According to past events, the strongest event was a funnel cloud; the jurisdiction can see an EF0 to EF1 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 554 Residential buildings built before 1980 (83.9% of housing stock) • 59 Mobile Homes (8.9% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • About 94 percent of the housing stock was either built before 1980 or does not have a permanent foundation this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Richwood | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 3.1 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| <p>Probability: Although the jurisdiction has no recorded events, the jurisdiction is near Clute. Perhaps Richwood has a similar likelihood that the event will occur. Clute’s probability is: Unlikely: 5.9 percent chance to occur within a given year.</p> | | | |
| <p>Extent: Similarly, Clute’s extent is: According to past events, the strongest event was a funnel cloud; the jurisdiction can see a EF10 to EF1 in the future.</p> | | | |
| <p>Identified Vulnerabilities:</p> <ul style="list-style-type: none"> • 356 Residential buildings built before 1980 (68.6% of housing stock) • 231 Mobile Homes (44.5% of housing stock) • 23 Boats/ RVs/ Vans acting as main housing (4.4% of housing stock) <p>Identified Impacts:</p> <ul style="list-style-type: none"> • 100 percent of the housing stock was either built before 1980 or does not have a permanent foundation this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Surfside Beach | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.2 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| <p>Probability: Although there have been no recorded events, the city of Surfside is near the jurisdiction of Quintana which has experienced one tornado; the probability maybe like Quintana’s which is: Unlikely; 5.9 percent chance of event occurring in a year.</p> | | | |
| <p>Extent: Similarly, Surfside Beach’s extent maybe like Quintana’s which is: According to past events, the strongest event was a funnel cloud; the jurisdiction can see an EF0 to EF1 in the future.</p> | | | |
| <p>Identified Vulnerabilities:</p> <ul style="list-style-type: none"> • 356 Residential buildings built before 1980 (68.6% of housing stock) • 231 Mobile Homes (44.5% of housing stock) • 23 Boats/ RVs/ Van acting as main housing (4.4% of housing stock) <p>Identified Impacts:</p> <ul style="list-style-type: none"> • 72 percent of the housing stock was either built before 1980; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Sweeny and Sweeny ISD | | | |
|---|------|--------------------------------|------|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance of event occurring in a year | | | |
| Extent: According to past events, the strongest tornado was an F0; the jurisdiction can see a EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 1,220 Residential buildings built before 1980 (73% of housing stock) • 127 Mobile Homes (7.6% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • 81 percent of the housing stock was either built before 1980 or does not have a permanent foundation this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| West Columbia | | | |
|--|------|--------------------------------|------|
| Planning Area (Sq. mi): | 2.58 | Occurrences since 2000: | 1 |
| Area Affected: | 100% | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance of event occurring in a year | | | |
| Extent: According to past events, the strongest tornado was an F0 (EF0); the jurisdiction can see a EF1 to EF2 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 1,447 Residential buildings built before 1980 (88.3% of housing stock) • 38 Mobile Homes (2.3% of housing stock) | | | |
| Identified Impacts | | | |
| <ul style="list-style-type: none"> • About 92 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

| Brazosport ISD | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 200 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| <p>Probability: Although the jurisdiction has no recorded events, the jurisdiction is throughout Brazoria County. Perhaps the ISD has a similar likelihood that the event will occur as unincorporated areas of the county. Brazoria County unincorporated area’s probability is: Very Likely; 100 percent chance event will occur in a year.</p> | | | |
| <p>Extent: Similarly, Brazoria’s extent is: According to past events, the strongest tornado was an EF1; the jurisdiction can see an EF1 to EF2 in the future.</p> | | | |
| <p>Identified Vulnerabilities:</p> <ul style="list-style-type: none"> • 12,000 students • 19 schools- 10 elementary schools, 3 high schools, 5 middle schools, 1 alternative school <p>Identified Impacts:</p> <ul style="list-style-type: none"> • Serious injury or loss of life if an event occurs during school hours or during extracurricular activities • Financial loss for the school district if any of the schools or administrative buildings are damaged due to the event. • School closures due to damage or during the day of the event may lead to: <ul style="list-style-type: none"> ○ A financial loss for families needing to find childcare or take off work ○ Students falling behind in course work • A potential increase in car crashes/ injuries if school closes during the middle of the day and parents are traveling to pick up their students during an event | | | |

| Velasco Drainage District | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 236 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| <p>Probability: Although the jurisdiction has no recorded events, the jurisdiction is throughout Brazoria County. Perhaps the district has a similar likelihood that the event will occur as unincorporated areas of the county. Brazoria County unincorporated area’s probability is: Very Likely; 100 percent chance event will occur in a year.</p> | | | |
| <p>Extent: Similarly, Brazoria’s extent is: According to past events, the strongest tornado was an EF1; the jurisdiction can see an EF1 to EF2 in the future.</p> | | | |
| <p>Identified Vulnerabilities:</p> <ul style="list-style-type: none"> • Administrative building 14 pump stations and levees throughout the district <p>Identified Impacts:</p> <ul style="list-style-type: none"> • Financial loss for the district if buildings, equipment or levees are damaged during the event | | | |

| Alvin ISD | | | |
|--|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 256 | Occurrences since 1871: | 0 |
| Area Affected: | 100 % | Annual Event Average: | 0 |
| <p>Probability: Although the jurisdiction has no recorded events, the jurisdiction is throughout Brazoria County. Perhaps the ISD has a similar likelihood that the event will occur as unincorporated areas of the county. Brazoria County unincorporated area's probability is: Very Likely; 100 percent chance event will occur in a year.</p> | | | |
| <p>Extent: Similarly, Brazoria's extent is: According to past events, the strongest tornado was an EF1; the jurisdiction can see an EF1 to EF2 in the future.</p> | | | |
| <p>Identified Vulnerabilities:</p> <ul style="list-style-type: none"> • 31 schools- 17 elementary schools, 3 high schools, 6 middle schools, 1 alternative school • 22,000 children 18 years and younger, adds an additional 1,000 students per year | | | |
| <p>Identified Impacts:</p> <ul style="list-style-type: none"> • Serious injury or loss of life if an event occurs during school hours or during extracurricular activities • Financial loss for the school district if any of the schools or administrative buildings are damaged due to the event. • School closures due to damage or during the day of the event may lead to: <ul style="list-style-type: none"> ○ A financial loss for families needing to find childcare or take off work ○ Students falling behind in course work • A potential increase in car crashes/ injuries if school closes during the middle of the day and parents are traveling to pick up their students during an event | | | |

| Port Freeport | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 0 |
| Area Affected: | 100% | Annual Event Average: | 0 |
| <p>Probability: Although there have been no recorded events, the Port of Freeport is near the jurisdiction of Freeport which has experienced one tornado; the probability maybe like Freeport's which is: Unlikely; 5.9 percent chance of event occurring in a year</p> | | | |
| <p>Extent: Similarly, the Port of Freeport's extent maybe like the Jurisdiction of Freeport's which is: According to past events, the strongest event was a funnel cloud; the jurisdiction can see an EF0 to EF1 in the future.</p> | | | |
| <p>Identified Vulnerabilities:</p> <ul style="list-style-type: none"> • Port facilities, equipment, and administrative buildings | | | |
| <p>Identified Impacts:</p> <ul style="list-style-type: none"> • Serious injury or loss of life if an event occurs while staff or visitors are at the port • Financial loss for the port if damage occurs and economic loss for the surrounding cities and state if the port is closed for a prolonged time. | | | |

| Freeport | | | |
|--|-------|--------------------------------|------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 1 |
| Area Affected: | 100 % | Annual Event Average: | .059 |
| Probability: Unlikely; 5.9 percent chance of event occurring in a year | | | |
| Extent: According to past events, the strongest event was a funnel cloud; the jurisdiction can see an EF0 to EF1 in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 4,004 Residential buildings built before 1980 (82.9% of housing stock) • 229 Mobile Homes (4.9% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • About 88 percent of the housing stock was either built before 1980 or does not have a permanent foundation; this may lead to an increase in home damage, a financial loss for residents, and a potential increase in serious injuries or loss of life throughout the jurisdiction. | | | |

Part 6.10: Dam & Levee Failure

6.10 Dam and Levee Failure

According to FEMA's Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams, extent is measured through judging the potential for human, economic, lifeline, and environmental loss.

| Hazard Potential Classification | Loss of Human Life | Economic, Environmental, Lifeline Losses |
|---------------------------------|---------------------------------|---|
| Low | None Expected | Low and generally limited to owner |
| Significant | None Expected | Yes |
| High | Probable. One or more expected. | Yes (But not necessary for this classification) |

Source: <https://www.fema.gov/>

Historic Occurrence

Brazoria County does not have any dam or levee failures identified since 2000. There was a levee breach near West Columbia in a neighborhood to the north, Columbia Lakes, during Hurricane Harvey on August 27th, 2017. While this levee protects hundreds of homes and during this event the county evacuated these neighborhoods and residents to the south-east, this incident was not a levee break. The breached levee increased flooding in the nearby neighborhoods.

There are 51 known dams and levees in Brazoria County. These dams are maintained by public, state, federal, local, or partnering entities. All dams have been classified as 'Low' in the hazard potential classification.

| Jurisdiction | Name | Hazard Potential Classification |
|-----------------------|---------------------------------------|---------------------------------|
| Unincorporated County | Beal Reservoir Levee | Low |
| Unincorporated County | Black Ranch Lake Levee | Low |
| Unincorporated County | Brazos River Club Levee | Low |
| Unincorporated County | Mallard Lake Club Dam | Low |
| Alvin | Division Lake Levee | Low |
| Unincorporated County | Lake Jackson Levee | Low |
| Unincorporated County | Mowery Lake Levee | Low |
| Alvin | Duck Lake Dam | Low |
| Unincorporated County | Solutia Reservoir Levee | Low |
| Unincorporated County | Salt Bayou Lake Water | Low |
| Brazoria | Brazoria Reservoir Dam | Low |
| Lake Jackson | Buffalo Camp Bayou Reservoir Dam | Low |
| Liverpool | Dingle Lake Number 1 Levee | Low |
| Danbury | Lazy CZ Number 1 Reservoir Levee | Low |
| Danbury | McCullough Lake Levee | Low |
| Danbury | McCullough Number 17 Reservoir | Low |
| Danbury | Reservoir Number Levee Complex 2 | Low |
| Danbury | Reservoir Number 9 Levee Complex 2 | Low |
| Unincorporated County | Linnville Bayou Reservoir Dam | Low |
| Unincorporated County | Markle Lake Levee | Low |
| Unincorporated County | San Bernard Reservoir Number 1 | Low |
| Unincorporated County | San Bernard Reservoir Number 2 Levee | Low |
| Unincorporated County | San Bernard Reservoir Number 3 Levee | Low |
| Angleton | Angleton Fishing & Hunting Club Levee | Low |

| | | |
|-----------------------|--------------------------------------|-----|
| Angleton | Bar X Ranch Lake Levee | Low |
| Unincorporated County | Bieri Lakes Reservoir Number 1 Levee | Low |
| Unincorporated County | Bieri Lakes Reservoir Number 2 Levee | Low |
| Unincorporated County | Bieri Lakes Reservoir Number 3 Levee | Low |
| Unincorporated County | Bieri Lakes Reservoir Number 4 Levee | Low |
| Angleton | Bintliff Lake Levee | Low |
| Angleton | Coale Dam | Low |
| Angleton | Hudeck Reservoir Levee | Low |
| Unincorporated County | Mccormack Reservoir Number 3 Levee | Low |
| Unincorporated County | Mccormack Reservoir Number 4 Levee | Low |
| Unincorporated County | Tigner-Farrer Levee | Low |
| Holiday Lakes | William Harris Reservoir Dam | Low |
| Unincorporated County | Raleigh Farms Reservoir Levee | Low |
| Unincorporated County | Brazoria City Reservoir Levee | Low |
| Brazoria | Dacus Lake Dam | Low |
| Unincorporated County | TDCJ Clemens Unit Dam 1 | Low |
| Unincorporated County | TDCJ Clemens Unit Dam 2 | Low |
| Unincorporated County | Columbia Lakes Reservoir Dam | Low |
| Unincorporated County | Griffth Reservoir Levee | Low |
| Unincorporated County | Lagoon Reservoir Dam | Low |
| Unincorporated County | Live Oak 1 Levee | Low |
| Unincorporated County | Live Oak 2 Levee | Low |
| Unincorporated County | Pappas Lakes and Lodge Levee | Low |
| Alvin | Amoco Chemicals Reservoir Levee | Low |
| Unincorporated County | Dingle Lake 2 Levee | Low |
| Unincorporated County | Mustang Lake East Dam | Low |
| Unincorporated County | Mustang Lake West Dam | Low |

Hazard Analysis & Vulnerability Identification

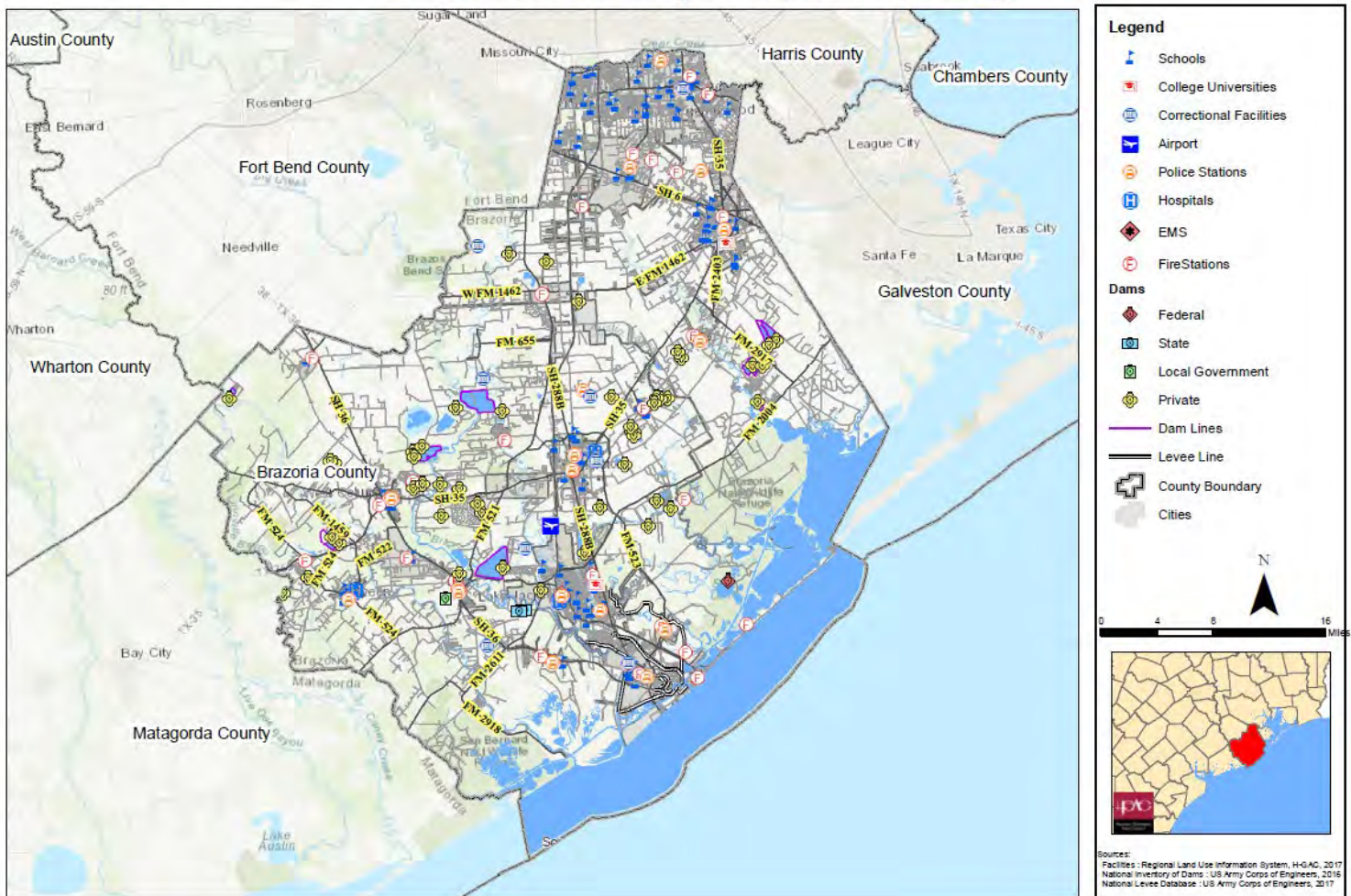
A data deficiency exists for dams throughout the county. An inundation map and modeling a dam failure could not be completed with current information available. More research and information regarding dams is needed and is included as a mitigation action in this plan.

The hazard analysis uses historic hazard event data to determine the probability of an event occurring again within the next five years. The analysis calculates the average number of events in each jurisdiction annually and then multiplies by five. With no recorded occurrences in the last 17 years and limited data there is unknown information.

The hazard analysis also provides hazard extent data for each affected jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history. Information from stakeholders, FEMA, and H-GAC's critical facilities database were used for this analysis.

Only the communities at risk of experiencing impacts from a dam or levee failure are profiled. Those jurisdictions include Unincorporated Brazoria County, Holiday Lakes, West Columbia, Bailey's Prairie, Brazoria, Freeport, Port of Freeport, and Oyster Creek. The remaining jurisdictions participating in this plan are not at risk for dam and failure and will not be profiled.

Dam & Levee Map : Brazoria County



Brazoria County (All Jurisdictions)

Identified Vulnerabilities:

As described in the hazard identification section, there are no records of failed dams or levees in the county and no available inundation maps. For the purposes of this plan, all immediately downstream critical facilities, residences, and human life will be treated as vulnerable to dam and levee failures. Each dam and levee has a low hazard classification, and some flooding can be expected in the event of a complete or partial failure. Because of the low hazard classification, this analysis only considered structures and property within 1 mile of dams and levees. Based on this assumption, the following vulnerabilities have been identified:

- 667 residences immediately downstream of dam and levees are considered vulnerable.
- Approximately 1,057 acres of agricultural land is vulnerable
- 84 downstream critical facilities are vulnerable to a dam and levee failure

Potential Impacts:

- Residential, commercial, and public property loss throughout the county due to flooding in localized areas or throughout the county
- In total, 631,021 acres in total throughout the county in farmland at risk of flooding due to a dam or levee failure
- Mass evacuations during a levee breach or failure may strain shelters throughout the county or may create a potential for an increase in car accidents leading to serious injury or financial loss for residents throughout the county
- Destroyed powerlines or electrical substations may lead to a loss of communication for a particular jurisdiction or for a large portion of the county. This could lead to an inability to reach people in need.
- In the instance that flooding occurs at critical facility without a generator or the generator does not work, critical facilities could lose power and may not be usable due to flooding or power outage. This may slow down first responders and allow for a greater loss of life, injury, or property damage particularly when dam or levee failure is accompanied by other hazardous events.

| Brazoria County (Unincorporated) | | | |
|---|-------|--------------------------------|---|
| Planning Area (Sq. mi): | 1,475 | Occurrences since 2000: | 0 |
| Area Affected: | 6% | Annual Event Average: | 0 |
| Probability: Not Likely, Less than 10% chance event will occur within the next 5 years | | | |
| Greatest Extent of Damage: Complete failure of dam and levees during major rain event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 312 residential structures • Vulnerable populations are concentrated near the coast near the San Bernard Wildlife Refuge • Critical facilities including: 3 fire station, 5 schools, 1 shelter, 2 correctional facilities | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Expensive repairs and rebuilding associated with flooding of properties and structures. | | | |

| Bailey's Prairie | | | |
|---|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 7.7 | Occurrences since 2000: | 0 |
| Area Affected: | 6% | Annual Event Average: | 0 |
| Probability: Not Likely, Less than 10% chance event will occur within the next 5 years | | | |
| Greatest Extent of Damage: Complete failure of dam and levees during major rain event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 11 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Expensive repairs and rebuilding associated with flooding of properties and structures. | | | |

| Brazoria | | | |
|--|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 0 |
| Area Affected: | 5% | Annual Event Average: | 0 |
| Probability: Complete failure of dam and levees during major rain event. | | | |
| Greatest Extent of Damage: Not Likely, Less than 10% chance event will occur within the next 5 years | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 correctional facility, 1 electrical substation, 1 EMS, 4 fire stations, 9 schools, 6 shelters, 2 police stations, 2 hospitals, 6 shelters, and 2 emergency operation centers • 14 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Expensive repairs and rebuilding associated with flooding of properties and structures. | | | |

| Holiday Lakes | | | |
|---|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 1 | Occurrences since 2000: | 0 |
| Area Affected: | 30% | Annual Event Average: | 0 |
| Probability: Not Likely, Less than 10% chance event will occur within the next 5 years | | | |
| Greatest Extent of Damage: Complete failure of dam and levees during major rain event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 26 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Expensive repairs and rebuilding associated with flooding of properties and structures. | | | |

| Oyster Creek | | | |
|---|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 0 |
| Area Affected: | 15% | Annual Event Average: | 0 |
| Probability: Not Likely, Less than 10% chance event will occur within the next 5 years | | | |
| Greatest Extent of Damage: Complete failure of dam and levees during major rain event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 fire station, 1 police station, 1 power plant, and 1 shelter • 8 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Expensive repairs and rebuilding associated with flooding of properties and structures. | | | |

| West Columbia | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.58 | Occurrences since 2000: | 0 |
| Area Affected: | 27% | Annual Event Average: | 0 |
| Probability: Not Likely, Less than 10% chance event will occur within the next 5 years | | | |
| Greatest Extent of Damage: Complete failure of dam and levees during major rain event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 electrical substation, 1 EMS, 1 fire station, 3 schools, 3 shelters, 4 police stations, and 1 powerplant • 66 residential structures at risk | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Expensive repairs and rebuilding associated with flooding of properties and structures. | | | |

| Port Freeport | | | |
|--|------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 0 |
| Area Affected: | 45% | Annual Event Average: | 0 |
| Probability: Not Likely, Less than 10% chance event will occur within the next 5 years | | | |
| Greatest Extent of Damage: Complete failure of dam and levees during major rain event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Administrative buildings, cargo ships, equipment, semi-trucks • Over 20 staff and visitors at the port | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Expensive repairs and rebuilding associated with flooding of properties and structures. • Economic losses would also be expected if port activities were to be halted due to levee failures. • Loss of staff wages due to closing of port. | | | |

| Freeport | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 0 |
| Area Affected: | 33% | Annual Event Average: | 0 |
| Probability: Not Likely, Less than 10% chance event will occur within the next 5 years | | | |
| Greatest Extent of Damage: Complete failure of dam and levees during major rain event. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Critical facilities including: 1 correctional facility, 5 electrical substations, 2 EMS, 3 fire stations, 6 schools, 5 shelters, 8 police stations, 1 emergency operations center, 2 wastewater treatment plants, and 1 power plant • 230 residential structures exposed to hazard | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Expensive repairs and rebuilding associated with flooding of properties and structures. | | | |

Part 6.11: Expansive Soils

6.11 Expansive Soils

The chart below shows the Linear Extensibility Percent (LEP) and Coefficient of Linear Extent (COLE) to show the Shrink-Swell Class of expansive soils. COLE is a test frequently used to characterize expansive soils. COLE is a measure expressed as a fraction of the change in a soil sample dimension from the moist to dry state. The LEP is a measure expressed as a percentage of the change in a soil sample dimension from the moist to dry state. The Shrink-Swell Class is found in comparing these two measurements. A Moderate to Very High rating marks soils that have the potential to contract and expand, leading to broken foundations and water pipes, for example.

| Shrink-Swell Class | Linear Extensibility Percent (LEP) | Coefficient of Linear Extent (COLE) |
|--------------------|------------------------------------|-------------------------------------|
| Low | 3 | 0.03 |
| Moderate | 3 to 6 | .03-.06 |
| High | 6 to 9 | .06-.09 |
| Very High | Greater than or equal to 9 | Greater than or equal to 0.09 |

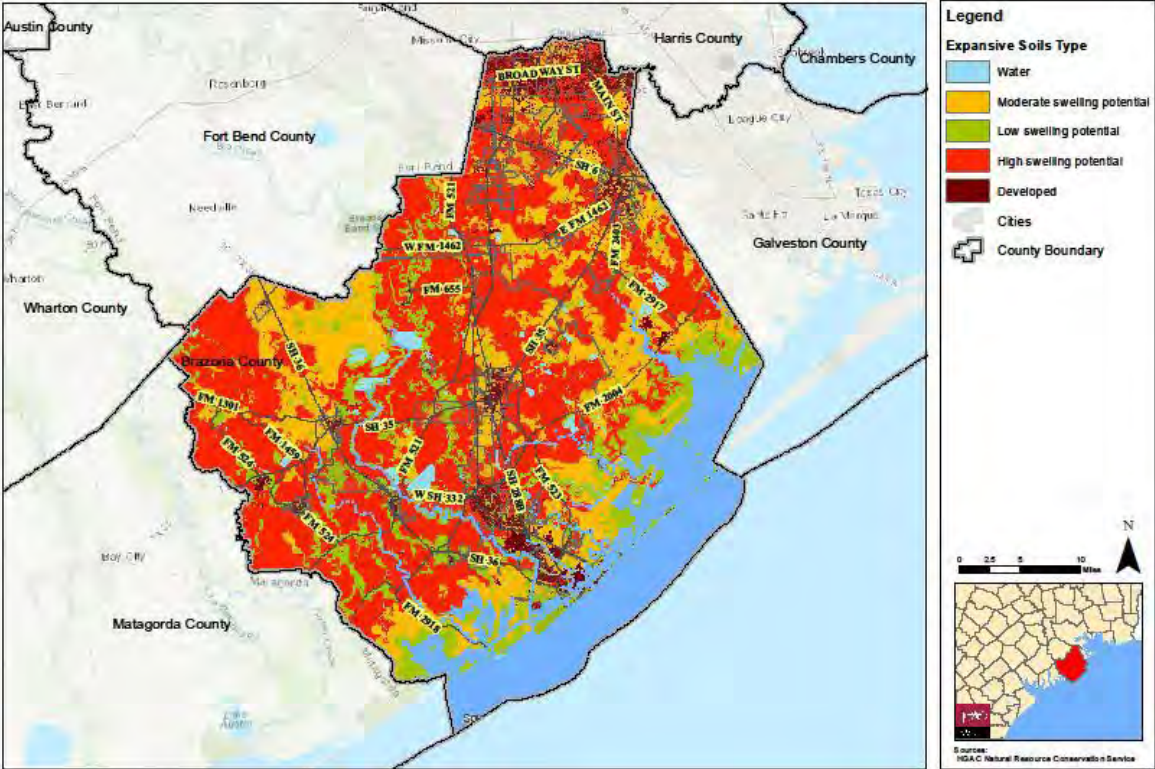
Source: <https://www.nrcs.usda.gov>

Brazoria County Expansive Soils Data

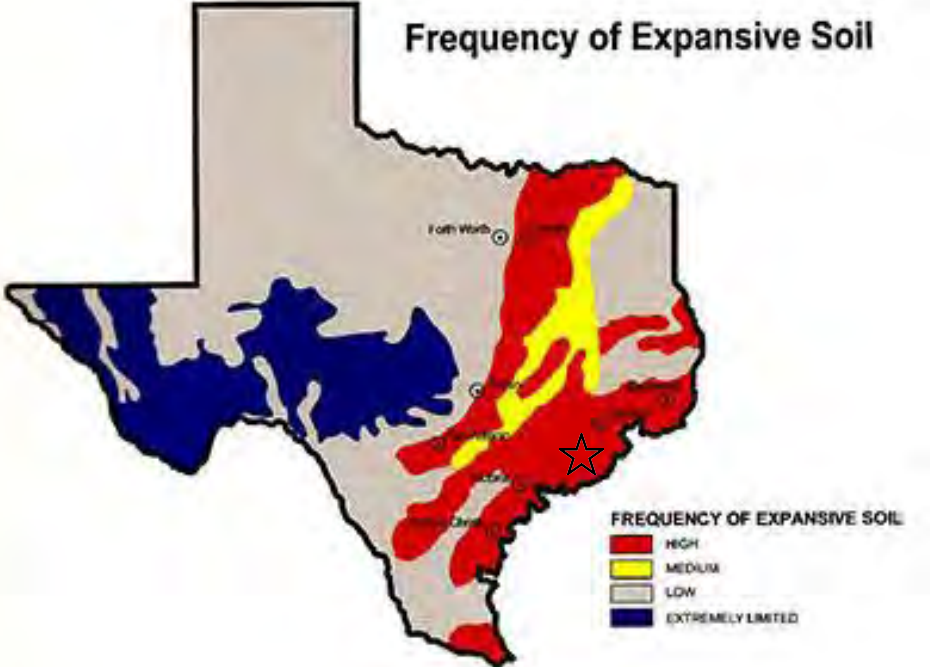
| Jurisdiction | Low Swelling Potential | Moderate Swelling Potential | High Swelling Potential |
|---------------------------|------------------------|-----------------------------|-------------------------|
| Unincorporated | | | X |
| City of Alvin | | | X |
| City of Angleton | | | X |
| City of Baileys Prairie | | | X |
| City of Bonney | | | X |
| City of Brazoria | | | X |
| City of Brookside Village | | | X |
| City of Clute | | | X |
| City of Danbury | | | X |
| City of Iowa Colony | | | X |
| City of Hillcrest Village | | | X |
| Town of Holiday Lakes | | | X |
| City of Jones Creek | | | X |
| City of Lake Jackson | | | X |
| City of Liverpool | | | X |
| City of Manvel | | | X |
| City of Oyster Creek | | | X |
| City of Quintana | X | | |
| City of Richwood | | | X |
| City of Surfside Beach | X | | |
| City of Sweeny | | | X |
| City of West Columbia | | | X |
| Brazosport ISD | | | X |
| Velasco Drainage District | | | X |
| Port of Freeport | | | X |

While there are no previous events recorded, the chart directly above and the Expansive Soil Map directly below help define the extent and location of expansive soils for each of the participating jurisdictions. The Frequency of Expansive Soils map further below helps to demonstrate the probability of expansive soils in the planning area.

Expansive Soil Map : Brazoria County



Frequency of Expansive Soil



Source: <http://www.tellafirma.com/find-texas-expansive-soils/>. Star notes Brazoria county's general location.

Hazard Analysis & Vulnerability Identification

The hazard analysis provides hazard extent data for each participating jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history. A data deficiency for "Occurrences" was addressed by assigning 1 occurrence for any jurisdiction that had Moderate to High shrink swell classes.

Information from stakeholders, USDA's Natural Resource Conservation Services, and H-GAC's critical facilities database were used for this analysis.

To identify vulnerabilities for each jurisdiction, this plan used the following methods:

- American Community Survey (ACS 2016, 5 year) data on residential structures
- GIS analysis of structures within the high to very high shrink swell classes; and
- Stakeholder identified vulnerabilities.

Brazoria County (All Jurisdictions)

Identified Vulnerabilities:
 Broken foundations and water pipes in commercial and residential buildings and public property. While newer buildings can be impacted; older buildings including critical facilities and homes are more likely to be impacted; this is due to older buildings being exposed to numerous weather events and seasons, having building standards that do not take expansive soils into account, and the lack of engineering solutions to mitigate expansive soils in the past. Therefore, the vulnerabilities focus on older buildings in each of the jurisdictions.

Identified Impacts:
 Jurisdictions can be impacted by expensive financial costs to repair foundations and water lines for public facilities. School districts, home owners, and business owners could also be impacted by broken pipes, cracked foundations, and other structural repairs caused by expanding and contracting soils. Pipes in critical facilities may also lead to a loss of service, or damaged roads/bridges can increase response time to get to someone in need.

Brazoria County (Unincorporated)

| | | | |
|--------------------------------|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 1,475 | Occurrences since 2000: | 1 |
| Area Affected: | 85% | Annual Event Average: | .06 |

Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year.

Extent: Based off Brazoria County's expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future.

Identified Vulnerabilities:

- Critical facilities including: 3 fire station, 5 schools, 1 shelter, and 2 correctional facilities

Identified Impacts:

- Financial cost to county to repair foundations for public facilities
- Cracked pipes in critical facilities may lead to a loss of service or increased response time to get to someone in need.

| Alvin | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 25.6 | Occurrences since 2000: | 1 |
| Area Affected: | 75% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 6,275 Residential buildings built before 1980 (65.8% of housing stock) • Critical facilities including: 14 schools, 5 electrical substations, 4 fire stations, 2 EMS, 1 wastewater treatment plant, 2 shelters, 6 police stations, and 1 emergency operation center | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responders take to get to someone in need. | | | |

| Angleton | | | |
|--|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 11.27 | Occurrences since 2000: | 1 |
| Area Affected: | 75% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 6,426 Residential buildings built before 1980 (80 % of housing stock) • Critical facilities including: 3 correctional facilities, 1 electrical substation, 1 EMS, 2 fire stations, 9 schools, 3 shelters, 9 police stations, and 2 hospitals | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

| Bailey's Prairie | | | |
|--|-----|--------------------------------|-----|
| Planning Area (Sq. mi): | 7.7 | Occurrences since 2000: | 1 |
| Area Affected: | 75% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County's expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 82 Residential buildings built before 1980 (85.5% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

| Bonney | | | |
|---|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 1.66 | Occurrences since 2000: | 1 |
| Area Affected: | 75 % | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County's expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 107 Residential buildings built before 1980 (73.1% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities | | | |

| Brazoria | | | |
|---|-----|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 1 |
| Area Affected: | 75% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 1,129 Residential buildings built before 1980 (80% of housing stock) • Critical facilities including: 1 correctional facility, 1 electrical substation, 1 EMS, 4 fire stations, 9 schools, 6 shelters, 2 police stations, 2 hospitals, 6 shelters, and 2 emergency operation centers | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

| Brookside Village | | | |
|--|-------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.085 | Occurrences since 2000: | 1 |
| Area Affected: | 50% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 480 Residential buildings built before 1980 (79.1% of housing stock) • 1 police station | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

| Clute | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 5.6 | Occurrences since 2000: | 1 |
| Area Affected: | 75 % | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 3,347 Residential buildings built before 1980 (64.8% of housing stock) • Critical facilities including: 1 EMS, 1 electrical substation, 1 fire station, 5 schools, 5 shelters, 2 police stations, 2 hospitals, 1 emergency operation center, and 1 wastewater treatment | | | |
| Identified Impacts | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

| Danbury and Danbury ISD | | | |
|---|-----|--------------------------------|-----|
| Planning Area (Sq. mi): | 1.0 | Occurrences since 2000: | 1 |
| Area Affected: | 75% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 500 Residential buildings built before 1980 (86.2% of housing stock) • Critical facilities including: 1 electrical substation, 1 EMS, 1 fire station, 3 schools, and 1 police station | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responders take to get to someone in need. | | | |

| Iowa Colony | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 7.33 | Occurrences since 2000: | 1 |
| Area Affected: | 50% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 263 Residential buildings built before 1980 (60% of housing stock) • Critical facilities including: 1 EMS and 1 school | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

| Hillcrest Village | | | |
|---|-----|--------------------------------|-----|
| Planning Area (Sq. mi): | 0.4 | Occurrences since 2000: | 1 |
| Area Affected: | 25% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 289 Residential buildings built before 1980 (82.9% of housing stock) | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities | | | |

Holiday Lakes

| | | | |
|--------------------------------|-----|--------------------------------|-----|
| Planning Area (Sq. mi): | 1 | Occurrences since 2000: | 1 |
| Area Affected: | 25% | Annual Event Average: | .06 |

Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year.

Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future.

- Identified Vulnerabilities:**
- 3,347 Residential buildings built before 1980 (64.8% of housing stock)
- Identified Impacts:**
- Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities

Jones Creek

| | | | |
|--------------------------------|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.6 | Occurrences since 2000: | 1 |
| Area Affected: | 25 % | Annual Event Average: | .06 |

Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year.

Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future.

- Identified Vulnerabilities:**
- 3,347 Residential buildings built before 1980 (64.8% of housing stock)
 - Critical facilities including: 1 school and 1 shelter
- Identified Impacts:**
- Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities
 - Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need.

| Lake Jackson | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 20.9 | Occurrences since 2000: | 1 |
| Area Affected: | 25% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 8,272 Residential buildings built before 1980 (70.1% of housing stock) • Critical facilities including: 1 dam, 1 electrical substation, 2 EMS, 2 fire stations, 1 hospital, 2 police stations, 7 schools, 9 shelters, and 1 wastewater treatment facility | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

| Liverpool | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 1.1 | Occurrences since 2000: | 1 |
| Area Affected: | 25 % | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 177 Residential buildings built before 1980 (72.2% of housing stock) • Critical facilities including: 1 fire station and 2 police stations | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

Manvel

| | | | |
|--------------------------------|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 23.6 | Occurrences since 2000: | 1 |
| Area Affected: | 25 % | Annual Event Average: | .06 |

Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year.

Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future.

- Identified Vulnerabilities:**
- 971 Residential buildings built before 1980 (32.8% of housing stock)
 - Critical facilities including: 1 EMS, 2 fire stations, 3 police stations, 4 schools, and 1 shelter
- Identified Impacts:**
- Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities
 - Cracked pipes in critical facilities may lead to a loss of service or length the time first responderstake to get to someone in need.

Oyster Creek

| | | | |
|--------------------------------|-----|--------------------------------|-----|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 1 |
| Area Affected: | 25% | Annual Event Average: | .06 |

Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year.

Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future.

- Identified Vulnerabilities:**
- 356 Residential buildings built before 1980 (68.6% of housing stock)
 - Critical facilities including: 1 fire station, 1 police station, 1 power plant, and 1 shelter
- Identified Impacts:**
- Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities
 - Cracked pipes in critical facilities may lead to a loss of service or length the time first responderstake to get to someone in need.

Quintana

| | | | |
|--------------------------------|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 0 |
| Area Affected: | 10% | Annual Event Average: | 0 |

Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year.

Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of low; the jurisdiction can see a moderate to very high shrink swell class in the future.

- Identified Vulnerabilities:**
- 554 Residential buildings built before 1980 (83.9% of housing stock)
- Identified Impacts:**
- Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities

Richwood

| | | | |
|--------------------------------|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 3.1 | Occurrences since 2000: | 1 |
| Area Affected: | 50 % | Annual Event Average: | .06 |

Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year.

Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future.

- Identified Vulnerabilities:**
- 356 Residential buildings built before 1980 (68.6% of housing stock)
 - Critical facilities including: 1 police station, 1 school, and 1 shelter
- Identified Impacts:**
- Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities
 - Cracked pipes in critical facilities may lead to a loss of service or length the time first responderstake to get to someone in need.

| Surfside Beach | | | |
|--|-----|--------------------------------|---|
| Planning Area (Sq. mi): | 2.2 | Occurrences since 2000: | 0 |
| Area Affected: | 10% | Annual Event Average: | 0 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of low; the jurisdiction can see a moderate to high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 356 Residential buildings built before 1980 (68.6% of housing stock) • Critical facilities including: 1 fire station, and 1 police station | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

| Sweeny and Sweeny ISD | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 1 |
| Area Affected: | 75 % | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 1,220 Residential buildings built before 1980 (73% of housing stock) • Critical facilities including: 1 electrical substation, 1 EMS, 2 fire stations, 1 hospital, 2 emergency operations centers, 3 police stations, 2 schools, 1 shelter, 3 schools, 2 power plants | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

| West Columbia | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.58 | Occurrences since 2000: | 1 |
| Area Affected: | 50% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 1,447 Residential buildings built before 1980 (88.3% of housing stock) • Critical facilities including: 1 electrical substation, 1 EMS, 1 fire station, 3 schools, 3 shelters, 4 police stations, and 1 powerplant | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

| Brazosport ISD | | | |
|--|-----|--------------------------------|-----|
| Planning Area (Sq. mi): | 200 | Occurrences since 2000: | 1 |
| Area Affected: | 75% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the ISD has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the ISD has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 19 schools- 10 elementary schools, 3 high schools, 5 middle schools, 1 alternative school | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Cracked pipes and foundations in buildings may lead to a financial loss for the school district • A disruption in school services for repairs could result in loss wages for parents who cannot find alternative childcare, and disrupt educational progress of students. | | | |

Velasco Drainage District

| | | | |
|--------------------------------|-----|--------------------------------|-----|
| Planning Area (Sq. mi): | 236 | Occurrences since 2000: | 1 |
| Area Affected: | 75% | Annual Event Average: | .06 |

Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year.

Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future.

- Identified Vulnerabilities:**
- Administrative building
 - 14 pump stations and levees
- Identified Impacts:**
- Financial cost of repairing the foundation of the administration building and pumps and levees damaged

Alvin ISD

| | | | |
|--------------------------------|------|--------------------------------|---|
| Planning Area (Sq. mi): | 256 | Occurrences since 1871: | 0 |
| Area Affected: | 75 % | Annual Event Average: | 0 |

Probability: Very Likely; based off the frequency of expansive soils map above, the ISD has a high chance of seeing expansive soils within the year.

Extent: Based off Brazoria County’s expansive soils map above, the ISD has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future.

- Identified Vulnerabilities:**
- 31 schools- 17 elementary schools, 3 high schools, 6 middle schools, 1 alternative school
- Identified Impacts:**
- Cracked pipes and foundations in buildings may lead to a finical loss for the school district
 - A disruption in school services for repairs could result in loss wages for parents who cannot find alternative childcare and disrupt educational progress of students.

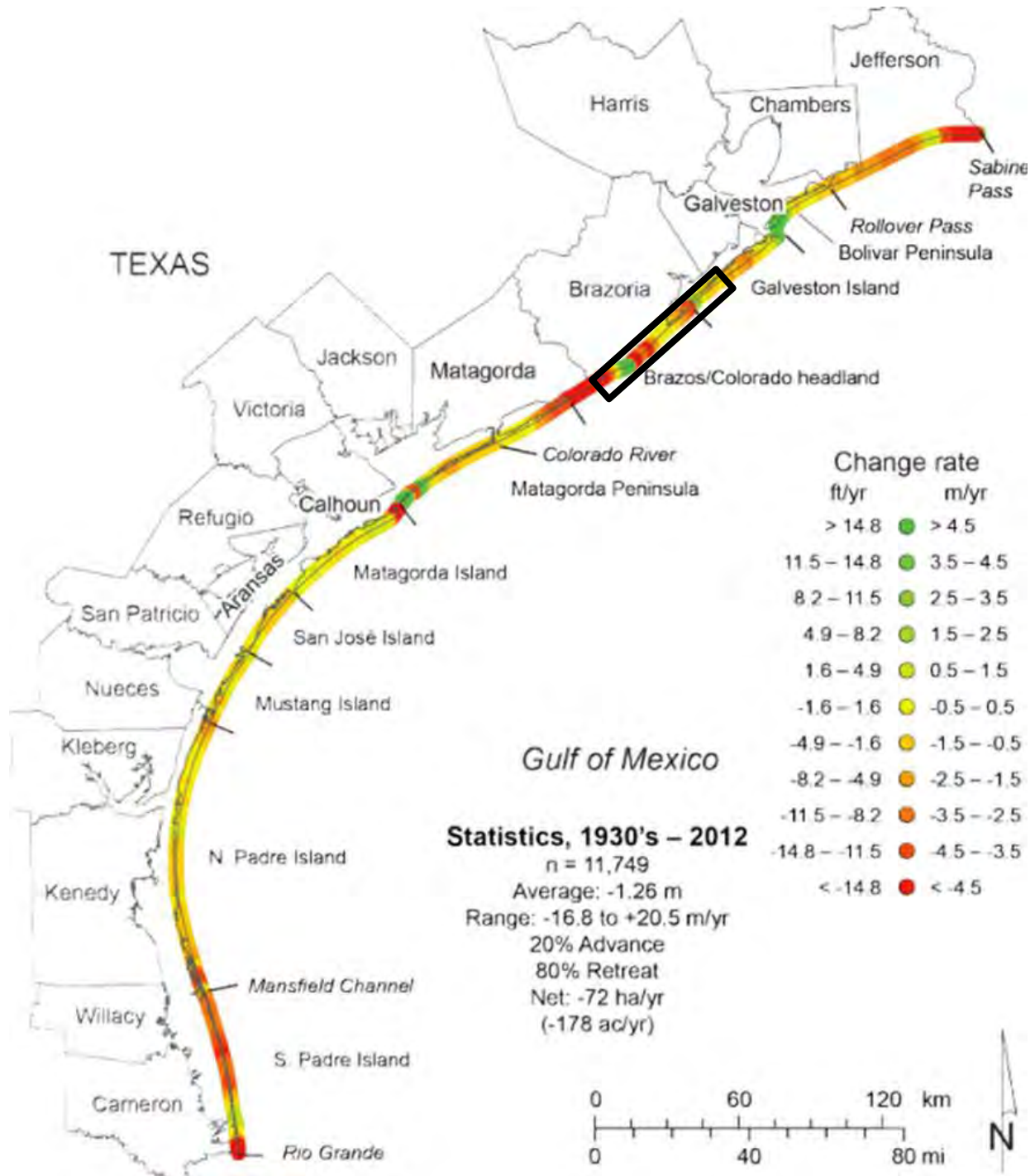
| Port Freeport | | | |
|--|------|--------------------------------|-----|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 1 |
| Area Affected: | 10% | Annual Event Average: | .06 |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Port facilities and administrative buildings | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Cracked pipes and foundations in buildings may lead to a financial loss for the port. • A disruption of economic activities at the port due to required repairs | | | |

| Freeport | | | |
|---|------|--------------------------------|---|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 1 |
| Area Affected: | 10% | Annual Event Average: | |
| Probability: Very Likely; based off the frequency of expansive soils map above, the jurisdiction has a high chance of seeing expansive soils within the year. | | | |
| Extent: Based off Brazoria County’s expansive soils map above, the jurisdiction has a current shrink-swell class of high; the jurisdiction can see a high to very high shrink swell class in the future. | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • 4,004 Residential buildings built before 1980 (82.9% of housing stock) • Critical facilities including: 1 correctional facility, 5 electrical substations, 2 EMS, 3 fire stations, 6 schools, 5 shelters, 8 police stations, 1 emergency operations center, 2 wastewater treatment plants, and 1 power plant | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost to residents and jurisdiction of repairing foundations for homes and public facilities • Cracked pipes in critical facilities may lead to a loss of service or length the time first responder take to get to someone in need. | | | |

Part 6.12: Coastal Erosion

6.12 Coastal Erosion

Coastal Erosion is measured through feet or meters lost per year. The map below shows the southeast coast of Texas with Brazoria County labeled between Galveston and Matagorda counties.



Source: Coastal Erosion Planning & Response Act. Black rectangle shows general Brazoria area

Historic Occurrence

There have been no recorded erosion events in the county between 2000 to 2017.

Hazard Analysis & Vulnerability Identification

The hazard analysis uses historic hazard event data to determine the probability of an event occurring again within a given year.

The hazard analysis also provides hazard extent data for each participating jurisdiction. The extent data is the most extreme data recorded during a storm or hazard event and represents the worst damage a jurisdiction has experienced in recent history. Information from stakeholders, FEMA, and H-GAC's critical facilities database were used for this analysis.

The jurisdictions below are alongside the coast and are profiling this hazard. All other participating jurisdictions are not profiling coastal erosion.

Brazoria County (All Participating Jurisdictions Impacted by Coastal Erosion)

Identified Vulnerabilities:

- Local shops and businesses that depend on tourism
- Community infrastructure include roads, bridges, and critical facilities along the coast
- Residents living along the coast
- Port infrastructure

Identified Impacts:

- Economic loss for jurisdictions and the county if local businesses have to close due to damage or loss of tourists/ customers
- Financial loss for business owners along the coast that need to make repairs to buildings or have less customers over time
- Closure of the port due to repairs may lead to an economic loss for the county
- Residential and commercial property loss throughout the county along the coast may lead to a financial loss for residents and jurisdictions that need to repair or replace property

| Brazoria County (Unincorporated) | | | |
|--|-------|--------------------------------|------------|
| Planning Area (Sq. mi): | 1,475 | Occurrences since 2000: | 0; Ongoing |
| Area Affected: | 30 % | Annual Event Average: | 0; Ongoing |
| Probability: Likely; coasts are affected by storms and other natural events as well as development along the coast on a day-to-day basis. | | | |
| Greatest Extent of Damage: According to the map above the county is seeing < 14.8 feet per year; the county could expect to see greater than 14.8 feet per year | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Treasure Island Beach- Beach erosion • Follett’s Island- Wetlands protection in southeast of the county | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost of beach replenishment for the county • Potential loss of revenue from tourism along the coast • Loss of natural habitat and wildlife along the coast | | | |

| Quintana | | | |
|--|-------|--------------------------------|------------|
| Planning Area (Sq. mi): | 2 | Occurrences since 2000: | 0; Ongoing |
| Area Affected: | 100 % | Annual Event Average: | 0; Ongoing |
| Probability: Likely; coasts are affected by storms and other natural events as well as development along the coast on a day-to-day basis. | | | |
| Greatest Extent of Damage: According to the map above the jurisdiction is seeing < 14.8 feet per year; the jurisdiction could expect to see greater than 14.8 feet per year | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Residential and commercial property along the coast | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost of beach replenishment for the jurisdiction • Potential loss of revenue from tourism along the coast • Loss of natural habitat and wildlife along the coast | | | |

| Surfside Beach | | | |
|--|-------|--------------------------------|------------|
| Planning Area (Sq. mi): | 2.2 | Occurrences since 2000: | 0; Ongoing |
| Area Affected: | 100 % | Annual Event Average: | 0; Ongoing |
| Probability: Likely; coasts are affected by storms and other natural events as well as development along the coast on a day-to-day basis. | | | |
| Greatest Extent of Damage: According to the map above the jurisdiction is seeing < 14.8 feet per year; the jurisdiction could expect to see greater than 14.8 feet per year | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Breakaways • Residential and commercial property along the coast • Land near Beach Drive | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost of beach replenishment for the jurisdiction • Potential loss of revenue from tourism along the coast • Loss of natural habitat and wildlife along the coast | | | |

| Port Freeport | | | |
|---|------|--------------------------------|------------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 0; Ongoing |
| Area Affected: | 75 % | Annual Event Average: | 0; Ongoing |
| Probability: Likely; coasts are affected by storms and other natural events as well as development along the coast on a day-to-day basis. | | | |
| Greatest Extent of Damage: According to the map above the jurisdiction is seeing < 14.8 feet per year; the jurisdiction could expect to see greater than 14.8 feet per year | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> • Erosion along the fence line • Safety of vessels throughout the port | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> • Financial cost of land lost and equipment or infrastructure damaged • Loss of natural habitat and wildlife along the coast | | | |

| Freeport | | | |
|--|------|--------------------------------|------------|
| Planning Area (Sq. mi): | 2.81 | Occurrences since 2000: | 0; Ongoing |
| Area Affected: | 75% | Annual Event Average: | 0; Ongoing |
| Probability: Likely; coasts are affected by storms and other natural events as well as development along the coast on a day-to-day basis. | | | |
| Greatest Extent of Damage: According to the map above the jurisdiction is seeing < 14.8 feet per year; the jurisdiction could expect to see greater than 14.8 feet per year | | | |
| Identified Vulnerabilities: | | | |
| <ul style="list-style-type: none"> Residential and commercial property along the coast particularly near the Brazos River Delta | | | |
| Identified Impacts: | | | |
| <ul style="list-style-type: none"> Financial cost of beach replenishment for the jurisdiction Potential loss of revenue from tourism along the coast Loss of natural habitat and wildlife along the coast | | | |

Part 7: Mitigation Strategy

Part 7: MITIGATION STRATEGY

The planning process, hazard analysis, and vulnerability assessment serve as a foundation for a meaningful hazard mitigation strategy. The mitigation strategy provides an outline for how the county and the local jurisdictions aim to address and reduce the risks associated with the natural hazards identified in the HMAP and reduce the potential impact on residents and structures identified through the Vulnerability Analysis. The mitigation strategy is divided into three sections the mission statement, goals and objectives, and the mitigation action plan. The mission statement provides the overall purpose of the mitigation strategy and the HMAP. The goals and objectives provide milestones for how the county aims to meet this purpose. The mitigation action plan details specific mitigation actions, or projects, programs, and polices the county aims to meet these goals and objectives.

Mission Statement

The HMAP aims to implement new policies, programs, and projects to reduce the risks and impacts associated with natural hazards, including public education and partnerships between local officials and residents.

Goal

Reduce the loss of public and private infrastructure throughout the county due to natural hazards

Objective

Raise and remove structures in the 500- year floodplain through creating, implementing, and updating county programs and local codes

Objective

Retrofit coastal roads to prevent loss from coastal erosion

Objective

Create levees or berms to protect sewage treatment facilities throughout the county

Goal

Create predictability along the Brazos river floodplain

Objective

Through collaborative projects with public and private partners rid oyster creek of obstructions in order to allow river to flow naturally

Objective

Raise and repair lost river bank to keep flood waters in the river

Objective

Partner with local and county officials to identify at least three additional measures to keep water where it should be throughout the county

Goal

Improve collaboration and communication between fire, police, medical units, and local jurisdictions

Objective

The county and all local jurisdictions shall share a common radio or communications network

Objective

Provide educational opportunities for municipalities to understand the importance of staying in contact with MACC (Multi-Agency Coordination Center)

Objective

Develop a common dispatch procedure for the county and local jurisdictions

Mitigation Action Plan

The mitigation action plan explains the specific programs, policies, and projects that the county and the local jurisdictions aim to implement for the county to reach its HMAP objectives and goals. The mitigation action plan provides the details of each mitigation action including which local department will be in charge of implementing the actions, how the county or local jurisdiction plan to pay for these actions, and the estimated time for implementing these actions.

Each jurisdiction and the county prioritized their mitigation actions based on their greatest vulnerabilities and needs. Actions were rated 1, 2, or 3 with 1 being the highest priority. Within each of the priority categories, a sub-category for feasibility was created. Each action was evaluated for feasibility using FEMA's mitigation action evaluation worksheet (Appendix A). After evaluating the mitigation actions based on priorities and feasibility, the actions were ranked. The actions are separated by jurisdiction and then ranked as described. The charts below demonstrate the final ranking of mitigation actions based on their scoring.

Ongoing Mitigation Strategies

Past mitigation strategies, that were not complete due to unavailable funding opportunities, are still viable projects and will be carried over to this updated plan. Careful review of past projects by each participating jurisdiction will be monitored and ready to move forward, as funding becomes available. New projects have been added to the mitigation strategies and a new plan addition, Annex E, will be a placeholder for future projects as ideas and funding are presented and attainable.

Mitigation Strategy N6 – Project Title – “Elevate Structures in Flood Zone” is currently in progress.

All other mitigation strategies were unable to be started or completed due to funding opportunities. Some are being discussed with current grant opportunities and will be noted as they progress.

All Participating Jurisdictions

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|---|--|----------------------------|--|-----|
| Jurisdiction: | All participating jurisdictions | | Action Number: | P1 |
| Hazard(s) Addressed: | Flooding, Hurricane, Wildfire, Drought, Lightning, Heat Events, Hail, Winter Weather, Tornado, Expansive Soils | | | |
| Project Title: | Educating public on mitigation techniques | | | |
| Project Description: | Implement an outreach and education campaign to educate the public on mitigation techniques for all hazards to reduce loss of life and property. | | | |
| Responsible Entity: | County Emergency Managers, All participating jurisdictions mayors and city councils | | | |
| Losses avoided: | Residents and business owners | | | |
| Cost Estimate: | 10,000 | Timeframe: | 3 months | |
| Potential Funding Sources: | Local budget and salary, HMPG, Fire Prevention and Safety Grants | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|--|-----|
| Jurisdiction: | Brazoria County, Quintana, Surfside Beach, Port Freeport, Freeport | | Action Number: | P2 |
| Hazard(s) Addressed: | Coastal Erosion | | | |
| Project Title: | Educating public on mitigation techniques | | | |
| Project Description: | Implement an outreach and education campaign to educate the public on mitigation techniques for coastal erosion to reduce loss of life and property. | | | |
| Responsible Entity: | County Emergency Managers, jurisdictions mayors, and city councils | | | |
| Losses avoided: | Residents and businesses | | | |
| Cost Estimate: | 9,000 | Timeframe: | 3-6 months | |
| Potential Funding Sources: | Local budget and salary, HMPG, | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|--|-----|
| Jurisdiction: | Unincorporated Brazoria County, Holiday Lakes, West Columbia, Bailey's Prairie, Brazoria, Freeport, Port of Freeport, and Oyster Creek | | Action Number: | P3 |
| Hazard(s) Addressed: | Dam and Levee Failure | | | |
| Project Title: | Educating public on mitigation techniques | | | |
| Project Description: | Implement an outreach and education campaign to educate the public on mitigation techniques for dam and levee failure to reduce loss of life and property. | | | |
| Responsible Entity: | County Emergency Managers, jurisdictions, mayors and city councils | | | |
| Losses avoided: | Residents and businesses | | | |
| Cost Estimate: | 9,000 | Timeframe: | 3-6 months | |
| Potential Funding Sources: | Local budget and salary, HMPG | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | All participating jurisdictions | | Action Number: | P4 |
| Hazard(s) Addressed: | Hail, Tornado, Hurricane | | | |
| Project Title: | Retrofitting structures for hail and wind protection | | | |
| Project Description: | All participating jurisdictions will retrofit city and county owned structures with roofs and window panes that can withstand hail and high wind damage. | | | |
| Responsible Entity: | Emergency Coordinator, Brazoria County | | | |
| Losses avoided: | Buildings, residents, and city/ county employees in county and city buildings when a hail storm hits. | | | |
| Cost Estimate: | 60,000 | Timeframe: | 60 months | |
| Potential Funding Sources: | HMGP, PDM, Local budgets | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|---|----------------------------|------------------------------------|-----|
| Jurisdiction: | All participating jurisdictions | | Action Number: | P5 |
| Hazard(s) Addressed: | Wildfire | | | |
| Project Title: | Technical support for residents to reduce the risk of wildfire | | | |
| Project Description: | The county and partnering cities will provide incentives and technical support for property owners to reduce underbrush throughout the county to properly cut back trees, upgrade fences, and replace landscape materials with nonflammable materials | | | |
| Responsible Entity: | County's Emergency Management Coordinator | | | |
| Losses avoided: | Homes within the wild-urban interface and residents living within these areas | | | |
| Cost Estimate: | 5,000 | Timeframe: | 3 months | |
| Potential Funding Sources: | HMPG, Current county and city budget/ staff time | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|--|-----|
| Jurisdiction: | All participating jurisdictions | | Action Number: | P6 |
| Hazard(s) Addressed: | Wildfire | | | |
| Project Title: | Rebate program for wildfire protection | | | |
| Project Description: | The city will develop a rebate program for residents who use non-combustible material when renovating properties or building new homes | | | |
| Responsible Entity: | Mayors and County Emergency Management Coordinator | | | |
| Losses avoided: | Residents and existing and new properties | | | |
| Cost Estimate: | 150,000 | Timeframe: | 12 to 24 months | |
| Potential Funding Sources: | HMPG, current city and staff time | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|---|----------------------------|--|----|
| Jurisdiction: | All participating jurisdictions | | Action Number: | P7 |
| Hazard(s) Addressed: | Heat Events | | | |
| Project Title: | Installing misting stations | | | |
| Project Description: | The county and partnering cities will install misting stations throughout city and county owned parks and property. | | | |
| Responsible Entity: | County Emergency Coordinator | | | |
| Losses avoided: | Loss of life; Especially the elderly and children in the county | | | |
| Cost Estimate: | 5,000 | Timeframe: | 6 to 12 months | |
| Potential Funding Sources: | HMPG, current city and staff time | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|---|----------------------------|------------------------------------|-----|
| Jurisdiction: | All participating jurisdictions | | Action Number: | P8 |
| Hazard(s) Addressed: | Drought | | | |
| Project Title: | Adopting ordinance for drought tolerant plants | | | |
| Project Description: | All participating jurisdictions will develop an ordinance to require incorporating drought tolerant landscape design into all new county and city owned properties. | | | |
| Responsible Entity: | Emergency Coordinators for the county and partnering jurisdictions. | | | |
| Losses avoided: | Structures throughout the jurisdiction impacted by drought | | | |
| Cost Estimate: | 1,000 | Timeframe: | 3 months | |
| Potential Funding Sources: | Current staff time | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | All participating jurisdictions | | Action Number: | P9 |
| Hazard(s) Addressed: | Lightning | | | |
| Project Title: | Rebate program for lightning rods | | | |
| Project Description: | All participating jurisdictions will work to develop a program that offers reduced price lightning rods and technical assistance for homeowners throughout the county. | | | |
| Responsible Entity: | County Emergency Coordinator | | | |
| Losses avoided: | Homes and residents who could be affected by lightning throughout the county. | | | |
| Cost Estimate: | 150,000 | Timeframe: | 12 months | |
| Potential Funding Sources: | HMGP, FP&S Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|---|----------------------------|------------------------------------|-----|
| Jurisdiction: | All participating jurisdictions | | Action Number: | P10 |
| Hazard(s) Addressed: | Expansive Soils, Drought | | | |
| Project Title: | Drip irrigation | | | |
| Project Description: | All participating jurisdictions will install drip irrigation around critical facilities' foundations throughout the county. This action mitigates the damage that shrinking and expanding soils cause on foundations and pipes. | | | |
| Responsible Entity: | Emergency Coordinator | | | |
| Losses avoided: | Cost of repair to critical facilities' foundations, water and sewer lines. | | | |
| Cost Estimate: | 250,000 | Timeframe: | 12 months | |
| Potential Funding Sources: | HMGP, FP&S Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|---|----------------------------|------------------------------------|-----|
| Jurisdiction: | All participating jurisdictions | | Action Number: | P11 |
| Hazard(s) Addressed: | Winter Weather | | | |
| Project Title: | Warning system for icy roadways | | | |
| Project Description: | All participating jurisdictions will install signage and sensors to alert drivers during winter weather on major roadways, curved roads, and steep roads. | | | |
| Responsible Entity: | County Emergency Coordinator | | | |
| Losses avoided: | Residents and visitors traveling throughout the county. | | | |
| Cost Estimate: | 250,000 | Timeframe: | 12-24 months | |
| Potential Funding Sources: | HMGP, FP&S Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|---------------------------------------|-----|
| Jurisdiction: | All participating jurisdictions | | Action Number: | P12 |
| Hazard(s) Addressed: | Flooding, Hurricane/Tropical Storm, Wildfire, Drought, Dam and Levee Failure | | | |
| Project Title: | Non-structural mitigation | | | |
| Project Description: | Preserve natural lands and green space to reduce the impacts of natural hazards. Up to 35,000 acres of land tracts could be purchased from willing sellers for their natural ecosystem services. Including floodwater storage, groundwater recharge, erosion control, drought mitigation, and wildfire damage reduction. The land will be converted to parks, wildlife management areas, community forests, and/or other public open spaces. | | | |
| Responsible Entity: | The Trust for Public Land and voluntary partnering jurisdictions. | | | |
| Losses avoided: | Reduce the loss of life and property by preserving pervious surface and open space to reduce the effects of flooding. Reduce agricultural and water reservoir losses during droughts, and reduce the loss of life and property during wildfires, floods, and dam/ levee failures by using wetlands and wetland forests as natural fire breaks and storm infrastructure. | | | |
| Cost Estimate: | 65,000,000.00 | Timeframe: | 60 months – currently in process | |
| Potential Funding Sources: | HMGP, FMA, PDM, Philanthropic Institutions, the Deep Water Horizon Settlement, and Local budgets. | Benefit-Cost Ratio: | Greater than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Unincorporated Brazoria County, Holiday Lakes, West Columbia, Bailey's Prairie, Brazoria, Freeport, Port of Freeport, and Oyster Creek. | Action Number: | P13 |
| Hazard(s) Addressed: | Flood, Dam and Levee Failure | | |
| Project Title: | Updating Maps | | |
| Project Description: | Each jurisdiction will work to update their dam and levee failure inundation maps to identify the probability and impact of a dam and levee failures in their jurisdiction. The mapping action will also identify the homes, critical facilities and agricultural lands that are vulnerable to a complete dam or levee failure, determine the extent of damage that can be expected, and show the probability and impact of dam failure. The updated inundation maps will also be made available to public. | | |
| Responsible Entity: | County Emergency Coordinator | | |
| Losses avoided: | Homes and residents (loss of life) who could be affected by flooding throughout the county | | |
| Cost Estimate: | 150,000 | Timeframe: | 12 months |
| Potential Funding Sources: | HMGP, FP&S Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

Multi-Jurisdiction Mitigation Actions

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Lake Jackson, Clute, Velasco Drainage District | Action Number: | M1 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Flag Lake Drainage Infrastructure Project | | |
| Project Description: | Lake Jackson, Clute, and Velasco Drainage District will conduct a Flag Lake drainage study. Runoff from Lake Jackson flows into Clute. Using the study, Clute and Velasco Drainage District would implement a drainage project that lessens the flooding impact from the Lake Jackson runoff. | | |
| Responsible Entity: | Lake Jackson EMC, Mayor, Clute EMC, Mayor and Drainage District Director | | |
| Partners: | Clute, Velasco Drainage District | | |
| Losses avoided: | | | |
| Cost Estimate: | 350,000 | Timeframe: | 24 months |
| Potential Funding Sources: | USACE Planning Assistance to States, Flood Mitigation Assistance Program, HMGP, TWDB Research and Planning Fund | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Quintana, Freeport | Action Number: | M2 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms and Coastal Erosion | | |
| Project Title: | Prevention, Property Protection | | |
| Project Description: | Develop and implement a beach nourishment project on each jurisdiction's shoreline to mitigate the effects of coastal erosion. | | |
| Responsible Entity: | Quintana Mayor, Freeport Parks Engineering Department Manager | | |
| Losses avoided: | Life safety and public property | | |
| Cost Estimate: | 6,000,000 | Timeframe: | 48 to 60 months |
| Potential Funding Sources: | FEMA, HMG, CEPRA, CIAP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

Bailey's Prairie

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Bailey's Prairie | Action Number: | A1 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Property Protection | | |
| Project Description: | Project will clear obstacles, widen and reshape ditches, and upgrade culverts to restore adequate drainage to mitigate flooding | | |
| Responsible Entity: | City Engineer and Mayor | | |
| Losses avoided: | Homes, businesses, and public facilities | | |
| Cost Estimate: | 250,000 | Timeframe: | 24 months |
| Potential Funding Sources: | HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Bailey's Prairie | Action Number: | A2 |
| Hazard(s) Addressed: | Hail | | |
| Project Title: | Educate Public of Home Improvement Opportunities | | |
| Project Description: | Educate elderly, low-income residents of grant funding opportunities to insulate the foundation of pier and beam homes, and update homes to withstand strong winds and hail. | | |
| Responsible Entity: | City Council | | |
| Losses avoided: | Life, health, and safety of vulnerable populations, and property damage | | |
| Cost Estimate: | 2,000 | Timeframe: | 12 months |
| Potential Funding Sources: | Local Budget, HMGP, USDA Home Repair grant | Benefit-Cost Ratio: | Less than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Bailey's Prairie | Action Number: | A3 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Adopting City Ordinance | | |
| Project Description: | The city shall adopt a land use ordinance which requires any structure within the 100-year floodplain to be elevated 2 feet above base flood elevation. | | |
| Responsible Entity: | City Council and mayor | | |
| Losses avoided: | Homes, businesses, and residents within the 100-year flood plain. | | |
| Cost Estimate: | 5,000 | Timeframe: | 6 months |
| Potential Funding Sources: | HMGP, current city budget and staff time. | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Bailey's Prairie | Action Number: | A4 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Adopting land-use ordinance | | |
| Project Description: | The city shall adopt a land-use ordinance which prohibits building residential or commercial structures in the 100-year floodplain. | | |
| Responsible Entity: | City Manager, City Council, Office of Code Enforcement | | |
| Losses avoided: | Future buildings and infrastructure that may have been built within the 100-year flood plain | | |
| Cost Estimate: | 5,000 | Timeframe: | 6 months |
| Potential Funding Sources: | Current city budget and salary, HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

Surfside Beach

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Surfside Beach | Action Number: | B1 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms, Coastal Erosion | | |
| Project Title: | Installing Shoreline Structures | | |
| Project Description: | Install groins along the beach front throughout the city specifically near Breakaway to decrease coastal erosion and damage caused by storm surge and hurricanes. | | |
| Responsible Entity: | Mayor and EMC | | |
| Losses avoided: | Shoreline erosion, loss of natural wildlife habitat, etc. | | |
| Cost Estimate: | 12,000,000 | Timeframe: | 48 months |
| Potential Funding Sources: | HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

| | | | |
|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Surfside Beach | Action Number: | B2 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms, Coastal Erosion | | |
| Project Title: | Installing Shoreline Structures | | |
| Project Description: | Extend revetment wall to jetties throughout the city to reduce coastal erosion and decrease the impacts caused by hurricanes and storm surge. | | |
| Responsible Entity: | Mayor and EMC | | |
| Losses avoided: | Coastal erosion, wildlife habitat, infrastructure, etc. | | |
| Cost Estimate: | 2,500,000 | Timeframe: | 48 months |
| Potential Funding Sources: | HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

| | | | |
|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Surfside Beach | Action Number: | B3 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Property Protection | | |
| Project Description: | Install hurricane shutters on city hall/court/police station. | | |
| Responsible Entity: | Mayor and EMC | | |
| Losses avoided: | Loss of municipal buildings, lives, essential documents, and equip | | |
| Cost Estimate: | 35,000 | Timeframe: | 12 months |
| Potential Funding Sources: | HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

| | | | |
|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Surfside Beach | Action Number: | B4 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms, Coastal Erosion | | |
| Project Title: | Protecting Shorelines | | |
| Project Description: | Develop and implement a shoreline protection program. | | |
| Responsible Entity: | Mayor and EMC | | |
| Losses avoided: | Natural wildlife habitat, property, shoreline | | |
| Cost Estimate: | 3,500,000 | Timeframe: | 24 months |
| Potential Funding Sources: | TX Coastal Coordination Council - TX Coastal Management Program, USACE- Emergency Rehabilitation of Flood Control Works | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|--|
| Jurisdiction: | Surfside Beach | Action Number: | B5 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms, Coastal Erosion | | |
| Project Title: | Natural Resource Protection | | |
| Project Description: | Acquisition of seaward property and re-establish stabilizing vegetation. | | |
| Responsible Entity: | Mayor and EMC | | |
| Losses avoided: | Life and property along the coast | | |
| Cost Estimate: | 1,000,000 | Timeframe: | 36 to 60 months |
| Potential Funding Sources: | HMGP, PDM Program, Flood Mitigation Assistance Program, HUD-Disaster Recovery Initiative, TX Coastal Coordination Council - TX | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

West Columbia

| | | | |
|---|--|----------------------------|------------------------------------|
| Jurisdiction: | West Columbia | Action Number: | C1 |
| Hazard(s) Addressed: | Flooding, Hurricane, Wildfire, Drought, Lightning, Heat Events, Hail, Winter Weather, Tornado, Dam and Levee Failure | | |
| Project Title: | Structure Hardening | | |
| Project Description: | Harden and reinforce critical facilities throughout the city: Purchase and install generators for all critical facilities, harden windows to withstand hurricane, tornado, and hail, and install irrigation system around foundations to prevent foundation cracking and breaking pipes. | | |
| Responsible Entity: | City Manager, EMC and Mayor | | |
| Losses avoided: | Reduce the risk to critical facilities and assets during a natural hazard event | | |
| Cost Estimate: | 2,500,000 | Timeframe: | 24-36 months |
| Potential Funding Sources: | HMGP, CDBG, PDM, FP&S Grants, Weatherization Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | West Columbia | Action Number: | C2 |
| Hazard(s) Addressed: | Floods, Hurricane, Tropical Storms, Drought, Heat Events, and Winter Storms | | |
| Project Title: | Upgrade water & maintain/Improve existing water storage capacity | | |
| Project Description: | Upgrade older water storage tanks throughout the city with newer and/or improvements to existing water storage tanks. | | |
| Responsible Entity: | Public Works Director, TCEQ and Mayor | | |
| Losses avoided: | Upgrading or maintaining water storage capacities to enable proper firefighting capabilities, to sufficiently handle potential breaks in water lines or the dripping of faucets during extreme cold, ample capacity for watering, misting stations and firefighting during drought conditions, and ample water storage to supply the community during any emergency that may increase the stay-at-home population, such as during COVID-19. | | |
| Cost Estimate: | \$3,500,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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| Jurisdiction: | West Columbia | Action Number: | C3 |
| Hazard(s) Addressed: | Floods, Hurricane, Tropical Storms, Severe Thunderstorms | | |
| Project Title: | Develop and implement a Master Drainage Plan for the City | | |
| Project Description: | This action proposes creating a drainage master plan for the City that will provide a comprehensive planning document that provides basic information and necessary guidance for the county-wide drainage system, including but not limited to an H&H study. | | |
| Responsible Entity: | City of West Columbia Mayor and Brazoria County EMC | | |
| Losses avoided: | Protection to property and life. | | |
| Cost Estimate: | \$100,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants such as FEMA BRIC, FEMA FMA, FEMA HMGP, CDBG-MIT | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|-----|
| Jurisdiction: | West Columbia | | Action Number: | C4 |
| Hazard(s) Addressed: | Floods, Hurricane, Tropical Storms, Severe Thunderstorms | | | |
| Project Title: | Highway Drainage and Evacuation Routes | | | |
| Project Description: | SH 36 (Columbia Dr.) drainage ditches to be widened and reshaped. Upgrade culverts to restore adequate drainage to prevent flooding, relocate and improve one lift station to minimize damage from potential flooding, and widening highway for evacuation of surrounding areas to include the addition of an overpass at SH 35 & SH36, project location is from Westview to City Limits. | | | |
| Responsible Entity: | TxDOT and City Manager | | | |
| Losses avoided: | Reduce the loss of property due to flooding and improve evacuation routes. | | | |
| Cost Estimate: | \$125,000,000 | Timeframe: | 60 months | |
| Potential Funding Sources: | TxDOT | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | West Columbia | | Action Number: | C5 |
| Hazard(s) Addressed: | Floods, Hurricane/Tropical Storms, Severe Thunderstorms | | | |
| Project Title: | Drainage Improvements | | | |
| Project Description: | Partner with local drainage district to maintain and improve drainage in and around the City. Widen and reshape drainage ditches and upgrade culverts to restore adequate drainage to mitigate flooding. | | | |
| Responsible Entity: | City Manager, Mayor, Brazoria County EMC and Brazoria Co. Drainage District No. 11 Director | | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | | |
| Cost Estimate: | \$5,000 | Timeframe: | As funding becomes available | |
| Potential Funding Sources: | Federal, State, County and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

Lake Jackson

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Lake Jackson | Action Number: | D1 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Dam/ Levee Failure | | |
| Project Title: | Jackson Oaks II Levee Service Road Repair | | |
| Project Description: | Repair service road/levee on north side of Jackson Oaks II subdivision to reduce the flooding of home and streets. | | |
| Responsible Entity: | Velasco Drainage District Director and City Manager | | |
| Losses avoided: | Reduce flood waters in streets and homes. | | |
| Cost Estimate: | 75,000 | Timeframe: | Nearing completion |
| Potential Funding Sources: | Local funds: Velasco Drainage will provide manpower and equipment and Lake Jackson will provide materials to bring the berm and service road back to its original height. | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Lake Jackson | Action Number: | D2 |
| Hazard(s) Addressed: | Hurricane/Tropical Storms, Lightning | | |
| Project Title: | Lightning Protection of Critical Facilities | | |
| Project Description: | Conduct a city-wide lightning vulnerability assessment for key infrastructure. Communications, fuel storage tanks and distribution, pump systems, wells and install surge protectors or other lightning protection for property. | | |
| Responsible Entity: | Public Works Director | | |
| Losses avoided: | Reduce risk to critical facilities and assets during a storm event. | | |
| Cost Estimate: | 25,000 | Timeframe: | 12 months |
| Potential Funding Sources: | Local Budget | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|--|
| Jurisdiction: | Lake Jackson | Action Number: | D3 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms, Tornado, Hail, Winter Weather | | |
| Project Title: | Protect Powerlines from winds and falling limbs | | |
| Project Description: | Remove or trim trees that pose a threat to power lines in the event of strong winds, winter weather, or hail. | | |
| Responsible Entity: | Public Works Director and Parks Department Director | | |
| Losses avoided: | Reduce risk to critical facilities and assets during storms. | | |
| Cost Estimate: | 300,000 | Timeframe: | 24-60 months |
| Potential Funding Sources: | City and Center Point funding of private contractors. Center Point has become more active in removing trees near power lines as part of their efforts to harden the system. The City would work on trees in parks and parkways near power lines. | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|--|
| Jurisdiction: | Lake Jackson | Action Number: | D4 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms, Tornado, Hail, Winter Weather | | |
| Project Title: | Shy Pond Drainage | | |
| Project Description: | Remove old, damaged drainage piping and restore the drainage system. | | |
| Responsible Entity: | Public Works Director and Parks Department Director | | |
| Losses avoided: | Reduce flood waters in the pond, streets, and homes | | |
| Cost Estimate: | \$1,500,000.00 | Timeframe: | 0-24 months |
| Potential Funding Sources: | City Funding | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|--|
| Jurisdiction: | Lake Jackson | Action Number: | D5 |
| Hazard(s) Addressed: | Drought | | |
| Project Title: | Harris Reservoir Expansion | | |
| Project Description: | Expand the reservoir in size to hold more water to ensure enough water during drought conditions. Shore up the riverbank to help prevent erosion. | | |
| Responsible Entity: | A collaboration: Dow Chemical, BWA, and the 7 local city's Mayors | | |
| Losses avoided: | Ensuring the area has enough water for drinking and other necessary needs | | |
| Cost Estimate: | 750,000,000.00 | Timeframe: | 0-60 months |
| Potential Funding Sources: | All partners will share the cost. Lake Jackson's portion in 15% | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|--|
| Jurisdiction: | Lake Jackson | Action Number: | D6 |
| Hazard(s) Addressed: | Flooding | | |
| Project Title: | City of Lake Jackson Flood Study | | |
| Project Description: | Have a flood study performed for the City of Lake Jackson for evaluation purposes, to identify areas of concern for future hazard mitigation. | | |
| Responsible Entity: | City of Lake Jackson Mayor and City Manager | | |
| Losses avoided: | Flooding | | |
| Cost Estimate: | 6,000,000.00 | Timeframe: | 0-60 |
| Potential Funding Sources: | City Funds & Grants | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|--|
| Jurisdiction: | Lake Jackson | Action Number: | D7 |
| Hazard(s) Addressed: | Flooding | | |
| Project Title: | Eastside Drainage | | |
| Project Description: | Flood mitigation for the Eastside Drainage area of Lake Jackson. Restore ditches, resize culverts, slop panels, prevent erosion. Area is roughly south of Oyster Creek Drive, west of Dixie Drive and Flag Lake Drive, and east of Sycamore, to Highway 332. | | |
| Responsible Entity: | Engineering Director and Public Works Director | | |
| Losses avoided: | Reduce flood waters in streets and homes | | |
| Cost Estimate: | \$15,000,000.00 | Timeframe: | 24-60 months |
| Potential Funding Sources: | City funds and GLO funding | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|--|
| Jurisdiction: | Lake Jackson | Action Number: | D8 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms, Tornadoes, Extreme Heat, Winter Weather, Electrical Infrastructure Failure. | | |
| Project Title: | Standby Generators for Critical Infrastructure Sites | | |
| Project Description: | 9 standby generators at 9 city critical infrastructure sites. Generator sizes are specific for each site. This includes engineering and installation to completion. | | |
| Responsible Entity: | City of Lake Jackson Mayor, City Manager and EMC | | |
| Losses avoided: | During any sustained power outages, this project would ensure that the city will be able to maintain the critical infrastructure sites to operate in an emergency state. This includes generators needed for the Municipal Water System, thereby providing power to maintain pumps and pressure during a sustained power outage. The generators for the water system are required to meet Senate Bill 3 | | |
| Cost Estimate: | 5,000,000.00 | Timeframe: | 6 to 36 months |
| Potential Funding Sources: | HMPG & City Funds | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|--|
| Jurisdiction: | Lake Jackson | Action Number: | D9 |
| Hazard(s) Addressed: | Flooding | | |
| Project Title: | Moss-Chestnut Street Drainage Outfall | | |
| Project Description: | Flood mitigation for the Moss-Chestnut Street drainage area of Lake Jackson. The mitigation project includes the replacement of roadway crossings, enlarging channels, resizing culverts, and installing slope paving for erosion control for pollution prevention plan. The area is roughly south of Oyster Creek Drive, west of Dixie Drive, and east of Sycamore. | | |
| Responsible Entity: | Engineering Department Director and Public Works Director | | |
| Losses avoided: | Reduce flood waters in streets and homes | | |
| Cost Estimate: | \$11,000,000.00, which includes a cost contingency | Timeframe: | 24-60 months |
| Potential Funding Sources: | City funds, Bonds, and HMGP | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

Holiday Lakes

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Holiday Lakes | Action Number: | E1 |
| Hazard(s) Addressed: | Wildfire | | |
| Project Title: | Becoming an active participant in Firewise USA program, and implement the program in the community. | | |
| Project Description: | The City will become an active participant in the Firewise USA program and encourage local neighborhoods to join the program as well. | | |
| Responsible Entity: | Mayor and city council | | |
| Losses avoided: | Property and residents throughout the city | | |
| Cost Estimate: | 4,000 | Timeframe: | 24 Months |
| Potential Funding Sources: | HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

Velasco Drainage District

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Velasco Drainage District | Action Number: | F1 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Structural Project | | |
| Project Description: | Construct a 75-acre detention pond south of the Sea Center adjacent to the Clute/Lake Jackson Drainage Channel. Provide 800,000 gallons per minute of diverted flood water into pond. | | |
| Responsible Entity: | Velasco Drainage District Director | | |
| Losses avoided: | Mitigated damage of homes, businesses, and public facilities of Lake Jackson and Clute | | |
| Cost Estimate: | 2,000,000 | Timeframe: | 36-60 months |
| Potential Funding Sources: | TWDB Small Flood Control Projects, NRCS Watershed Protection and Flood Prevention Program, Disaster Relief/Urgent needs Fund for CDBG, PDM, HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Velasco Drainage District | Action Number: | F2 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Structural Project | | |
| Project Description: | Construct detention pond in the Clute/Lake Jackson watershed. Propose to build near the East Levee Pump Station adjacent to the Clute/Lake Jackson Pump Station. | | |
| Responsible Entity: | Velasco Drainage District Director | | |
| Losses avoided: | Mitigated damage of homes, businesses, and public facilities of Lake Jackson and Clute | | |
| Cost Estimate: | 2,000,000 | Timeframe: | 24-36 months |
| Potential Funding Sources: | TWDB Small Flood Control Projects, NRCS Watershed Protection and Flood Prevention Program, Disaster Relief/Urgent needs Fund or CDBG, PDM, HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | Velasco Drainage District | | Action Number: | F3 |
| Hazard(s) Addressed: | Floods | | | |
| Project Title: | Property Protection, Structural Project | | | |
| Project Description: | Purchase and install additional pump equipment in the East Levee Pump Station. Would provide an additional 780,000 gallons capacity per minute stormwater infrastructure capacity to the Clute/Lake Jackson watershed. | | | |
| Responsible Entity: | Velasco Drainage District Director | | | |
| Losses avoided: | Flooding of Dow Chemical & Other Industrial & Residential areas | | | |
| Cost Estimate: | 4,500,000 | Timeframe: | 24-36 months | |
| Potential Funding Sources: | TWDB, Small Flood Control Projects, NRCS Watershed Protection and Flood Prevention Program, Disaster Relief/Urgent Needs Fund for CDBG, PDM, HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | Velasco Drainage District | | Action Number: | F4 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | | |
| Project Title: | Property Protection | | | |
| Project Description: | Project will clear obstacles, widen and reshape ditches, and upgrade culverts to restore adequate drainage to mitigate flooding throughout the entire drainage district. | | | |
| Responsible Entity: | Velasco Board of Supervisors and Drainage District Director | | | |
| Losses avoided: | Homes, business, and public facilities | | | |
| Cost Estimate: | 2,500,000 | Timeframe: | 48 months | |
| Potential Funding Sources: | HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Velasco Drainage District | Action Number: | F5 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms | | |
| Project Title: | Hurricane resistant powerline poles | | |
| Project Description: | All new power line poles installed within the district will be resistant to hurricane winds. | | |
| Responsible Entity: | Engineering Department Director | | |
| Losses avoided: | Homes, business, and public facilities | | |
| Cost Estimate: | 120,000 | Timeframe: | 36 months |
| Potential Funding Sources: | HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

Manvel

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G1 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Structural Project | | |
| Project Description: | Street drainage improvements: widen and reshape ditches, and upgrade culverts to restore adequate drainage to mitigate flooding in Manvel neighborhoods. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 100,000 | Timeframe: | 48 months |
| Potential Funding Sources: | FEMA-HMGP, PDM, FMA, City, County, Drainage Districts | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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| Jurisdiction: | Manvel | Action Number: | G2 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Structural Project | | |
| Project Description: | All road drainage improvements, including storm sewer rehabilitation and ditch deepening. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 500,000 | Timeframe: | 48 months |
| Potential Funding Sources: | FEMA-HMGP, PDM, FMA, City, County, Drainage Districts | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G3 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Structural Project | | |
| Project Description: | State Highway 6 drainage improvements, including storm sewer upgrades to meet current capacities, ditch deepening, and sub regional detention ponds. Project will also widen and reshape ditches, and upgrade culverts. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 3,000,000 | Timeframe: | 48 months |
| Potential Funding Sources: | FEMA-HMGP, PDM, FMA, City, County, Drainage Districts, Gulf Coast Water Authority TXDOT | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G4 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Structural Project | | |
| Project Description: | Gates Loop subdivision drainage improvements including deepening and widening ditches around Gates Loop and Sandy Point Rd. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 100,000 | Timeframe: | 12 months |
| Potential Funding Sources: | FEMA-HMGP, PDM, FMA, City, County, Drainage Districts | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G5 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Structural Project | | |
| Project Description: | Reed Lane, Sherri Circle, Booth Plummer Road and 1128 South of Hwy 6, drainage improvements, including storm sewer rehabilitation and ditch deepening. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 150,000 | Timeframe: | 12 months |
| Potential Funding Sources: | FEMA-HMGP, PDM, FMA, City, County, Drainage Districts | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G6 |
| Hazard(s) Addressed: | Floods, Hurricanes /Tropical Storms | | |
| Project Title: | Public Education and Planning | | |
| Project Description: | Improve GIS database to include repetitive loss properties areas and flooded structure data. Data to be used for future drainage infrastructure planning and to provide outreach and emergency services to residents in substantial risk zones. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 20,000 | Timeframe: | 12 months |
| Potential Funding Sources: | FEMA-HMGP, PDM, FMA, SRL, City, County, Drainage Districts | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G7 |
| Hazard(s) Addressed: | Wildfire and Drought | | |
| Project Title: | Public Education | | |
| Project Description: | Conduct wildfire outreach and education campaign. Make presentations at civic club meetings and local schools. Work with Texas A&M Forest Service to develop and implement a Wild Land Urban Interface loss reduction plan. | | |
| Responsible Entity: | Mayor, City Manager and County EMC | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 10,000 | Timeframe: | 6 months |
| Potential Funding Sources: | PGM, HMGP, Texas Forest Service | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G8 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Property Protection | | |
| Project Description: | Acquire Repetitive Loss (RL) and Severe Repetitive Loss (SRL) properties in the 100-year flood plain, as identified by FEMA and NFIP | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 1,700,000 | Timeframe: | 60 months |
| Potential Funding Sources: | FEMA-HMGP, PDM, FMA, SRL, City, County, Drainage Districts | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G9 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | City Ordinance | | |
| Project Description: | The city shall adopt a land use ordinance which requires any structure within the 100-year floodplain to be elevated 2 feet above base flood elevation. | | |
| Responsible Entity: | City council, Mayor and City Manager | | |
| Losses avoided: | Homes, businesses, and residents within the 100-year flood plain | | |
| Cost Estimate: | 5,000 | Timeframe: | 6 months |
| Potential Funding Sources: | HGMP, current city and staff time | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G10 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Adopting land-use ordinance | | |
| Project Description: | The city shall adopt a land-use ordinance which prohibits building residential or commercial structures in the 100-year floodplain | | |
| Responsible Entity: | City Manager, City Council, Office of Code Enforcement Director | | |
| Losses avoided: | Future buildings and infrastructure that may have been built within the 100-year flood plain. | | |
| Cost Estimate: | 5,000 | Timeframe: | 12 months |
| Potential Funding Sources: | Current city budget and salary, HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G11 |
| Hazard(s) Addressed: | Wildfire | | |
| Project Title: | Education and Outreach: Firewise USA program | | |
| Project Description: | The City will become an active participant in the Firewise USA program and implement a Firewise plan and outreach campaign in the community. | | |
| Responsible Entity: | Mayor and city council | | |
| Losses avoided: | Property and residents throughout the city | | |
| Cost Estimate: | 4,000 | Timeframe: | 12 months |
| Potential Funding Sources: | HMP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G12 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms | | |
| Project Title: | Hurricane resistant powerline poles | | |
| Project Description: | All new power line poles installed within the jurisdiction will be wind resistant to Hurricane grade winds. | | |
| Responsible Entity: | Engineering Department Director | | |
| Losses avoided: | Homes, businesses, and public facilities | | |
| Cost Estimate: | 250,000 | Timeframe: | 48 months |
| Potential Funding Sources: | HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G13 |
| Hazard(s) Addressed: | Hail, Hurricanes, Winter Storms | | |
| Project Title: | Educate public of home improvement opportunities | | |
| Project Description: | Educate elderly, low-income residents of grant funding opportunities to insulate the foundation of pier and beam homes, and update homes to withstand hurricane force winds and hail. | | |
| Responsible Entity: | County EMC, partnering jurisdictions mayors and city councils, code enforcement and building department Manager | | |
| Losses avoided: | Life, health, and safety of vulnerable populations, and property damage | | |
| Cost Estimate: | 2,500 | Timeframe: | 6 months |
| Potential Funding Sources: | HMGP, USDA Home Repair Grant | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G14 |
| Hazard(s) Addressed: | Wildfire | | |
| Project Title: | Reducing underbrush for wildfire prevention | | |
| Project Description: | The city will work to reduce underbrush on identified wild-urban interface areas through techniques such as using skid steers or goats. | | |
| Responsible Entity: | County EMC, Mayor and City Manager | | |
| Losses avoided: | Current and future buildings and residents in wild-urban interface areas | | |
| Cost Estimate: | 500,000 | Timeframe: | 12-24 months |
| Potential Funding Sources: | HMGP, local budget and current salary, fire prevention and safety grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G15 |
| Hazard(s) Addressed: | Tornado | | |
| Project Title: | Tornado mitigation through rebate program | | |
| Project Description: | The city will develop a rebate program for building owners who install straps, structural bracings, window shutters, or interlocking roof shingles in new construction or when renovating residences or businesses. | | |
| Responsible Entity: | City Manager, Office of Code Enforcement Director | | |
| Losses avoided: | Resident, homes, business, and local facilities | | |
| Cost Estimate: | 5,000 | Timeframe: | 3 months |
| Potential Funding Sources: | Current city budget and salary, HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G16 |
| Hazard(s) Addressed: | Drought, Expansive Soils | | |
| Project Title: | Structural and foundation protection | | |
| Project Description: | Install moisture sensing irrigation systems at all existing and future county, local and critical facilities. Irrigation systems automatically water building to reduce the impacts of shrinking and swelling soils during drought. | | |
| Responsible Entity: | Facilities and building department Director | | |
| Losses avoided: | Structural foundations and anticipated cost of repairs | | |
| Cost Estimate: | 175,000 | Timeframe: | 36-48 months |
| Potential Funding Sources: | Local budgets and HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Manvel | Action Number: | G17 |
| Hazard(s) Addressed: | Dam/ Levee Failure | | |
| Project Title: | Structural | | |
| Project Description: | Incorporate routine repairs and structural renovation efforts of dams and levee into capital improvement plans. | | |
| Responsible Entity: | County EMC, partnering jurisdictions, mayors, city councils, capital improvement boards, engineering department Director | | |
| Losses avoided: | Lives, homes, businesses, critical assets, public facilities, and infrastructure destruction in the event of dam or levee failure. | | |
| Cost Estimate: | 1,500,000 | Timeframe: | 24-36 months |
| Potential Funding Sources: | HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

Brazoria

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H1 |
| Hazard(s) Addressed: | Flooding, Hurricane, Wildfire, Lightning, Heat Events, Hail, Winter Weather, Tornado, Dam and Levee Failure | | |
| Project Title: | Communication and Emergency Services | | |
| Project Description: | Purchase radio/ communication equipment to improve communication leading up to and during natural disasters. Equipment will be protected against electrical surges caused by lightning, and elevated 4' above base flood level to protect equipment from flooding. | | |
| Responsible Entity: | Police Chief, Fire Marshall, Mayor, City Manager and Public Works Director | | |
| Losses avoided: | Residents (loss of life) and existing and new properties | | |
| Cost Estimate: | 120,000 | Timeframe: | 36-60 months |
| Potential Funding Sources: | Federal, State, Local, HMGP, PDM, FEMA Emergency Operations Center Funding, FEMA Emergency Management Performance Grant, USDA Rural Utilities Service Weather Radio Grant Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H2 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Prevention | | |
| Project Description: | Develop and implement a drainage improvement program: Widen and reshape city owned drainage ditches, and upgrade culverts to restore adequate drainage to mitigate flooding, and increase size of culverts, including box culverts. | | |
| Responsible Entity: | Public works department Director | | |
| Losses avoided: | Flooding of homes and roads. | | |
| Cost Estimate: | 100,000 | Timeframe: | 12-24 months |
| Potential Funding Sources: | Drainage district funds available, Local funds, TWDB-Clean Water Development Board (Development Fund, USDA NRCA Watershed Protection and Flood Prevention Program, EPA-NPS Grant Program, 406 Public Assistance Program (following federal disaster declaration | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H3 |
| Hazard(s) Addressed: | Flooding, Hurricane, Wildfire, Lightning, Heat Events, Hail, Winter Weather, Tornado, Dam and Levee Failure | | |
| Project Title: | Property Protection | | |
| Project Description: | Retrofit Emergency Operations Center at City Hall. Add storm protection to glass doors and windows at EOC, Police Station, and Fire Station. Install network connection and Emergency Dispatch radio in EOC. | | |
| Responsible Entity: | City EMC, Mayor and City Manager | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 75,000 | Timeframe: | 12 months |
| Potential Funding Sources: | City funds, FEMA-HMGP and PDM program Federal, State, Local, FEMA-Emergency Management Performance Grant, Dept. of Justice-State Homeland Security Program, FEMA All Hazards Operational Planning, PDM, HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|--|
| Jurisdiction: | Brazoria | Action Number: | H4 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms and Wildfire | | |
| Project Title: | Emergency Services | | |
| Project Description: | Replace aging Fire/EMS chief/ EMS Command and Emergency Management Staff command vehicles that are more than 100,000 miles or older than seven years old. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 150,000 | Timeframe: | 12 months |
| Potential Funding Sources: | Federal, state, local, FEMA-Assistance to Fire Fighters Grant, FEMA-All Hazards Operational Planning | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H5 |
| Hazard(s) Addressed: | All Hazards | | |
| Project Title: | Emergency Services | | |
| Project Description: | Upgrade Brazoria Life Flight Landing Zone by replacing fence, landing surface and install pavement markings; improve drainage system and replace electrical system. | | |
| Responsible Entity: | City EMC, Mayor and City Manager | | |
| Losses avoided: | Loss of life and Continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$ 250,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, FEMA-Emergency Management Performance Grant, Homeland Security, PDM, and HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H6 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms and Hail | | |
| Project Title: | Property Protection | | |
| Project Description: | Install hurricane shutters on City Hall, fire station and police department. | | |
| Responsible Entity: | City EMC, Mayor and City Manager | | |
| Losses avoided: | Prevents the need for expensive repairs, the loss of power, communication, and ability to provide emergency services. | | |
| Cost Estimate: | 40,000 | Timeframe: | 12-24 months |
| Potential Funding Sources: | USACE-Small Flood Control Projects, USDA NRCS-Emergency Watershed Protection Agency, TWDB-Clean Water State Revolving Fund, TWDB (Development Fund II)-Texas Water Development Fund, USDA NRCS-Watershed Protection and Flood Prevention Program, EPA-NPS Grant | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H7 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Tornado, Hail, Heat Events, Winter Storms | | |
| Project Title: | Public Information and Education | | |
| Project Description: | Develop severe weather warning system to alert the public of impending natural disasters. | | |
| Responsible Entity: | Police Chief and Fire Marshall | | |
| Losses avoided: | Loss of life and property protection | | |
| Cost Estimate: | 95,000 | Timeframe: | 6 months |
| Potential Funding Sources: | USDA-Rural Utilities Service-Weather Radio Grant Program, DOJ-State Homeland Security Program, National Weather Service, HMGP, PDM, FEMA-Emergency Operations Center Funding, FEMA-Emergency Management Performance Grant, USDA-Environmental Quality Incentive | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H8 |
| Hazard(s) Addressed: | Floods and Wildfire | | |
| Project Title: | Emergency Services | | |
| Project Description: | Purchase street sign and barricades to block off streets for evacuation | | |
| Responsible Entity: | Police Chief and City EMC | | |
| Losses avoided: | Flooding, Homes lost, loss of life | | |
| Cost Estimate: | 2,500 | Timeframe: | 6 months |
| Potential Funding Sources: | Local funds | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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| Jurisdiction: | Brazoria | Action Number: | H9 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Property Protection | | |
| Project Description: | Install security system for City service center. | | |
| Responsible Entity: | Public Works Department Director | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 5,000 | Timeframe: | 12-24 months |
| Potential Funding Sources: | FEMA-Emergency Management Performance Grant, Dept. of Justice-State Homeland Security Program, FEMA-All Hazards Operational Planning | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H10 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire | | |
| Project Title: | Emergency Services | | |
| Project Description: | Purchase rescue vehicle | | |
| Responsible Entity: | Fire Marshall | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 250,000 | Timeframe: | 6 months |
| Potential Funding Sources: | FEMA-Assistance to Firefighter's Grant | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|--|
| Jurisdiction: | Brazoria | Action Number: | H11 |
| Hazard(s) Addressed: | Floods, Wildfire, Tornado | | |
| Project Title: | Emergency Services | | |
| Project Description: | Purchase emergency medical service, fire and police rescue equipment. | | |
| Responsible Entity: | Police Chief, Fire Marshall, EMS Director, Mayor and City Manager | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 50,000 | Timeframe: | 6 months |
| Potential Funding Sources: | DOJ-State Homeland Security Program, FEMA-Assistance to Firefighter's Grant | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H12 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Tornado | | |
| Project Title: | Public Information and Awareness, Emergency Services | | |
| Project Description: | Develop evacuation plan. | | |
| Responsible Entity: | Police Chief, Fire Marshall and Public Works Department Director | | |
| Losses avoided: | Residents and existing and new properties | | |
| Cost Estimate: | 10,000 | Timeframe: | 6 months |
| Potential Funding Sources: | PDM Program, FEMA Emergency Management Performance Grant, Flood Mitigation Assistance Program, HMGP, USDA Environmental Quality Incentives Program, FEMA-All Hazards Operational Planning, FEMA Hazardous Materials Assistance Program, FEMA Fire Management As | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H13 |
| Hazard(s) Addressed: | Wildfire | | |
| Project Title: | Becoming an active participant in Firewise USA program | | |
| Project Description: | The City will become an active participant in the Firewise USA program and implement a Firewise plan and outreach campaign in the community. | | |
| Responsible Entity: | Mayor and city council | | |
| Losses avoided: | Property and residents throughout the city. | | |
| Cost Estimate: | 4,000 | Timeframe: | 12 months |
| Potential Funding Sources: | HMP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H14 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Adopting land-use ordinance | | |
| Project Description: | The city shall adopt a land-use ordinance which prohibits building residential or commercial structures in the 100-year floodplain. | | |
| Responsible Entity: | City manager, City Council, Office of Code Enforcement Director | | |
| Losses avoided: | Future buildings and infrastructure that may have been built within the 100-year floodplain. | | |
| Cost Estimate: | 5,000 | Timeframe: | 4 months |
| Potential Funding Sources: | Current city budget and salary, HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H15 |
| Hazard(s) Addressed: | Tornado | | |
| Project Title: | Tornado mitigation through rebate program | | |
| Project Description: | The city will develop a rebate program for building owners who install straps, structural bracings, window shutters, or interlocking roof shingles in new construction or when renovating residences or businesses | | |
| Responsible Entity: | City Manager, Office of Code Enforcement Director | | |
| Losses avoided: | Residents, homes, business, and local facilities | | |
| Cost Estimate: | 5,000 | Timeframe: | 3 months |
| Potential Funding Sources: | Current city budget and salary, HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H16 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storm | | |
| Project Title: | Hurricane resistant powerline poles | | |
| Project Description: | All new power line poles installed within the jurisdiction will be wind resistant to Hurricane grade winds. | | |
| Responsible Entity: | Engineering Department Director | | |
| Losses avoided: | Homes, businesses, and public facilities | | |
| Cost Estimate: | 120,000 | Timeframe: | 36 Months |
| Potential Funding Sources: | HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H17 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms Hail and Winter Storms | | |
| Project Title: | Educate public of home improvement opportunities | | |
| Project Description: | Educate elderly, low-income residents of grant funding opportunities to insulate the foundation of pier and beam homes, and update homes to withstand hurricane force winds and hail. | | |
| Responsible Entity: | County EMC, partnering jurisdictions mayors and city councils, code of enforcement and building department Director | | |
| Losses avoided: | Life, health, and safety of vulnerable populations, and property damage. | | |
| Cost Estimate: | 2,500 | Timeframe: | 6 months |
| Potential Funding Sources: | HMGP, USDA Home Repair Grant | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H18 |
| Hazard(s) Addressed: | Dam/ Levee Failure | | |
| Project Title: | Structural | | |
| Project Description: | Incorporate routine repairs and structural renovation efforts of dams and levee into capital improvement plans. | | |
| Responsible Entity: | County EMC, partnering jurisdictions, mayors, city councils, capital improvement boards, engineering department Director | | |
| Losses avoided: | Lives, homes, businesses, critical assets, public facilities, and infrastructure destruction in the event of dam or levee failure. | | |
| Cost Estimate: | 1,500,000 | Timeframe: | 24-36 months |
| Potential Funding Sources: | HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H19 |
| Hazard(s) Addressed: | All Hazards | | |
| Project Title: | Emergency Services | | |
| Project Description: | Construct a new Multi Jurisdiction Emergency Services building to house Fire Station, EMS, Police, and EOC. | | |
| Responsible Entity: | Mayor and City Manager and Emergency Services District Director | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$3,000,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | FEMA EOC Funding & Performance Grant, HMPG, and BRIC Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H20 |
| Hazard(s) Addressed: | Flooding, Hurricane, and Tornado | | |
| Project Title: | | | |
| Project Description: | Construct a new City Hall to withstand Hurricane Force winds and continue city operations after a disaster event | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Continuity of services during and after natural disasters and/or hazards. | | |
| Cost Estimate: | \$2,000,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, TWDB, HMPG, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | City of Brazoria, Brazoria County, West of the Brazos DD #11 | Action Number: | H21 |
| Hazard(s) Addressed: | Floods, Hurricanes, Tropical Storms | | |
| Project Title: | Implement Drainage Improvements to Outfall Channels | | |
| Project Description: | Widen and reshape channels, removal of trees and vegetation, and upgrade culverts to restore conveyance in channels and ditches to mitigate flooding. | | |
| Responsible Entity: | Mayor and City Manager and Drainage District #11 Director | | |
| Partners: | City of Brazoria, Brazoria County, and West of the Brazos DD #11 | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$2,000,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, TWDB, HMGP, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | City of Brazoria | Action Number: | H22 |
| Hazard(s) Addressed: | Floods, Hurricanes, Tropical Storms | | |
| Project Title: | Magnolia Subdivision Drainage Improvements | | |
| Project Description: | Construct detention pond, channel improvements, and upgrade culverts | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$1,750,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, TWDB, HMGP, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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| Jurisdiction: | Brazoria and West of the Brazos DD #11 | Action Number: | H23 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Implement Storm Sewer Master Plan | | |
| Project Description: | Conduct a drainage study to determine additional improvements to the drainage channels and conveyance restrictions. Using the study, the city would implement projects to widen and reshape channels and upgrade culverts to restore adequate conveyance to mitigate flooding. | | |
| Responsible Entity: | Mayor and City Manager and Drainage District #11 Director | | |
| Partners: | City of Brazoria and West of the Brazos DD #11 | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$500,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, TWDB, HMGP, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H24 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Garden Acres Subdivision Drainage Improvements | | |
| Project Description: | Construct detention pond, channel and ditch improvements, and upgrade culverts | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$1,950,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, TWDB, HMGP, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H25 |
| Hazard(s) Addressed: | Drought and Wildfire | | |
| Project Title: | Construct additional EST, Replace GST | | |
| Project Description: | Conduct an additional EST and replace 400,000 gal GST for additional storage to be used during a drought and fire protection to homes and businesses. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Loss of life; continuity of services during and after natural disasters and/or hazards. | | |
| Cost Estimate: | \$2,000,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, TWDB, HMGP, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | City of Brazoria | Action Number: | H26 |
| Hazard(s) Addressed: | Expansive Soils | | |
| Project Title: | Waterline Replacement Program | | |
| Project Description: | Replace old cast iron waterlines, service lines, fire hydrants, and valves throughout the city to provide adequate water during droughts, fire protection, and promote water conservation. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Loss of life; continuity of services during and after natural disasters and/or hazards. | | |
| Cost Estimate: | \$2,500,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, TWDB, HMGP, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H27 |
| Hazard(s) Addressed: | Flooding, Hurricanes, and Tropical Storms | | |
| Project Title: | Sanitary Sewer Collections System Rehab | | |
| Project Description: | Replace brick manholes, clay & concrete sewer mains, and service lines with PVC to eliminate infiltration/inflow of water into sewer system thereby preventing overflows of sewer into rivers and streams. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Continuity of services during natural disasters and/or hazards and protecting the environment. | | |
| Cost Estimate: | \$12,000,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, TWDB, HMGP, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | City of Brazoria | Action Number: | H28 |
| Hazard(s) Addressed: | Flooding, Hurricanes, and Tropical Storms | | |
| Project Title: | Lift Station Improvements | | |
| Project Description: | Rehabilitate Lift Station pumps, electrical, reline wet wells to prevent water intrusion during events and maintain pumping capacity and protect the environment. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Continuity of services during and after natural disasters and/or hazards. | | |
| Cost Estimate: | \$3,500,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, TWDB, HMGP, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H29 |
| Hazard(s) Addressed: | Floods, Hurricanes, & Tropical Storms | | |
| Project Title: | Sanitary Sewer I&I and Capacity Study | | |
| Project Description: | Conduct smoke testing, physical manhole inspections and GIS mapping of the system. Conduct a capacity study to ensure orderly development that would not impact existing system. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Continuity of services during natural disasters and/or hazards and orderly development. | | |
| Cost Estimate: | \$500,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H30 |
| Hazard(s) Addressed: | All Hazards | | |
| Project Title: | New Public Works Facility | | |
| Project Description: | Construct new Public Works facility to withstand hurricane force winds in order for employees to respond during and after a disaster hits. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Loss of life; continuity of services during and after natural disasters and/or hazards. | | |
| Cost Estimate: | \$1,000,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H31 |
| Hazard(s) Addressed: | Floods, Hurricanes, Tropical Storms & Winter Storms | | |
| Project Title: | Lift Station Rehabilitation | | |
| Project Description: | Rehabilitate 11 Lift Stations to maintain operability during events by upgrading electrical controls and pumps, seal coat inside wet wells, or upsizing lift stations. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Continuity of services during natural disasters and/or hazards and orderly development. | | |
| Cost Estimate: | \$1,000,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H32 |
| Hazard(s) Addressed: | Wildfire, Drought, & Heat Events | | |
| Project Title: | Fire Hydrant Inspection, Repairing & Replacement | | |
| Project Description: | Inspect all fire hydrants for operability and replace outdated hydrants to maintain adequate flow to fight fires; install new fire hydrants where fire protection is lacking. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Loss of life; continuity of services during and after natural disasters and/or hazards. | | |
| Cost Estimate: | \$500,000, | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H33 |
| Hazard(s) Addressed: | All Hazards | | |
| Project Title: | Property Protection | | |
| Project Description: | Install security system for City Service center and Fire Stations | | |
| Responsible Entity: | Public Works Director and Fire Marshall | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$ 25,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H34 |
| Hazard(s) Addressed: | Floods, Hurricanes, Tropical Storms | | |
| Project Title: | Emergency Services | | |
| Project Description: | Purchase a high-water rescue vehicle | | |
| Responsible Entity: | Police Chief and Fire Marshall | | |
| Losses avoided: | Loss of life during natural disasters and/or hazards. | | |
| Cost Estimate: | \$195,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants, Texas Forest Service | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H35 |
| Hazard(s) Addressed: | All Hazards | | |
| Project Title: | Property Protection | | |
| Project Description: | Install storm protection to glass doors and windows, hurricane shutters at EOC, Police Station, Fire Station and auxiliary building at FS #2 | | |
| Responsible Entity: | City EMC | | |
| Losses avoided: | Continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$ 125,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, FEMA-Emergency Management Performance Grant, Homeland Security, PDM, and HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria | Action Number: | H36 |
| Hazard(s) Addressed: | Floods, Hurricanes, Tropical Storms, Winter Storm, Hail, and Lightning | | |
| Project Title: | Emergency Services | | |
| Project Description: | Purchase back-up generators for all critical facilities and Fire Stations | | |
| Responsible Entity: | Public Works Director and Fire Marshall | | |
| Losses avoided: | Continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$300,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants, Texas Forest Service | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

Hillcrest Village

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Hillcrest Village | Action Number: | I1 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Tornado, Drought, Heat Events, Hail, and Winter Storms, Expansive Soils | | |
| Project Title: | Emergency Management Services | | |
| Project Description: | Develop an outreach website and online notification system for residents to obtain Emergency information as well as informing the public of available programs to assist them in hazardous situations. | | |
| Responsible Entity: | Emergency Management Coordinator | | |
| Losses avoided: | Dangerous situations avoided due to the lack of information by the residents especially the elderly and low income. | | |
| Cost Estimate: | 5,000 | Timeframe: | 24 months |
| Potential Funding Sources: | Local Budgets. | Benefit-Cost Ratio: | Less than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Hillcrest Village | Action Number: | I2 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Tornado, Heat Events, Hail, and Winter Storms | | |
| Project Title: | Emergency Management Services | | |
| Project Description: | Purchase and install backup 60KW generator to power Emergency Operations Command Center during power outages. | | |
| Responsible Entity: | Emergency Management Coordinator | | |
| Losses avoided: | Loss of life due to the incapacity to respond during emergency situations. | | |
| Cost Estimate: | 50,000 | Timeframe: | 24 months |
| Potential Funding Sources: | Local Budgets. | Benefit-Cost Ratio: | Less than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Hillcrest Village | Action Number: | I3 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Flood Mitigation | | |
| Project Description: | Partner with local Drainage District to widen and reshape drainage ditches, and upgrade culverts to restore adequate drainage to mitigate flooding. | | |
| Responsible Entity: | Public Works Director and Velasco Drainage District Director | | |
| Losses avoided: | Repairs to homes flooded due to improper drainage. | | |
| Cost Estimate: | 5,000 | Timeframe: | 12 months |
| Potential Funding Sources: | Local Budgets. | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Hillcrest Village | Action Number: | I4 |
| Hazard(s) Addressed: | Wildfire, Drought, and Heat Events | | |
| Project Title: | Fire Mitigation | | |
| Project Description: | Replace outdated fire Hydrants and associated system requirements with upgraded equipment. | | |
| Responsible Entity: | Public Works Director | | |
| Losses avoided: | Repairs to city structures and homes flooded due to improper drainage. | | |
| Cost Estimate: | 100,000 | Timeframe: | 36 months |
| Potential Funding Sources: | Local Budgets. | Benefit-Cost Ratio: | Less than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Hillcrest Village | Action Number: | I5 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Flood Mitigation | | |
| Project Description: | Conduct an engineering survey to establish proper drainage for 24 Homes in the Flood Zone. | | |
| Responsible Entity: | Public Works Director | | |
| Losses avoided: | Repairs to city structures and homes flooded due to improper drainage. | | |
| Cost Estimate: | 5,000 | Timeframe: | 12 months |
| Potential Funding Sources: | Local Budgets. | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|--|
| Jurisdiction: | Hillcrest Village | Action Number: | I6 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Flood Mitigation | | |
| Project Description: | Purchase additional land for retention pond construction to mitigate flooding in flood zones. | | |
| Responsible Entity: | Emergency Management Coordinator | | |
| Losses avoided: | Repairs to homes and city structures after flooding. | | |
| Cost Estimate: | 250,000 | Timeframe: | 72 months |
| Potential Funding Sources: | Local, State and Federal Grants. | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

Clute

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Clute | Action Number: | J1 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Waste water treatment plant | | |
| Project Description: | Replace the old generator unit with a new unit at the waste water treatment plant. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | During any power outages, this would assure that the waste water treatment plant would continue to operate and avoid sewer back up. This plant serves Clute; Richwood | | |
| Cost Estimate: | 225,000 | Timeframe: | 36 to 48 months |
| Potential Funding Sources: | HMPG | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Clute | Action Number: | J2 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Infrastructure | | |
| Project Description: | Deepen Velasco drainage District ditch between Lake Bend Ramp; Mammoth Lake, Lakeview, College park | | |
| Responsible Entity: | Mayor and City Manager, Velasco drainage District Director | | |
| Losses avoided: | Clute Ramp; Lake Jackson subdivision flooding | | |
| Cost Estimate: | 1,500,000 | Timeframe: | 24 to 36 months |
| Potential Funding Sources: | HMPG | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Clute | Action Number: | J3 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Refurbish Temple Ditch | | |
| Project Description: | Refurbish Temple Ditch from Plantation to SH332, Deepen, widen, replace culverts and Clean. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Temple ditch is one of the city's main ditch for drainage especially during a storm or heavy rain. | | |
| Cost Estimate: | 750,000 | Timeframe: | 12 to 24 months |
| Potential Funding Sources: | HMPG | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Clute | Action Number: | J4 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Deepen VDD ditch behind high school | | |
| Project Description: | Deepen Velasco drainage district ditch behind the Brazos wood high school to Lake Bend outfall | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | This ditch drains both Lake Jackson and Clute during heavy rains or storms. This would avoid subdivisions in both cities from flooding. | | |
| Cost Estimate: | 350,000 | Timeframe: | 12 months |
| Potential Funding Sources: | HMPG | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Clute | Action Number: | J5 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | College Park Pump Station | | |
| Project Description: | Install a permanent ditch water pumping station at College Park. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | Flooding of Homes throughout the subdivision | | |
| Cost Estimate: | 250,000 | Timeframe: | |
| Potential Funding Sources: | HMPG | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Clute | Action Number: | J6 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms | | |
| Project Title: | Lexington & Creek Rd Water Pumping station | | |
| Project Description: | Install permanent ditch water pumping station at Lexington & Creek Road. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | This ditch receives rain water from Lake Jackson and Clute. Flooding | | |
| Cost Estimate: | 250,000 | Timeframe: | 24 to 36 months |
| Potential Funding Sources: | HMPG | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Clute | Action Number: | J7 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Flag Lake Dry Culverts | | |
| Project Description: | Deepen ditch and replace culverts on Flag Lake Dry to increase storm water infrastructure capacity. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | The flooding of homes and businesses along Flag Lake Dr. | | |
| Cost Estimate: | 200,000 | Timeframe: | 12 months |
| Potential Funding Sources: | HMPG | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Clute | Action Number: | J8 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Wood shore Lift Station | | |
| Project Description: | Obtain and install a SCADA notification system for the Wood Shore sewer lift station. | | |
| Responsible Entity: | Mayor and City Manager | | |
| Losses avoided: | The is used to monitor the lift station levels and flows, and possibly pump failure. A pump failure could cause potentially sewer to back up in the subdivision. | | |
| Cost Estimate: | 25,000 | Timeframe: | 6 months |
| Potential Funding Sources: | HMPG | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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| Jurisdiction: | Clute | Action Number: | J9 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Bumpy Rd sewer lift station | | |
| Project Description: | Deepen Wet Well at Bumpy Rd sewer lift station. This would increase the sewer capacity. | | |
| Responsible Entity: | Clute Mayor and City Manager | | |
| Losses avoided: | The inability to keep up with the City's sewer demands in times of heavy rains | | |
| Cost Estimate: | 350,000 | Timeframe: | 12 to 24 months |
| Potential Funding Sources: | HMPG | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

Port of Freeport

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L1 |
| Hazard(s) Addressed: | Flooding, Hurricane, Wildfire, Drought, Lightning, Heat Events, Hail, Winter Weather, Tornado, Dam and Levee Failure, Coastal Erosion | | |
| Project Title: | Warning System | | |
| Project Description: | Develop audio warning system for notifying the Port personnel and tenants of an imminent natural hazard threat. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Human injury and loss of life Property damage | | |
| Cost Estimate: | 250,000 | Timeframe: | 4 to 6 months |
| Potential Funding Sources: | Grant funding will be used with matching funds coming from Port Freeport funds. | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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| Jurisdiction: | Port Freeport | Action Number: | L2 |
| Hazard(s) Addressed: | Flooding, Hurricane, Wildfire, Drought, Lightning, Heat Events, Hail, Winter Weather, Tornado, Dam and Levee Failure, Coastal Erosion | | |
| Project Title: | Weather Station | | |
| Project Description: | Update and expand the current weather station capabilities to give more detailed and earlier warnings of potentially threatening natural hazards. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Human injury or loss of life Property and equipment damage | | |
| Cost Estimate: | 35,000 | Timeframe: | 3 months |
| Potential Funding Sources: | Grant funds will be utilized with matching coming from Port Freeport funds. | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L3 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Tornado, Dam/ Levee Failure, and Winter Storms | | |
| Project Title: | Record Management System | | |
| Project Description: | Identify and implement a paperless records management system to improve resilience before and after a disaster. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Data loss (financial and sales), Engineering drawings destroyed or damaged, Administrative documents such as policies and procedures, Records required by law (ex. compliance and open record data) | | |
| Cost Estimate: | 75,000 | Timeframe: | 6 to 9 months |
| Potential Funding Sources: | Grant funds would be used with the matching coming from Port Freeport funds. | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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| Jurisdiction: | Port Freeport | Action Number: | L4 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Dam/ Levee Failure, and Winter Storms | | |
| Project Title: | Drainage Improvement | | |
| Project Description: | Implement drainage improvements to drain water away from the transit shed facilities and dock areas. Widen and reshape drainage ditches, and upgrade culverts to restore adequate drainage to mitigate flooding. | | |
| Responsible Entity: | Port Freeport Engineering Director | | |
| Losses avoided: | Building damage, Cargo damage/loss, Human injury | | |
| Cost Estimate: | 3,750,000 | Timeframe: | 9 to 12 months |
| Potential Funding Sources: | Grant funds will be used which the grant match coming from Port Freeport funds. | Benefit-Cost Ratio: | Less than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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| Jurisdiction: | Port Freeport | Action Number: | L5 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms, Wildfire, Tornado, Hail, and Winter Storms | | |
| Project Title: | Storm Shutters | | |
| Project Description: | Install storm shutters on all exterior Port facility windows and glass doors | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Human injury or death and Facility damage | | |
| Cost Estimate: | 325,000 | Timeframe: | 9 to 12 months |
| Potential Funding Sources: | The match will be paid with Port Freeport funds. | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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| Jurisdiction: | Port Freeport | Action Number: | L6 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Tornado, Dam/ Levee Failure, Hail, Winter Storms | | |
| Project Title: | Communication Center Improvements | | |
| Project Description: | Expand the information and communication capabilities of the Port Freeport Emergency Operation Center to better communicate vessel traffic and waterway information to channel users before, during and after natural disaster | | |
| Responsible Entity: | Port Freeport Operations Director | | |
| Losses avoided: | Human injury or death Marine vessel damage or loss Water channel blockage Damage to the shore line, Decreased channel depth, Environmental hazard release/spill, Vessel collision | | |
| Cost Estimate: | 425,000 | Timeframe: | 6 to 9 months |
| Potential Funding Sources: | Match will be paid with Port Freeport funds | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L7 |
| Hazard(s) Addressed: | All Hazards | | |
| Project Title: | Emergency Power Back-up | | |
| Project Description: | Implement a backup power solution for critical Port Freeport infrastructure which includes a fixed back up emergency power generator for the Port Freeport Administration Building and two mobile emergency power generator trailers. | | |
| Responsible Entity: | Port Freeport Engineering Manager | | |
| Losses avoided: | Lose the function of Administrative, Operation, and cargo storage facilities Impact to economy (\$126.6M/day) Loss of economy income (\$20.8M/day) | | |
| Cost Estimate: | 350,000 | Timeframe: | 6 to 9 months |
| Potential Funding Sources: | Match will be paid with Port Freeport funds | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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| Jurisdiction: | Port Freeport | Action Number: | L8 |
| Hazard(s) Addressed: | Coastal Erosion | | |
| Project Title: | Erosion Barrier | | |
| Project Description: | Add an erosion barrier wall to eliminate or reduce erosion along the Port's fence line. | | |
| Responsible Entity: | Port Freeport Engineering Manager | | |
| Losses avoided: | Human injury, Cargo damage, Property damage, Loss of usable property for cargo storage | | |
| Cost Estimate: | 250,000 | Timeframe: | 12 to 18 months |
| Potential Funding Sources: | Match will be paid with Port Freeport funds | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L9 |
| Hazard(s) Addressed: | Wildfire, Drought, Heat Events | | |
| Project Title: | Cooling zones | | |
| Project Description: | Implement cooling zones in the Port to protect Port users from extreme heat. Cooling fans can also be utilized to deflect smoke and chemical released gases to a non-populated area. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Human injury or death, Cargo damage, Facility damage | | |
| Cost Estimate: | 175,000 | Timeframe: | 6 to 9 months |
| Potential Funding Sources: | Match will be paid with Port Freeport funds | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|--|
| Jurisdiction: | Port Freeport | Action Number: | L10 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Tornado, Hail, Winter Storms | | |
| Project Title: | Crane simulator | | |
| Project Description: | Install a crane simulator and implement a crane training program to improve resilience after a natural disaster. This capability would allow technicians and operators to train on crane troubleshooting and repairs in a training. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | During crane down time, the technicians will be better prepared to get the crane operational again. In return, this reduces the lost time and allows vessel to get out of the port in a timelier manner. | | |
| Cost Estimate: | 300,000 | Timeframe: | 12 to 18 months |
| Potential Funding Sources: | Match will be paid with Port Freeport funds | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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| Jurisdiction: | Port Freeport | Action Number: | L11 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms, Wildfire, Tornado, Heat Events and Winter Storms | | |
| Project Title: | Emergency Vessel Simulator | | |
| Project Description: | Design and construct a ship vessel simulator for emergency response training to improve the response and rescue capabilities for first responders in the region. The marine training prop would be utilized to train local firefighters in a realistic live setting. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Human injury or death, Property loss, Cargo loss, Channel blockage, Dock damage, Environmental spill or release | | |
| Cost Estimate: | 425,000 | Timeframe: | 12 to 18 months |
| Potential Funding Sources: | Match will be paid with Port Freeport funds | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L12 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Tornado, Drought, Dam/ Levee Failure, Heat Events, and Winter Storms | | |
| Project Title: | IT Fail-over | | |
| Project Description: | Implement an IT fail-over at a second location to assure proper network operation during and after a natural disaster. In the event the main data center failed, the fail-over location would take over IT network operations. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Commercial interruption (\$126.6M/day economic impact) | | |
| Cost Estimate: | 225,000 | Timeframe: | 9 to 12 months |
| Potential Funding Sources: | Match will be paid with Port Freeport funds | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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| Jurisdiction: | Port Freeport | Action Number: | L13 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Tornado, Dam/ Levee Failure and Winter Storms | | |
| Project Title: | Weather Cameras | | |
| Project Description: | Expand the current video management system to include weather cameras along the waterway to remotely monitoring weather conditions, search for people in distress, and evaluate damage caused by natural hazards. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Human injury or death, Vessel damage or loss, Commercial interruption (\$126.6M/day in economic impact), Cargo damage or loss, Shoreline damage | | |
| Cost Estimate: | 200,000 | Timeframe: | 9 to 12 months |
| Potential Funding Sources: | Match will be paid with Port Freeport funds | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L14 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms, Wildfire, Tornado, Hail, and Winter Storms | | |
| Project Title: | Channel lighting | | |
| Project Description: | Add additional lighting along the waterway for increased vessel safety and visibility during poor weather conditions. | | |
| Responsible Entity: | Port Freeport Engineering Manager | | |
| Losses avoided: | Human injury or death, Vessel damage or loss, Cargo damage or loss, Commercial interruption (\$226.6M/day in economic impact), Shore line damage | | |
| Cost Estimate: | 150,000 | Timeframe: | 12 to 18 months |
| Potential Funding Sources: | Match will be paid with Port Freeport funds | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|--|
| Jurisdiction: | Port Freeport | Action Number: | L15 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Tornado, Drought, Dam/ Levee Failure Heat Events and Winter Storms | | |
| Project Title: | Power Back up | | |
| Project Description: | Upgrade the IT power backup and electrical grounding protection capabilities for Port of Freeport's Data Center to protect data and IT equipment during a natural hazard. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Commercial interruption (\$226.6M/day in economic impact), Cargo damage or loss, Port facilities not functional, including the Emergency Operation Center | | |
| Cost Estimate: | 250,000 | Timeframe: | 3 to 6 months |
| Potential Funding Sources: | Match will be paid with Port Freeport funds | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L16 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storm, Erosion, and Dam/ Levee Failure | | |
| Project Title: | Water Flow Monitor | | |
| Project Description: | Design and install a system which will transmit water flow characteristics for the surrounding creeks, rivers, and intracoastal waterway to a central location, so the information can be shared with other waterway users while increasing the safety of vessel | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Human injury or death, Vessel damage or loss, Cargo damage or loss, Commercial interruption (\$226.6M/day in economic impact), Hazardous material release or spill | | |
| Cost Estimate: | 185,000 | Timeframe: | 12 to 18 months |
| Potential Funding Sources: | Match will be paid with Port Freeport funds | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | Port Freeport | | Action Number: | L17 |
| Hazard(s) Addressed: | Drought, Extreme Heat, Flood, Hail, Tornado, Wildfire, Lightning, Levee Failure, Severe Weather, Winter Storm, or Tropical Cyclone | | | |
| Project Title: | Emergency Alert System | | | |
| Project Description: | Audio and visual warning system for notifying the Port personnel and port users of an imminent natural hazard threat. | | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; property and facility damage. | | | |
| Cost Estimate: | \$200,000 | Timeframe: | When funding becomes available | |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | Port Freeport | | Action Number: | L18 |
| Hazard(s) Addressed: | Drought, Extreme Heat, Flood, Hail, Tornado, Wildfire, Lightning, Levee Failure, Severe Weather, Winter Storm, or Tropical Cyclone | | | |
| Project Title: | Weather Station Enhancement | | | |
| Project Description: | Update and expand the current weather station capabilities to give more detailed and earlier warnings of potentially threatening natural hazards | | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; property and facility damage. | | | |
| Cost Estimate: | \$35,000 | Timeframe: | When funding becomes available | |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L19 |
| Hazard(s) Addressed: | Drought, Extreme Heat, Flood, Hail, Tornado, Wildfire, Lightning, Levee Failure, Severe Weather, Winter Storm, Coastal Erosion, Expansive Soils, or Tropical Cyclone | | |
| Project Title: | Paperless Record System | | |
| Project Description: | Identify and implement a paperless records management system to improve resilience before and after a disaster. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; data loss (financial and sales); engineering drawings destroyed or damaged; administrative documents such as policies and procedures; records required by law (ex. compliance and open record data) | | |
| Cost Estimate: | \$150,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L20 |
| Hazard(s) Addressed: | Flood, Levee Failure, Severe Weather, Winter Storm, Coastal Erosion, Expansive Soils, or Tropical Cyclone | | |
| Project Title: | Drainage Improvements | | |
| Project Description: | Implement drainage improvements to drain water away from the transit shed facilities and dock areas. Widen and reshape drainage ditches, and upgrade culverts to restore adequate drainage to mitigate flooding. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; cargo damage; reduction in cargo staging areas. | | |
| Cost Estimate: | \$3,500,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L21 |
| Hazard(s) Addressed: | Drought, Extreme Heat, Flood, Hail, Tornado, Wildfire, Lightning, Levee Failure, Severe Weather, Winter Storm, Coastal Erosion, Expansive Soils, or Tropical Cyclone | | |
| Project Title: | Channel User Communications | | |
| Project Description: | Expand the information and communication capabilities of the Port Freeport Emergency Operation Center to better communicate vessel traffic and waterway information to channel users before, during and after natural disaster. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; marine vessel damage; waterway channel blockage; shoreline damage; environmental hazardous spill/release; marine vessel collision. | | |
| Cost Estimate: | \$400,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L22 |
| Hazard(s) Addressed: | Drought, Extreme Heat, Flood, Hail, Tornado, Wildfire, Lightning, Levee Failure, Severe Weather, Winter Storm, Coastal Erosion, Expansive Soils, or Tropical Cyclone | | |
| Project Title: | Back-up Generator for Administration Building | | |
| Project Description: | Implement a backup power solution for critical Port Freeport infrastructure which includes a static Back-up emergency power generator for the Port Freeport Administration Building. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$425,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L23 |
| Hazard(s) Addressed: | Drought, Extreme Heat, Flood, Hail, Tornado, Wildfire, Levee Failure, Severe Weather, Winter Storm, Coastal Erosion, Expansive Soils, or Tropical Cyclone | | |
| Project Title: | Fence Line Erosion Barrier | | |
| Project Description: | Add an erosion barrier wall to eliminate or reduce erosion along the Port's fence line. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; cargo damage; property damage; loss of usable property for cargo storage. | | |
| Cost Estimate: | \$300,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L24 |
| Hazard(s) Addressed: | Extreme Heat, Flood, Hail, Tornado, Lightning, Severe Weather, Winter Storm, or Tropical Cyclone | | |
| Project Title: | Crane Maintenance Simulator | | |
| Project Description: | Install a crane simulator and implement a crane training program to improve resilience after a natural disaster. This capability would allow technicians and operators to train on crane troubleshooting and repairs in a training. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; time delays to supply chain. | | |
| Cost Estimate: | \$350,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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| Jurisdiction: | Port Freeport | Action Number: | L25 |
| Hazard(s) Addressed: | Extreme Heat, Flood, Tornado, Wildfire, Lightning, Levee Failure, Severe Weather, Winter Storm, or Tropical Cyclone | | |
| Project Title: | Emergency Response Training Simulator | | |
| Project Description: | Design and construct a ship vessel simulator for emergency response training to improve the response and rescue capabilities for first responders in the region. The marine training prop would be utilized to train local firefighters in a realistic live setting simulating a response to a natural hazard incident on a maritime vessel. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; cargo loss; delays to supply chain; dock damage. | | |
| Cost Estimate: | \$600,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L26 |
| Hazard(s) Addressed: | Drought, Extreme Heat, Flood, Hail, Tornado, Wildfire, Lightning, Levee Failure, Severe Weather, Winter Storm, Coastal Erosion, Expansive Soils, or Tropical Cyclone | | |
| Project Title: | Network Failover Site | | |
| Project Description: | Implement an IT fail-over at a second location to assure proper network operation during and after a natural disaster. In the event the main data center failed, the fail-over location would take over IT network operations. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; delays to the supply chain. | | |
| Cost Estimate: | \$460,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L27 |
| Hazard(s) Addressed: | Flood, Hail, Tornado, Wildfire, Levee Failure, Severe Weather, Winter Storm, Coastal Erosion, Expansive Soils, or Tropical Cyclone | | |
| Project Title: | Channel Weather Cameras | | |
| Project Description: | Expand the current video management system to include weather cameras along the waterway to remotely monitoring weather conditions, search for people in distress, and evaluate damage caused by natural hazards. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; delays to the supply chain. | | |
| Cost Estimate: | \$225,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L28 |
| Hazard(s) Addressed: | Drought, Extreme Heat, Flood, Hail, Tornado, Wildfire, Lightning, Levee Failure, Severe Weather, Winter Storm, Coastal Erosion, Expansive Soils, or Tropical Cyclone | | |
| Project Title: | Network Infrastructure Power Backup and Electrical Grounding | | |
| Project Description: | Upgrade the IT power backup and electrical grounding protection capabilities for Port of Freeport's Data Center to protect data and IT equipment during a natural hazard. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; Emergency Operation Center going off-line. | | |
| Cost Estimate: | \$75,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L29 |
| Hazard(s) Addressed: | Drought, Extreme Heat, Flood, Hail, Tornado, Wildfire, Lightning, Levee Failure, Severe Weather, Winter Storm, Coastal Erosion, Expansive Soils, or Tropical Cyclone | | |
| Project Title: | Backup Internet Services | | |
| Project Description: | Add cellular and satellite internet service to the Emergency Operation Center, which would be utilized in the event of fiber internet service failure. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; Emergency Operation Center going off-line; delays to the supply chain. | | |
| Cost Estimate: | \$75,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Ye |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L30 |
| Hazard(s) Addressed: | Drought, Extreme Heat, Flood, Tornado, Wildfire, Levee Failure, Severe Weather, Winter Storm, Coastal Erosion, Expansive Soils, or Tropical Cyclone | | |
| Project Title: | Pavement, Roadways and Surface Repairs | | |
| Project Description: | Repair damages to roadways, driveways, entrances, parking lots and cargo staging area surfaces caused by a natural hazard. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$5,000,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Port Freeport | Action Number: | L31 |
| Hazard(s) Addressed: | Drought, Flood, Tornado, Wildfire, Levee Failure, Severe Weather, Coastal Erosion, Expansive Soils, or Tropical Cyclone | | |
| Project Title: | Dock Repairs | | |
| Project Description: | Repair damages to the docks caused by a natural hazard, particularly if a natural hazard causes a ship to break loss and crash into the dock. | | |
| Responsible Entity: | Port Freeport Protective Services Chief | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards; inability to handle cargo; divert cargo to other ports causing supply chain delays and shortages; spoiled food cargo. | | |
| Cost Estimate: | \$20,000,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

Brazosport College

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | Brazosport College | | Action Number: | S1 |
| Hazard(s) Addressed: | Emergencies on Campus (human and natural), Active Shooter, Floods, Severe Thunderstorms, Tornado, Hail, Public Safety | | | |
| Project Title: | Internal and External Campus-Wide Emergency Warning System Upgrade (<i>TV screens inside buildings, personal computers, desk phones, and outside speakers</i>) | | | |
| Project Description: | Install, improve, and upgrade the campus-wide warning system for notifying all persons on campus of an imminent human or natural hazard threat on many platforms. This project would include software that would encompass all means of notification possible. | | | |
| Responsible Entity: | Brazosport College EMC and Police Chief | | | |
| Losses avoided: | Human injury and loss of life | | | |
| Cost Estimate: | \$254,000 | Timeframe: | When funding becomes available | |
| Potential Funding Sources: | Hazard Mitigation Program Grant | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

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|---|---|----------------------------|------------------------------------|-----|
| Jurisdiction: | Brazosport College | | Action Number: | S2 |
| Hazard(s) Addressed: | Hurricanes, Tornadoes, High Winds, Public Safety | | | |
| Project Title: | Roofing and Structural Re-enforcement | | | |
| Project Description: | Reinforcing RTU's and piping on all building roofs. This will prevent system damages and flying debris caused by strong storms and hurricanes. Also, correcting structural issues in several concrete columns that are deteriorating from rusted rebar that has busted out large pieces of concrete in our Sadler and BASF buildings. | | | |
| Responsible Entity: | Brazosport College EMC and Police Chief | | | |
| Losses avoided: | Loss of Property, Continuity of services during natural disasters. | | | |
| Cost Estimate: | \$850,000 | Timeframe: | When funding becomes available | |
| Potential Funding Sources: | Hazard Mitigation Program Grant | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | Brazosport College | | Action Number: | S3 |
| Hazard(s) Addressed: | Emergencies on Campus – Public Safety, Active Shooter, Fire, Chemical Release, Explosion | | | |
| Project Title: | North Emergency Roadway | | | |
| Project Description: | Design, engineer and construct a rock-based ~754’ emergency roadway to the north end of campus that would exit into Oyster Bend Subdivision. Roadway would only be used for emergency ingress/egress to Oyster Bend subdivision. | | | |
| Responsible Entity: | Brazosport College EMC and Police Chief | | | |
| Losses avoided: | Human injury and loss of life | | | |
| Cost Estimate: | \$125,000 | Timeframe: | When funding becomes available | |
| Potential Funding Sources: | Hazard Mitigation Program Grant, Brazoria County Pct. 1 Road and Bridge | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | Brazosport College | | Action Number: | S4 |
| Hazard(s) Addressed: | Emergencies on Campus (human and natural), Active Shooter, Fire, Floods, Severe Thunderstorms, Tornados | | | |
| Project Title: | Building Automation Systems (Automated External Door Locks) | | | |
| Project Description: | Install building automation systems to all exterior doors to buildings on campus to be used in case of an imminent human or natural hazard threat. | | | |
| Responsible Entity: | Brazosport College EMC and Police Chief | | | |
| Losses avoided: | Human injury and loss of life | | | |
| Cost Estimate: | \$400.000 | Timeframe: | When funding becomes available | |
| Potential Funding Sources: | Hazard Mitigation Program Grant | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | Brazosport College | | Action Number: | S5 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Severe Thunderstorms, Tornado, Hail | | | |
| Project Title: | Upgrade Exterior Glass/Windows | | | |
| Project Description: | Upgrading campus exterior windows to windstorm rated glass. Due to our coastal location, amount of exterior window walls, and large amounts of trees, we need the added building and student/staff protection from severe storms and hurricanes. | | | |
| Responsible Entity: | Brazosport College EMC and Police Chief | | | |
| Losses avoided: | Loss of/damage to property; continuity of services during natural disasters. | | | |
| Cost Estimate: | \$2,500.000 | Timeframe: | When funding becomes available | |
| Potential Funding Sources: | Hazard Mitigation Program Grant | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | Brazosport College | | Action Number: | S6 |
| Hazard(s) Addressed: | Public Safety, Crime Reduction | | | |
| Project Title: | Lighting Improvement on campus and jogging trail | | | |
| Project Description: | Install additional and stronger light coverage in darker areas between buildings, parking lots, sidewalks, and along the campus/community walking trail. | | | |
| Responsible Entity: | Brazosport College EMC and Police Chief | | | |
| Losses avoided: | Life Safety, Crime Reduction | | | |
| Cost Estimate: | \$250,000 | Timeframe: | When funding becomes available | |
| Potential Funding Sources: | Hazard Mitigation Program Grant | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

Sweeny

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|---|--|----------------------------|--|
| Jurisdiction: | Sweeny | Action Number: | T1 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Dam/ Levee Failure, | | |
| Project Title: | Drainage Improvements | | |
| Project Description: | Implement drainage improvement program to include widening and reshaping drainage ditches, and upgrade culverts to restore adequate drainage on CR 332 | | |
| Responsible Entity: | West Brazos Drainage District #11 Director, Sweeny Mayor and City Manager | | |
| Losses avoided: | Life safety, protect property | | |
| Cost Estimate: | 500,000 | Timeframe: | 36-60 months |
| Potential Funding Sources: | HMPG | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|--|
| Jurisdiction: | Sweeny | Action Number: | T2 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Dam/ Levee Failure | | |
| Project Title: | Drainage | | |
| Project Description: | Enlarge culverts along Stevenson Slough to increase stormwater infrastructure. | | |
| Responsible Entity: | Sweeny Mayor and City Manager | | |
| Losses avoided: | Life safety and protect property | | |
| Cost Estimate: | 125,000 | Timeframe: | 36-60 months |
| Potential Funding Sources: | HMPG | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|--|
| Jurisdiction: | Sweeny | Action Number: | T3 |
| Hazard(s) Addressed: | Drought, Heat Events, Expansive Soils, Winter Storms | | |
| Project Title: | Replace Infrastructure | | |
| Project Description: | Replacement of aging water and sewer lines throughout the city that are vulnerable to failure during natural disasters. | | |
| Responsible Entity: | Sweeny Public Works Director | | |
| Losses avoided: | Protect our sewer plant with less rain water going into broken sewer lines | | |
| Cost Estimate: | 10,000,000 | Timeframe: | 36-48 months |
| Potential Funding Sources: | FEMA Grants, TWDB Grants | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

Unincorporated Brazoria County

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|---|--|----------------------------|--|
| Jurisdiction: | Brazoria County | Action Number: | N1 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Structural Project | | |
| Project Description: | Widen and reshape drainage ditches, and upgrade culverts to restore adequate drainage to mitigate flooding. Use a drainage study to target high impact areas. | | |
| Responsible Entity: | County Road and Bridge Dept. Manager and County Drainage District Director | | |
| Losses avoided: | Property and lives throughout the city | | |
| Cost Estimate: | 500,000 | Timeframe: | 48 months |
| Potential Funding Sources: | Drainage district funds as available, Local funds, TWDB-Clean Water Revolving Fund, TWDB (Development Fund II), USDA NRCS-Watershed Protection and Flood Prevention Program, EPA NPS Grant Program, 406 Public Assistance, USACE-Clearing and Snagging P | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria County | Action Number: | N2 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Public Education | | |
| Project Description: | Implement campaign on public education of ICC (Increased Cost of Compliance) coverage. | | |
| Responsible Entity: | Brazoria County NFIP Administrator | | |
| Losses avoided: | Life safety and public property | | |
| Cost Estimate: | 5,000 | Timeframe: | 24 months |
| Potential Funding Sources: | Flood Mitigation Assistance Program, Hazard Grant Program, ICC training for public and insurance agents may be available free of charge through FEMA | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria County | Action Number: | N3 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | |
| Project Title: | Structural Project, Property Protection | | |
| Project Description: | Implement dune and beach restoration to protect county beach areas between Surfside Beach and San Luis Pass | | |
| Responsible Entity: | County Rd and Bridge Dept. Director and Parks Dept. Director | | |
| Losses avoided: | Life safety and public property | | |
| Cost Estimate: | 750,000 | Timeframe: | 18 months |
| Potential Funding Sources: | USACE-Emergency Stream Bank and Shoreline Protection, USACE-Planning Assistance to States, HMGP, USACE-Nonstructural Alternatives to Structural Rehabilitation of Damages Flood Control Works, USACE-Planning Assistance to States | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria County | Action Number: | N4 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Coastal River Flood Extent Analysis | | |
| Project Description: | Determine flood extents, in Brazoria County, because of recent hurricane disasters, by analyzing the post event aerial imagery through a GIS image classification process, and compare the flood extent area to other sources, such as LIDAR surface elevate | | |
| Responsible Entity: | Engineering Department Director | | |
| Losses avoided: | Will prevent future loss of life and property, by refining evacuation area decisions, floodplain updates, development / building construction codes. | | |
| Cost Estimate: | 50,000 | Timeframe: | 6 to 12 months. |
| Potential Funding Sources: | 90 percent - HMGP, PDM, TWDB FMA; 10 percent In-kind service match on part of Brazoria County through labor and in-turn data provision. | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|-----|
| Jurisdiction: | Brazoria County | | Action Number: | N5 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms and Erosion | | | |
| Project Title: | Prevention, Property Protection | | | |
| Project Description: | Treasure Island Revetment project. The project also focuses on developing alternatives for a beach nourishment project near the revetment and fishing pier area to widen the beach and provide a buffer to reduce storm impacts to the existing s | | | |
| Responsible Entity: | Commissioner Donald "Dude" Payne, Brazoria County Pct. 1 | | | |
| Losses avoided: | Life safety and public property | | | |
| Cost Estimate: | 4,000,000 | Timeframe: | 48 to 60 months | |
| Potential Funding Sources: | FEMA, HMG, CEPRA, CIAP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|--|-----|
| Jurisdiction: | Brazoria County | | Action Number: | N6 |
| Hazard(s) Addressed: | Floods and Hurricane/ Tropical Storms | | | |
| Project Title: | Elevate structures in flood zone | | | |
| Project Description: | Elevate structures in flood zone. During Harvey Brazoria County had 12,000 structures flooded. Over 70% of these structures are pre-firm and do not meet current FEMA elevation standards. FEMA estimates that over 400 structures may be substantially damaged and must be elevated to meet current standards | | | |
| Responsible Entity: | Floodplain District Director | | | |
| Losses avoided: | The County estimates 60,000,000.00 in savings from flood damage to structures. | | | |
| Cost Estimate: | 60,000,000 | Timeframe: | 60 months | |
| Potential Funding Sources: | | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

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|---|---|----------------------------|--|-----|
| Jurisdiction: | Brazoria County | | Action Number: | N7 |
| Hazard(s) Addressed: | Floods | | | |
| Project Title: | NFIP Technical Material | | | |
| Project Description: | Place copies of FEMA Flood-related technical bulletins in County libraries. | | | |
| Responsible Entity: | Emergency Management Coordinator | | | |
| Losses avoided: | Creating an awareness of building requirements for NFIP participants will encourage them to build sensibly or modify existing structure, to be more flood damage-resistant. | | | |
| Cost Estimate: | 1,000 | Timeframe: | 6 months | |
| Potential Funding Sources: | PDM, HMGP, local funds | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | Brazoria County | | Action Number: | N8 |
| Hazard(s) Addressed: | Flood and Hurricane/ Tropical Storms | | | |
| Project Title: | Property Protection | | | |
| Project Description: | Removal of debris, widen and reshape drainage ditches, and upgrade culverts to restore adequate drainage to mitigate flooding throughout the county. | | | |
| Responsible Entity: | Brazoria County EMC and Velasco Drainage District Director | | | |
| Losses avoided: | Life safety and public property | | | |
| Cost Estimate: | 500,000 | Timeframe: | 12 months | |
| Potential Funding Sources: | PDM, HMGP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|--|
| Jurisdiction: | Brazoria County | Action Number: | N9 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Secure and develop park land surrounding Hanson-Riverside County Park and San Bernard River area | | |
| Project Description: | Purchase adjacent tracts of approximately 335 acres surrounding existing Hanson-Riverside County Park footprint. This land is divided into a few tracts, but all is listed as one owner, and much of it was impacted by recent flooding by near-record levels of the San Bernard River | | |
| Responsible Entity: | Brazoria County Parks Department Director | | |
| Losses avoided: | To help mitigate future flooding to which this area is prone. | | |
| Cost Estimate: | 6,000,000 | Timeframe: | 15 to 24 months |
| Potential Funding Sources: | County funds and all available grants, commercial and governmental | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|--|
| Jurisdiction: | Brazoria County | Action Number: | N10 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Secure and develop Park land of surrounding tracts near Camp Mohawk County Park | | |
| Project Description: | Purchase approximately 160 acres adjacent to and surrounding Camp Mohawk County Park, which will involve negotiating with several landowners of smaller tracts, and one large, 107-acre tract. Minimal but useful development of trails and boardwalks would be appropriate along this new acreage, and no doubt utilized by citizens of surrounding neighborhoods who already visit the park for day use such as hiking, biking, fishing and other recreation. Such development could also be engineered and appropriately elevated so as to help mitigate future high-water issues. | | |
| Responsible Entity: | Brazoria County Park Department Director | | |
| Losses avoided: | This area along Chocolate Bayou is also historically prone to flooding. During Hurricane Harvey, this immediate vicinity received huge amounts of rain along the bayou and its watershed, and the park and surrounding neighborhoods experienced severe flooding with hundreds of homes affected. Converting remaining undeveloped land into park space is perhaps the single most practical use of it, and would likely be welcomed by the surrounding populace. | | |
| Cost Estimate: | 7,500,000 | Timeframe: | 14 to 24 months |
| Potential Funding Sources: | County Funds and any applicable grants | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Brazoria County | Action Number: | N11 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Property Protection | | |
| Project Description: | Dig ditch to take water that builds up in Quail Ridge subdivision to the Austin Bayou. | | |
| Responsible Entity: | Brazoria County Engineering Department Director | | |
| Losses avoided: | Life safety and public property | | |
| Cost Estimate: | 75,000 | Timeframe: | 12 months |
| Potential Funding Sources: | Road and Bridge funds operating budget, TWDB-Clean Water Revolving Fund, TWDB (Development Fund II) - Texas Water Development Fund, USDA NRCS-Watershed Protection and Flood Prevention Program, EPA NPS Grant Program ,406 Public Assistance, USACE-Clear | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|--|
| Jurisdiction: | Brazoria County | Action Number: | N12 |
| Hazard(s) Addressed: | Floods | | |
| Project Title: | Land Acquisitions and Park Development for Brazoria County Park System | | |
| Project Description: | Secure and develop Park land on and surrounding Lake Tenneco | | |
| Responsible Entity: | Brazoria County Parks Department Director | | |
| Losses avoided: | Property losses during floods and preservation of floodplain and bottom land. | | |
| Cost Estimate: | 7,000,000 | Timeframe: | 12 to 24 months |
| Potential Funding Sources: | County funds, mitigation grants, CBD Grants | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|--|-----|
| Jurisdiction: | Brazoria County | | Action Number: | N13 |
| Hazard(s) Addressed: | Floods | | | |
| Project Title: | Land acquisitions and Park Development for Brazoria County Park System Near Brazos River Park | | | |
| Project Description: | Acquire available three tracts of land adjacent to and near Brazos River County Park, develop and improve Park facilities and access | | | |
| Responsible Entity: | Brazoria County Parks Department Director | | | |
| Losses avoided: | Flooding of residences and preservation of flood plain | | | |
| Cost Estimate: | 3,000,000 | Timeframe: | 13 to 24 months | |
| Potential Funding Sources: | County funds, mitigation and other state and federal grants | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

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|---|---|----------------------------|------------------------------------|-----|
| Jurisdiction: | Brazoria County | | Action Number: | N14 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Tornado and Winter Storms | | | |
| Project Title: | Standby Generator for Airport Terminal Building | | | |
| Project Description: | Install a standby generator to power the airport terminal and adjacent hanger during power outages. | | | |
| Responsible Entity: | Brazoria County Airport Director | | | |
| Losses avoided: | Life Safety and Public Property | | | |
| Cost Estimate: | 150,000 | Timeframe: | 12 months | |
| Potential Funding Sources: | County budget, HMPG | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|------------------------------------|-----|
| Jurisdiction: | Brazoria County | | Action Number: | N16 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, and Coastal Erosion | | | |
| Project Title: | Prevention, Property Protection, Natural Resource Protection | | | |
| Project Description: | Create a feeder beach for Follett’s Island to slow the current erosion rate and protect wetlands in southeast Brazoria County. | | | |
| Responsible Entity: | Commissioner Donald "Dude" Payne, Brazoria County Pct. 1 | | | |
| Losses avoided: | Life safety and public property | | | |
| Cost Estimate: | 5,000,000 | Timeframe: | 18 months | |
| Potential Funding Sources: | HMG, PD, CEPTRA, CIAP | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|--|-----|
| Jurisdiction: | Brazoria County | | Action Number: | N17 |
| Hazard(s) Addressed: | Floods | | | |
| Project Title: | Property Acquisition | | | |
| Project Description: | Acquisition and demolition of severe repetitive loss properties along 14 miles of the Brazoria County coastline. | | | |
| Responsible Entity: | Brazoria County Floodplain Dept Director | | | |
| Losses avoided: | Occupied homes | | | |
| Cost Estimate: | 5,000,000 | Timeframe: | 24 months | |
| Potential Funding Sources: | HMG, PDM, FMA, RFC, SRL | Benefit-Cost Ratio: | Approximately a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes |

BRAZOSPORT INDEPENDENT SCHOOL DISTRICT

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | BRAZOSPORT INDEPENDENT SCHOOL DISTRICT | Action Number: | V1 |
| Hazard(s) Addressed: | ACTIVE SHOOTER (MASS CASUALTY) | | |
| Project Title: | Educating students, staff, substitute teachers, and visitors on the Standard Response Protocols for an active shooter (Mass casualty) event. | | |
| Project Description: | Implement an outreach and education campaign to educate students in grades 7th - 12th, staff, substitute teachers, and visitors on the Standard Response Protocols for an active shooter (Mass casualty) event. This training will help mitigate the loss of life and damage to property. This training will occur at the Districts Campuses (10 Elementary schools, 3 High schools, 5 Middle schools, and 1 Alternative school) | | |
| Responsible Entity: | Brazosport ISD EMC | | |
| Losses avoided: | Loss of life, prevention training, continuity of response, services, and recovery before, during, and after an event. | | |
| Cost Estimate: | \$20,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce the effects of hazards on existing buildings? | | | Yes or No |
| Does this action reduce the effects of hazards for new buildings, infrastructure, or future development? | | | Yes or No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes or No |

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| Jurisdiction: | BRAZOSPORT INDEPENDENT SCHOOL DISTRICT | Action Number: | V2 |
| Hazard(s) Addressed: | Flooding, Hurricanes, Tropical Storm, Lighting, Heat, Winter Storm, Tornado | | |
| Project Title: | Installation of Generators as a Secondary Source of Power during power outages due to Weather events. This allows the below instructional facilities to function as COMMUNITY SAFE ROOMS | | |
| Project Description: | <p>Installation of 13 Generators at the following Instructional Campuses:</p> <ul style="list-style-type: none"> ● Stephen F. Austin Elementary / Madge Griffith Elementary ● Elisabet Ney Pre-Kindergarten / Gladys Polk Elementary ● Velasco Elementary / R. O'Hare Lanier Middle School ● Grady Rasco Middle School / Clute Intermediate School ● Freeport Intermediate School / Lake Jackson Intermediate School ● Brazosport High School / Brazos Success Academy / Lighthouse Learning Center <p>During power outage events, these facilities would be able to be community-safe rooms.</p> | | |
| Responsible Entity: | BRAZOSPORT ISD EMC | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | \$4,550,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce the effects of hazards on existing buildings? | | | Yes or No |
| Does this action reduce the effects of hazards for new buildings, infrastructure, or future development? | | | Yes or No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes or No |

Freeport

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|---|--|----------------------------|------------------------------------|----|
| Jurisdiction: | Freeport | | Action Number: | R1 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Severe Thunderstorms, Tornado, Hail, Winter Storms | | | |
| Project Title: | Generator – City Hall | | | |
| Project Description: | Purchase Generator for critical facilities | | | |
| Responsible Entity: | City of Freeport Mayor and City Manager | | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters. | | | |
| Cost Estimate: | \$425,000.00 | Timeframe: | 12 to 36 months | |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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|---|--|----------------------------|------------------------------------|----|
| Jurisdiction: | Freeport | | Action Number: | R2 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Severe Thunderstorms, Tornado, Hail, Winter Storms | | | |
| Project Title: | Generator – Recreation Center | | | |
| Project Description: | Purchase Generator for critical facilities | | | |
| Responsible Entity: | City of Freeport Mayor and City Manager | | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters. | | | |
| Cost Estimate: | \$200,000.00 | Timeframe: | 12 to 36 months | |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | No |

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| Jurisdiction: | Freeport | Action Number: | R3 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Severe Thunderstorms, Tornado, Hail, Winter Storms | | |
| Project Title: | Generator – Service Center | | |
| Project Description: | Purchase Generator for critical facilities | | |
| Responsible Entity: | City of Freeport Public Works Director | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters. | | |
| Cost Estimate: | \$200,000.00 | Timeframe: | 12 to 36 months |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Freeport | Action Number: | R4 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Severe Thunderstorms, Tornado, Hail, Winter Storms | | |
| Project Title: | Generator – Civic Center | | |
| Project Description: | Purchase Generator for critical facilities | | |
| Responsible Entity: | City of Freeport Public Works Director | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters. | | |
| Cost Estimate: | \$200,000.00 | Timeframe: | 12 to 36 months |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Freeport | Action Number: | R5 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Severe Thunderstorms, Tornado, Hail, Winter Storms, Drought, Expansive Soil, Dam / Levee Failure, Heat Events | | |
| Project Title: | Upgrade water and waste water lines | | |
| Project Description: | Upgrade old and weak water and wastewater pipes throughout the city with need to be replaced. | | |
| Responsible Entity: | City of Freeport Public Works Director and TCEQ | | |
| Losses avoided: | Due to old water and wastewater lines throughout the city, we have many pipes break or collapse every year. Some breaks and collapses are due to inundation of rain water into the waste waterlines or creating washout of dirt around water and wastewater pipes. | | |
| Cost Estimate: | \$5,000,000.00 | Timeframe: | 60 months |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Freeport | Action Number: | R6 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Severe Thunderstorms, Tornado, Hail, Winter Storms, Drought, Expansive Soil, Dam / Levee Failure, Heat Events | | |
| Project Title: | Communication | | |
| Project Description: | Purchase radio/communication equipment for emergency response personnel to communicate during disasters. | | |
| Responsible Entity: | City of Freeport Fire Chief, EMS Director, Police Chief and EMC | | |
| Losses avoided: | Emergency Services, Continuity of services during response, recovery to disasters | | |
| Cost Estimate: | \$200,000.00 | Timeframe: | 60 months |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Freeport | Action Number: | R7 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Severe Thunderstorms, Tornado, Hail, Winter Storms, Expansive Soil, Dam / Levee Failure | | |
| Project Title: | Master Drainage Plan | | |
| Project Description: | Develop and implement a master drainage plan for the City. | | |
| Responsible Entity: | City of Freeport Mayor and City Manager, Public Works Director and TCEQ | | |
| Losses avoided: | Mitigate existing flood prone areas and prepare for future development and growth of the City. | | |
| Cost Estimate: | \$300,000.00 | Timeframe: | 60 months |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Freeport | Action Number: | R8 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Severe Thunderstorms, | | |
| Project Title: | West Second Street Drainage Improvements | | |
| Project Description: | Implement drainage improvement program to include enlarging culverts to increase stormwater infrastructure and replacing existing roadway grade to supplement the drainage to inlets. | | |
| Responsible Entity: | City of Freeport Mayor and City Manager, Public Works Director | | |
| Losses avoided: | Mitigate existing flood prone areas and prepare for future development and growth of the City. | | |
| Cost Estimate: | \$10,000,000.00 | Timeframe: | 60 months |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Freeport | Action Number: | R9 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Severe Thunderstorms, | | |
| Project Title: | Velasco Blvd Second Street Drainage Improvements | | |
| Project Description: | Implement drainage improvement program to include enlarging culverts to increase stormwater infrastructure and replacing existing roadway grade to supplement the drainage to inlets. | | |
| Responsible Entity: | City of Freeport Mayor and City Manager, Public Works Director | | |
| Losses avoided: | Mitigate existing flood prone areas and prepare for future development and growth of the City. | | |
| Cost Estimate: | \$10,000,000.00 | Timeframe: | 60 months |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Freeport | Action Number: | R10 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Severe Thunderstorms, | | |
| Project Title: | Freeport Municipal Golf Course Riverbank Erosion | | |
| Project Description: | Implement drainage improvement program. River bank stabilization in preventing flooding the property and eroding river bank when the Brazos River floods. | | |
| Responsible Entity: | City of Freeport Mayor and City Manager, Public Works Director | | |
| Losses avoided: | Mitigate existing bank erosion from the Brazos River. River bank stabilization and slope. | | |
| Cost Estimate: | \$10,000,000.00 | Timeframe: | 60 months |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

City of Danbury

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|---|--|----------------------------|------------------------------------|-----------|
| Jurisdiction: | City of Danbury | | Action Number: | K1 |
| Hazard(s) Addressed: | Danbury TX 77534 | | | |
| Project Title: | Lift Station Power | | | |
| Project Description: | Install quick disconnects to the 7 lift stations in town that do not have a emergency generator, so during times of power outages we can take the mobile generators to them, and have the pumps working. | | | |
| Responsible Entity: | City of Danbury Mayor and City Manager | | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | | |
| Cost Estimate: | \$15,000.00 | Timeframe: | When funding becomes available | |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes or No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes or No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes or No |

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|---|---|----------------------------|------------------------------------|-----------|
| Jurisdiction: | City of Danbury | | Action Number: | K2 |
| Hazard(s) Addressed: | 1600 Ave L Danbury TX 77534 | | | |
| Project Title: | Protect the Waste plant | | | |
| Project Description: | Install lightening protection devices and methods at the waste water treatment plant. We need to minimize any damage caused by a lightning strike to our towns waste water plant. | | | |
| Responsible Entity: | City of Danbury Utility department Director | | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | | |
| Cost Estimate: | \$7,000.00 | Timeframe: | When funding becomes available | |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio | |
| Does this action reduce effects of hazards on existing buildings? | | | | Yes or No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | | Yes or No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | | Yes or No |

Jones Creek

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Jones Creek | Action Number: | Q1 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms Severe Thunderstorms | | |
| Project Title: | Partner for Drainage | | |
| Project Description: | Partner with local drainage district to maintain and improve drainage: Widen and reshape drainage ditches, and upgrade culverts to restore adequate drainage to mitigate flooding. | | |
| Responsible Entity: | Jones Creek Streets Department Manager | | |
| Losses avoided: | Prevention of flooding | | |
| Cost Estimate: | 1,000 | Timeframe: | 12 to 18 months |
| Potential Funding Sources: | City and County Funds | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Jones Creek | Action Number: | Q2 |
| Hazard(s) Addressed: | Floods Hurricane/ Tropical Storms Severe Thunderstorms | | |
| Project Title: | Highway Drainage | | |
| Project Description: | Highway 36 drainage (7) ditches to be widened and reshaped. Upgrade culverts to restore adequate drainage to mitigate flooding. | | |
| Responsible Entity: | TXDOT, Mayor and City Manager | | |
| Losses avoided: | Reduction of property loss due to flooding | | |
| Cost Estimate: | 250,000 | Timeframe: | 36 months |
| Potential Funding Sources: | TXDOT | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Jones Creek | Action Number: | Q3 |
| Hazard(s) Addressed: | Floods Hurricane/ Tropical Storms Severe Thunderstorms | | |
| Project Title: | Master Drainage | | |
| Project Description: | Develop and implement a master drainage plan for the City. | | |
| Responsible Entity: | Jones Creek EMC, Mayor and City Manager | | |
| Losses avoided: | | | |
| Cost Estimate: | 100,000 | Timeframe: | 18 months |
| Potential Funding Sources: | Flood Mitigation Assistance Program, HMPG, TWDB, USACE | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Jones Creek | Action Number: | Q4 |
| Hazard(s) Addressed: | Hurricane/ Tropical Storms, Severe Thunderstorms, Tornado, Hail | | |
| Project Title: | Retrofitting | | |
| Project Description: | Retrofit City Hall/Emergency Operations Center with hurricane shutters, and any other storm related protection systems. | | |
| Responsible Entity: | Jones Creek EMC, Mayor and City Manager | | |
| Losses avoided: | Protection of EOC and City Hall | | |
| Cost Estimate: | 50,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | City Funds, FEMA HMPG and PDM Programs, State and local Grant Sources | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Jones Creek | Action Number: | Q5 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Severe Thunderstorms, Tornado, Hail, Winter Storms | | |
| Project Title: | Communication | | |
| Project Description: | Purchase radio/communication equipment for emergency response personnel to communicate during disasters. | | |
| Responsible Entity: | Jones Creek EMC, Mayor and City Manager | | |
| Losses avoided: | Emergency Services | | |
| Cost Estimate: | 60,000 | Timeframe: | When funds become available |
| Potential Funding Sources: | Federal, State, and Local grants; HMPG; PDM | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

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|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Jones Creek | Action Number: | Q6 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Severe Thunderstorms, Tornado, Drought, Hail, Winter Storms | | |
| Project Title: | Debris Management | | |
| Project Description: | Develop and maintain a debris management plan to speed up the removal of debris generated by flood/hurricane events, etc. | | |
| Responsible Entity: | Jones Creek EMC, Mayor and City Manager | | |
| Losses avoided: | | | |
| Cost Estimate: | 25,000 | Timeframe: | As needed within 5 years |
| Potential Funding Sources: | Public Assistance | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

| | | | |
|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Jones Creek | Action Number: | Q7 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Severe Thunderstorms, Tornado, Hail, Winter Storms | | |
| Project Title: | Emergency Siren | | |
| Project Description: | Installation of an emergency siren to utilize in the event of a natural or man-made disaster. | | |
| Responsible Entity: | Jones Creek Marshal | | |
| Losses avoided: | Siren would help prevent loss of life and property. | | |
| Cost Estimate: | 5,000 | Timeframe: | 12 months |
| Potential Funding Sources: | | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

| | | | |
|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Jones Creek | Action Number: | Q8 |
| Hazard(s) Addressed: | Flooding, Hurricane, Wildfire, Drought, Lightning, Heat Events, Hail, Winter Weather, Tornado, Dam and Levee Failure, Coastal Erosion | | |
| Project Title: | Training | | |
| Project Description: | Implement emergency management training programs. | | |
| Responsible Entity: | Jones Creek EMC | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters. | | |
| Cost Estimate: | 7,500 | Timeframe: | 6 months |
| Potential Funding Sources: | Emergency Management Institute, FEMA Training Programs | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

| | | | |
|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Jones Creek | Action Number: | Q9 |
| Hazard(s) Addressed: | Floods, Hurricane/ Tropical Storms, Wildfire, Severe Thunderstorms, Tornado, Hail, Winter Storms | | |
| Project Title: | Generator | | |
| Project Description: | Purchase equipment generators for critical facilities | | |
| Responsible Entity: | Jones Creek Street Department Manager | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters. | | |
| Cost Estimate: | 40,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Program | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

Sweeny Independent School District

| | | | |
|---|--|----------------------------|------------------------------------|
| Jurisdiction: | Sweeny Independent School District | Action Number: | Y1 |
| Hazard(s) Addressed: | Flooding, Hurricanes, Tropical Storm, Lighting, Heat, Winter Storm, Tornado | | |
| Project Title: | Installation of Generators as a Secondary Source of Power during power outages due to Weather events. This allows the below instructional facilities to function as COMMUNITY SAFE ROOMS | | |
| Project Description: | <p>Installation of 3 Generators at the following Instructional Campuses:</p> <p>Sweeny High School Sweeny Junior High School Sweeny Elementary</p> <p>During weather events that cause power outages, these facilities would be able to be community-safe rooms for the citizens located in close proximity to these facilities.</p> | | |
| Responsible Entity: | Sweeny ISD Police Chief and EMC | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | 1,050,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes or No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes or No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes or No |

Danbury Independent School District

| | | | |
|---|---|----------------------------|------------------------------------|
| Jurisdiction: | Danbury Independent School District | Action Number: | U1 |
| Hazard(s) Addressed: | Flooding, Hurricanes, Tropical Storms, Lightning, Heat, Winter Storm, Tornado | | |
| Project Title: | Installation of Generators as a secondary source of power during power outages due to weather events. This allows the below instructional facilities to function as a Community Safe Room | | |
| Project Description: | <p>Installation of 2 generators at the following Instructional Campuses:</p> <ol style="list-style-type: none"> 1. Danbury Elementary School 2. Danbury Secondary Schools (Middle and High Schools) <p>During weather events that cause power outages, these facilities would be able to be community safe rooms for the citizens located in close proximity to these facilities.</p> | | |
| Responsible Entity: | Danbury ISD EMC and Superintendent | | |
| Losses avoided: | Loss of life; continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | 700,000.00 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes or No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes or No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes or No |

Drainage District No. 11

| | | | |
|---|--|----------------------------|------------------------------------|
| Jurisdiction: | West Brazoria County Drainage District No. 11 | Action Number: | W1 |
| Hazard(s) Addressed: | Flooding and Hurricane/Tropical Storm | | |
| Project Title: | Drainage Studies | | |
| Project Description: | Perform various detailed studies within the district to determine best method of water outflow to the main tributaries to optimize drainage. Results of the studies will be the basis for future projects. | | |
| Responsible Entity: | West Brazoria County Drainage District No. 11 Director | | |
| Losses avoided: | | | |
| Cost Estimate: | 200,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

| | | | |
|---|---|----------------------------|------------------------------------|
| Jurisdiction: | West Brazoria County Drainage District No. 11 | Action Number: | W2 |
| Hazard(s) Addressed: | Flooding and Hurricane/Tropical Storm | | |
| Project Title: | Improvement Projects | | |
| Project Description: | To prevent localized community, perform all engineering and survey and provide materials and construction to clean 150 miles of sloughs, ditches and creeks. The work will cover removal of existing trees and brush, regrade/reshape, installation of culverts where required and grass seeding of the completed ditch, slough or creek. | | |
| Responsible Entity: | West Brazoria County Drainage District No. 11 Director | | |
| Losses avoided: | Reduce the loss of life and property during flooding events. | | |
| Cost Estimate: | 15,000,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

| | | | |
|---|---|----------------------------|------------------------------------|
| Jurisdiction: | West Brazoria County Drainage District No. 11 | Action Number: | W3 |
| Hazard(s) Addressed: | Flooding and Hurricane/Tropical Storm | | |
| Project Title: | Land Purchase | | |
| Project Description: | Preserve natural lands and green space to reduce the impacts from flooding and hurricane/tropical storms. Up to 1,000 acres of land tracts could be purchased from willing sellers for their natural ecosystem services, including water detention and management of water outflow. The land will be converted to parks, wildlife management areas and/or other public open spaces. | | |
| Responsible Entity: | West Brazoria County Drainage District No. 11 Director | | |
| Losses avoided: | Reduce the loss of life and property by preserving pervious surface and open space to reduce the effects of flooding. Reduce agricultural and water reservoir losses during droughts and reduce the loss of life and property during floods and tropical storms/hurricanes by using wetlands and wetland forests as natural storm infrastructure. | | |
| Cost Estimate: | 10,000,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | No |

| | | | |
|---|--|----------------------------|------------------------------------|
| Jurisdiction: | West Brazoria County Drainage District No. 11 | Action Number: | W4 |
| Hazard(s) Addressed: | Flooding and Hurricane/Tropical Storm | | |
| Project Title: | Data Base Management System | | |
| Project Description: | Develop a GIS database of all ditches, sloughs and creeks within the district and periodically update as new information becomes available. Use output from the GIS database to develop a planning tool to track all information relative to the specific ditch, slough or creek, (e.g., property easements, license agreements, last ditch maintenance, planned maintenance, etc.). | | |
| Responsible Entity: | West Brazoria County Drainage District No. 11 Director | | |
| Losses avoided: | | | |
| Cost Estimate: | 200,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

| | | | |
|---|--|----------------------------|------------------------------------|
| Jurisdiction: | West Brazoria County Drainage District No. 11 | Action Number: | W5 |
| Hazard(s) Addressed: | Flooding and Hurricane/Tropical Storm | | |
| Project Title: | Master Drainage Plan | | |
| Project Description: | Provision of all Project Management and Engineering to develop the Master Drainage Plan, inclusive of: Collect and review of existing reports, studies, gage data, etc., verify watershed boundaries, examine flooded structures and NFIP claims data Develop base conditions models for different storm conditions using Atlas 14 rainfall events, determine level of service for the main stem and tributaries Create HEC-RAS 2D models to determine sheet flow issues. Identify problem areas, areas for future development and constraints affecting the watershed Perform desktop environmental studies Develop Technical memorandum on baseline conditions, identify alternatives to solve existing flooding issues and perform hydraulic analysis to solve future flooding issues Develop Watershed Strategy via hierarchy of alternatives considering opportunities to team with other agencies, damage reduction, costs, priority areas to be worked and score each of the alternatives, issue a technical note providing documentation on the process of developing the strategy. Create a comprehensive Watershed Plan including a summary of projects and timeline for implementation, including maps, tables and other exhibits to document the analysis. | | |
| Responsible Entity: | West Brazoria County Drainage District No. 11 Director | | |
| Losses avoided: | Reduce the loss of life and property during flooding events. | | |
| Cost Estimate: | 1,500,000 | Timeframe: | When funding becomes available |
| Potential Funding Sources: | Federal, State, and Local Funds, Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes |

City of Richwood

| | | | |
|---|--|----------------------------|------------------------------------|
| Jurisdiction: | City of Richwood | Action Number: | Z1 |
| Hazard(s) Addressed: | Deficient Drainage | | |
| Project Title: | Stormwater Master Plan, Phase 1 | | |
| Project Description: | 6200 linear feet of main outfall stormwater drainage ditch in which slopes were graded, concrete channels added to base flow lines, and drainage grade reestablished | | |
| Responsible Entity: | City of Richwood Mayor and City Manager, Public Works Director | | |
| Losses avoided: | Continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | 1.6 million | Timeframe: | 2/2022 – 12/2022 |
| Potential Funding Sources: | Local Funds (General Obligation Bond) | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes or No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes or No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes or No |

| | | | |
|---|--|----------------------------|------------------------------------|
| Jurisdiction: | City of Richwood | Action Number: | Z2 |
| Hazard(s) Addressed: | Lack of Resiliency | | |
| Project Title: | American Rescue Plan Act, Lift Station & Water Well Generators | | |
| Project Description: | Replacement of High Service Booster Pumps. Backup power generators added at primary water well site as well as Service Center to serve as backup power to City SCADA system and one wastewater lift station. | | |
| Responsible Entity: | City of Richwood Public Works Director | | |
| Losses avoided: | Continuity of services during natural disasters and/or hazards. | | |
| Cost Estimate: | 988,170 | Timeframe: | 03/2023 – 03/2024 |
| Potential Funding Sources: | Federal & Public Assistance Grants | Benefit-Cost Ratio: | More than a 1:4 cost-benefit ratio |
| Does this action reduce effects of hazards on existing buildings? | | | Yes or No |
| Does this action reduce effects of hazards for new buildings, infrastructure, or future development? | | | Yes or No |
| Does mitigation action identify, analyze, and prioritize actions related to continued compliance with NFIP? | | | Yes or No |

Part 8: Plan Maintenance

Part 8: PLAN MAINTENANCE

To remain an effective tool, the HMAP will undergo continuous review and updates. This practice is known as plan maintenance and requires monitoring, evaluating, updating, and implementing the plan. To accomplish this, a plan maintenance team (PMT) is comprised of representatives from each of the County's participating jurisdictions.

| Plan Maintenance Team | |
|--------------------------------|---|
| Plan Maintenance Team Leader | Brazoria County EMC / Disaster Recovery Manager |
| Jurisdiction | Responsible Entity |
| Unincorporated Brazoria County | Brazoria County EMC / Floodplain Administrator |
| Angleton | EMC |
| Brazosport College | EMC |
| Drainage District 11 | Superintendent |
| Bonney | Mayor |
| Bailey's Prairie | Mayor |
| Brazoria | EMC / Mayor |
| Brazosport ISD | Assistant Superintendent / EMC |
| Brookside Village | Mayor |
| Clute | EMC |
| Danbury | Mayor |
| Hillcrest Village | EMC |
| Holiday Lakes | Mayor / City Secretary |
| Iowa Colony | Police Chief / City Manager |
| Jones Creek | Town Marshall |
| Lake Jackson | City Manager / Assistant EMC |
| Liverpool | EMC |
| Manvel | Fire Marshal |
| Oyster Creek | EMC |
| Port of Freeport | Safety & Security Chief |
| Freeport | Mayor / EMC |
| Quintana | EMC |
| Richwood | Police Chief / City Manager |
| Surfside Beach | City Secretary / Mayor |
| Sweeny | City Manager |
| Velasco Drainage District | Director |
| West Columbia | EMC / Police Chief |

Meeting Schedule

The PMT will hold its first meeting within two years after the plan's approval date and will continue to meet every year thereafter. A special meeting will be held 12 months prior to the plan's expiration to develop a timeline and strategy to update the plan in accordance with TDEM and FEMA's requirements.

Procedures

The PMT will meet annually to address necessary revisions to the whole planning and public participation process, and the entirety of the written plan including developing amendments, assessing the implementation progress, and identifying emerging risks and vulnerabilities in the county.

Each participating jurisdiction is responsible for reporting and requesting updates to the HMAP, and the team will explore multi-jurisdictional solutions when applicable. Any new public participation activity suggestions, changes to the maintenance or implementation procedures, mitigation actions, strategies, or required studies will be submitted to the County's representative. The representative will evaluate the items for compliance with TDEM and FEMA regulations before leading the process to adopt or approve the new items.

Recommended changes, updates, and revisions will be implemented based on available funding to support revisions, and updates and will be assigned to appropriate officials with pre-determined timelines for completion. Updates to the HMAP will then be adopted by the appropriate governing body.

Public Involvement

Continued stakeholder and public involvement will remain a vital component of the HMAP. The PMT will seek public input at all stages of Plan Maintenance related to the HMAP. The PMT Leader will also conduct outreach and involve the public through surveys, social media and online participation. The PMT Leader will advertise all meetings in local news outlets, on county and city social media pages and websites, and coordinate with all participating jurisdictions. Public surveys and online information will be a preferred method used.

In addition, each participating jurisdiction will seek input from the public on the status of existing hazards, emerging vulnerabilities, and evaluate the HMAP's strategy with the public. During each meeting, the PMT will provide an open comment forum through surveys, social media or other online interactive discussions with the public. The development of new goals and strategies will be a joint effort between the PMT and public participants.

Progress Monitoring

It is important to monitor and evaluate the progress each jurisdiction has made toward implementing the HMAP. This ensures goals, objectives, and the mitigation strategy are regularly re-evaluated and reviewed for feasibility. Each participating jurisdiction will provide a progress report on completed or ongoing mitigation projects at each Plan Maintenance meeting. Unaddressed mitigation actions will be evaluated for relevancy and/or amended to increase feasibility.

Plan Evaluation

Procedures to monitor and evaluate the HMAP were determined and adopted. This ensures that the entirety of the plan is regularly examined for feasibility, and that the HMAP remains a relevant and adaptive tool. An additional meeting will be held 12-months prior to the plan's expiration to develop a timeline and strategy to update the HMAP.

Plan Maintenance: Evaluation & Monitoring Procedures

| Method and Procedures | Schedule | Responsible Entity |
|---|--------------------------------------|--|
| <p>The PMT Leader will advertise all annual meetings in local newspapers, post invitations on the County social media pages, and post fliers at city and county buildings 30 days prior to the meetings in order to encourage public participation throughout the plan’s maintenance process.</p> | 30 days prior to public PMT meetings | PMT Leader |
| <p>Emerging risks and vulnerabilities will be identified and discussed.</p> <ol style="list-style-type: none"> 1) PMT members are responsible for monitoring each hazard in their jurisdiction, and provide an update on any new occurrences and emerging risks. 2) The PMT Leader will seek input from participants and the public at the annual meetings by opening the meeting for public comment. | Annually | PMT representative from each participating jurisdiction |
| <p>The PMT will monitor the entirety of the planning process and the written plan to ensure the HMAP remains relevant and the strategy continues to be effective.</p> <ol style="list-style-type: none"> 1) PMT members will identify new projects and/or re-prioritize existing strategies based on changes in their jurisdiction. 2) Funding sources and multijurisdictional cooperation for new initiatives will be determined. 3) PMT members will review public participation outreach strategies in order to identify new or different methods of outreach in order to reach more community members 4) The Plan Maintenance Team Leader will report on any suggestions for planning, maintenance, or implementation process for the plan. | Annually | PMT representative from each participating jurisdiction |
| <p>Each participating jurisdiction will evaluate their progress implementing the mitigation strategy.</p> <ol style="list-style-type: none"> 1) Representatives will publicly discuss progress and submit written progress reports to the team leader. 2) Completed and ongoing mitigation actions will be discussed by responsible entity. 3) Unaddressed mitigation actions will be evaluated for relevancy and/or amended to increase feasibility. 4) Feasibility of the mitigation strategy will be evaluated, and any necessary revisions will be proposed. 5) The team leader will seek comment from the public after each participating jurisdiction's presentation. | Annually | PMT, the responsible department identified in the mitigation action up for discussion, and the public. |
| <p>The PMT will develop a timeline and strategy to update the plan 12 months before it expires. The update strategy will include:</p> <ol style="list-style-type: none"> 1) Identify entities responsible for drafting and submitting the update to TDEM 2) Send appropriate representatives to G-318 training. 3) Determine funding needs and funding sources for plan update. | 12 months prior to HMAP's expiration | PMT, and PMT Leader |

Existing Plans & Regulations

Several existing plans and programs that require integration of the HMAP have been identified by the participating jurisdictions. These known planning mechanisms will be amended to support mitigation efforts, and both plans will be reviewed for contradictions.

- DRP: Disaster Recovery Plan**
- CP: Comprehensive Plan**
- FMP: Floodplain Management Plan**
- SMP Stormwater Management Plan**
- EOP: Emergency Operations Plan**
- COOP: Continuity of Operations Plan**
- TP: Transportation Plan**
- SO: Subdivision Ordinance**
- AB: Annual Budget**
- MA: Mutual Aid Agreement**
- FDPO: Flood Damage Prevention Ordinance**
- CIP: Capital Improvements Plan**

| Jurisdiction | DRP | CP | FMP | SMP | EOP | COOP | TP | SO | AB | MA | FDPO | CIP |
|--------------------------------|-----|----|-----|-----|-----|------|----|----|----|----|------|-----|
| Unincorporated Brazoria County | x | x | x | | x | x | x | | x | x | | |
| Alvin | | | | | x | | | | x | x | | |
| Angleton | x | x | x | x | x | x | x | x | x | x | x | x |
| Bailey's Prairie | x | x | x | | x | | x | x | x | x | x | |
| Bonney | | | | | | | | | x | x | | |
| Brazoria | | | | | x | | | x | x | x | | |
| Brookside Village | | | | | x | | | | x | x | | |
| Clute | x | | x | | x | | | | x | x | | x |
| Danbury | | | | | x | | | | x | x | | |
| Hillcrest | | | | | x | | | | x | x | | |
| Holiday Lakes | | | x | | x | | | | x | x | x | |
| Iowa Colony | | x | x | | x | | | x | x | x | x | x |
| Jones Creek | | | | | x | | | | x | x | x | |
| Lake Jackson | x | x | x | x | x | | x | x | x | x | | x |
| Liverpool | | | | | | | | | x | x | | |
| Manvel | x | x | x | x | x | x | x | x | x | x | x | x |
| Oyster Creek | | | | | x | | | | x | x | | |
| Quintana | | | | | x | | | x | x | x | | |
| Richwood | | | | | x | x | | | x | x | | x |
| Surfside Beach | x | | x | x | x | | | x | x | x | x | x |
| Sweeny | x | | x | | x | x | x | | x | x | | x |
| West Columbia | x | | x | | x | x | x | | x | x | | x |
| Alvin ISD | | | | | x | | | | x | x | | |
| Brazosport ISD | | | | | x | | | | x | | | |
| Freeport | | | | x | x | | | x | x | | x | |
| Port of Freeport | | | | | x | | | | x | x | | |
| Velasco Drainage District | x | | x | x | x | | | | x | x | | |

Plan Integration

Integrating the HMAP into county and local planning mechanisms is key to its success. Effective integration allows communities to benefit from existing plans and procedures to further reduce their vulnerability and risk. Upon approval of the plan and approval of updates or revisions as proposed by the PMT, each participating jurisdiction will follow the pre-determined actions:

To update and revise existing planning mechanisms to further integrate the HMAP, all participating jurisdictions will follow a basic process(es) described in this section.

- 1.) Propose a policy, strategy, or regulatory amendment to the proper governing body.
- 2.) Advertise the amendment a minimum of 60 days before the meeting where it will be discussed.
 Advertising procedures for the public meeting(s) is outlined in the public involvement measures described in Section 8 of this plan, and will also abide by each jurisdiction's local regulations.
- 3.) Provide the public, elected officials, and governing bodies the opportunity to discuss and comment upon proposed change(s).
- 4.) If the proposal is accepted, the change is implemented by the appropriate governing authority.

| Jurisdiction | Integration Method |
|--------------------------------|---|
| Unincorporated Brazoria County | The HMAP and plan amendments will be presented to Commissioner’s Court by the PMT Leader. Upon approval by Commissioner’s Court, approved actions will be acted upon as funding becomes available and integrated into the identified county planning mechanisms. The PMT Leader will coordinate with the representatives tasked with maintaining the EOP and MA to incorporate the HMAP |
| Alvin | Alvin's PMT representative will select appropriate mitigation actions to be implemented using the City's local budget, and develop an implementation proposal. The budget request and implementation proposal will be presented before City Council. An agenda will be published 30 days before the meeting. |
| Angleton | The Angleton PMT representative will draft a proposal for incorporating the HMAP's mitigation strategy into their existing planning mechanisms. The proposal will be presented to the Planning and Zoning Commission (when applicable). Upon approval, it will be presented to the City Council for consideration. Angleton will advertise the amendment(s) no less than 30 days before the meetings. Upon approval, city staff will act to incorporate the HMAP into their existing planning mechanisms. |
| Bailey’s Prairie | The Bailey's Prairie PMT representatives will draft a proposal for incorporating the HMAP's mitigation recommendations into their existing planning mechanisms. The proposal will be presented to the City Alderman for consideration. Bailey's Prairie will advertise the amendment no less than 25 days before the meeting where it will be discussed. |
| Bonney | Bonney's PMT representative will select mitigation actions to be budgeted into the City of Bonney's annual budget to be implemented the following year. The proposal will be presented before City Council. An agenda will be published 30 days in advance. |
| Brazoria | The Brazoria City Manager will draft a proposal for incorporating the HMAP's mitigation strategy into their existing planning mechanisms. The proposal will be presented to the City Council and mayor for consideration. Brazoria will post an agenda for the public hearing no less than 14 days before the meeting when it will be considered. Upon approval, the city manager will initiate the process to incorporate the HMAP into their existing planning mechanisms. |
| Brookside | Brookside Village's PMT representative will select mitigation actions to be budgeted into the Brookside Village annual budget to be implemented the following year. The proposal will be presented before City Council. An agenda will be published 15 days in advance. |

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| Clute | The Clute PMT representative will draft a proposal for incorporating the HMAP's mitigation strategy into their existing planning mechanisms. The proposal will be presented at a joint public hearing of the Planning and Zoning Commission and City Council for consideration. Clute will advertise the amendment(s) no less than 30 days before the meetings. Upon approval, city staff will act to incorporate the HMAP into their existing planning mechanisms. |
| Danbury | Danbury's PMT representative will select mitigation actions to be budgeted into the Danbury annual budget and be implemented the following year. The proposal will be presented before City Council and will follow General Law Type A municipality laws for adoption. |
| Hillcrest | Hillcrest's PMT representative will select mitigation actions to be implemented using the local budget. An agenda will be published 30 days in advance, the proposal will be presented before City Council. |
| Holiday Lakes | The Holiday Lakes PMT representative will draft a proposal for incorporating the HMAP's mitigation recommendations into their existing planning mechanisms. The proposal will be presented to the Town Council for consideration. Holiday Lakes will advertise the amendment no less than 14 days before the meeting where it will be considered. Upon approval, city staff will act to incorporate the HMAP into their existing planning mechanisms. |
| Iowa Colony | The Iowa Colony PMT representative will draft a proposal for incorporating the HMAP's mitigation strategy into their existing planning mechanisms. The proposal will be presented at a public hearing for the Mayors and City Council's consideration. Iowa Colony will post the agenda no less than 7 days before the meetings. Upon approval, city staff will act to incorporate the HMAP into their existing planning mechanisms. |
| Jones Creek | Jones Creek's PMT representative will draft a proposal for incorporating the HMAP's mitigation strategy into their existing planning mechanisms. The proposal will be presented before City Alderman and will follow Type A municipality laws for adoption and implementation. |
| Lake Jackson | The Lake Jackson City Secretary and PMT representative will draft a proposal for incorporating the HMAP's mitigation strategy into their existing planning mechanisms. The proposal will be presented to the City Council and mayor for consideration. Lake Jackson will post an agenda of the meeting no less than 7 days before the meeting when it will be considered. Upon approval, the PMT representative will initiate the process to incorporate the HMAP into their existing planning mechanisms with the assistance of Lake Jackson City Staff. |
| Liverpool | Liverpool's PMT representative will select appropriate mitigation actions to be implemented using the City's local budget, and develop an implementation proposal. The budget request and implementation proposal will be presented before City Council on the first Tuesday of the month following the annual PMT meetings. |
| Manvel | The Manvel PMT representative will draft a proposal for incorporating the HMAP's mitigation strategy into their existing planning mechanisms. The proposal will be presented at a public hearing for City Council consideration. Manvel will post the agenda no less than 14 days before the meetings. Upon approval, city and county staff will act to incorporate the HMAP into their existing planning mechanisms. |
| Oyster Creek | Oyster Creek's PMT representative will select appropriate mitigation actions to be implemented using the City's local budget and develop an implementation proposal. The proposal will be presented before City Council. An agenda will be published 30 days before the meeting on the city's website: http://www.cityfoystercreek.org |
| Quintana | Quintana's mayor will select mitigation actions to be implemented using the local budget, and will integrate new flood regulations in accordance with the HMAP's recommendations into the Code of Ordinances. An agenda will be published 30 days in advance, the |

| | |
|---------------------------|---|
| | proposal will be presented before City Council on the third Tuesday after the annual PMT meeting. |
| Richwood | The Richwood PMT representatives will draft a proposal to incorporate the HMAP's mitigation strategy into their existing planning mechanisms. The proposal will be presented to the Town Council for consideration. Upon approval, city staff will act to incorporate the HMAP into their existing planning mechanisms. |
| Surfside Beach | The Surfside PMT representatives will draft a proposal for incorporating the HMAP's mitigation recommendations into the CP and SO and present to city council. Upon approval, City staff will incorporate the HMAP into the CP and SO. |
| Sweeny | The Sweeny City Manager will draft a proposal for incorporating the HMAP's mitigation recommendations into their existing planning mechanisms. The proposal will be presented to the City Council and mayor for consideration. Sweeny will post an agenda of the meeting no less than 30 days before the meeting when it will be considered. Upon approval, the city manager will initiate the process to incorporate the HMAP into their existing planning mechanisms. |
| Brazosport ISD | The superintendent will coordinate with the PMT to ensure that students and their parents are provided proper educational resources, and that school integrates mitigation strategies and actions into their Improvement Plan and facilities schedules. |
| West Columbia | The West Columbia PMT representatives will draft a proposal for incorporating the HMAP's mitigation recommendations into their existing planning mechanisms. The proposal will be presented to the City Council for consideration. West Columbia will advertise the amendment no less than 1 month before the meeting when it will be considered. Upon approval, city staff will act to incorporate the HMAP into their existing planning mechanisms. |
| Alvin ISD | The superintendent of Alvin ISD will coordinate with the PMT to ensure that students and their parents are provided proper educational resources, and that school integrates mitigation strategies and actions into their Improvement Plan and facilities schedules. |
| Port of Freeport | The Port of Freeport will incorporate the HMAP and any subsequent updates into their EOP. The fire chief is responsible for presenting amendments to the Community Advisory Council for consideration. |
| Freeport | The Freeport PMT representative will work with the City Manager to draft a proposal for incorporating the HMAP's mitigation recommendations into their existing planning mechanisms. The proposal will be presented to the City Council and mayor for consideration. Freeport will post an agenda of the meeting no less than 30 days before the meeting when it will be considered. Upon approval, the city manager will initiate the process to incorporate the HMAP into their existing planning mechanisms. |
| Velasco Drainage District | Plan amendments and updates will be presented to the Velasco Drainage District superintendent by the PMT Leader. Upon approval by the Velasco Drainage District, approved actions will be acted upon and/or integrated into their FMP, EOP, and SMP but the appointed staff member. |
| Sweeny ISD | The superintendent and EMC will coordinate with the PMT to ensure that students and their parents are provided proper educational resources, and that school integrates mitigation strategies and actions into their Improvement Plan and facilities schedules. |
| Danbury ISD | Danbury ISD's PMT representative will draft a proposal for incorporating the HMAP's mitigation strategy into their existing planning mechanisms. This coordination will be through the school's superintendent, City Mayor and Brazoria County EMC. |
| Damon ISD | Damon ISD will be working with Brazoria County EMC to develop an integration plan and method to incorporate into the existing planning mechanisms for the school district. |

The previous Hazard Mitigation Plan has not been incorporated into any other planning mechanisms.

Appendix A: Planning Process

The Planning Process began with HGAC over 5 years ago. Brazoria County and participating jurisdictions have used this as a springboard to help develop our methodology in updating our plan.

Training our PMT and other participating jurisdiction officials with the G-318 course helped guide our progression giving us useful tools to update the plan.

Our team chose to use surveys for public participation to increase results. Public meeting turnout has been low to non-existent with the pandemic.

Our surveys resulted in over 100 responses and gave valuable information from the public about their concerns, anxieties and hierarchies for Hazard Mitigation.

APPENDIX A: Planning Process Documentation

Public Meeting Press Release & Advertisement



HOUSTON-GALVESTON AREA COUNCIL

PO Box 22777 • Houston, Texas 77227-2777 • 713-627-3200

NEWS RELEASE

FOR IMMEDIATE RELEASE

September 29, 2017

Contact: Joey Kaspar: (713) 993-4547 or Joey.Kaspar@h-gac.com
 Becki Begley: (713) 993-2410 or Becki.Begley@h-gac.com (Media Inquiries Only)

BRAZORIA COUNTY HAZARD MITIGATION PLAN KICK-OFF MEETING

The Houston-Galveston Area Council (H-GAC), in partnership with Brazoria County, City of Angleton, City of Brazoria, City of Clute, City of Iowa Colony, City of Lake Jackson, City of Liverpool, City of Quintana, City of Surfside Beach, City of Sweeny, and City of West Columbia, is hosting the first public meeting to develop Brazoria County's Hazard Mitigation Plan. The meeting will be held from 9:00 a.m. to noon, October 25, at the Nolan Ryan Center, 2925 TX-35, Alvin, TX 77511.

A Hazard Mitigation Plan is a strategic plan that proposes actions to reduce or eliminate long-term risk to people and property from future natural disasters. Public input and involvement is important for developing a comprehensive approach to reduce the effects of natural disasters on communities.

All Brazoria County residents are invited to participate and contribute their local expertise during the planning process. Mitigation actions developed by participants will be considered for inclusion in the County's Hazard Mitigation Plan to be submitted to the Federal Emergency Management Agency (FEMA).

The meeting agenda is available on H-GAC's website at <http://www.h-gac.com/community/community/hazard/documents/10-25-17-Brazoria-County-Meeting-Agenda.pdf>

More information on hazard mitigation plans is available on FEMA's website at <https://www.fema.gov/hazard-mitigation-planning>.

For more information about the meeting, contact Joey Kaspar, (713) 993-4547 or at Joey.Kaspar@h-gac.com, or Amy Combs, (713) 993-4544 or at Amy.Combs@h-gac.com.

Houston-Galveston Area Council

The Houston-Galveston Area Council (www.h-gac.com) is a voluntary association of local governments in the 13-county Gulf Coast Planning Region—an area of 12,500 square miles and more than 6 million people. H-GAC works to promote efficient and accountable use of local, state, and federal tax dollars and serves as a problem-solving and information forum for local government needs.

Hazard Mitigation Plan 2023

Kick-off Meeting

November 9, 2022

1. Welcome – Steve Rosa
2. Sign in
3. Documentation is important – public involvement is vital
4. HMGP update vs. new plan development
5. Current HMGP review (mission and goals)
6. Review Hazard Rankings
7. Participating jurisdictions' responsibilities:
 - A. Mitigation Strategies (Proposed Projects)
 - B. Documented Public Participation (Surveys, Social Media, etc...)
 - C. Documented Press Releases
 - D. Jurisdiction Profile Changes
8. Role of Brazoria County:
 - A. Writing Plan Update
 - B. Collecting Hazus Analysis Data
 - C. Organizing Jurisdiction projects
 - D. Submitting Plan Draft and Final Plan
 - E. Distributing Plan Templates
9. HMGP 2023 Update Timeline (end of May final draft) and Next Meeting

Questions / Comments

Kick-Off Meeting Breakdown

Welcome & Overview of Hazard Mitigation Plans & Procedures

The presentation will also include project timelines, partner roles and responsibilities.

Review 2022 Risk Assessment

Attendees will participate in a breakout session to review the draft risk assessment maps, charts, and provide feedback.

Local Risk Assessment & Capability Form

Meeting attendees will fill out a form describing the frequency of a hazard, and rate their mitigation capabilities in their jurisdiction.

Break

Mitigation Actions Presentation & Activity

Creating mitigation actions and facilitate a practice exercise in writing a mitigation action and strategies

Update 2018 Mitigation Actions & Write New Actions

Review 2018 mitigation actions for viability, and update actions to meet new FEMA standards. With remaining time, draft new mitigations for 2023.

Questions

Sign In Sheet From Kick-Off Meeting November 9, 2022

| CHECK-IN LIST | | HMGP 2023 | TASK NAME: HMGP 2023 Kick-off | FOR: Documentation | DATE: Nov. 9th, 2022 | |
|----------------------------|----------------------|---------------------------------------|-------------------------------|--------------------|----------------------|--------------|
| HMGP 2023 Kick-off Meeting | | | | | TIME: 0900 | |
| # | PRINT NAME | E-MAIL ADDRESS & PHONE # | TIME IN | TIME OUT | INITIALS IN | INITIALS OUT |
| 14 | Katrice Davis | Katrice.davis@braport.edu | 0900 | | KD | |
| 15 | Paul Davis | Chief@westcolumbiatr.org | 9 | | PD | |
| 16 | JY MORROW | JY.MORROW@EAZOSPORTS.D.NET | 0900 | | JM | |
| 17 | Sheng Ly | sheng.ly@angelon.tx.us | 9:00 | | SL | |
| 18 | Debbie A. Sutherland | cid.manager@westcolumbiatr.org | 9am | | DS | |
| 19 | Eric FERSTER | efoster@renewal.tx.gov | 9:00 | | | |
| 20 | Christophe D'Neilly | cmotley@freepert.tx.us | 0915 | | CD | |
| 21 | David Launghood | david@relascadairnage.org | 9:13 | | DL | |
| 22 | Joe Williams | Joe@relascadairnage.district.com | 9:15 | | | |
| 23 | Glenda Hurd | ghurd@cobv.tx.org | 9:15 | | | |
| 24 | Steve ROSA | Stevenc.Rosa@brazosrivercounty.tx.gov | 8:30 | | SR | |
| 25 | | | | | | |
| 26 | | | | | | |



| CHECK-IN LIST | | HMGP 2023 | TASK NAME: HMGP 2023 Kick-off | FOR: Documentation | DATE: Nov. 9th, 2022 TIME: 0900 | | |
|---------------|--------------------|--|-------------------------------|--------------------|------------------------------------|-------------|--------------|
| # | PRINT NAME | E-MAIL ADDRESS & PHONE # | CHECK-IN LOCATION: BC EOC | TIME IN | TIME OUT | INITIALS IN | INITIALS OUT |
| 1 | Charlie Davis | charlie.d@brazoriacountytx.gov | | 0830 | | CD | CD |
| 2 | Bryan Sidelstrom | bsidelstrom@lakejacksowd.net | | 0842 | | BS | BS |
| 3 | Hobbs, Travis | emcehillcrestvillage.tx.gov | | 0846 | | TH | |
| 4 | Holmes, S. Michael | Sholmes@Richwood.tx.gov | | 0844 | | SH | |
| 5 | Robert Hemmingar | rhemmingar@houseliving.tx.gov | | 0845 | | RH | |
| 6 | Allen King | AKing@joida.cedevm.dallas.tx.gov | | 0845 | | AK | |
| 7 | Randall Rhyne | RANDY.RHYNE@sanperry.tx.gov randallrr1@qswi.com | | 0853 | | RR | |
| 8 | Naseu Coathouse | naseu@toratoricountytx.gov | | 8:30 | | CC | CC |
| 9 | Will Blackstock | wblackstock@nlctexas.gov | | 8:50 | | WB | |
| 10 | Chris Hogan | hogan@portfreepart.com | | 8:50 | | CH | |
| 11 | Sheila Williams | citymanager@cityofbentonpa.gov | | 8:53 | | SW | |
| 12 | Marreas Ratten | marreas@brazoriafire.org | | 8:55 | | MR | |
| 13 | David Kocurek | projectmanager@cityofbrazoria.org | | 8:55 | | DK | DK |

Online Surveys Sample

A new entry to a form/survey has been submitted.
Form Name: Hazard Mitigation Date & Time: 04/04/2023 4:32 PM Response #: 61
Submitter ID: 59915
IP address: 50.249.86.61
Time to complete: 7 min. , 23 sec.
Survey Details Page 1

1. How long have you lived in Brazoria County?

10 years or more

2. Are you responding on behalf of a resident or commercial property?

Commercial

3. Do you own or rent your place of residence/business?

Rent

4. What is the Zip Code of your Primary residence?

77566

5. How concerned are you about the following hazards affecting our community?

Not Concerned Somewhat Concerned Very Concerned
Dam/Levee Failure [] [x] []
Drought and Water Shortage [] [x] []
Flood (Localized/Stormwater) [] [] [x]
Hailstorm [x] [] []
Lightning [x] [] []
Tornado and/or Straight Line Wind [] [x] [] Severe Weather (Hurricane/Tropical Storms) [] [] [x]
Beach/River Erosion [x] [] []
Extreme Heat [] [x] []
Winter Extreme Weather [] [x] []
Wildfire [x] [] []

6. In the past 5 years, have you been affected by any of the above hazards?

(o) Yes

7. If yes, please list the hazards that affected you?

Freeze

8. Natural disasters can have a significant impact on a community but planning for these events can help lessen the impact. The following statements will help us determine community priorities in planning for these hazards. Please tell us how important each is to you.

| | Very Important | Neutral | Not Important |
|--|-------------------------------------|-------------------------------------|--------------------------|
| Protecting private property | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Protecting critical facilities (hospitals, transportation networks, fire stations) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Preventing development of businesses and neighborhoods in hazard prone areas | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Protecting natural environment | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Protecting historical/cultural landmarks | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Promoting cooperation among public agencies, citizens and businesses | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Protecting and reducing damage to utilities | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Increasing emergency services (Law Enforcement, Fire, EMS) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

9. What are the most effective ways for you to receive information about disaster preparedness? (Choose all that apply)

County Website

[Empty text box]

Social Media Television/Radio

Email

10. Do you have flood insurance through the National Flood Insurance Program?

(o) Yes

11. Please add any additional comments.

Not answered

12. Enter contact information (Optional)

Name Hidden
Company Hidden
Address Hidden
City Lake Jackson
State Texas
Zip Code 77566
Email Hidden

Thank you,
Brazoria County, TX

Course Title: G-318 Local Mitigation Planning Workshop

Course Location: Lake Jackson, TX Lake Jackson Civic Center Instructor: Ellis, Michelle

Course Beginning Date: 10/19/2022 Course Ending Date: 10/20/2022

| P/F/I | Please Print Name Last, First (MI) | FEMA SID | Signature | Day 1 | | Day 2 | | Day 3 | | Day 4 | | Day 5 | | Day 6 | | Day 7 | |
|-------|------------------------------------|----------------|--------------------------|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|
| | | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| | 16 Sidebottom, Bryan Ray | 0000 000975 | <i>Bryan Sidebottom</i> | | | | | | | | | | | | | | |
| | 17 Sutherland, Debbie A | | <i>Debbie Sutherland</i> | | | | | | | | | | | | | | |
| | 18 Towne, Rhueben Walter | 000924 856 | <i>Rhueben Towne</i> | | | | | | | | | | | | | | |
| | 19 Williams, Sheila Jo | | <i>Sheila Williams</i> | | | | | | | | | | | | | | |
| | 20 Williams II, David Carson | 000726 0387 | <i>David Williams II</i> | | | | | | | | | | | | | | |
| | 21 | | | | | | | | | | | | | | | | |
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| | 29 | | | | | | | | | | | | | | | | |
| | 30 | | | | | | | | | | | | | | | | |

I certify that the above people were present during the teaching of this class.

Lead Instructor Signature _____ Date _____

Lead Instructor Name (Print) _____

From: To:

Cc:

Subject: Date: Attachments:

Importance:

[EXTERNAL]City West Columbia Project Identification Meeting Follow-up Monday, October 31, 2022 1:38:32 PM

High

Good afternoon,

Thank you all for joining us for the West Columbia Project Identification Exercise on Thursday, October 27th! I wanted to follow up with some of our program resources. Attached you will find our technical assistance flyer. As you're also aware, Texas Community Watershed Partners also includes the [Green Infrastructure for Texas \(GIFT\)](#) program, which assists communities in developing nature-based stormwater management practices. Finally, you can participate in our [Texas Citizen Planner](#) courses online to build your expertise in policy tools and best practices for more resilient planning. Should any of these programs interest you or if you'd like more information, please feel free to reach out to me. I'm also glad to set up a follow-up meeting (virtual or in-person) if you'd like to continue working with the CHARM model you used last week.

Finally, we'll be developing a report detailing key discussion topics and priority projects, as well as possible funding sources. We will share that with you in the next few weeks. Once again, thank you so much for joining us for the West Columbia Project Identification Exercise, and we'll hope to work with you again in the near future!

Best,

Dana Snyder

Urban Resilience Planner | Project Manager
Community Health and Resource Management (CHARM)
Texas Community Watershed Partners | Texas A&M AgriLife Extension Service
[1335 Regents Park Dr., STE. 260, Houston, TX 77058](#)





Community Assistance Programs

Our team is here to assist your efforts to become more resilient – at no cost.

Texas A&M AgriLife Extension’s expertise in community development and mitigation planning can support your local projects and needs. We are able to offer various no-cost, in-kind technical assistance and consultation services to Texas communities through a Cooperating Technical Partners agreement with FEMA Region 6.



Project Identification Exercises

An Interactive, Data-Driven Workshop: We can facilitate mitigation project identification exercises for your community using our CHARM platform, using CHARM’s risk data and interactive exercises and your local knowledge to create an engaging and collaborative experience for local stakeholders.

Identifying Local Issues and Priorities: Bringing local champions and experts around the table provides an opportunity for discussion and coordination. During a typical three-hour exercise, participants review local risk data, identify emerging or unmapped hazards and issues, assess potential mitigation opportunities or strategies, and prioritize next steps and implementation needs.

Connecting You to Implementation and Funding: We know that mitigation efforts and projects take planning time and funding. After the workshop, we review your priority projects from the exercise and develop recommendations for implementation strategies, other community assistance opportunities, and funding sources such as state and federal grant and loan programs.



Technical Assistance Services

Ordinance and Plan Writing: Zoning, subdivision, floodplain, and building regulations are some of the most effective ways to reduce future risk. We work closely with your community’s key stakeholders to strategically develop regulations that reflect local priorities and capacity.

Technical Analyses: Assessing current risk and future conditions is an important step in the planning process. We can use our expertise with GIS and data including our CHARM platform to study local questions such as long-term buildout, buyout feasibility, and potential future impacts of hazards.

Education and Facilitation Assistance: Informed community leaders and stakeholders are critical. We can create customized trainings for your community and assist with meeting facilitation, visioning exercises, and community engagement process design.

GIS, Data, and Mapping Support: We believe that data is an important asset for decision-making that should be easily accessible. We can assist with data creation, data gathering, and GIS trainings to ensure your community has access to the best available information to use in decision-making.



We’d love to work with you!



Let us know how we can help your community become more resilient. To schedule a consultation, contact Andrew Knuppel at andrew.knuppel@ag.tamu.edu.

Current Hazard Mitigation Project – Public Meeting in Lake Jackson – February 2, 2023



Freeport Project Public Open House Scheduled for February 2023

The Freeport Project, a component of the Sabine Pass to Galveston Bay Program (S2G Program), will host a public open house on February 2, 2023, to provide the public with information about project progress.

The Freeport Project is one of three projects included in the S2G Program and focuses on improvements to the existing hurricane flood protection system in the Freeport area. These improvements will reduce the risk of flooding from coastal storm surge, while not inducing adverse impacts to area residents and businesses within the Freeport area. The Freeport Project is a partnership of the U.S. Army Corps of Engineers (USACE) and its non-Federal sponsor, the Velasco Drainage District.

Date, time, and location information for the public open house is as follows:

Thursday, February 2, 2023
4 p.m. – 7 p.m.
Lake Jackson Civic Center
333 TX-332
Lake Jackson, Texas 77566

Informational displays will be available for public viewing and project team representatives will be available to provide information and answer questions.

Public feedback and participation are encouraged. The public open house is intended to inform and provide opportunities for the public to participate in the Freeport Project. **The public open house is not part of the formal National Environmental Policy Act (NEPA) process, which was completed in 2017.**

Comments received during this time will be taken into consideration by the Freeport Project Team but will not be documented as part of a NEPA-required public comment period. Written comments will be accepted during the public open houses and may be emailed to S2GFreeport@usace.army.mil.

To learn more about the Freeport Project, visit the project website and StoryMap:

- Project website – www.swg.usace.army.mil/S2G/Freeport/
- Project StoryMap – <https://bit.ly/FreeportStoryMap>

Appendix B: Critical Facilities

APPENDIX B: Critical Facilities

| TYPE | NAME |
|------------------------------------|---|
| Colleges Universities | Alvin Community College |
| Electric Substation | ROSHARON |
| Electric Substation | ALVIN |
| Electric Substation | ALVIN AUTO |
| Electric Substation | UNKNOWN307671 |
| Electric Substation | TAP303544 |
| EMS | STARFIRE EMERGENCY MEDICAL SERVICES INCORPORATED |
| EMS | ALVIN EMERGENCY MEDICAL SERVICES |
| Fire Station | Wolfe Airpark Fire Dept. |
| Fire Station | County Road 143 VFD |
| Fire Station | Alvin Fire Department |
| Fire Station | Alvin Fire Station 3 |
| Hazardous Waste Treatment Facility | INEOS USA LLC - CHOCOLATE BAYOU PLANT |
| Hazardous Waste Treatment Facility | MONSANTO CHOCOLATE BAYOU |
| High Schools | ALVIN H S |
| Local Emergency Operation Center | ALVIN EMERGENCY OPERATIONS CENTER |
| Natural Gas Receipt Delivery | CS #12 W RECEIPTS PLUS FUEL |
| Natural Gas Receipt Delivery | SOUTHERN PINES (DEL) |
| Police Station | ALVIN COMMUNITY COLLEGE POLICE DEPARTMENT |
| Police Station | ALVIN POLICE DEPARTMENT |
| Police Station | ALVIN INDEPENDENT SCHOOL DISTRICT POLICE DEPARTMENT |
| Police Station | HILLCREST VILLAGE CITY MARSHALS OFFICE |
| Police Station | Brazoria County Sheriff's Dept |
| Police Station | Alvin Police-Crime Stoppers |
| School | HOOD-CASE EL |
| School | ASSETS |
| School | MARK TWAIN EL |
| School | FAIRVIEW J H |
| School | WALT DISNEY EL |
| School | R L STEVENSON PRI |
| School | G W HARBY J H |
| School | ALVIN EL |
| School | ALVIN PRI |
| School | LONGFELLOW EL |
| School | ALVIN J H |
| School | MELBA PASSMORE EL |
| Shelter | Chocolate Bayou Worship Center |

| | |
|----------------------------------|--|
| Shelter | Living Stones Church |
| Solid Waste Landfill | CITY OF ALVIN LANDFILL |
| Toxic Release Inventory Facility | MHBA CB LLLP |
| Toxic Release Inventory Facility | MAINLAND CUSTOM MARBLE INC. |
| Toxic Release Inventory Facility | INPUT/OUTPUT INC - ALVIN |
| Toxic Release Inventory Facility | INEOS USA LLC - CHOCOLATE BAYOU PLANT |
| Toxic Release Inventory Facility | LYONDELL CHEMICAL CO - CHOCOLATE BAYOU CHEMICALS PLANT |
| Toxic Release Inventory Facility | MONSANTO CHOCOLATE BAYOU |
| Toxic Release Inventory Facility | HUNTSMAN CORP (PART) |
| Wastewater Treatments Plant | CITY OF ALVIN WWTP |
| Correctional Facilities | Brazoria County Jail and Detention Ctr |
| Correctional Facilities | Brazoria County Juvenile Detention Center and Residential Treatment Facility |
| Correctional Facilities | RETRIEVE PRISON FACILITY |
| Electric Substation | ANGLETON |
| EMS | ANGLETON AREA EMERGENCY MEDICAL SERVICES |
| Fire Station | Holiday Lakes |
| Fire Station | Angleton Fire Dept. |
| High Schools | ANGLETON H S |
| Hospital | UTMB ANGLETON-DANBURY MEDICAL CENTER |
| Hospital | ANGLETON-DANBURY GENERAL HOSPITAL |
| Local Emergency Operation Center | BRAZORIA COUNTY EMERGENCY OPERATIONS CENTER |
| Police Station | BRAZORIA COUNTY JUVENILE DETENTION CENTER |
| Police Station | BRAZORIA COUNTY SHERIFFS OFFICE / BRAZORIA COUNTY JAIL |
| Police Station | ANGLETON INDEPENDENT SCHOOL DISTRICT POLICE DEPARTMENT |
| Police Station | ANGLETON POLICE DEPARTMENT |
| Police Station | TEXAS DEPARTMENT OF PUBLIC SAFETY - HIGHWAY PATROL REGION 2 DISTRICT A SERGEANT 0 AREA 7 |
| Police Station | Brazoria County Sheriff's Ofc |
| Police Station | Angleton Police Dept. |
| Police Station | Brazoria County Criminal Div. |
| Police Station | Brazoria County Criminal |
| School | WESTSIDE EL |
| School | SOUTHSIDE EL |
| School | FRONTIER EL |
| School | NORTHSIDE EL |
| School | BRAZORIA CO JUVENILE DETENTION |

| | |
|----------------------------------|--|
| School | ANGLETON J H SCHOOL |
| School | RANCHO ISABELLA EL |
| School | CENTRAL EL |
| Shelter | First Baptist Church - Angleton |
| Shelter | UMC Family Life Center |
| Shelter | Angleton ISD Admin Building |
| Solid Waste Landfill | SEABREEZE ENVIRONMENTAL LANDFILL |
| Toxic Release Inventory Facility | BENCHMARK ELECTRONICS |
| Toxic Release Inventory Facility | MALLINCKRODT MEDICAL INC INTERVENTIONAL PRODUCTS PLANT |
| Toxic Release Inventory Facility | GREIF BROTHERS CORP |
| Correctional Facilities | CLEMENS PRISON FACILITY |
| Electric Substation | BRAZORIA |
| Fire Station | Texas Mid-coast NWR |
| Fire Station | Wild Peach VFD |
| Fire Station | Brazoria Fire Department |
| Fire Station | Rivers End Fire Dept. |
| Local Emergency Operation Center | BRAZORIA EMERGENCY OPERATIONS CENTER-ALTERNATE |
| Local Emergency Operation Center | BRAZORIA EMERGENCY OPERATIONS CENTER |
| Police Station | BRAZORIA POLICE DEPARTMENT |
| Police Station | Brazoria Police Dept. |
| School | WILD PEACH EL |
| School | BARROW EL |
| School | WEST BRAZOS J H |
| Shelter | First Baptist Church of Brazoria |
| Shelter | Brazoria First Assembly of God - Bldg. 1 |
| Shelter | Barrow Elementary School |
| Shelter | Brazoria First Assembly of God - Bldg. 2 |
| Shelter | West Brazoria Jr High School |
| Shelter | Wild Peach Elementary School |
| Toxic Release Inventory Facility | CHEVRON PHILLIPS CHEMICAL CO LP CLEMENS TERMINAL |
| Police Station | BROOKSIDE VILLAGE POLICE DEPARTMENT |
| EMS | CLUTE EMERGENCY MEDICAL SERVICES |
| Fire Station | Clute VFD |
| High Schools | BRAZOSWOOD H S |
| Local Emergency Operation Center | CLUTE EMERGENCY OPERATIONS CENTER |
| Police Station | CLUTE POLICE DEPARTMENT |
| Police Station | Richwood Police Dept. |
| School | LIGHTHOUSE LEARNING CENTER - AEC |
| School | CLUTE INT |

| | |
|--|--|
| School | T W OGG EL |
| School | GRIFFITH EL |
| Shelter | T.W. Ogg Elementary School |
| Shelter | Madge Griffith Elementary |
| Shelter | Clute Intermediate School |
| Shelter | First Baptist Church |
| Shelter | First Baptist Church Of Richwood |
| Toxic Release Inventory Facility | INEOS USA LLC STRATTON RIDGE |
| Toxic Release Inventory Facility | SOUTHERN REFUSE COMPANY |
| Toxic Release Inventory Facility | BENCHMARK ELECTRONICS INC |
| Wastewater Treatments Plant | CLUTE-RICHWOOD WWTP |
| Fire Station | Damon Fire Dept. |
| High Schools | DAMON H S |
| School | DAMON ISD |
| EMS | DANBURY VOLUNTEER FIRE DEPARTMENT AND EMERGENCY MEDICAL SERVICES |
| Fire Station | Danbury Fire Dept. |
| High Schools | DANBURY H S |
| Police Station | DANBURY POLICE DEPARTMENT |
| School | DANBURY MIDDLE |
| School | DANBURY EL |
| CERCLA(Superfund) National Priorities List | GULFCO MARINE MAINTENANCE |
| Correctional Facilities | CITY OF FREEPORT |
| Electric Substation | FREEPORT |
| Electric Substation | VELASCO |
| Electric Substation | BOOSTER |
| Electric Substation | TAP303600 |
| Electric Substation | BRYAN |
| EMS | FREEPORT FIRE AND EMERGENCY MEDICAL SERVICES DEPARTMENT |
| EMS | VILLAGE OF SURFSIDE BEACH EMERGENCY MEDICAL SERVICES |
| Fire Station | Demi John VFD |
| Fire Station | Jones Creek FD |
| Fire Station | Freeport Fire Dept. |
| Hazardous Waste Treatment Facility | BASF CORP - FREEPORT SITE |
| Hazardous Waste Treatment Facility | GULF CHEMICAL & METALLURGICAL CORP |
| Hazardous Waste Treatment Facility | DOW CHEMICAL CO FREEPORT FACILITY |
| High Schools | BRAZOSPORT H S |

| | |
|----------------------------------|---|
| Local Emergency Operation Center | FREEPORT EMERGENCY OPERATIONS CENTER |
| Police Station | JONES CREEK POLICE DEPARTMENT |
| Police Station | BRAZORIA COUNTY CONSTABLE - PRECINCT 1 |
| Police Station | FREEPORT CITY MARSHALS OFFICE |
| Police Station | FREEPORT POLICE DEPARTMENT |
| Police Station | Oyster Creek City Marshall |
| Police Station | Freeport Police Dept. |
| Police Station | Surfside Police Dept. |
| Police Station | Jones Creek Police Dept. |
| School | JANE LONG EL |
| School | FREEPORT INT |
| School | VELASCO EL |
| School | O'HARA LANIER MIDDLE |
| School | O A FLEMING EL |
| Shelter | Brazosport High School |
| Shelter | Freeport Intermediate School |
| Shelter | O.A. Fleming Elementary |
| Shelter | Velasco Elementary |
| Shelter | Lanier Middle School |
| Toxic Release Inventory Facility | SHINTECH INC |
| Toxic Release Inventory Facility | VERNOR MATERIAL & EQUIP |
| Toxic Release Inventory Facility | DSM NUTRITIONAL PRODUCTS |
| Toxic Release Inventory Facility | FREEPORT VINYL TECHNOLOGIES CO |
| Toxic Release Inventory Facility | AIR LIQUIDE FREEPORT HYCO PLANT |
| Toxic Release Inventory Facility | MARTIN OPERATING PTNR - FREEPORT OOS |
| Toxic Release Inventory Facility | SENTRY POLYMERS |
| Toxic Release Inventory Facility | MIDSTREAM FUEL SERVICE LLC FREEPORT 1 |
| Toxic Release Inventory Facility | BRASKEM AMERICA INC OYSTER CREEK PLANT |
| Toxic Release Inventory Facility | SHIN-ETSU SILICONES OF AMERICA - CARBON FUNCTIONAL SILANES FACILITY |
| Toxic Release Inventory Facility | COASTAL OYSTER CREEK AMMONIA CHEMICAL PLANT |
| Toxic Release Inventory Facility | AIR LIQUIDE AMERICA CORP. |
| Toxic Release Inventory Facility | AIR LIQUIDE FREEPORT HPU PLANT |
| Toxic Release Inventory Facility | CONOCOPHILLIPS FREEPORT |

| | |
|----------------------------------|---|
| Toxic Release Inventory Facility | NALCO CO |
| Toxic Release Inventory Facility | BASF CORP - HARBOR TERMINAL |
| Toxic Release Inventory Facility | TEXAS BARGE & BOAT INC |
| Toxic Release Inventory Facility | BASF CORP - FREEPORT SITE |
| Toxic Release Inventory Facility | CHEMICAL SPECIALTIES INC |
| Toxic Release Inventory Facility | HUNTSMAN ETHYLENEAMINES PLANT |
| Toxic Release Inventory Facility | GULF CHEMICAL & METALLURGICAL CORP |
| Toxic Release Inventory Facility | DOW CHEMICAL CO FREEPORT FACILITY |
| Toxic Release Inventory Facility | SI GROUP INC |
| Toxic Release Inventory Facility | MARTIN OPERATING PTNR FREEPORT FM 1495 |
| Toxic Release Inventory Facility | US DOE BRYAN MOUND SPR SITE |
| Wastewater Treatments Plant | CENTRAL WWTF |
| Wastewater Treatments Plant | US DOE SPR BRYAN MOUND OIL SRG |
| Toxic Release Inventory Facility | THIRD COAST PACKAGING INC FRIENDSWOOD |
| EMS | IOWA COLONY VOLUNTEER FIRE DEPARTMENT |
| School | MERIDIANA EL |
| School | S F AUSTIN EL |
| Shelter | S.F. Austin Elementary |
| Toxic Release Inventory Facility | CONOCOPHILLIPS CO JONES CREEK TERMINAL |
| Colleges Universities | Brazosport College |
| Dam | BUFFALO CAMP BAYOU RESERVOIR DAM |
| Electric Substation | LAKE JACKSON |
| EMS | LAKE JACKSON EMERGENCY MEDICAL SERVICES |
| EMS | LAKE Jackson Disaster Trans |
| Fire Station | Richwood Fire Dept. |
| Fire Station | Lake Jackson Fire Dept. |
| Hospital | BRAZOSPORT MEMORIAL HOSPITAL |
| Police Station | LAKE JACKSON POLICE DEPARTMENT |
| Police Station | Lake Jackson Police Dept |
| School | BESS BRANNEN EL |
| School | LAKE JACKSON INT |
| School | A P BEUTEL EL |
| School | ELISABET NEY EL |
| School | O M ROBERTS EL |

| | |
|------------------------------------|--|
| School | RASCO MIDDLE |
| Shelter | Christ Lutheran Church |
| Shelter | O.M. Roberts Elementary |
| Shelter | Lake Jackson Intermediate School |
| Shelter | Elizabet Ney Elementary |
| Shelter | Rasco Middle School |
| Shelter | Bess Brannen Elementary |
| Shelter | A.P. Beutel Elementary |
| Shelter | Willow Drive Baptist Church |
| Shelter | Brazos wood High School |
| Wastewater Treatments Plant | CITY OF LAKE JACKSON |
| Fire Station | Liverpool VFD |
| Police Station | LIVERPOOL POLICE DEPARTMENT |
| Police Station | Liverpool Police Dept. |
| EMS | MANVEL EMERGENCY MEDICAL SERVICES |
| Fire Station | Manvel VFD |
| Fire Station | Manvel Fire Department |
| High Schools | MANVEL H S |
| Police Station | MANVEL POLICE DEPARTMENT |
| Police Station | BRAZORIA COUNTY CONSTABLE - PRECINCT 2 |
| Police Station | Manvel Police Dept. |
| School | RED DUKE EL |
| School | E C MASON EL |
| School | RODEO PALMS J H |
| Shelter | Manvel Junior High School |
| Toxic Release Inventory Facility | KEESHAN & BOST CHEMICAL CO INC |
| Toxic Release Inventory Facility | BENCHMARK RESEARCH & TECHNOLOGY INC |
| Shelter | Delaware Valley School Dist.-Delaware Valley Middle/High |
| Hazardous Waste Treatment Facility | PHILLIPS 66 SWEENY COMPLEX |
| Toxic Release Inventory Facility | PHILLIPS 66 SWEENY COMPLEX |
| Toxic Release Inventory Facility | PHILLIPS 66 SWEENY COMPLEX |
| Fire Station | Oyster Creek Community VFD |
| Police Station | OYSTER CREEK POLICE DEPARTMENT |
| Shelter | Brazoria County Youth Home |
| Brownfields | PEARLAND ASSAULT BASEBALL CLUB |
| Correctional Facilities | Pearland Police Department Jail Division |
| Electric Substation | SOUTHWYCK |
| Electric Substation | PEARLAND |
| Electric Substation | MARY'S CREEK |

| | |
|----------------------------------|---|
| EMS | PINNACLE ENTITIES INCORPORATED DOING BUSINESS AS PINNACLE AMBULANCE SERVICE |
| EMS | PEARLAND AREA EMERGENCY MEDICAL SERVICES |
| Fire Station | Pearland Fire Department |
| Fire Station | Pearland Fire Station 2 |
| Fire Station | Pearland Fire Station 5 |
| Fire Station | Pearland Fire Station 3 |
| Fire Station | Pearland Fire Station 4 |
| Fire Station | Brookside Village VFD |
| High Schools | SHADOW CREEK H S |
| High Schools | ROBERT TURNER COLLEGE AND CAREER H S |
| High Schools | GLENDA DAWSON H S |
| High Schools | PEARLAND H S |
| Hospital | MEMORIAL HERMANN PEARLAND HOSPITAL |
| Hospital | PEARLAND MEDICAL CENTER |
| Local Emergency Operation Center | PEARLAND CITY EMERGENCY OPERATIONS CENTER |
| Police Station | PEARLAND POLICE DEPARTMENT |
| Police Station | Police Dept.-Records Div. |
| Police Station | BRAZORIA COUNTY CONSTABLE - PRECINCT 3 |
| Police Station | Brookside Police Dept. |
| School | LAURA INGALLS WILDER |
| School | SILVERCREST EL |
| School | PEARLAND J H SOUTH |
| School | NOLAN RYAN J H |
| School | SILVERLAKE EL |
| School | MASSEY RANCH EL |
| School | ROGERS MIDDLE |
| School | MARY BURKS MAREK EL |
| School | GLENN YORK EL |
| School | BERRY MILLER J H |
| School | MAGNOLIA EL |
| School | ALEXANDER MIDDLE |
| School | PEARLAND J H WEST |
| School | C J HARRIS EL |
| School | PACE CENTER |
| School | PEARLAND J H EAST |
| School | LEON H SABLATURA MIDDLE |
| School | H C CARLESTON EL |
| School | SAM JAMISON MIDDLE |
| School | SHADYCREST EL |
| School | E A LAWHON EL |
| School | RUSTIC OAK EL |
| School | CHALLENGER EL |

| | |
|----------------------------------|---|
| School | BARBARA COCKRELL EL |
| Shelter | Pearland Junior High South |
| Shelter | City of Pearland Rec Center |
| Shelter | Faith Center Church |
| Shelter | First Presbyterian Church |
| Shelter | FIRST UNITED METHODIST CHURCH |
| Shelter | Pearland High School |
| Solid Waste Landfill | DIXIE FARM ROAD LANDFILL (HILL SAND CO) |
| Toxic Release Inventory Facility | EPM - ISE MAGTECH |
| Toxic Release Inventory Facility | BTU GASES |
| Toxic Release Inventory Facility | DAVIS LYNCH |
| Toxic Release Inventory Facility | THIRD COAST TERMINALS PEARLAND |
| Toxic Release Inventory Facility | TEXAS HONING, INC. (PEARLAND) |
| Toxic Release Inventory Facility | PACKAGING SERVICES CO INC PEARLAND FACILITY |
| Wastewater Treatments Plant | FAR NORTHWEST WWTP |
| Wastewater Treatments Plant | SOUTHWEST ENVIRONMENTAL CENTER |
| Wastewater Treatments Plant | LONGWOOD WWTP |
| Wastewater Treatments Plant | BARRY ROSE WWTF |
| Police Station | RICHWOOD POLICE DEPARTMENT |
| School | GLADYS POLK EL |
| Shelter | Gladys Polk Elementary |
| Correctional Facilities | DARRINGTON PRISON FACILITY |
| Correctional Facilities | RAMSEY PRISON FACILITY |
| Fire Station | Iowa Colony VFD |
| Fire Station | Rosharon Volunteer Fire Dept. |
| School | MANVEL J H |
| School | SAVANNAH LAKES EL |
| School | DON JETER EL |
| Shelter | First Baptist Church |
| Toxic Release Inventory Facility | SCHLUMBERGER ROSHARON CAMPUS |
| Fire Station | Surfside Beach VFD |
| Police Station | SURFSIDE BEACH POLICE DEPARTMENT |
| Electric Substation | SWEENY |
| EMS | SWEENY FIRE AND RESCUE |
| Fire Station | Sweeny Fire and Rescue |
| Fire Station | Old Ocean Fire Dept. |

| | |
|----------------------------------|---|
| High Schools | SWEENY H S |
| Hospital | SWEENY COMMUNITY HOSPITAL |
| Local Emergency Operation Center | SWEENY CITY EMERGENCY OPERATIONS CENTER-ALTERNATE |
| Local Emergency Operation Center | SWEENY CITY EMERGENCY OPERATIONS CENTER |
| Police Station | SWEENY INDEPENDENT SCHOOL DISTRICT POLICE DEPARTMENT |
| Police Station | SWEENY POLICE DEPARTMENT |
| Police Station | Sweeny Police Dept. |
| School | SWEENY J H |
| School | SWEENY EL |
| Shelter | Sweeny Junior High School |
| Solid Waste Landfill | CITIES OF BRAZORIA & WEST COLUMBIA LANDFILL |
| Toxic Release Inventory Facility | PHILLIPS 66 CO. FREEPORT II TERMINAL |
| Toxic Release Inventory Facility | CONOCOPHILLIPS SAN BERNARD TERMINAL |
| Brownfields | BLANCHARD AUTO SALES |
| Electric Substation | UNKNOWN307693 |
| EMS | CENTRAL EMERGENCY MEDICAL SERVICES INCORPORATED |
| Fire Station | Columbia Lakes VFD |
| High Schools | COLUMBIA H S |
| Local Emergency Operation Center | WEST COLUMBIA EMERGENCY OPERATIONS CENTER |
| Local Emergency Operation Center | WEST COLUMBIA EMERGENCY OPERATIONS CENTER-ALTERNATE |
| Police Station | BRAZORIA COUNTY CONSTABLE - PRECINCT 4 |
| Police Station | WEST COLUMBIA POLICE DEPARTMENT |
| Police Station | COLUMBIA-BRAZORIA INDEPENDENT SCHOOL DISTRICT POLICE DEPARTMENT |
| Police Station | West Columbia City Police |
| School | WEST COLUMBIA EL |
| School | WEST COLUMBIA CHARTER SCH |
| Shelter | West Columbia Elementary School |
| Shelter | Columbia High School |
| Shelter | West Columbia High School |
| Dam | BEAL RESERVOIR LEVEE |
| Dam | BLACK RANCH LAKE LEVEE |
| Dam | BRAZOS RIVER CLUB LEVEE |
| Dam | MALLARD LAKE CLUB DAM |
| Dam | DIVISION LAKE LEVEE |
| Dam | LAKE JACKSON LEVEE |
| Dam | MOWERY LAKE LEVEE |
| Dam | DUCK LAKE DAM |
| Dam | SOLUTIA RESERVOIR LEVEE |

| | |
|-----|--|
| Dam | SALT BAYOU LAKE WATER |
| Dam | TWIN LAKES DAM |
| Dam | BRAZORIA RESERVOIR DAM |
| Dam | DINGLE LAKE NO 1 LEVEE |
| Dam | LAZY C Z NO 1 RESERVOIR LEVEE |
| Dam | MCCULLOUGH LAKE LEVEE |
| Dam | RES NO 17 LEVEE-MCCULLOUGH RES COMPLEX |
| Dam | RESERVOIR NO 10 LEVEE-COMPLEX NO 2 |
| Dam | RESERVOIR NO 9 LEVEE-COMPLEX NO 2 |
| Dam | LINNVILLE BAYOU RESERVOIR DAM |
| Dam | MARKLE LAKE LEVEE |
| Dam | SAN BERNARD RESERVOIR NO 1 |
| Dam | SAN BERNARD RESERVOIR NO 2 LEVEE |
| Dam | SAN BERNARD RESERVOIR NO 3 LEVEE |
| Dam | ANGLETON FISHING & HUNTING CLUB LEVEE |
| Dam | BAR X RANCH LAKE LEVEE |
| Dam | BIERI LAKES RESERVOIR NO 1 LEVEE |
| Dam | BIERI LAKES RESERVOIR NO 2 LEVEE |
| Dam | BIERI LAKES RESERVOIR NO 3 LEVEE |
| Dam | BIERI LAKES RESERVOIR NO 4 LEVEE |
| Dam | BINTLIFF LAKE LEVEE |
| Dam | CLARK RESERVOIR DAM |
| Dam | COALE DAM |
| Dam | FLAG LAKE LEVEE |
| Dam | HUDECK RESERVOIR LEVEE |
| Dam | MCCORMACK RESERVOIR NO 3 LEVEE |
| Dam | MCCORMACK RESERVOIR NO 4 LEVEE |
| Dam | TIGNER-FARRER LEVEE |
| Dam | WILLIAM HARRIS RESERVOIR DAM |
| Dam | RALEIGH FARMS RESERVOIR LEVEE |
| Dam | BRAZORIA CITY RESERVOIR LEVEE |
| Dam | DACUS LAKE DAM |
| Dam | TDCJ CLEMENS UNIT DAM NO 1 |
| Dam | TDCJ CLEMENS UNIT DAM NO 2 |
| Dam | COLUMBIA LAKES RESERVOIR DAM |
| Dam | GRIFFITH RESERVOIR LEVEE |
| Dam | LAGOON RESERVOIR DAM |
| Dam | LIVE OAK NO 1 LEVEE |
| Dam | LIVE OAK NO 2 LEVEE |
| Dam | PAPPAS LAKES AND LODGE LEVEE |
| Dam | AMOCO CHEMICALS RESERVOIR LEVEE |
| Dam | DINGLE LAKE NO 2 LEVEE |
| Dam | MUSTANG LAKE EAST DAM |
| Dam | MUSTANG LAKE WEST DAM |

| | |
|---------------------|---------------|
| Electric Substation | MANVEL |
| Electric Substation | DAMON |
| Electric Substation | NASH |
| Electric Substation | TAP303549 |
| Electric Substation | TAP303550 |
| Electric Substation | ARCOLA |
| Electric Substation | HASTINGS |
| Electric Substation | MUSTANG BAYOU |
| Electric Substation | UNKNOWN307510 |
| Electric Substation | OASIS |
| Electric Substation | NORTH ALVIN |
| Electric Substation | TAP303542 |
| Electric Substation | TAP303543 |
| Electric Substation | MEADOW |
| Electric Substation | HOFMAN |
| Electric Substation | RIWOOD |
| Electric Substation | CAVERN |
| Electric Substation | SINTEK |
| Electric Substation | SEAWAY |
| Electric Substation | SEAWAY SW |
| Electric Substation | QUINTANA |
| Electric Substation | TAP303551 |
| Electric Substation | BIPORT |
| Electric Substation | LIVERPOOL |
| Electric Substation | STRATT |
| Electric Substation | BRAZOSPORT |
| Electric Substation | UNKNOWN307694 |
| Electric Substation | UNKNOWN307695 |
| Electric Substation | UNKNOWN307696 |
| Electric Substation | UNKNOWN307863 |
| Electric Substation | UNKNOWN307864 |
| Electric Substation | UNKNOWN307865 |
| Electric Substation | UNKNOWN307866 |
| Electric Substation | UNKNOWN307688 |
| Electric Substation | RETRIEVE |
| Electric Substation | UNKNOWN307698 |
| Electric Substation | UNKNOWN307700 |
| Electric Substation | UNKNOWN307801 |
| Electric Substation | UNKNOWN308021 |
| Electric Substation | UNKNOWN307691 |
| Electric Substation | UNKNOWN307692 |
| Electric Substation | UNKNOWN307862 |
| Electric Substation | UNKNOWN307511 |
| Electric Substation | AMOCO |

| | |
|------------------------------|---|
| Electric Substation | DOW VELASCO |
| Electric Substation | UNKNOWN307708 |
| Electric Substation | SURFSIDE |
| Electric Substation | UNKNOWN307794 |
| Electric Substation | BASF |
| Electric Substation | UNKNOWN307799 |
| Electric Substation | TAP303552 |
| Electric Substation | UNKNOWN308071 |
| Natural Gas Receipt Delivery | DUHON #1 |
| Natural Gas Receipt Delivery | GMT-FRISCO |
| Natural Gas Receipt Delivery | RAMSEY ENTEX |
| Power Plant | FREEPORT LP PRETREATMENT FACILITY |
| Power Plant | SWEENEY IGCC PLANT |
| Power Plant | SWEENEY COGEN FACILITY |
| Power Plant | CHOCOLATE BAYOU WORKS |
| Power Plant | ASCEND PERFORMANCE MATERIALS TEXAS INC. |
| Power Plant | DOW CHEMICAL TEXAS OPERATION |
| Power Plant | OYSTER CREEK UNIT VIII |
| Power Plant | BASF FREEPORT WORKS |
| Power Plant | FREEPORT ENERGY CENTER |
| Wastewater Treatments Plant | OYSTER CREEK WWTP |
| Wastewater Treatments Plant | CITY OF WEST COLUMBIA - WWTP |
| EOC | BRAZORIA COUNTY |
| | |

Appendix C: Hazus Analysis



Hazus-MH: Flood Global Risk Report

Region Name: Brazoria County

Flood Scenario: 100-year

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.



FEMA

RiskMAP
Increasing Resilience Together



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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Texas

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 1,443 square miles and contains 10,082 census blocks. The region contains over 107 thousand households and has a total population of 313,166 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 109,747 buildings in the region with a total building replacement value (excluding contents) of 33,799 million dollars (2010 dollars). Approximately 93.55% of the buildings (and 86.99% of the building value) are associated with residential housing.



FEMA



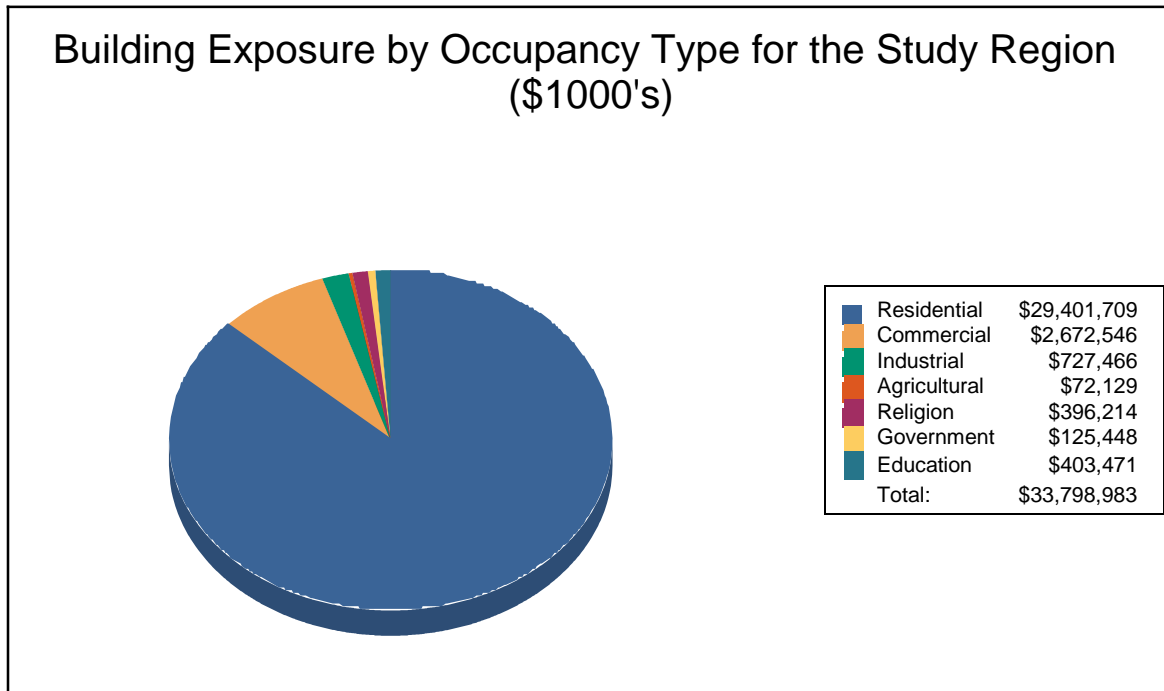
Building Inventory

General Building Stock

Hazus estimates that there are 109,747 buildings in the region which have an aggregate total replacement value of 33,799 million (2014 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

**Table 1
Building Exposure by Occupancy Type for the Study Region**

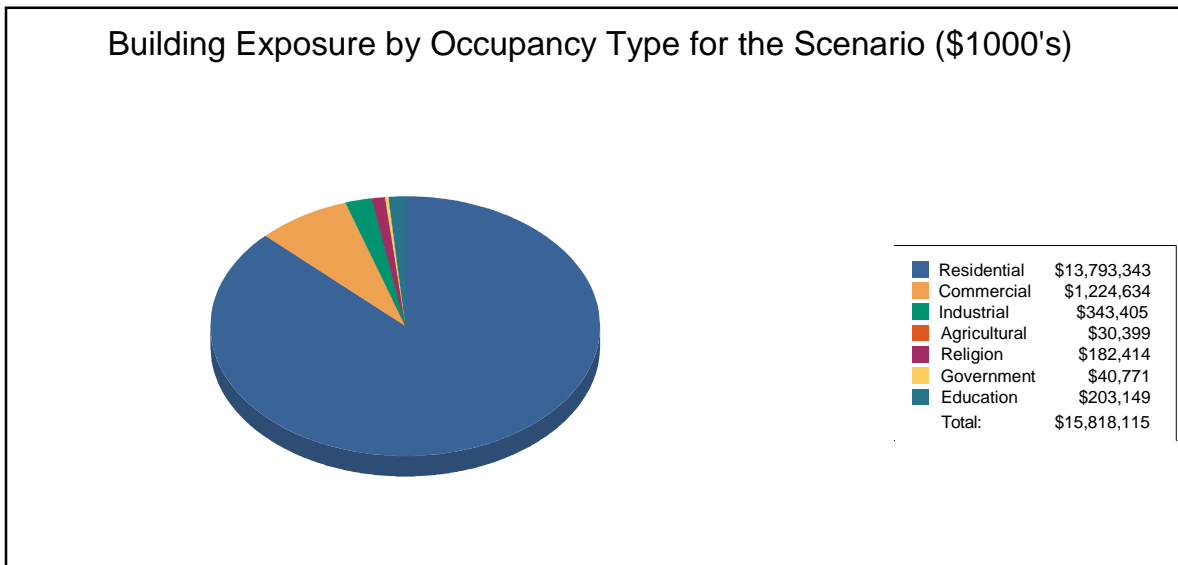
| Occupancy | Exposure (\$1000) | Percent of Total |
|--------------|-------------------|------------------|
| Residential | 29,401,709 | 87.0% |
| Commercial | 2,672,546 | 7.9% |
| Industrial | 727,466 | 2.2% |
| Agricultural | 72,129 | 0.2% |
| Religion | 396,214 | 1.2% |
| Government | 125,448 | 0.4% |
| Education | 403,471 | 1.2% |
| Total | 33,798,983 | 100.0% |





**Table 2
Building Exposure by Occupancy Type for the Scenario**

| Occupancy | Exposure (\$1000) | Percent of Total |
|--------------|-------------------|------------------|
| Residential | 13,793,343 | 87.2% |
| Commercial | 1,224,634 | 7.7% |
| Industrial | 343,405 | 2.2% |
| Agricultural | 30,399 | 0.2% |
| Religion | 182,414 | 1.2% |
| Government | 40,771 | 0.3% |
| Education | 203,149 | 1.3% |
| Total | 15,818,115 | 100.0% |



Essential Facility Inventory

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 234 beds. There are 99 schools, 22 fire stations, 19 police stations and 1 emergency operation center.





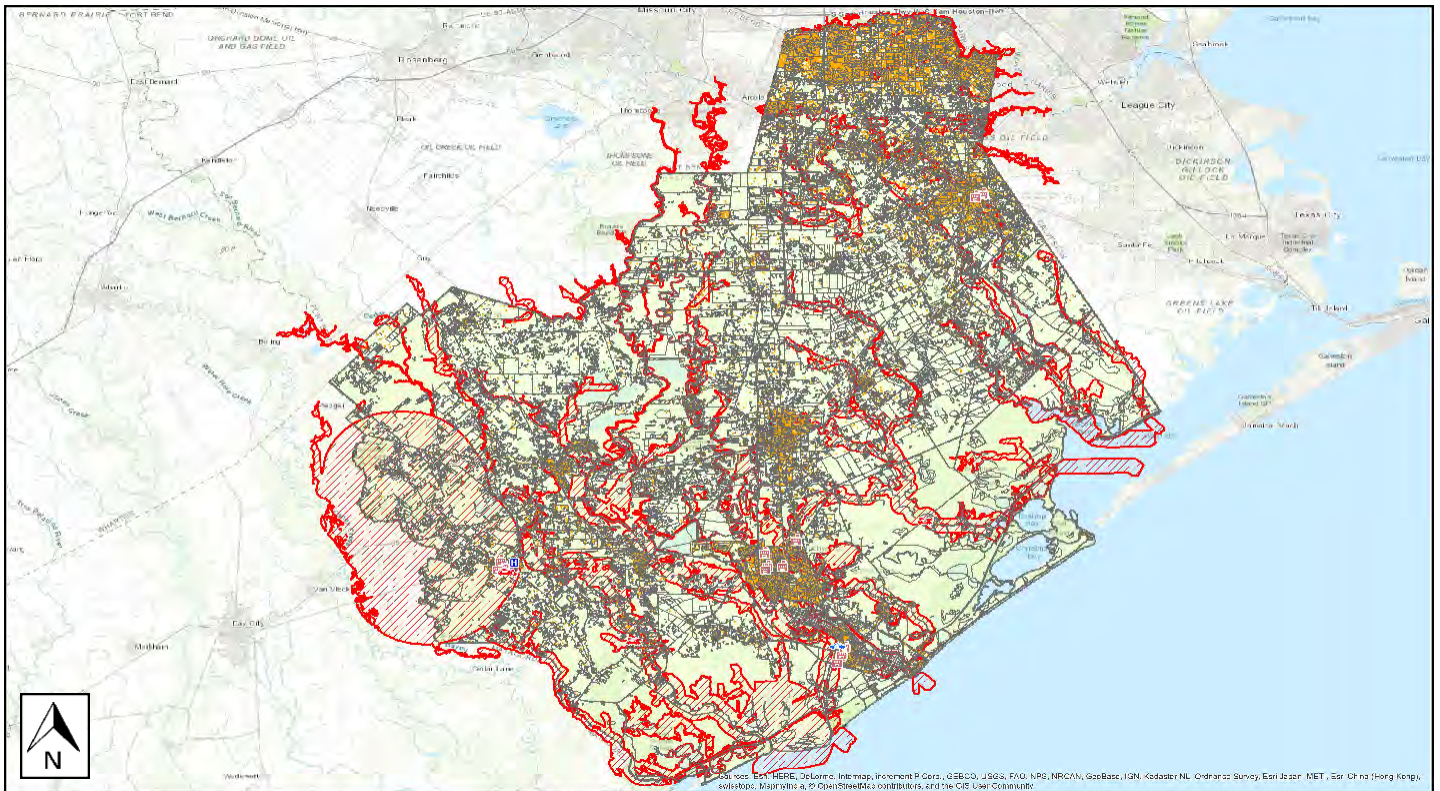
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

- Study Region Name:** Brazoria County
- Scenario Name:** 100-Year
- Return Period Analyzed:** 100
- Analysis Options Analyzed:** No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure





Building Damage

General Building Stock Damage

Hazus estimates that about 5,797 buildings will be at least moderately damaged. This is over 54% of the total number of buildings in the scenario. There are an estimated 1,611 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = \$300K) Overview Map

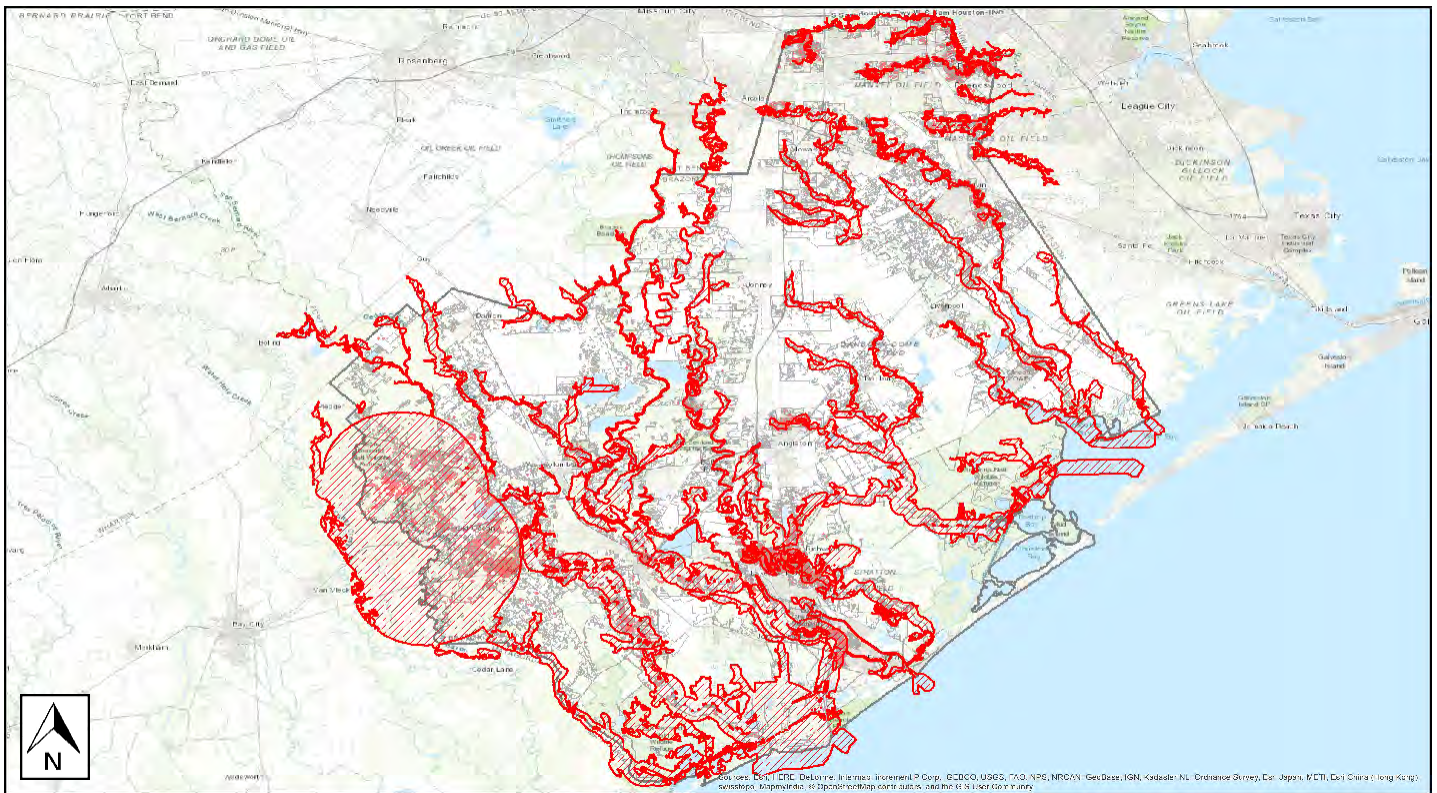




Table 3: Expected Building Damage by Occupancy

| Occupancy | 1-10 | | 11-20 | | 21-30 | | 31-40 | | 41-50 | | Substantially | |
|--------------|--------------|-------|--------------|-------|--------------|-------|------------|-------|------------|------|---------------|-------|
| | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) |
| Agriculture | 1 | 50.00 | 0 | 0.00 | 0 | 0.00 | 1 | 50.00 | 0 | 0.00 | 0 | 0.00 |
| Commercial | 30 | 37.04 | 35 | 43.21 | 10 | 12.35 | 2 | 2.47 | 3 | 3.70 | 1 | 1.23 |
| Education | 2 | 66.67 | 1 | 33.33 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Government | 1 | 25.00 | 0 | 0.00 | 1 | 25.00 | 2 | 50.00 | 0 | 0.00 | 0 | 0.00 |
| Industrial | 6 | 28.57 | 5 | 23.81 | 1 | 4.76 | 2 | 9.52 | 1 | 4.76 | 6 | 28.57 |
| Religion | 4 | 44.44 | 5 | 55.56 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Residential | 2,701 | 32.07 | 2,429 | 28.84 | 1,013 | 12.03 | 397 | 4.71 | 278 | 3.30 | 1,604 | 19.05 |
| Total | 2,745 | | 2,475 | | 1,025 | | 404 | | 282 | | 1,611 | |

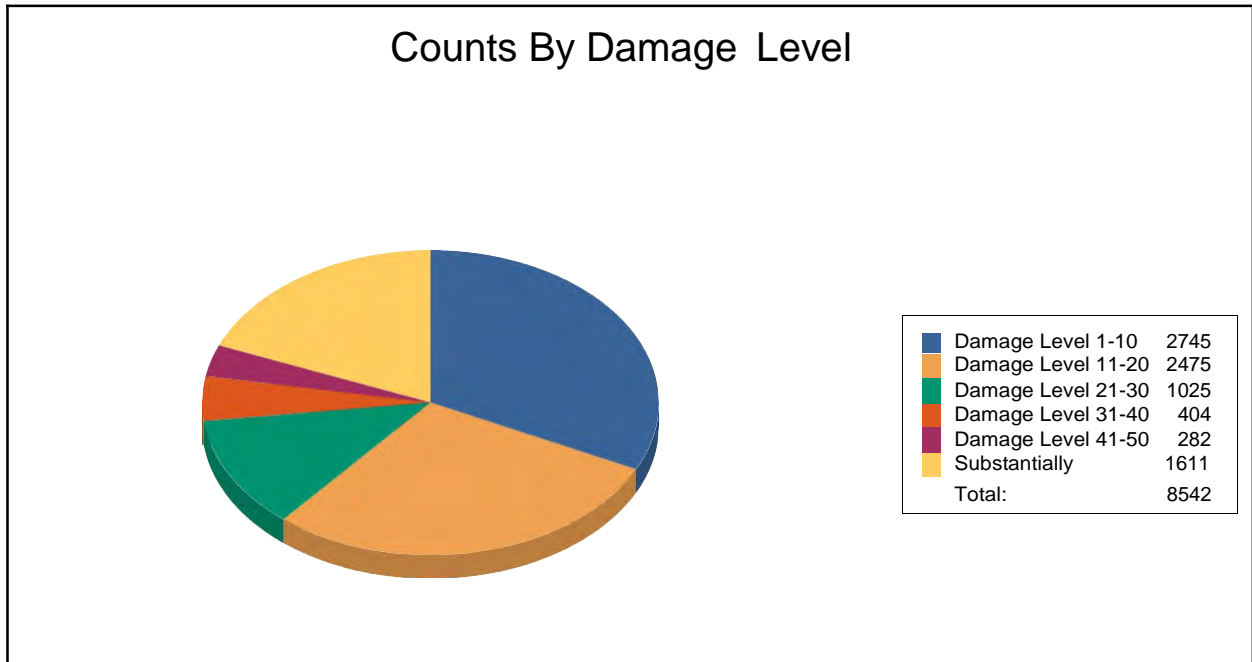




Table 4: Expected Building Damage by Building Type

| Building Type | 1-10 | | 11-20 | | 21-30 | | 31-40 | | 41-50 | | Substantially | |
|---------------|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|---------------|-----|
| | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) |
| Concrete | 6 | 75 | 0 | 0 | 1 | 13 | 1 | 13 | 0 | 0 | 0 | 0 |
| ManufHousing | 84 | 15 | 78 | 14 | 63 | 11 | 0 | 0 | 44 | 8 | 296 | 52 |
| Masonry | 231 | 35 | 224 | 34 | 65 | 10 | 23 | 4 | 13 | 2 | 97 | 15 |
| Steel | 7 | 32 | 9 | 41 | 3 | 14 | 2 | 9 | 1 | 5 | 0 | 0 |
| Wood | 2,400 | 33 | 2,142 | 30 | 890 | 12 | 376 | 5 | 221 | 3 | 1,212 | 17 |



Essential Facility Damage

Before the flood analyzed in this scenario, the region had 234 hospital beds available for use. On the day of the scenario flood event, the model estimates that 234 hospital beds are available in the region.

Before the flood analyzed in this scenario, the region had 234 hospital beds available for use. On the day of the scenario flood event, the model estimates that 214 hospital beds are available in the region.

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Before the flood analyzed in this scenario, the region had 234 hospital beds available for use. On the day of the scenario flood event, the model estimates that 234 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

| Classification | Total | # Facilities | | |
|-----------------|-------|-------------------|----------------------|-------------|
| | | At Least Moderate | At Least Substantial | Loss of Use |
| Fire Stations | 22 | 1 | 0 | 5 |
| Hospitals | 3 | 0 | 1 | 1 |
| Police Stations | 19 | 2 | 0 | 2 |
| Schools | 99 | 10 | 2 | 12 |

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.



Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

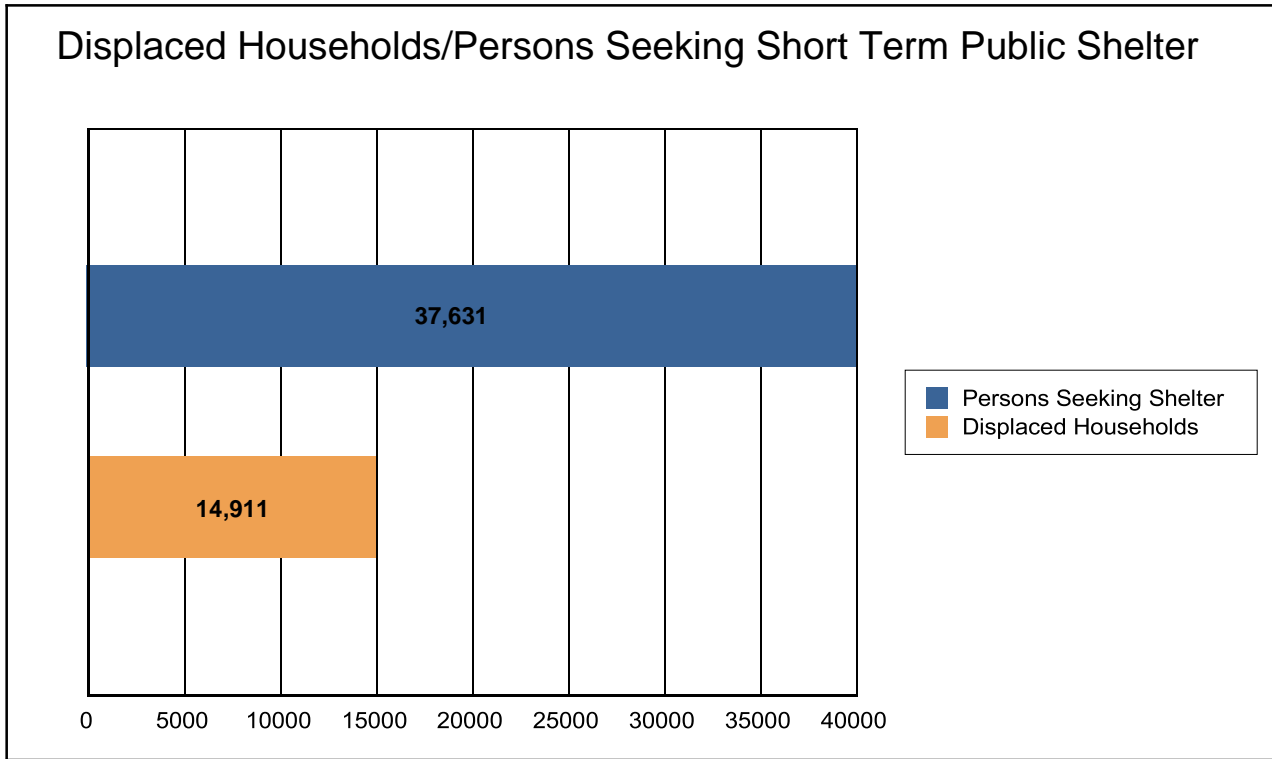
Analysis has not been performed for this Scenario.



Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 14,911 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 37,631 people (out of a total population of 313,166) will seek temporary shelter in public shelters.





Economic Loss

The total economic loss estimated for the flood is 1,368.81 million dollars, which represents 8.65 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 1,361.36 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 83.73% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

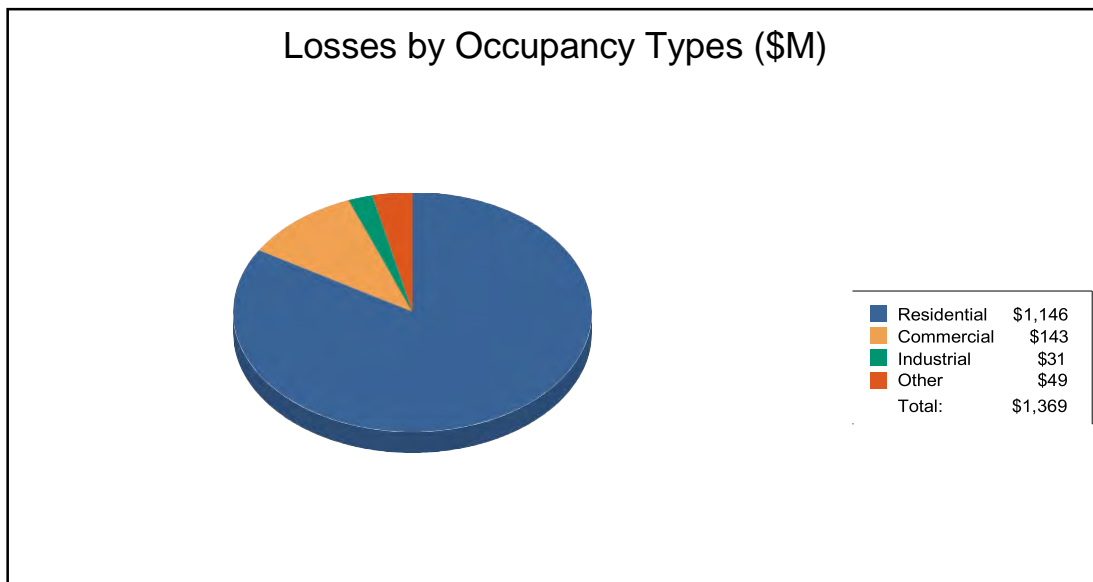


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Table 6: Building-Related Economic Loss Estimates
(Millions of dollars)

| Category | Area | Residential | Commercial | Industrial | Others | Total |
|------------------------------|-----------------|-----------------|---------------|--------------|--------------|-----------------|
| Building Loss | | | | | | |
| | Building | 731.76 | 38.15 | 9.33 | 8.83 | 788.08 |
| | Content | 411.57 | 100.64 | 18.39 | 36.92 | 567.51 |
| | Inventory | 0.00 | 2.15 | 3.30 | 0.33 | 5.77 |
| | Subtotal | 1,143.32 | 140.94 | 31.02 | 46.08 | 1,361.36 |
| Business Interruption | | | | | | |
| | Income | 0.04 | 0.84 | 0.00 | 0.46 | 1.34 |
| | Relocation | 2.13 | 0.17 | 0.00 | 0.19 | 2.49 |
| | Rental Income | 0.50 | 0.06 | 0.00 | 0.01 | 0.56 |
| | Wage | 0.10 | 1.02 | 0.00 | 1.94 | 3.06 |
| | Subtotal | 2.76 | 2.09 | 0.00 | 2.61 | 7.45 |
| ALL | Total | 1,146.08 | 143.03 | 31.02 | 48.68 | 1,368.81 |





Appendix A: County Listing for the Region

- Texas
 - Brazoria



Appendix B: Regional Population and Building Value Data

| | Population | Building Value (thousands of dollars) | | |
|---------------------------|----------------|---------------------------------------|------------------|-------------------|
| | | Residential | Non-Residential | Total |
| Texas | | | | |
| Brazoria | 313,166 | 29,401,709 | 4,397,274 | 33,798,983 |
| Total | 313,166 | 29,401,709 | 4,397,274 | 33,798,983 |
| Total Study Region | 313,166 | 29,401,709 | 4,397,274 | 33,798,983 |





Hazus-MH: Flood Global Risk Report

Region Name: Brazoria County

Flood Scenario: 500-year

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.



FEMA

RiskMAP
Increasing Resilience Together



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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Texas

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 1,443 square miles and contains 10,082 census blocks. The region contains over 107 thousand households and has a total population of 313,166 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 109,747 buildings in the region with a total building replacement value (excluding contents) of 33,799 million dollars (2010 dollars). Approximately 93.55% of the buildings (and 86.99% of the building value) are associated with residential housing.





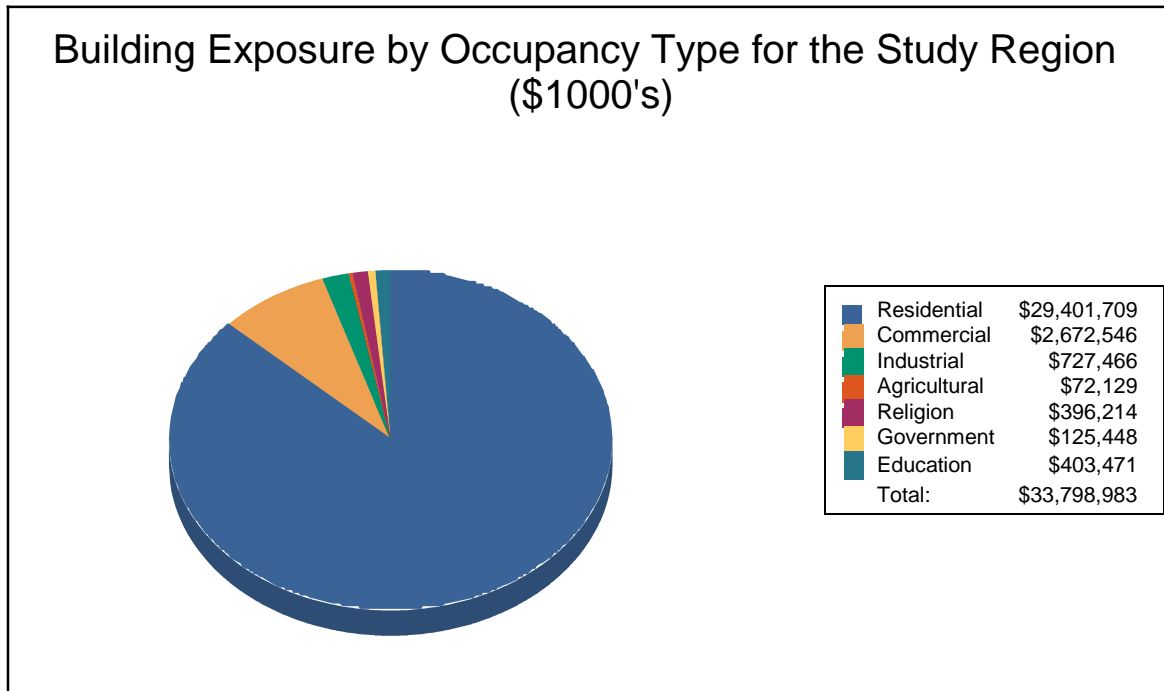
Building Inventory

General Building Stock

Hazus estimates that there are 109,747 buildings in the region which have an aggregate total replacement value of 33,799 million (2014 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

**Table 1
Building Exposure by Occupancy Type for the Study Region**

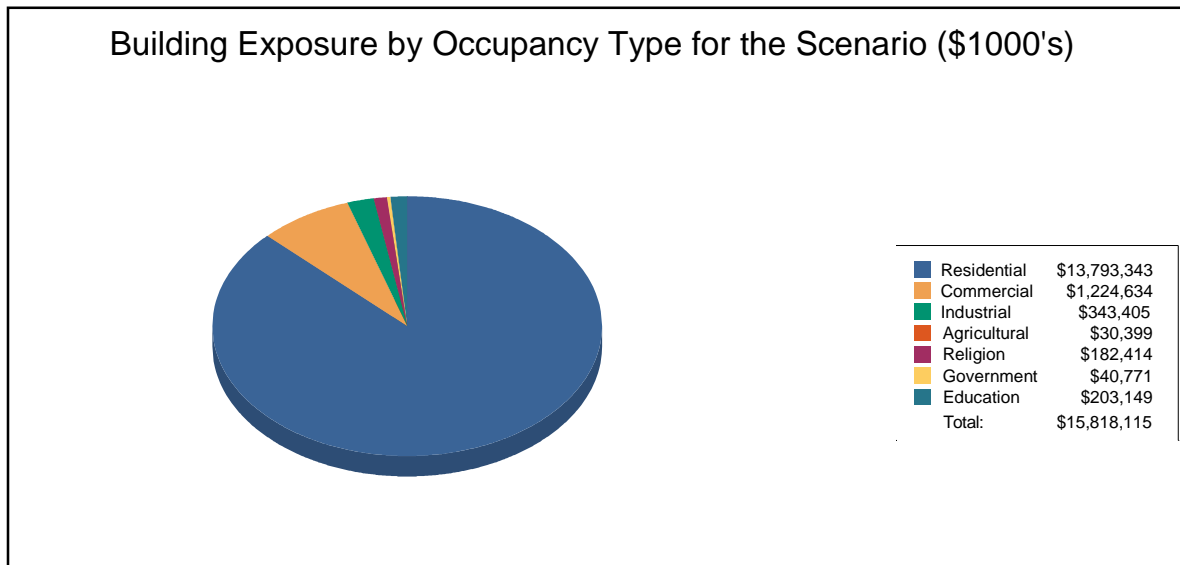
| Occupancy | Exposure (\$1000) | Percent of Total |
|--------------|-------------------|------------------|
| Residential | 29,401,709 | 87.0% |
| Commercial | 2,672,546 | 7.9% |
| Industrial | 727,466 | 2.2% |
| Agricultural | 72,129 | 0.2% |
| Religion | 396,214 | 1.2% |
| Government | 125,448 | 0.4% |
| Education | 403,471 | 1.2% |
| Total | 33,798,983 | 100.0% |





**Table 2
Building Exposure by Occupancy Type for the Scenario**

| Occupancy | Exposure (\$1000) | Percent of Total |
|--------------|-------------------|------------------|
| Residential | 13,793,343 | 87.2% |
| Commercial | 1,224,634 | 7.7% |
| Industrial | 343,405 | 2.2% |
| Agricultural | 30,399 | 0.2% |
| Religion | 182,414 | 1.2% |
| Government | 40,771 | 0.3% |
| Education | 203,149 | 1.3% |
| Total | 15,818,115 | 100.0% |



Essential Facility Inventory

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 234 beds. There are 99 schools, 22 fire stations, 19 police stations and 1 emergency operation center.





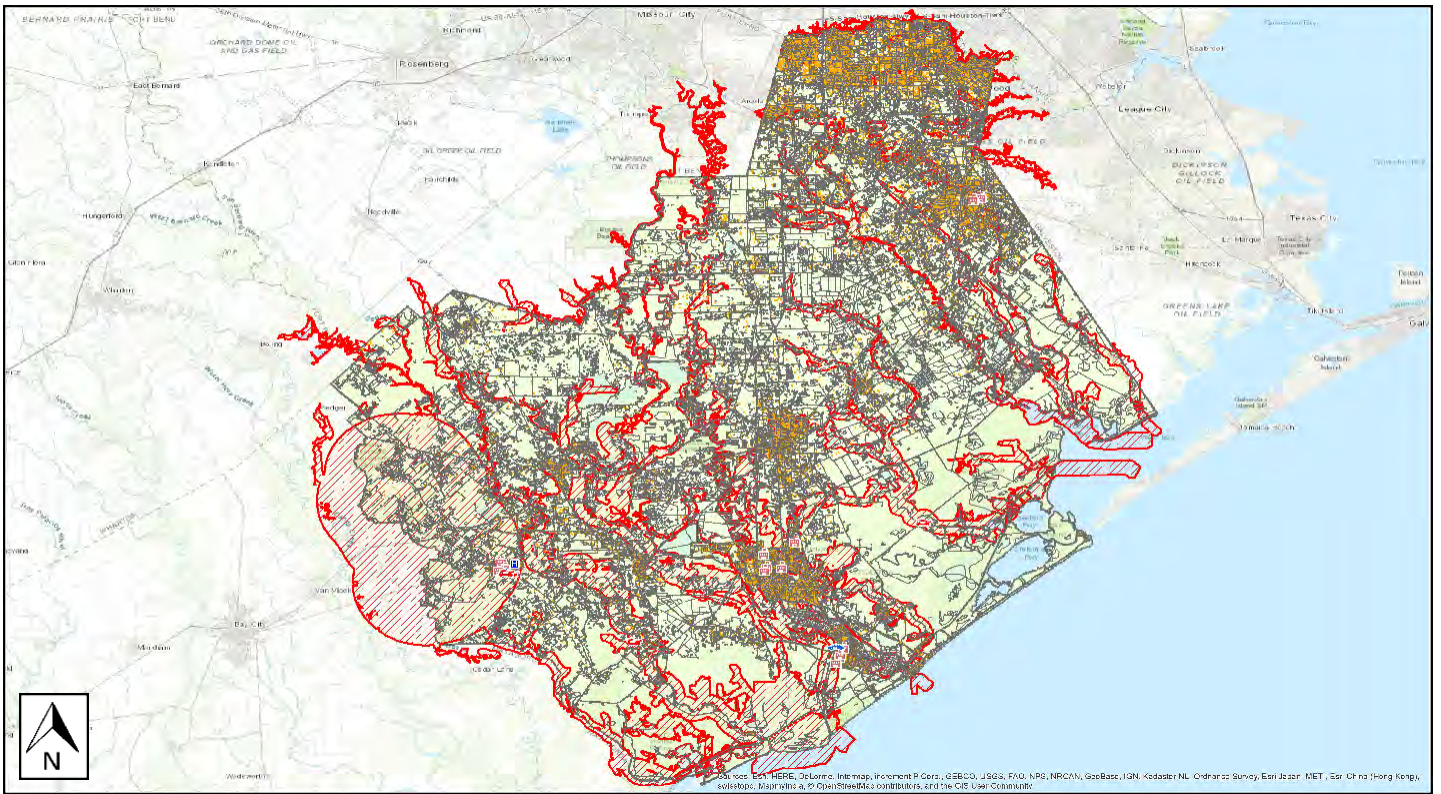
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

- Study Region Name:** Brazoria County
- Scenario Name:** 500-Year
- Return Period Analyzed:** 500
- Analysis Options Analyzed:** No What-ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



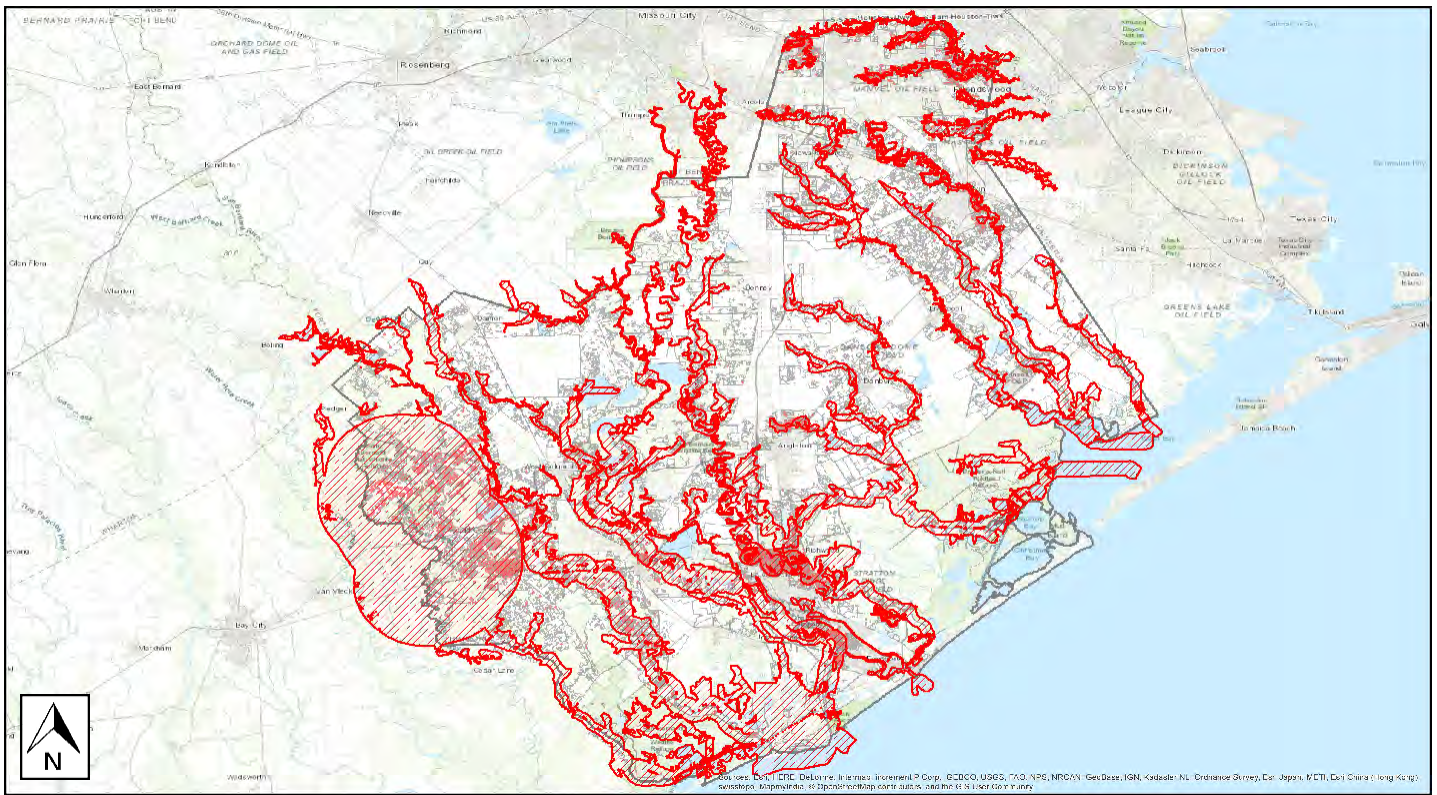


Building Damage

General Building Stock Damage

Hazus estimates that about 8,194 buildings will be at least moderately damaged. This is over 57% of the total number of buildings in the scenario. There are an estimated 1,939 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = \$300K) Overview Map



Source: Esri, DigitalGlobe, GeoEye, Earthstar (Informa), Inmarsat, Swire, C2BCO, USGS, NOAA, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, KCTI, DeLorme, Swire, China (Hong Kong), Swire, Singapore, SIA, GeoEye, AeroGRID, IGN, Esri, Swire, and other GIS data providers.





Table 3: Expected Building Damage by Occupancy

| Occupancy | 1-10 | | 11-20 | | 21-30 | | 31-40 | | 41-50 | | Substantially | |
|--------------|--------------|-------|--------------|-------|--------------|-------|------------|------|------------|-------|---------------|-------|
| | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) |
| Agriculture | 0 | 0.00 | 1 | 50.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 50.00 |
| Commercial | 45 | 40.18 | 52 | 46.43 | 0 | 0.00 | 5 | 4.46 | 1 | 0.89 | 9 | 8.04 |
| Education | 7 | 87.50 | 0 | 0.00 | 1 | 12.50 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Government | 3 | 75.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 25.00 | 0 | 0.00 |
| Industrial | 7 | 29.17 | 9 | 37.50 | 1 | 4.17 | 1 | 4.17 | 2 | 8.33 | 4 | 16.67 |
| Religion | 9 | 64.29 | 4 | 28.57 | 1 | 7.14 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Residential | 3,361 | 29.32 | 3,508 | 30.61 | 1,409 | 12.29 | 782 | 6.82 | 477 | 4.16 | 1,925 | 16.79 |
| Total | 3,432 | | 3,574 | | 1,412 | | 788 | | 481 | | 1,939 | |

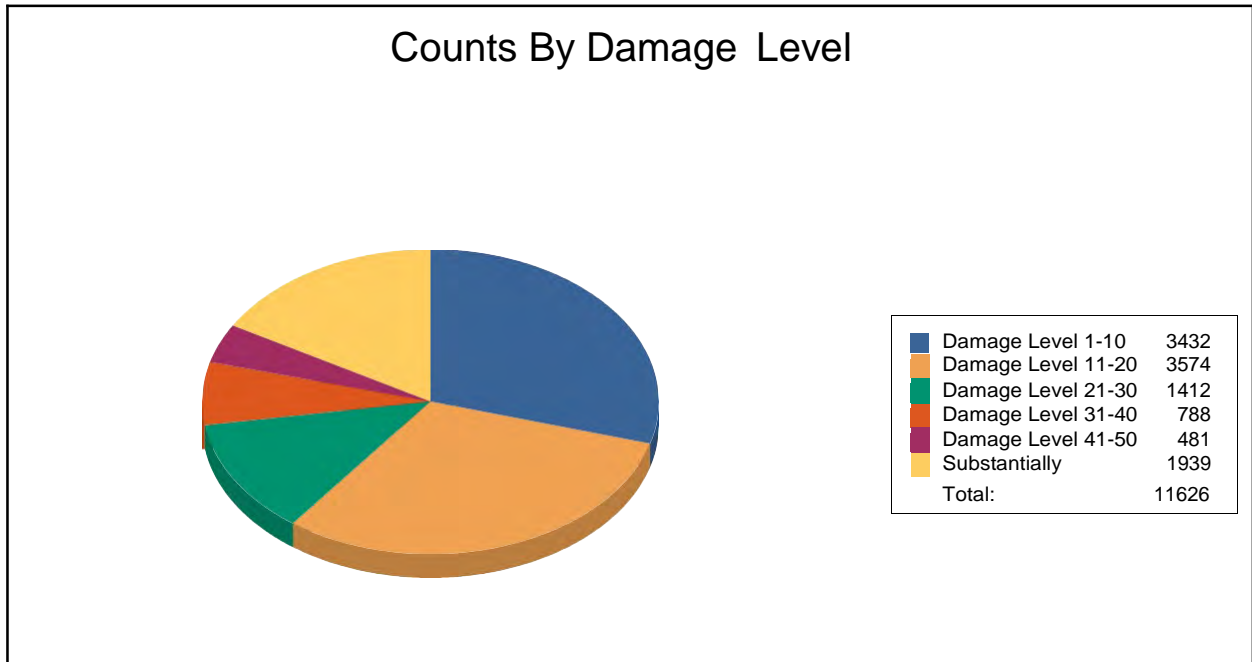




Table 4: Expected Building Damage by Building Type

| Building Type | 1-10 | | 11-20 | | 21-30 | | 31-40 | | 41-50 | | Substantially | |
|---------------|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|---------------|-----|
| | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) |
| Concrete | 6 | 50 | 4 | 33 | 0 | 0 | 1 | 8 | 0 | 0 | 1 | 8 |
| ManufHousing | 73 | 11 | 81 | 12 | 59 | 9 | 0 | 0 | 53 | 8 | 391 | 60 |
| Masonry | 319 | 33 | 331 | 34 | 109 | 11 | 54 | 6 | 28 | 3 | 126 | 13 |
| Steel | 15 | 42 | 17 | 47 | 0 | 0 | 2 | 6 | 1 | 3 | 1 | 3 |
| Wood | 3,008 | 30 | 3,131 | 32 | 1,243 | 13 | 730 | 7 | 397 | 4 | 1,410 | 14 |



Essential Facility Damage

Before the flood analyzed in this scenario, the region had 234 hospital beds available for use. On the day of the scenario flood event, the model estimates that 234 hospital beds are available in the region.

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Before the flood analyzed in this scenario, the region had 234 hospital beds available for use. On the day of the scenario flood event, the model estimates that 214 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

| Classification | Total | # Facilities | | |
|-----------------|-------|-------------------|----------------------|-------------|
| | | At Least Moderate | At Least Substantial | Loss of Use |
| Fire Stations | 22 | 3 | 1 | 5 |
| Hospitals | 3 | 1 | 0 | 1 |
| Police Stations | 19 | 1 | 1 | 2 |
| Schools | 99 | 10 | 2 | 16 |

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.





Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

Analysis has not been performed for this Scenario.



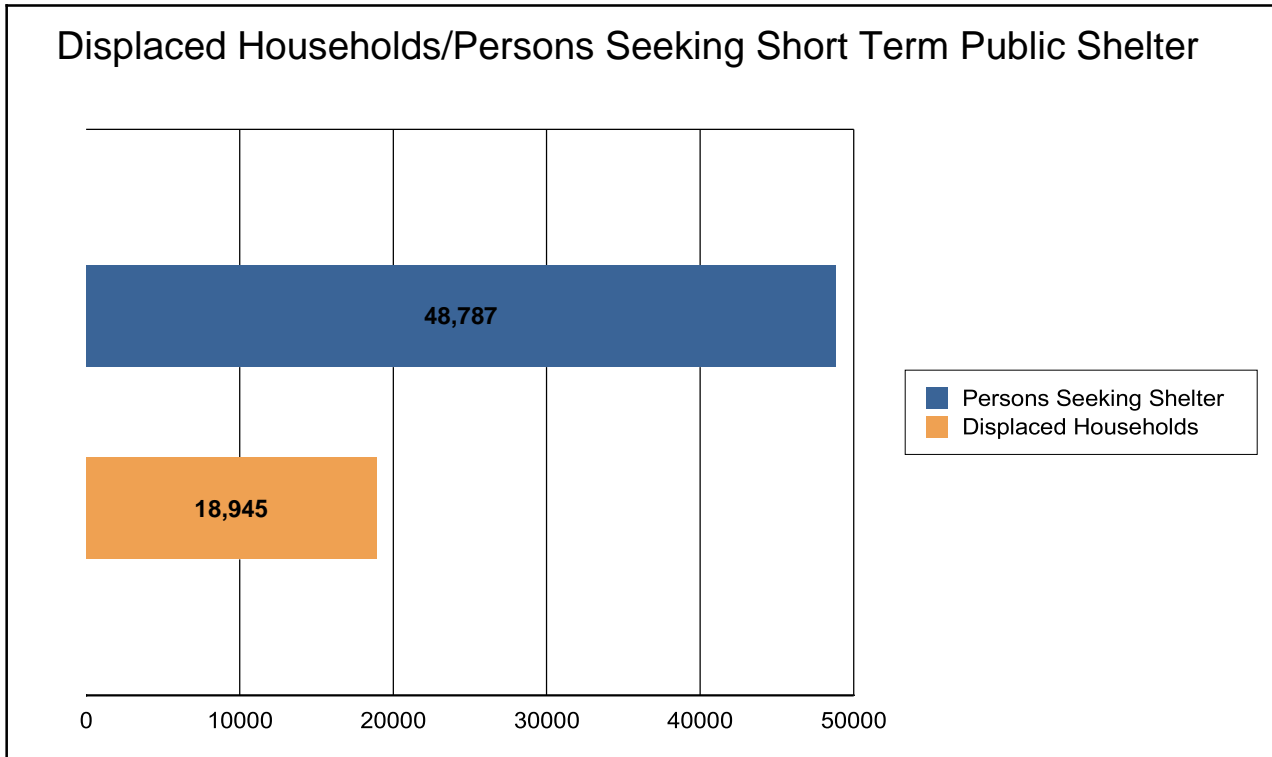
FEMA



Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 18,945 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 48,787 people (out of a total population of 313,166) will seek temporary shelter in public shelters.





Economic Loss

The total economic loss estimated for the flood is 1,897.96 million dollars, which represents 12.00 % of the total replacement value of the scenario buildings.

Building-Related Losses

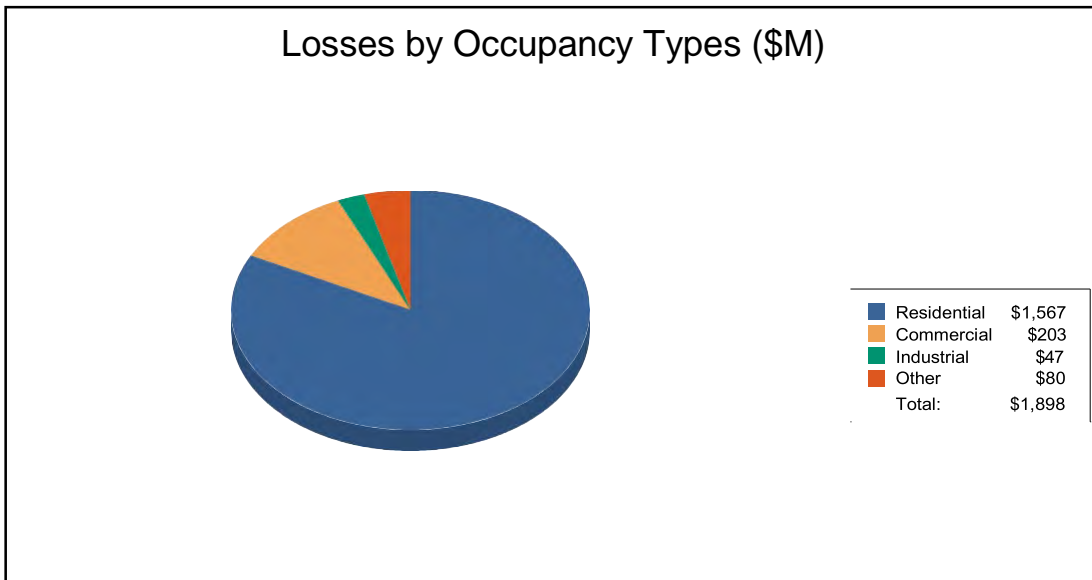
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 1,888.22 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 82.56% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.



Table 6: Building-Related Economic Loss Estimates
(Millions of dollars)

| Category | Area | Residential | Commercial | Industrial | Others | Total |
|------------------------------|-----------------|-----------------|---------------|--------------|--------------|-----------------|
| Building Loss | | | | | | |
| | Building | 1,004.77 | 55.72 | 14.30 | 16.99 | 1,091.78 |
| | Content | 558.62 | 141.18 | 27.87 | 59.84 | 787.51 |
| | Inventory | 0.00 | 3.47 | 5.06 | 0.40 | 8.92 |
| | Subtotal | 1,563.39 | 200.37 | 47.23 | 77.23 | 1,888.22 |
| Business Interruption | | | | | | |
| | Income | 0.05 | 1.17 | 0.00 | 0.56 | 1.77 |
| | Relocation | 2.77 | 0.25 | 0.00 | 0.24 | 3.26 |
| | Rental Income | 0.66 | 0.11 | 0.00 | 0.01 | 0.78 |
| | Wage | 0.13 | 1.41 | 0.00 | 2.39 | 3.93 |
| | Subtotal | 3.61 | 2.94 | 0.00 | 3.19 | 9.74 |
| ALL | Total | 1,566.99 | 203.32 | 47.23 | 80.43 | 1,897.96 |





Appendix A: County Listing for the Region

- Texas
 - Brazoria





Appendix B: Regional Population and Building Value Data

| | Population | Building Value (thousands of dollars) | | |
|---------------------------|----------------|---------------------------------------|------------------|-------------------|
| | | Residential | Non-Residential | Total |
| Texas | | | | |
| Brazoria | 313,166 | 29,401,709 | 4,397,274 | 33,798,983 |
| Total | 313,166 | 29,401,709 | 4,397,274 | 33,798,983 |
| Total Study Region | 313,166 | 29,401,709 | 4,397,274 | 33,798,983 |



Hazus-MH: Hurricane Global Risk Report

Region Name: Brazoria County

Hurricane Scenario: Probabilistic 1000-year Return Period

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique.

Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Texas

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 1,443.05 square miles and contains 50 census tracts. There are over 106 thousand households in the region and has a total population of 313,166 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 109 thousand buildings in the region with a total building replacement value (excluding contents) of 33,799 million dollars (2014 dollars). Approximately 94% of the buildings (and 87% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 109,747 buildings in the region which have an aggregate total replacement value of 33,799 million (2014 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Building Exposure by Occupancy Type

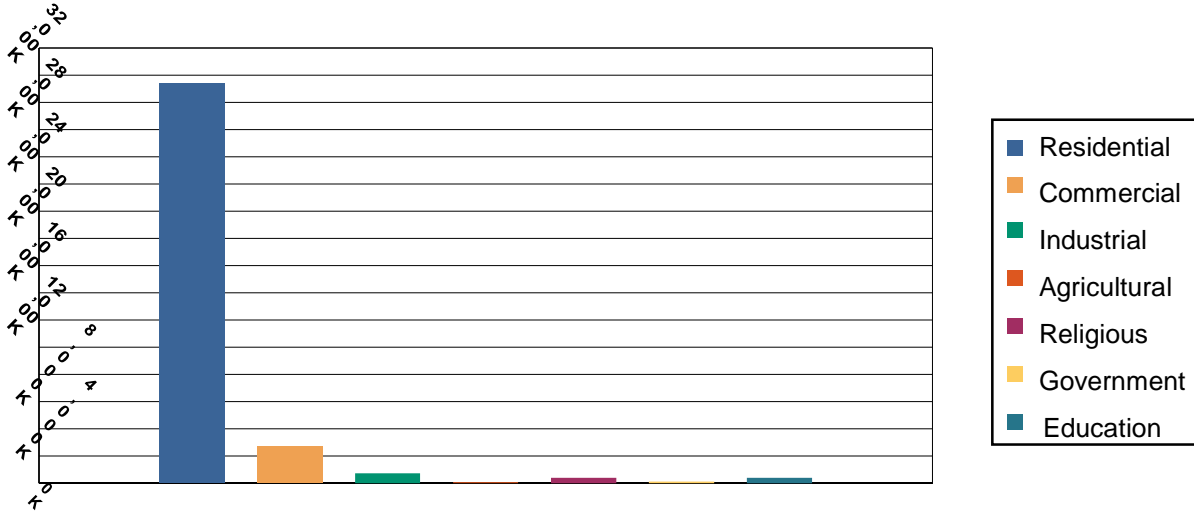


Table 1: Building Exposure by Occupancy Type

| Occupancy | Exposure (\$1000) | Percent of Tot |
|------------------|--------------------------|-----------------------|
| Residential | 29,401,709 | 86.99 % |
| Commercial | 2,672,546 | 7.91% |
| Industrial | 727,466 | 2.15% |
| Agricultural | 72,129 | 0.21% |
| Religious | 396,214 | 1.17% |
| Government | 125,448 | 0.37% |
| Education | 403,471 | 1.19% |
| Total | 33,798,983 | 100.00% |

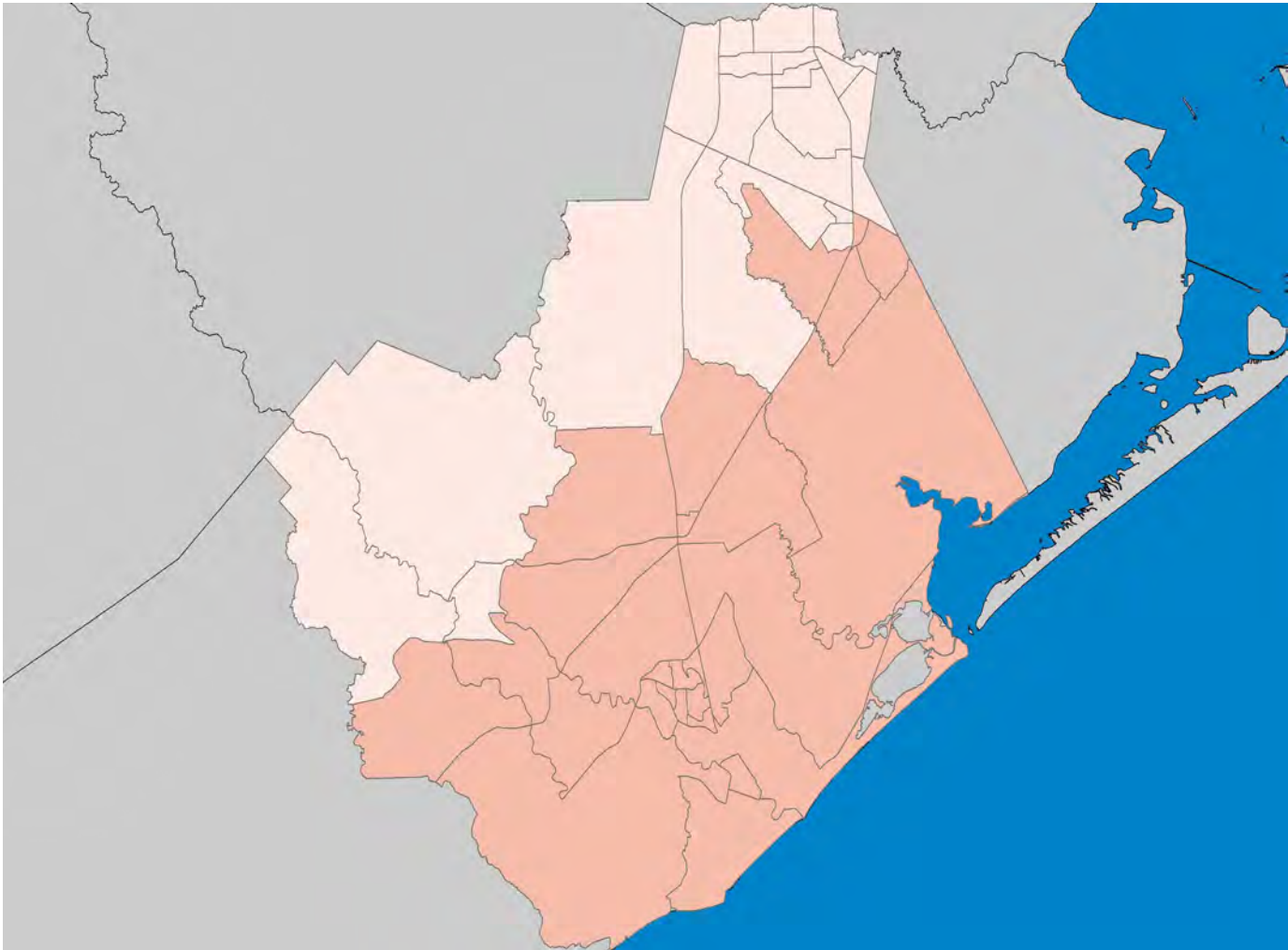
Essential Facility Inventory

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 234 beds. There are 99 schools, 22 fire stations, 19 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Thematic Map with peak gust windfield and HU track



Scenario Name: Probabilistic

Type: Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 66,546 buildings will be at least moderately damaged. This is over 61% of the total number of buildings in the region. There are an estimated 14,446 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Expected Building Damage by Occupancy

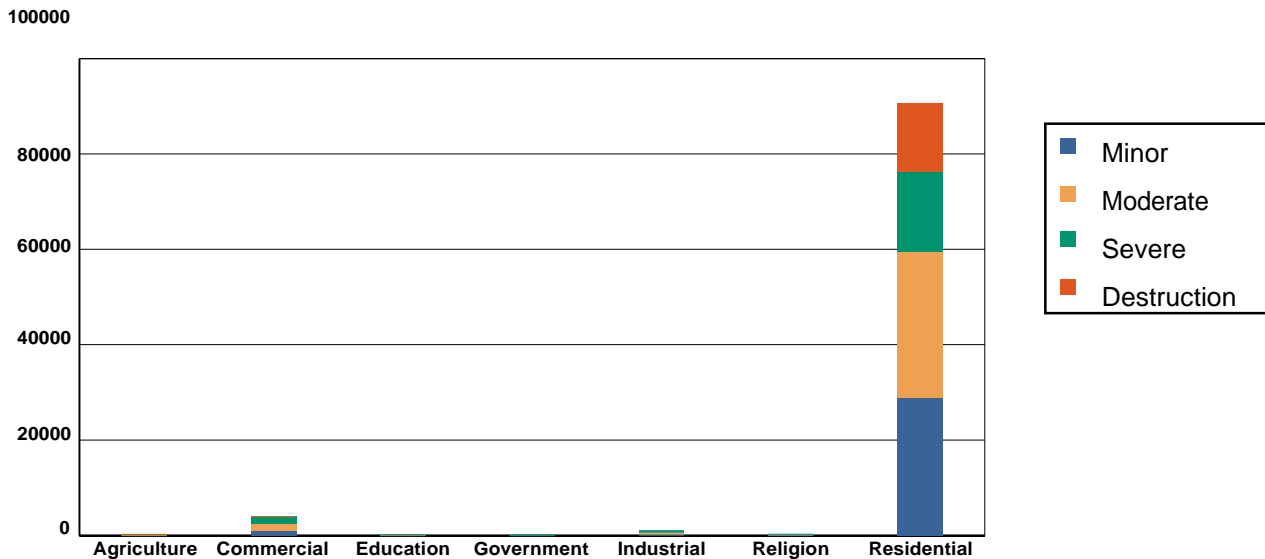


Table 2: Expected Building Damage by Occupancy: 1000 - year Event

| Occupancy | None | | Minor | | Moderate | | Severe | | Destruction | |
|--------------|---------------|-------|---------------|-------|---------------|-------|---------------|-------|---------------|-------|
| | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) |
| Agriculture | 29 | 9.43 | 36 | 11.82 | 73 | 23.70 | 118 | 38.51 | 51 | 16.54 |
| Commercial | 580 | 12.44 | 900 | 19.29 | 1,595 | 34.17 | 1,533 | 32.85 | 58 | 1.24 |
| Education | 23 | 13.41 | 27 | 16.11 | 51 | 30.29 | 67 | 40.05 | 0 | 0.13 |
| Government | 16 | 12.10 | 21 | 16.32 | 40 | 30.79 | 53 | 40.51 | 0 | 0.28 |
| Industrial | 164 | 12.25 | 227 | 16.89 | 408 | 30.44 | 531 | 39.55 | 12 | 0.87 |
| Religion | 59 | 12.71 | 100 | 21.43 | 150 | 32.02 | 156 | 33.51 | 2 | 0.34 |
| Residential | 12,026 | 11.71 | 28,992 | 28.24 | 30,511 | 29.72 | 16,814 | 16.38 | 14,324 | 13.95 |
| Total | 12,897 | | 30,304 | | 32,827 | | 19,273 | | 14,446 | |

Table 3: Expected Building Damage by Building Type : 1000 - year Event

| Building Type | None | | Minor | | Moderate | | Severe | | Destruction | |
|---------------|--------|-------|--------|-------|----------|-------|--------|-------|-------------|-------|
| | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) |
| Concrete | 78 | 12.16 | 79 | 12.19 | 210 | 32.55 | 278 | 43.06 | 0 | 0.04 |
| Masonry | 1,283 | 12.21 | 2,872 | 27.34 | 3,521 | 33.52 | 2,104 | 20.03 | 724 | 6.90 |
| MH | 10,784 | 79.16 | 388 | 2.85 | 747 | 5.49 | 245 | 1.80 | 1,458 | 10.70 |
| Steel | 201 | 12.92 | 177 | 11.38 | 472 | 30.36 | 684 | 44.01 | 21 | 1.32 |
| Wood | 8,196 | 10.26 | 24,205 | 30.29 | 23,998 | 30.03 | 13,803 | 17.27 | 9,714 | 12.15 |

Essential Facility Damage

Before the hurricane, the region had 234 hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (only 0.00%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 0.00% of the beds will be in service. By 30 days, 9.00% will be operational.

Thematic Map of Essential Facilities with greater than 50% moderate

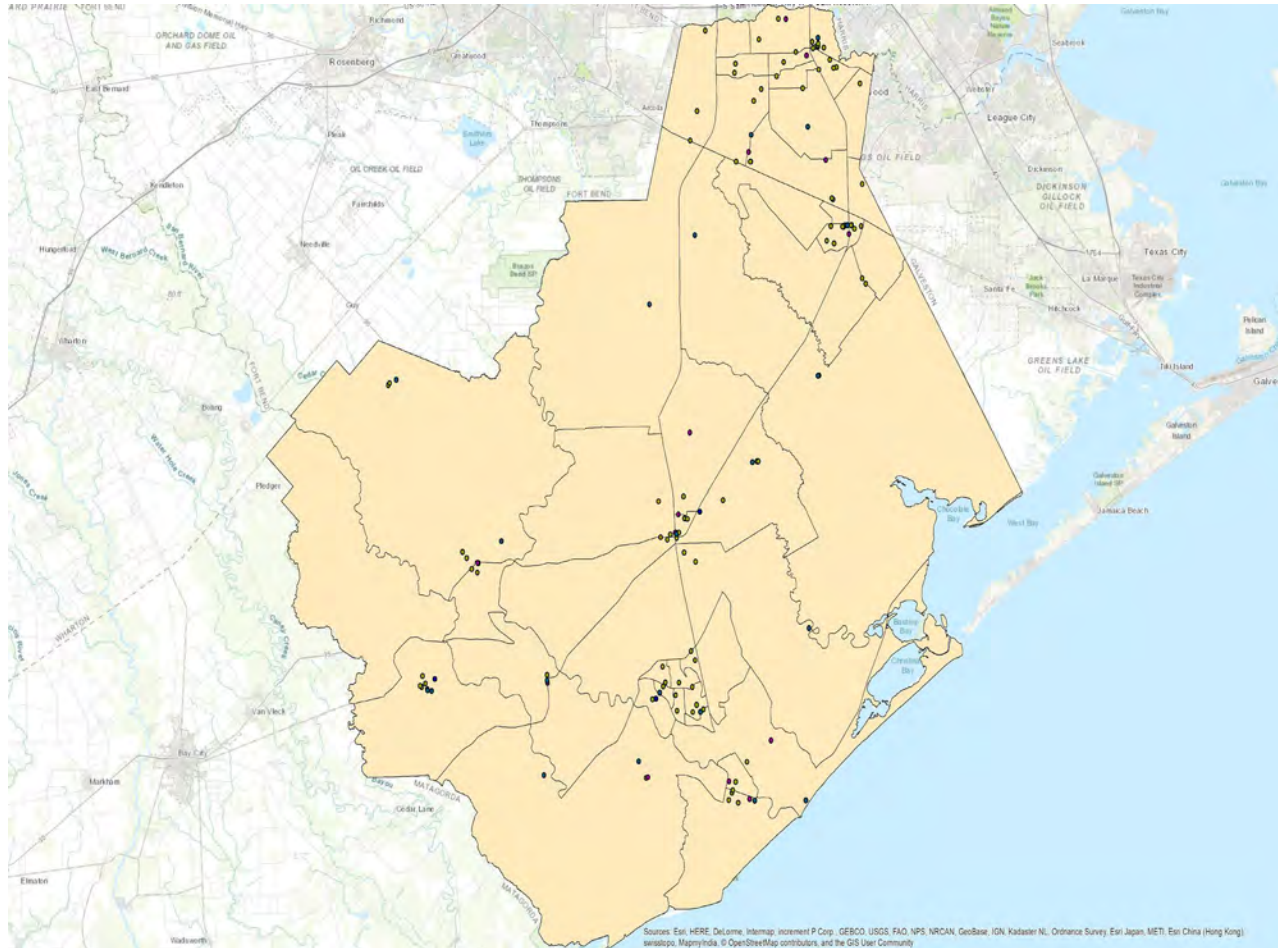
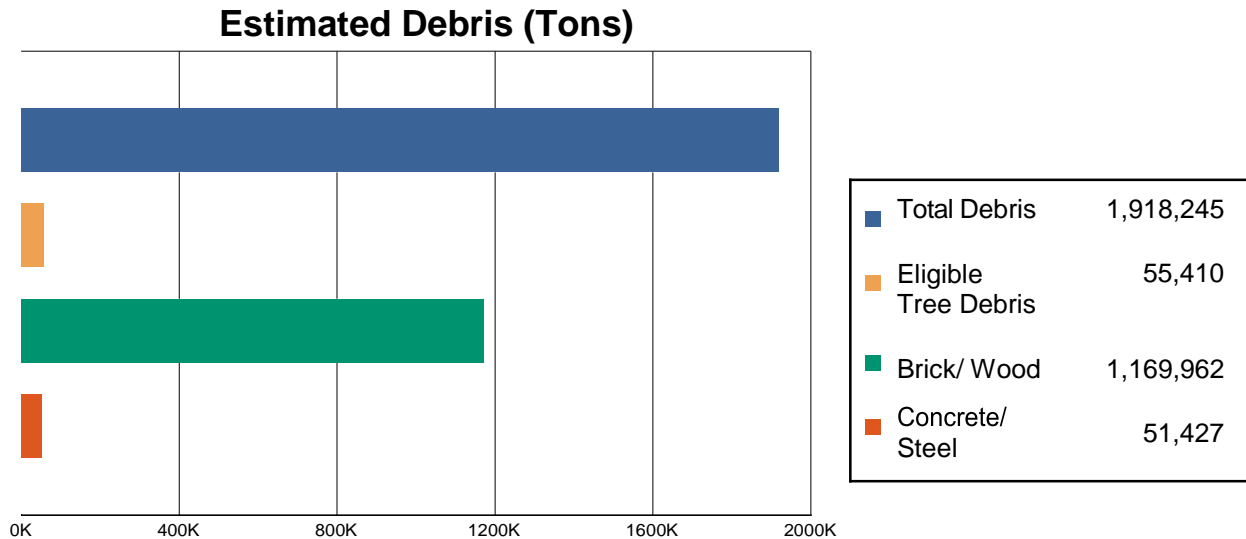


Table 4: Expected Damage to Essential Facilities

| Classification | Total | # Facilities | | |
|-----------------|-------|---|--------------------------------------|------------------------------|
| | | Probability of at Least Moderate Damage > 50% | Probability of Complete Damage > 50% | Expected Loss of Use < 1 day |
| EOCs | 1 | 1 | 0 | 1 |
| Fire Stations | 22 | 19 | 0 | 21 |
| Hospitals | 3 | 3 | 1 | 0 |
| Police Stations | 19 | 19 | 0 | 13 |
| Schools | 99 | 99 | 0 | 0 |

Induced Hurricane Damage

Debris Generation

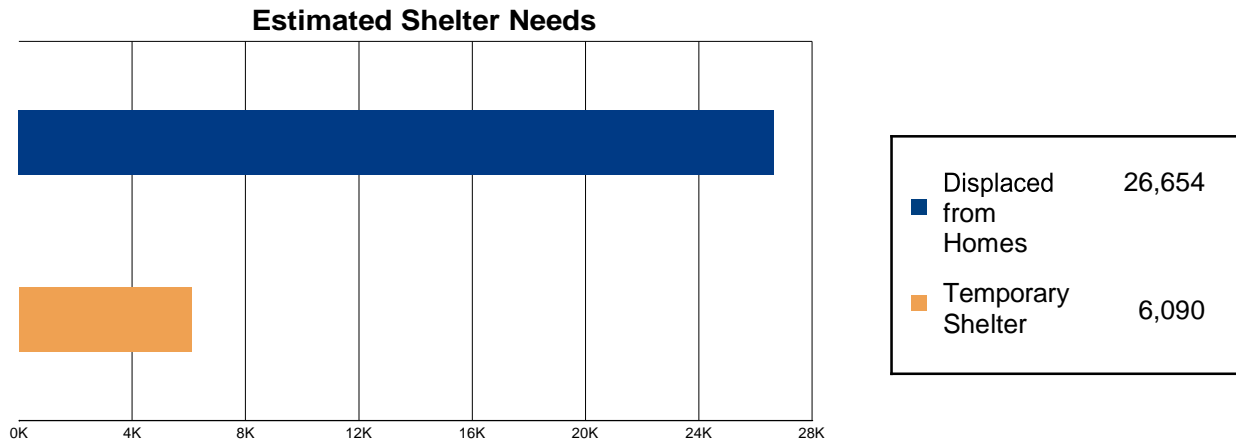


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,918,245 tons of debris will be generated. Of the total amount, 632,573 tons (33%) is Other Tree Debris. Of the remaining 1,285,672 tons, Brick/Wood comprises 91% of the total, Reinforced Concrete/Steel comprises of 4% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 49210 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 55,410 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 26,654 households to be displaced due to the hurricane. Of these, 6,090 people (out of a total population of 313,166) will seek temporary shelter in public shelters.

Economic Loss

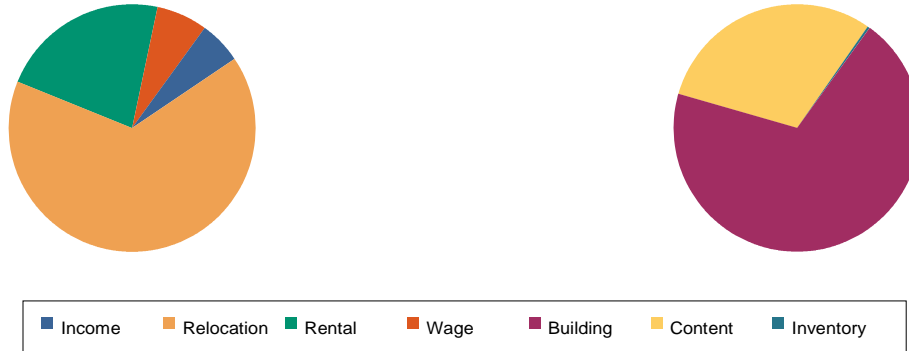
The total economic loss estimated for the hurricane is 15296.8 million dollars, which represents 45.26 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 15,297 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 88% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Total Loss by General Occupancy



Total Loss by Occupancy Type

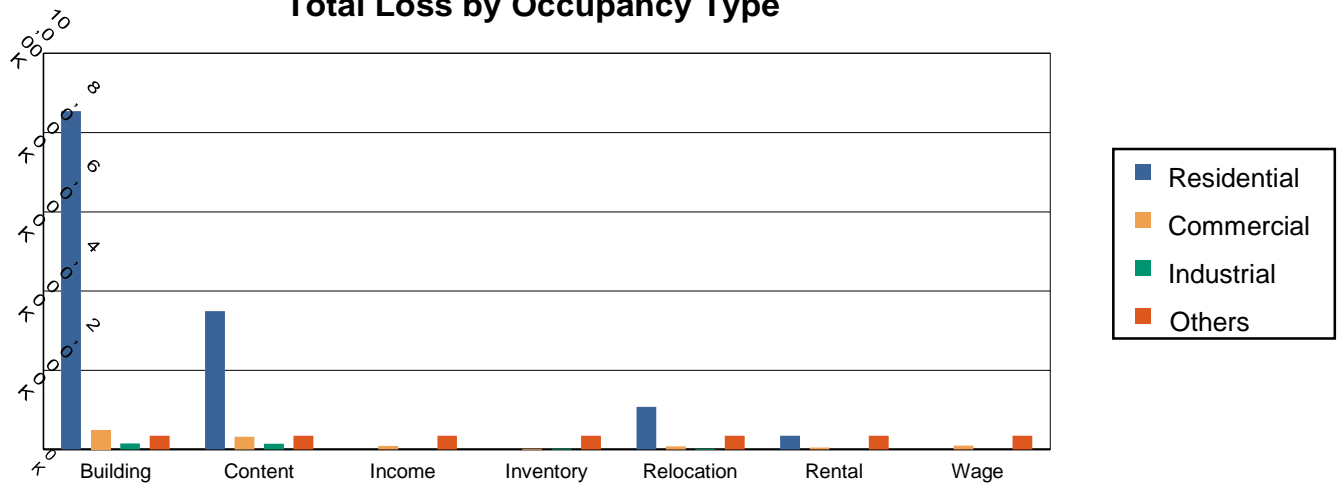


Table 5: Building-Related Economic Loss Estimates
(Thousands of dollars)

| Category | Area | Residential | Commercial | Industrial | Others | Total |
|-----------------------------------|-----------------|-------------|----------------------|---------------------|-------------------|-------------------|
| Property Damage | | | | | | |
| | Building | | 8,537,798.32 | 483,904.56 | 154,953.52 | 176,329.58 |
| | Content | | 3,492,952.03 | 325,507.33 | 145,398.56 | 118,348.33 |
| | Inventory | | 0.00 | 8,768.39 | 22,156.69 | 1,958.53 |
| | Subtotal | | 12,030,750.35 | 818,180.27 | 322,508.77 | 296,636.44 |
| Business Interruption Loss | | | | | | |
| | Income | | 2,632.73 | 93,233.11 | 2,873.38 | 2,257.09 |
| | Relocation | | 1,074,981.95 | 79,648.21 | 10,611.49 | 36,309.99 |
| | Rental | | 351,253.79 | 49,340.11 | 2,059.39 | 3,844.42 |
| | Wage | | 6,169.24 | 100,601.60 | 4,519.44 | 8,362.46 |
| | Subtotal | | 1,435,037.70 | 322,823.03 | 20,063.71 | 50,773.95 |
| Total | | | | | | |
| | Total | | 13,465,788.05 | 1,141,003.30 | 342,572.48 | 347,410.39 |

Appendix A: County Listing for the Region

Texas

- Brazoria

Appendix B: Regional Population and Building Value Data

| | Population | Building Value (thousands of dollars) | | |
|---------------------------|----------------|---------------------------------------|------------------|-------------------|
| | | Residential | Non-Residential | Total |
| Texas | | | | |
| Brazoria | 313,166 | 29,401,709 | 4,397,274 | 33,798,983 |
| Total | 313,166 | 29,401,709 | 4,397,274 | 33,798,983 |
| Study Region Total | 313,166 | 29,401,709 | 4,397,274 | 33,798,983 |

Quick Assessment Report

Study Region: Brazoria County

Scenario: Probabilistic

Regional Statistics

| | |
|---------------------------------------|---------|
| Area (Square Miles) | 1,443 |
| Number of Census Tracts | 50 |
| Number of People in the Region | 313,166 |
| General Building Stock | |

| <i>Occupancy</i> | <i>Building Count</i> | <i>Dollar Exposure (\$ K)</i> |
|------------------|-----------------------|-------------------------------|
| Residential | 102,667 | 29,401,709 |
| Commercial | 4,666 | 2,672,546 |
| Other | 2,414 | 1,724,728 |
| Total | 109,747 | 33,798,983 |

Scenario Results

Number of Residential Buildings Damaged

| <i>Return Period</i> | <i>Minor</i> | <i>Moderate</i> | <i>Severe</i> | <i>Destruction</i> | <i>Total</i> |
|----------------------|--------------|-----------------|---------------|--------------------|--------------|
| 10 | 390 | 13 | 0 | 0 | 403 |
| 20 | 12,270 | 1,472 | 51 | 72 | 13,865 |
| 50 | 29,314 | 9,603 | 1,523 | 1,232 | 41,672 |
| 100 | 24,995 | 13,995 | 4,376 | 3,486 | 46,852 |
| 200 | 29,961 | 19,406 | 8,370 | 6,715 | 64,452 |
| 500 | 31,997 | 27,467 | 13,405 | 11,857 | 84,725 |
| 1000 | 28,992 | 30,511 | 16,814 | 14,324 | 90,641 |

Number of Buildings Damaged

| <i>Return Period</i> | <i>Minor</i> | <i>Moderate</i> | <i>Severe</i> | <i>Destruction</i> | <i>Total</i> |
|----------------------|--------------|-----------------|---------------|--------------------|--------------|
| 10 | 441 | 15 | 0 | 0 | 457 |
| 20 | 12,937 | 1,658 | 72 | 74 | 14,741 |
| 50 | 30,804 | 10,617 | 1,855 | 1,246 | 44,522 |
| 100 | 26,112 | 15,159 | 5,131 | 3,519 | 49,920 |
| 200 | 31,430 | 21,177 | 9,801 | 6,782 | 69,190 |
| 500 | 33,445 | 29,670 | 15,515 | 11,967 | 90,598 |
| 1000 | 30,304 | 32,827 | 19,273 | 14,446 | 96,850 |

Shelter Requirements

| <i>Return Period</i> | <i>Displaced Households (#Households)</i> | <i>Short Term Shelter (#People)</i> |
|----------------------|---|-------------------------------------|
| 10 | 0 | 0 |
| 20 | 104 | 21 |
| 50 | 1,260 | 270 |
| 100 | 5,397 | 1,176 |
| 200 | 11,256 | 2,624 |
| 500 | 20,468 | 4,709 |
| 1000 | 26,654 | 6,090 |

Economic Loss (x 1000)

| ReturnPeriod | <u>Property Damage (Capital Stock) Losses</u> | | Business Interruption (Income) Losses |
|---------------------|--|--------------|--|
| | Residential | Total | |
| 10 | 35,116 | 35,813 | 795 |
| 20 | 344,228 | 364,500 | 33,776 |
| 50 | 1,725,419 | 1,909,965 | 288,220 |
| 100 | 3,552,626 | 3,960,211 | 577,756 |
| 200 | 5,693,060 | 6,555,734 | 985,210 |
| 500 | 9,483,735 | 10,702,035 | 1,524,986 |
| 1000 | 12,030,750 | 13,468,076 | 1,828,698 |
| Annualized | 128,635 | 144,315 | 20,474 |

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.



FEMA

RiskMAP
Increasing Resilience Together

Hazus: Hurricane Global Risk Report

Region Name: Hurricane Scenario:

Brazoria

Cat 5 HGAC Scenario

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

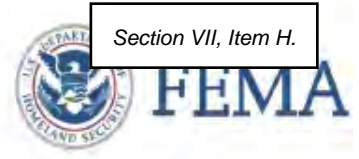


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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Texas

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 1,443.05 square miles and contains 50 census tracts. There are over 106 thousand households in the region and a total population of 313,166 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 109 thousand buildings in the region with a total building replacement value (excluding contents) of 31,721 million dollars (2014 dollars). Approximately 94% of the buildings (and 86% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 109,747 buildings in the region which have an aggregate total replacement value of 31,721 million (2014 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Building Exposure by Occupancy Type

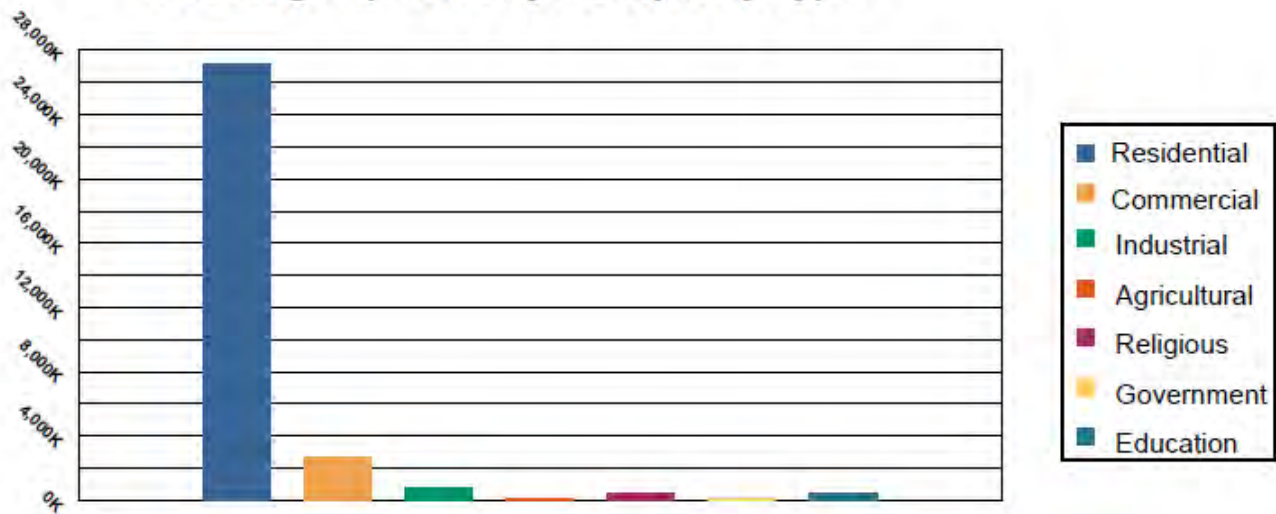


Table 1: Building Exposure by Occupancy Type

| Occupancy | Exposure (\$1000) | Percent of Tot |
|--------------|-------------------|----------------|
| Residential | 27,197,675 | 85.74 % |
| Commercial | 2,725,704 | 8.59% |
| Industrial | 737,081 | 2.32% |
| Agricultural | 80,369 | 0.25% |
| Religious | 415,968 | 1.31% |
| Government | 135,010 | 0.43% |
| Education | 429,622 | 1.35% |
| Total | 31,721,429 | 100.00% |

Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 357 beds. There are 122 schools, 32 fire stations, 27 police stations and 11 emergency operation facilities.



Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name: Cat 5 HGAC Scenario
Type: Deterministic
Maximum Peak Gust in Study Region: 193 mph

User Defined Storm Track Input Data

| Point | Latitude | Longitude | Time Step (hour) | Translation Speed (mph) | Radius To Max Winds (miles) | Max. Sustained Wind Speed (mph @ 10m) | Cental Pressure (mBar) | Profile Parameter | Radius to Hurricane Force Winds (miles) |
|-------|----------|-----------|------------------|-------------------------|-----------------------------|---------------------------------------|------------------------|-------------------|---|
| 1 | 26.60 | -91.36 | -- | 8.00 | 30.00 | 157.00 | 920.00 | -- | -- |
| 2 | 27.64 | -93.59 | -- | 8.00 | 30.00 | 157.00 | 920.00 | -- | -- |
| 3 | 28.52 | -94.51 | -- | 8.00 | 30.00 | 157.00 | 920.00 | -- | -- |
| 4 | 29.12 | -95.05 | -- | 8.00 | 30.00 | 157.00 | 920.00 | -- | -- |
| 5 | 29.63 | -95.58 | -- | 8.00 | 30.00 | 157.00 | 920.00 | -- | -- |
| 6 | 30.81 | -96.17 | -- | 8.00 | 30.00 | 157.00 | 920.00 | -- | -- |

Building Damage

General Building Stock Damage

Hazus estimates that about 109,375 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the region. There are an estimated 85,515 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

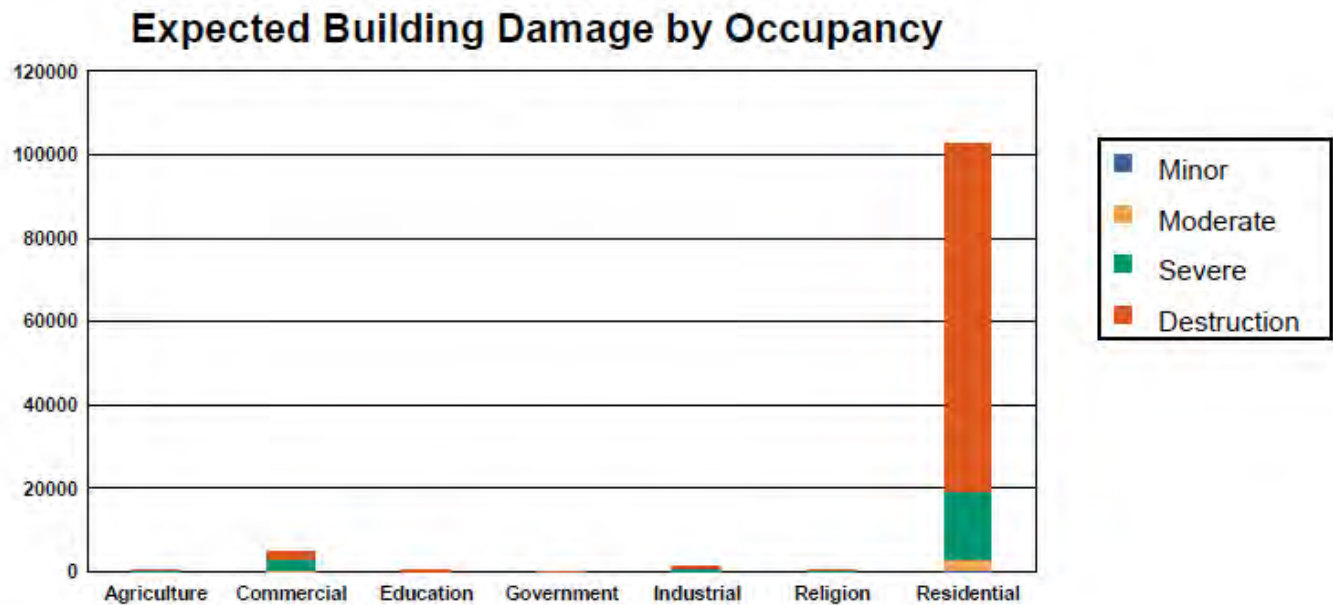


Table 2: Expected Building Damage by Occupancy

| Occupancy | None | | Minor | | Moderate | | Severe | | Destruction | |
|--------------|--------------|------|---------------|------|-----------------|------|------------------|-------|------------------|-------|
| | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) |
| Agriculture | 0.63 | 0.21 | 1.22 | 0.40 | 7.65 | 2.50 | 167.65 | 54.79 | 128.85 | 42.11 |
| Commercial | 12.27 | 0.26 | 24.70 | 0.53 | 189.54 | 4.06 | 2,930.71 | 62.81 | 1,508.78 | 32.34 |
| Education | 0.57 | 0.34 | 1.01 | 0.60 | 6.07 | 3.61 | 127.78 | 76.06 | 32.58 | 19.39 |
| Government | 0.40 | 0.31 | 0.73 | 0.56 | 4.61 | 3.52 | 96.45 | 73.62 | 28.81 | 21.99 |
| Industrial | 3.66 | 0.27 | 6.99 | 0.52 | 45.45 | 3.39 | 975.99 | 72.73 | 309.90 | 23.09 |
| Religion | 1.40 | 0.30 | 2.65 | 0.57 | 20.07 | 4.30 | 316.51 | 67.78 | 126.36 | 27.06 |
| Residential | 21.75 | 0.02 | 294.47 | 0.29 | 2,827.78 | 2.75 | 16,143.54 | 15.72 | 83,379.45 | 81.21 |
| Total | 40.69 | | 331.77 | | 3,101.17 | | 20,758.64 | | 85,514.73 | |

Table 3: Expected Building Damage by Building Type

| Building Type | None | | Minor | | Moderate | | Severe | | Destruction | |
|---------------|-------|------|-------|------|----------|------|--------|-------|-------------|-------|
| | Count | (%) | Count | (%) | Count | (%) | Count | (%) | Count | (%) |
| Concrete | 3 | 0.29 | 6 | 0.53 | 45 | 4.20 | 972 | 91.47 | 37 | 3.51 |
| Masonry | 15 | 0.12 | 54 | 0.44 | 427 | 3.50 | 4,675 | 38.29 | 7,038 | 57.65 |
| MH | 15 | 0.10 | 58 | 0.42 | 372 | 2.65 | 704 | 5.02 | 12,875 | 91.80 |
| Steel | 7 | 0.31 | 11 | 0.49 | 64 | 2.96 | 1,490 | 68.45 | 605 | 27.79 |
| Wood | 13 | 0.02 | 220 | 0.27 | 2,234 | 2.78 | 13,144 | 16.38 | 64,635 | 80.55 |



Essential Facility Damage

Before the hurricane, the region had 357 hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (only 0.00%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 0.00% of the beds will be in service. By 30 days, 0.00% will be operational.

Thematic Map of Essential Facilities with greater than 50% moderate

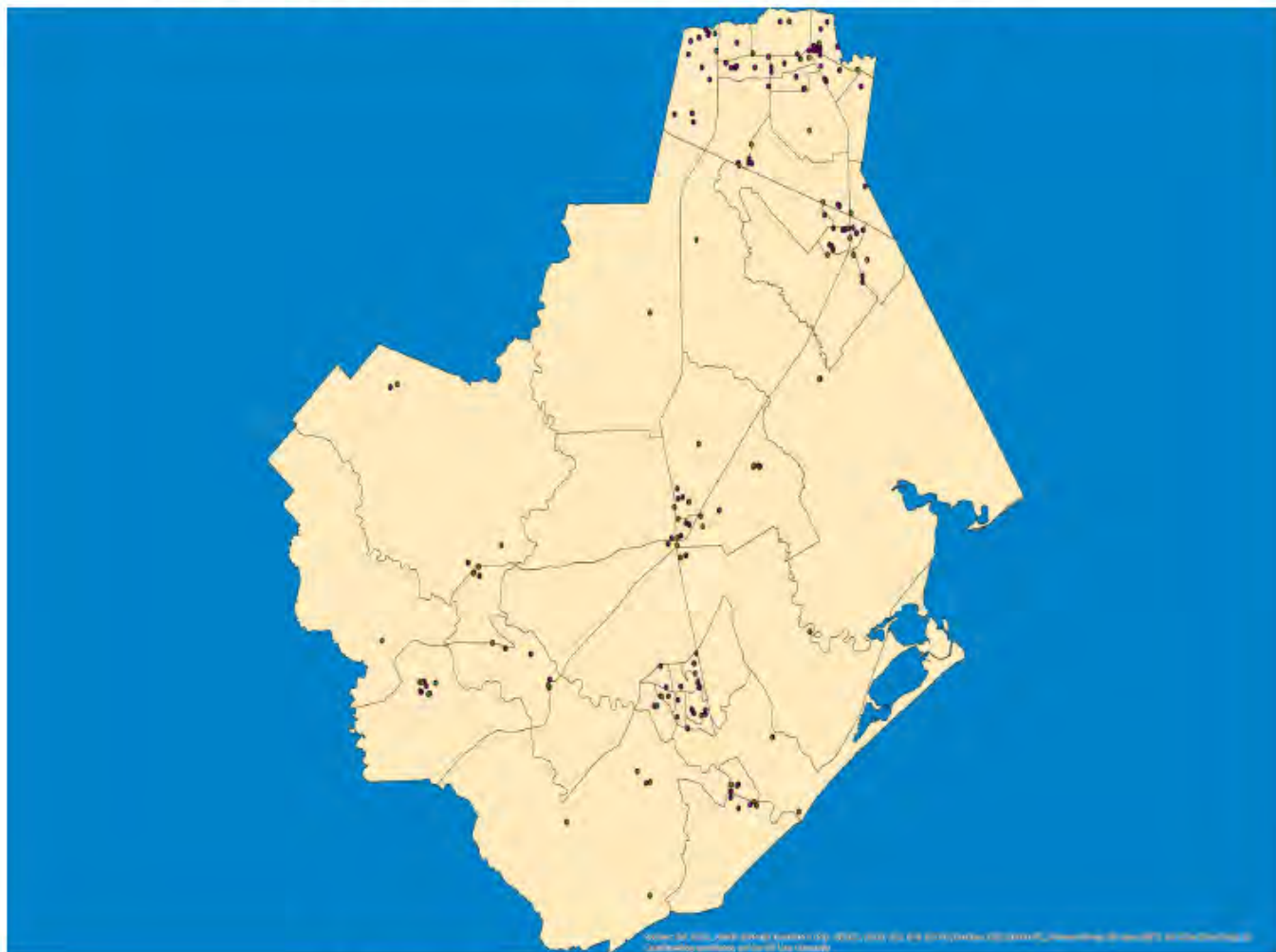
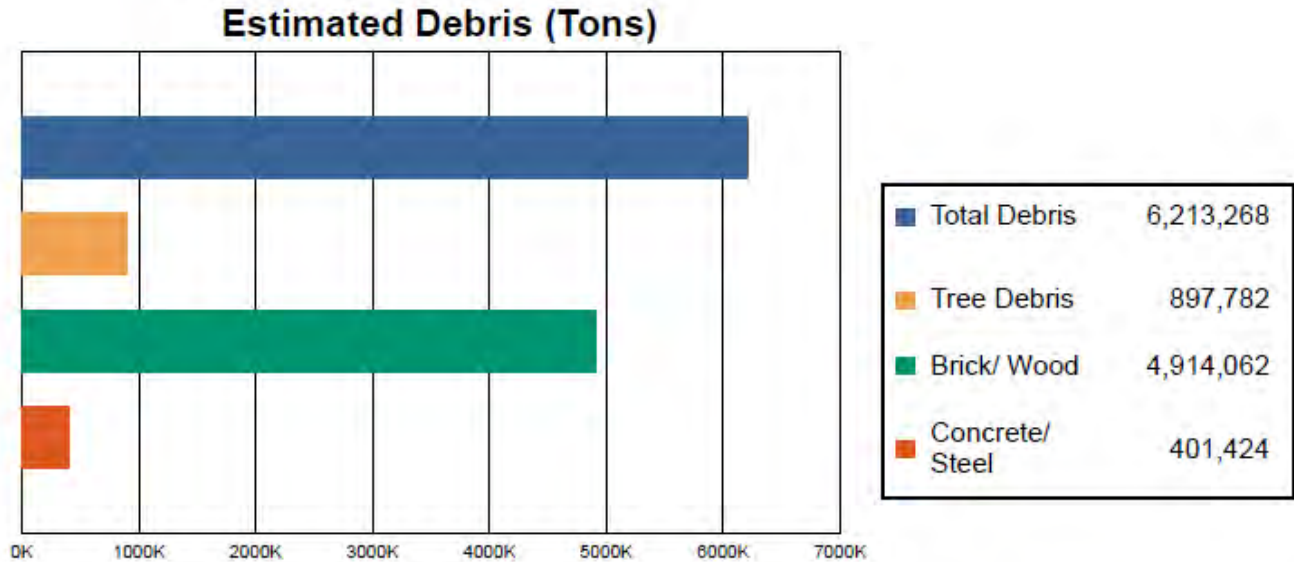


Table 4: Expected Damage to Essential Facilities

| Classification | Total | # Facilities | | |
|-----------------|-------|---|--------------------------------------|------------------------------|
| | | Probability of at Least Moderate Damage > 50% | Probability of Complete Damage > 50% | Expected Loss of Use < 1 day |
| EOCs | 11 | 11 | 0 | 0 |
| Fire Stations | 32 | 32 | 27 | 0 |
| Hospitals | 5 | 5 | 4 | 0 |
| Police Stations | 27 | 27 | 0 | 0 |
| Schools | 122 | 122 | 116 | 0 |

Induced Hurricane Damage

Debris Generation

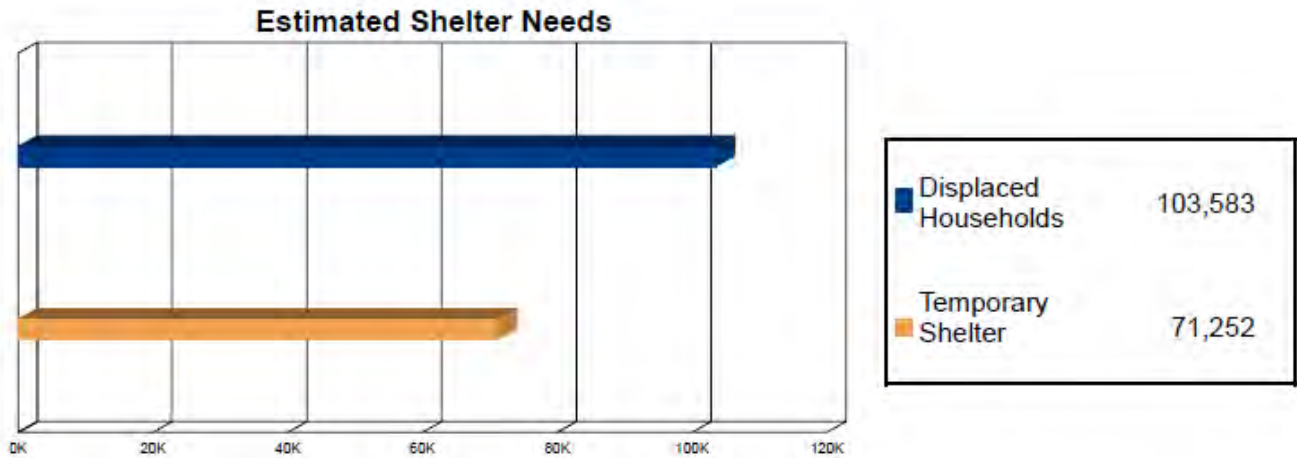


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 6,213,268 tons of debris will be generated. Of the total amount, 826,540 tons (13%) is Other Tree Debris. Of the remaining 5,386,728 tons, Brick/Wood comprises 91% of the total, Reinforced Concrete/Steel comprises of 7% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 212619 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 71,242 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 103,583 households to be displaced due to the hurricane. Of these, 71,252 people (out of a total population of 313,166) will seek temporary shelter in public shelters.

Economic Loss

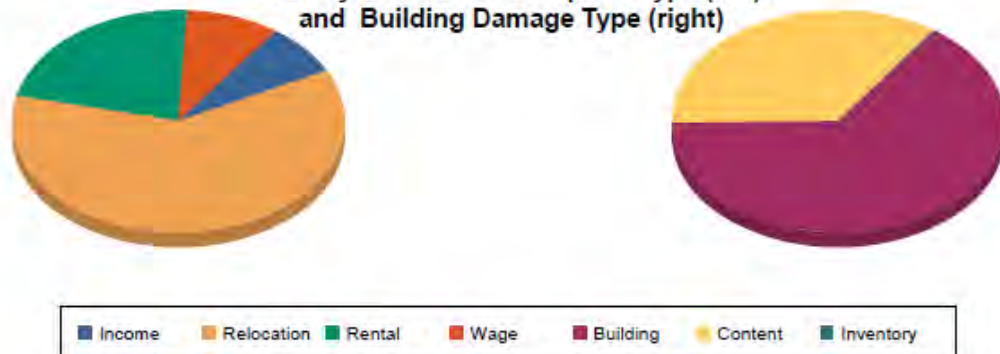
The total economic loss estimated for the hurricane is 49,957.1 million dollars, which represents 157.49 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 49,957 million dollars. 11% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 83% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

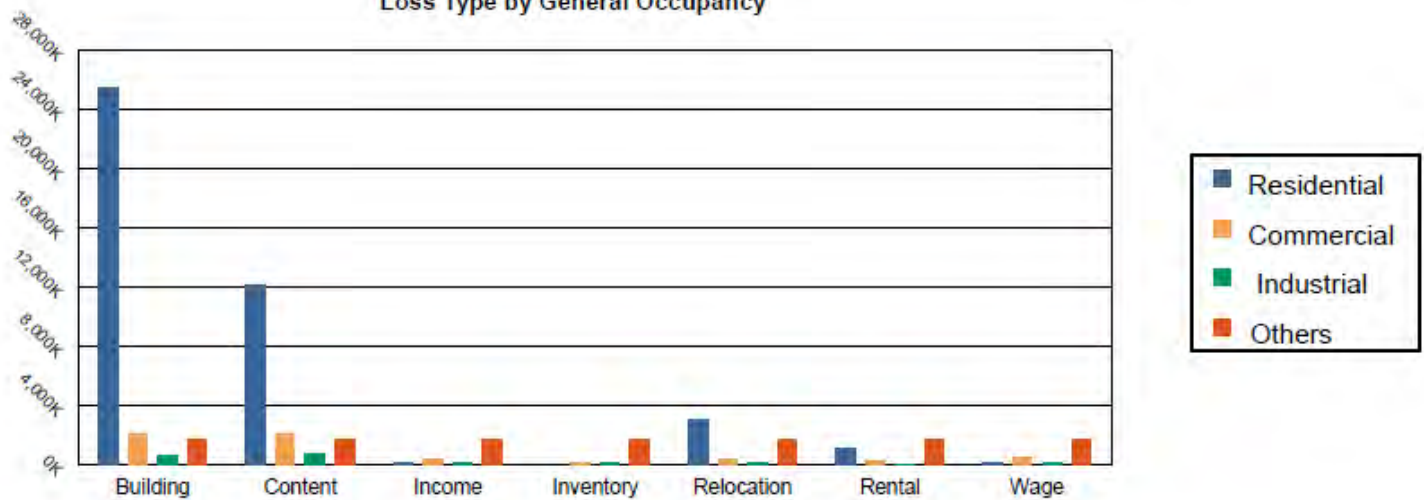


Table 5: Building-Related Economic Loss Estimates
(Thousands of dollars)

| Category | Area | Residential | Commercial | Industrial | Others | Total |
|-----------------------------------|-----------------|----------------------|---------------------|---------------------|---------------------|----------------------|
| Property Damage | | | | | | |
| | Building | 25,394,592.92 | 2,059,671.26 | 566,151.01 | 766,925.17 | 28,787,340.36 |
| | Content | 12,082,514.69 | 1,995,456.25 | 716,025.97 | 731,465.81 | 15,525,462.72 |
| | Inventory | 0.00 | 49,394.39 | 112,205.31 | 7,490.06 | 169,089.76 |
| | Subtotal | 37,477,107.61 | 4,104,521.90 | 1,394,382.30 | 1,505,881.04 | 44,481,892.85 |
| Business Interruption Loss | | | | | | |
| | Income | 15,499.12 | 373,868.75 | 9,813.93 | 9,852.62 | 409,034.42 |
| | Relocation | 2,946,505.56 | 267,720.06 | 25,664.50 | 113,287.53 | 3,353,177.66 |
| | Rental | 1,008,662.46 | 186,807.19 | 5,790.10 | 13,473.65 | 1,214,733.41 |
| | Wage | 36,426.65 | 413,018.54 | 15,344.37 | 33,434.43 | 498,223.99 |
| | Subtotal | 4,007,093.80 | 1,241,414.54 | 56,612.90 | 170,048.23 | 5,475,169.48 |



Section VII, Item H.

FEMA

Total

| | | | | | |
|-------|---------------|--------------|--------------|--------------|---------------|
| Total | 41,484,201.41 | 5,345,936.43 | 1,450,995.20 | 1,675,929.28 | 49,957,062.32 |
|-------|---------------|--------------|--------------|--------------|---------------|



Appendix A: County Listing for the Region

Texas
- Brazoria

Appendix B: Regional Population and Building Value Data

| | Population | Building Value (thousands of dollars) | | |
|---------------------------|----------------|---------------------------------------|------------------|-------------------|
| | | Residential | Non-Residential | Total |
| Texas | | | | |
| Brazoria | 313,166 | 27,197,675 | 4,523,754 | 31,721,429 |
| Total | 313,166 | 27,197,675 | 4,523,754 | 31,721,429 |
| Study Region Total | 313,166 | 27,197,675 | 4,523,754 | 31,721,429 |

Appendix D – Repetitive Loss Properties

APPENDIX D: REPETITIVE LOSS PROPERTIES

| ID Number | Community Name | Insured? | Occupancy | Losses | Total Paid | SRL Indicator |
|-----------|----------------|----------|-------------|--------|------------|---------------|
| 0043136 | Alvin, City of | No | Single Fmly | 2 | 46,237.00 | |
| 0039608 | Alvin, City of | No | Single Fmly | 2 | 26,568.39 | |
| 0025303 | Alvin, City of | No | Single Fmly | 2 | 33,855.89 | |
| 0025979 | Alvin, City of | No | Single Fmly | 2 | 20,093.44 | |
| 0034406 | Alvin, City of | No | Single Fmly | 2 | 22,603.52 | |
| 0037725 | Alvin, City of | No | Single Fmly | 2 | 28,011.42 | |
| 0044696 | Alvin, City of | No | Single Fmly | 4 | 42,795.95 | |
| 0045113 | Alvin, City of | No | Single Fmly | 3 | 31,783.93 | |
| 0017532 | Alvin, City of | No | Other Resid | 3 | 80,190.94 | |
| 0025767 | Alvin, City of | No | Single Fmly | 2 | 15,013.86 | |
| 0018679 | Alvin, City of | No | Single Fmly | 2 | 16,362.74 | |
| 0025650 | Alvin, City of | No | Single Fmly | 8 | 194,513.27 | VU |
| 0025914 | Alvin, City of | Sdf | Single Fmly | 5 | 140,630.86 | V |
| 0186126 | Alvin, City of | No | Single Fmly | 2 | 13,736.02 | |
| 0017530 | Alvin, City of | No | Other Resid | 2 | 41,622.42 | |
| 0017531 | Alvin, City of | No | Other Resid | 2 | 42,543.60 | |
| 0119332 | Alvin, City of | No | Single Fmly | 2 | 7,028.87 | |
| 0038459 | Alvin, City of | No | Single Fmly | 2 | 8,001.13 | |
| 0091027 | Alvin, City of | Yes | Single Fmly | 7 | 112,386.10 | V |
| 0172629 | Alvin, City of | No | Single Fmly | 4 | 51,396.47 | VU |
| 0186127 | Alvin, City of | No | Single Fmly | 2 | 42,779.08 | |
| 0262697 | Alvin, City of | Yes | Single Fmly | 2 | 187,084.33 | |
| 0093931 | Alvin, City of | Yes | Single Fmly | 4 | 45,562.95 | |
| 0181441 | Alvin, City of | No | Single Fmly | 2 | 29,500.92 | |
| 0002706 | Alvin, City of | No | Single Fmly | 7 | 25,295.97 | |
| 0012934 | Alvin, City of | No | Single Fmly | 2 | 24,694.51 | |
| 0044043 | Alvin, City of | No | Single Fmly | 2 | 37,764.26 | |
| 0017471 | Alvin, City of | No | Single Fmly | 2 | 23,186.56 | |
| 0115764 | Alvin, City of | No | Single Fmly | 2 | 44,839.61 | |
| 0012871 | Alvin, City of | No | Assmd Condo | 8 | 93,909.49 | VU |
| 0186547 | Alvin, City of | Yes | Single Fmly | 3 | 129,834.67 | |
| 0013252 | Alvin, City of | No | Single Fmly | 8 | 134,372.79 | VU |
| 0262686 | Alvin, City of | Yes | Single Fmly | 2 | 71,774.23 | |
| 0091319 | Alvin, City of | No | Single Fmly | 3 | 36,007.08 | |
| 0186093 | Alvin, City of | No | Single Fmly | 2 | 5,770.49 | |
| 0179567 | Alvin, City of | No | Single Fmly | 2 | 7,182.03 | |
| 0185406 | Alvin, City of | No | Single Fmly | 2 | 16,430.78 | |
| 0044581 | Alvin, City of | No | Othr-Nonres | 5 | 41,072.42 | VNU |
| 0035331 | Alvin, City of | No | Single Fmly | 2 | 35,300.95 | |
| 0083529 | Alvin, City of | No | Othr-Nonres | 3 | 14,522.54 | |
| 0211587 | Alvin, City of | No | 2-4 Family | 2 | 62,991.36 | |
| 0186085 | Alvin, City of | Yes | Single Fmly | 2 | 71,096.80 | |
| 0262683 | Alvin, City of | Yes | Single Fmly | 2 | 26,038.70 | |
| 0212640 | Alvin, City of | Yes | Single Fmly | 2 | 12,786.90 | |
| 0186118 | Alvin, City of | No | Single Fmly | 2 | 14,338.60 | |
| 0108987 | Alvin, City of | Sdf | Single Fmly | 6 | 283,637.73 | V |
| 0169739 | Alvin, City of | No | Single Fmly | 4 | 63,000.73 | |
| 0025156 | Alvin, City of | No | Othr-Nonres | 2 | 16,815.93 | |
| 0096873 | Alvin, City of | Yes | Single Fmly | 5 | 60,338.99 | |
| 0186548 | Alvin, City of | No | Single Fmly | 2 | 65,545.18 | |
| 0018615 | Alvin, City of | No | Single Fmly | 3 | 17,930.71 | |

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|---------|----------------|-----|-------------|---|------------|----|
| 0068838 | Alvin, City of | No | Single Fmly | 2 | 5,081.69 | |
| 0186160 | Alvin, City of | Yes | Single Fmly | 2 | 111,779.18 | |
| 0044364 | Alvin, City of | No | Othr-Nonres | 2 | 4,271.50 | |
| 0002937 | Alvin, City of | No | Single Fmly | 5 | 67,573.24 | VU |
| 0185925 | Alvin, City of | Yes | Single Fmly | 3 | 94,036.24 | |
| 0025983 | Alvin, City of | No | Single Fmly | 2 | 14,718.00 | |
| 0036616 | Alvin, City of | No | Single Fmly | 2 | 39,416.14 | |
| 0181159 | Alvin, City of | Yes | Single Fmly | 3 | 102,127.05 | |
| 0183779 | Alvin, City of | No | Single Fmly | 3 | 103,657.68 | |
| 0025954 | Alvin, City of | No | Single Fmly | 2 | 14,712.84 | |
| 0068830 | Alvin, City of | Yes | Single Fmly | 5 | 65,560.64 | |
| 0069910 | Alvin, City of | No | Single Fmly | 3 | 42,033.54 | |
| 0185441 | Alvin, City of | No | Assmd Condo | 2 | 11,752.61 | |
| 0185254 | Alvin, City of | No | Single Fmly | 2 | 23,884.08 | |
| 0091026 | Alvin, City of | No | Single Fmly | 3 | 42,891.30 | |
| 0094233 | Alvin, City of | Yes | Single Fmly | 3 | 60,116.71 | |
| 0262682 | Alvin, City of | Yes | Single Fmly | 2 | 88,131.69 | |
| 0185383 | Alvin, City of | No | Single Fmly | 2 | 13,526.00 | |
| 0096871 | Alvin, City of | No | Othr-Nonres | 2 | 6,963.84 | |
| 0044015 | Alvin, City of | No | Single Fmly | 2 | 14,599.11 | |
| 0018500 | Alvin, City of | Yes | Single Fmly | 3 | 25,277.78 | |
| 0026659 | Alvin, City of | Yes | Single Fmly | 3 | 20,239.02 | |
| 0026843 | Alvin, City of | No | Single Fmly | 2 | 23,820.71 | |
| 0025092 | Alvin, City of | No | Single Fmly | 2 | 20,630.71 | |
| 0096878 | Alvin, City of | Yes | Single Fmly | 5 | 141,139.80 | V |
| 0185556 | Alvin, City of | Yes | Single Fmly | 3 | 49,718.70 | |
| 0039734 | Alvin, City of | No | Single Fmly | 2 | 15,500.00 | |
| 0169084 | Alvin, City of | No | Single Fmly | 4 | 69,887.87 | VU |
| 0262698 | Alvin, City of | Yes | Single Fmly | 2 | 63,132.53 | |
| 0026006 | Alvin, City of | Sdf | Single Fmly | 7 | 205,694.67 | V |
| 0180165 | Alvin, City of | Yes | Single Fmly | 4 | 81,023.75 | |
| 0025896 | Alvin, City of | Sdf | Single Fmly | 4 | 106,073.60 | V |
| 0118860 | Alvin, City of | Sdf | Single Fmly | 4 | 54,609.94 | V |
| 0038040 | Alvin, City of | No | Single Fmly | 5 | 68,622.29 | |
| 0185093 | Alvin, City of | Yes | Single Fmly | 3 | 92,324.27 | P |
| 0068846 | Alvin, City of | Sdf | Single Fmly | 7 | 178,132.27 | V |
| 0180134 | Alvin, City of | Yes | Single Fmly | 4 | 115,985.68 | V |
| 0185562 | Alvin, City of | Yes | Single Fmly | 2 | 28,956.16 | |
| 0040526 | Alvin, City of | No | Single Fmly | 4 | 5,210.36 | |
| 0017301 | Alvin, City of | Yes | Single Fmly | 2 | 18,418.99 | |
| 0168559 | Alvin, City of | Yes | Single Fmly | 2 | 12,584.46 | |
| 0026052 | Alvin, City of | No | Single Fmly | 2 | 12,032.80 | PU |
| 0045107 | Alvin, City of | Yes | Single Fmly | 5 | 104,082.22 | P |
| 0134935 | Alvin, City of | No | Single Fmly | 3 | 36,800.83 | |
| 0068827 | Alvin, City of | No | Single Fmly | 2 | 19,223.06 | |
| 0018475 | Alvin, City of | No | Single Fmly | 2 | 21,348.16 | |
| 0026317 | Alvin, City of | No | Single Fmly | 2 | 18,965.02 | |
| 0068828 | Alvin, City of | No | Single Fmly | 2 | 28,595.87 | |
| 0026446 | Alvin, City of | No | Single Fmly | 2 | 21,256.83 | |
| 0017492 | Alvin, City of | No | Single Fmly | 2 | 30,687.64 | |
| 0018380 | Alvin, City of | Yes | Single Fmly | 5 | 90,867.84 | V |
| 0043905 | Alvin, City of | No | Other Resid | 3 | 27,292.20 | |
| 0037512 | Alvin, City of | No | Other Resid | 2 | 21,030.00 | |
| 0043906 | Alvin, City of | No | Other Resid | 2 | 26,908.39 | |

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|---------|-------------------|-----|-------------|----|------------|-----|
| 0045108 | Alvin, City of | No | Single Fmly | 2 | 6,979.62 | |
| 0068832 | Alvin, City of | No | Othr-Nonres | 2 | 38,098.65 | |
| 0068835 | Alvin, City of | Yes | Single Fmly | 3 | 46,801.13 | |
| 0044706 | Alvin, City of | Yes | Single Fmly | 3 | 80,912.91 | |
| 0118804 | Alvin, City of | No | Single Fmly | 5 | 101,968.74 | MVU |
| 0168132 | Alvin, City of | No | Single Fmly | 5 | 105,449.79 | MVU |
| 0069902 | Alvin, City of | Yes | Single Fmly | 4 | 159,106.93 | MV |
| 0017797 | Angleton, City of | No | Single Fmly | 2 | 13,339.47 | |
| 0039824 | Angleton, City of | No | Single Fmly | 2 | 18,699.13 | |
| 0017798 | Angleton, City of | No | Othr-Nonres | 2 | 13,084.37 | |
| 0026690 | Angleton, City of | No | Single Fmly | 2 | 5,676.81 | |
| 0046456 | Angleton, City of | No | 2-4 Family | 2 | 4,952.81 | |
| 0098432 | Angleton, City of | No | Single Fmly | 2 | 4,227.05 | |
| 0042414 | Angleton, City of | No | Single Fmly | 10 | 150,187.03 | VU |
| 0038393 | Angleton, City of | No | Single Fmly | 2 | 6,612.14 | |
| 0004492 | Angleton, City of | No | Single Fmly | 2 | 17,486.92 | |
| 0068987 | Angleton, City of | No | Single Fmly | 4 | 12,787.95 | |
| 0241877 | Angleton, City of | No | Single Fmly | 2 | 60,037.03 | |
| 0000800 | Angleton, City of | No | Single Fmly | 9 | 164,910.64 | VU |
| 0001873 | Angleton, City of | Sdf | Single Fmly | 8 | 164,011.86 | V |
| 0026135 | Angleton, City of | Sdf | Single Fmly | 5 | 52,195.91 | V |
| 0068991 | Angleton, City of | No | Single Fmly | 2 | 8,274.56 | |
| 0093902 | Angleton, City of | No | Single Fmly | 2 | 28,842.08 | |
| 0045764 | Angleton, City of | No | Single Fmly | 3 | 20,609.62 | |
| 0037424 | Angleton, City of | Sdf | Single Fmly | 4 | 78,309.75 | V |
| 0068978 | Angleton, City of | Yes | Single Fmly | 2 | 12,980.02 | |
| 0013091 | Angleton, City of | No | Single Fmly | 2 | 5,490.38 | |
| 0077125 | Angleton, City of | No | Single Fmly | 2 | 16,618.44 | |
| 0025350 | Angleton, City of | No | Single Fmly | 6 | 92,122.44 | VU |
| 0118938 | Angleton, City of | No | Single Fmly | 2 | 5,793.80 | |
| 0069694 | Angleton, City of | No | Single Fmly | 2 | 3,868.55 | |
| 0017804 | Angleton, City of | Sdf | Single Fmly | 5 | 40,198.06 | V |
| 0241492 | Angleton, City of | No | Single Fmly | 2 | 7,526.06 | |
| 0262773 | Angleton, City of | Yes | Single Fmly | 2 | 26,725.19 | |
| 0093940 | Angleton, City of | No | Single Fmly | 2 | 9,092.40 | |
| 0043406 | Angleton, City of | No | Single Fmly | 2 | 8,420.82 | |
| 0026358 | Angleton, City of | No | Single Fmly | 5 | 10,667.28 | |
| 0045057 | Angleton, City of | No | Single Fmly | 2 | 7,010.74 | |
| 0038461 | Angleton, City of | No | Single Fmly | 5 | 27,090.94 | |
| 0043608 | Angleton, City of | No | Single Fmly | 5 | 27,642.42 | |
| 0046301 | Angleton, City of | No | Single Fmly | 4 | 18,292.72 | |
| 0167356 | Angleton, City of | Yes | Single Fmly | 2 | 17,241.21 | |
| 0068984 | Angleton, City of | No | Single Fmly | 2 | 11,789.94 | |
| 0042918 | Angleton, City of | Yes | Single Fmly | 2 | 13,619.03 | |
| 0026560 | Angleton, City of | No | Single Fmly | 2 | 11,459.55 | |
| 0018586 | Angleton, City of | No | Single Fmly | 2 | 9,886.00 | |
| 0042272 | Angleton, City of | Yes | Single Fmly | 3 | 28,965.49 | |
| 0017510 | Angleton, City of | Yes | Single Fmly | 3 | 41,981.64 | |
| 0170982 | Angleton, City of | No | Single Fmly | 2 | 24,257.32 | |
| 0168453 | Angleton, City of | No | Single Fmly | 3 | 33,212.86 | |
| 0170983 | Angleton, City of | No | Single Fmly | 2 | 8,798.36 | |
| 0037487 | Angleton, City of | No | Single Fmly | 2 | 27,871.12 | |
| 0026467 | Angleton, City of | No | Single Fmly | 2 | 21,501.07 | |
| 0033619 | Angleton, City of | No | Single Fmly | 2 | 26,082.85 | |

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|---------|-----------------------------|-----|-------------|---|------------|----|
| 0042755 | Angleton, City of | Yes | Single Fmly | 2 | 19,006.41 | |
| 0025582 | Angleton, City of | No | Single Fmly | 2 | 26,698.91 | |
| 0026842 | Angleton, City of | No | Single Fmly | 7 | 187,020.51 | VU |
| 0046353 | Angleton, City of | No | Othr-Nonres | 2 | 13,769.00 | |
| 0068986 | Angleton, City of | Yes | Single Fmly | 3 | 23,985.96 | |
| 0035285 | Angleton, City of | No | Othr-Nonres | 2 | 6,024.22 | |
| 0026841 | Angleton, City of | Sdf | Single Fmly | 5 | 85,722.42 | V |
| 0008370 | Angleton, City of | No | Single Fmly | 5 | 30,652.15 | |
| 0241631 | Angleton, City of | Yes | Single Fmly | 2 | 7,395.80 | |
| 0026008 | Angleton, City of | No | Single Fmly | 2 | 6,994.09 | |
| 0172280 | Angleton, City of | Yes | Single Fmly | 3 | 31,541.81 | |
| 0026130 | Angleton, City of | No | Single Fmly | 2 | 9,132.30 | |
| 0043634 | Angleton, City of | No | Single Fmly | 2 | 6,810.00 | |
| 0017793 | Angleton, City of | No | Single Fmly | 2 | 3,067.75 | |
| 0043453 | Angleton, City of | No | Single Fmly | 2 | 3,127.62 | |
| 0262771 | Angleton, City of | Yes | Single Fmly | 2 | 312,767.59 | P |
| 0036349 | Angleton, City of | No | Single Fmly | 2 | 8,256.94 | |
| 0077080 | Angleton, City of | No | Single Fmly | 2 | 10,272.60 | |
| 0017816 | Angleton, City of | No | Single Fmly | 7 | 59,498.02 | VU |
| 0068989 | Angleton, City of | No | Single Fmly | 2 | 3,654.45 | |
| 0017767 | Angleton, City of | No | Single Fmly | 2 | 9,849.88 | |
| 0004923 | Angleton, City of | No | Single Fmly | 5 | 87,727.10 | VU |
| 0025555 | Angleton, City of | Yes | Single Fmly | 2 | 9,853.65 | |
| 0068980 | Angleton, City of | No | Othr-Nonres | 3 | 13,578.75 | |
| 0068981 | Angleton, City of | No | Single Fmly | 5 | 149,997.94 | VU |
| 0012898 | Angleton, City of | Sdf | Single Fmly | 7 | 207,224.97 | V |
| 0013043 | Angleton, City of | No | Single Fmly | 3 | 35,932.96 | |
| 0245319 | Angleton, City of | No | Single Fmly | 2 | 3,756.88 | |
| 0171472 | Angleton, City of | No | Othr-Nonres | 2 | 49,100.41 | |
| 0048719 | Angleton, City of | No | Othr-Nonres | 5 | 64,163.10 | |
| 0044660 | Angleton, City of | No | Othr-Nonres | 3 | 61,780.79 | |
| 0044863 | Angleton, City of | No | Othr-Nonres | 2 | 42,729.35 | |
| 0076302 | Angleton, City of | No | Single Fmly | 5 | 16,119.39 | |
| 0025891 | Angleton, City of | Sdf | Single Fmly | 5 | 121,991.97 | V |
| 0044609 | Angleton, City of | Sdf | Single Fmly | 6 | 139,804.41 | V |
| 0044942 | Angleton, City of | Yes | Single Fmly | 5 | 59,951.62 | |
| 0068976 | Angleton, City of | Yes | Single Fmly | 4 | 50,211.98 | |
| 0036903 | Angleton, City of | No | Single Fmly | 2 | 22,058.94 | |
| 0167354 | Angleton, City of | Yes | Othr-Nonres | 3 | 204,873.67 | |
| 0097093 | Angleton, City of | No | Single Fmly | 2 | 20,080.99 | |
| 0025112 | Angleton, City of | No | Other Resid | 4 | 14,599.58 | |
| 0025113 | Angleton, City of | No | Other Resid | 4 | 31,765.86 | |
| 0001868 | Angleton, City of | No | Other Resid | 5 | 33,675.70 | |
| 0033296 | Angleton, City of | No | 2-4 Family | 2 | 22,194.18 | |
| 0045291 | Angleton, City of | No | Assmd Condo | 2 | 30,634.19 | |
| 0258541 | Baileys Prairie, Village of | Yes | Single Fmly | 2 | 284,896.09 | |
| 0262774 | Baileys Prairie, Village of | Yes | Single Fmly | 2 | 257,250.74 | |
| 0119199 | Baileys Prairie, Village of | No | Single Fmly | 3 | 76,074.94 | |
| 0260309 | Baileys Prairie, Village of | Yes | Single Fmly | 2 | 29,569.12 | |
| 0258526 | Baileys Prairie, Village of | Yes | Single Fmly | 2 | 137,768.45 | |
| 0250014 | Baileys Prairie, Village of | Yes | Single Fmly | 3 | 322,423.97 | P |
| 0013179 | Baileys Prairie, Village of | Yes | Single Fmly | 3 | 137,908.79 | |
| 0260268 | Baileys Prairie, Village of | Yes | Single Fmly | 2 | 242,743.61 | P |
| 0259946 | Baileys Prairie, Village of | Yes | Single Fmly | 2 | 79,809.46 | |

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|---------|-----------------|----|-------------|---|-----------|----|
| 0017490 | Brazoria County | No | Assmd Condo | 2 | 12,043.88 | |
| 0017609 | Brazoria County | No | Single Fmly | 2 | 24,880.66 | |
| 0048508 | Brazoria County | No | Single Fmly | 2 | 7,031.65 | |
| 0018519 | Brazoria County | No | Single Fmly | 2 | 7,187.06 | |
| 0041008 | Brazoria County | No | Single Fmly | 2 | 3,946.10 | |
| 0025212 | Brazoria County | No | Single Fmly | 3 | 6,450.08 | |
| 0038788 | Brazoria County | No | Single Fmly | 2 | 4,814.82 | |
| 0025662 | Brazoria County | No | Single Fmly | 3 | 9,888.99 | |
| 0026721 | Brazoria County | No | Unknown | 2 | 28,495.94 | |
| 0015991 | Brazoria County | No | Single Fmly | 2 | 25,547.26 | |
| 0038638 | Brazoria County | No | Single Fmly | 2 | 16,608.61 | PU |
| 0041786 | Brazoria County | No | Single Fmly | 2 | 5,105.06 | |
| 0017543 | Brazoria County | No | Single Fmly | 4 | 97,583.69 | |
| 0026798 | Brazoria County | No | Single Fmly | 3 | 50,685.00 | |
| 0017452 | Brazoria County | No | Single Fmly | 2 | 34,716.83 | |
| 0018567 | Brazoria County | No | Single Fmly | 3 | 80,966.83 | |
| 0018559 | Brazoria County | No | Single Fmly | 2 | 18,071.81 | |
| 0016094 | Brazoria County | No | Single Fmly | 2 | 4,254.77 | |
| 0015990 | Brazoria County | No | Single Fmly | 4 | 33,437.04 | |
| 0036167 | Brazoria County | No | Single Fmly | 3 | 54,332.15 | |
| 0035346 | Brazoria County | No | Single Fmly | 2 | 14,367.73 | |
| 0043105 | Brazoria County | No | Single Fmly | 2 | 42,431.12 | |
| 0045452 | Brazoria County | No | Single Fmly | 2 | 4,743.92 | |
| 0037731 | Brazoria County | No | Single Fmly | 3 | 6,119.59 | |
| 0041184 | Brazoria County | No | Single Fmly | 3 | 11,069.46 | |
| 0069967 | Brazoria County | No | Single Fmly | 2 | 50,822.91 | |
| 0071507 | Brazoria County | No | Single Fmly | 2 | 54,833.36 | |
| 0026033 | Brazoria County | No | Single Fmly | 2 | 31,132.88 | |
| 0045541 | Brazoria County | No | Single Fmly | 2 | 24,714.61 | |
| 0026319 | Brazoria County | No | Single Fmly | 2 | 25,814.74 | |
| 0040644 | Brazoria County | No | Single Fmly | 2 | 36,747.17 | |
| 0026524 | Brazoria County | No | Single Fmly | 2 | 22,037.00 | |
| 0037485 | Brazoria County | No | Single Fmly | 2 | 28,641.59 | |
| 0037251 | Brazoria County | No | Single Fmly | 2 | 29,718.42 | |
| 0017514 | Brazoria County | No | Single Fmly | 2 | 56,118.69 | |
| 0039205 | Brazoria County | No | Single Fmly | 3 | 6,959.50 | |
| 0044406 | Brazoria County | No | Single Fmly | 2 | 44,308.83 | |
| 0026527 | Brazoria County | No | Unknown | 2 | 6,427.00 | |
| 0017612 | Brazoria County | No | Single Fmly | 3 | 10,701.05 | |
| 0015181 | Brazoria County | No | Assmd Condo | 2 | 29,901.70 | |
| 0017567 | Brazoria County | No | Single Fmly | 2 | 53,334.84 | |
| 0045810 | Brazoria County | No | Single Fmly | 3 | 21,362.59 | |
| 0043640 | Brazoria County | No | Single Fmly | 2 | 24,819.59 | |
| 0026372 | Brazoria County | No | Single Fmly | 3 | 30,100.74 | |
| 0045662 | Brazoria County | No | Single Fmly | 2 | 4,329.50 | |
| 0043301 | Brazoria County | No | Single Fmly | 3 | 8,745.33 | |
| 0035676 | Brazoria County | No | Single Fmly | 2 | 25,743.10 | |
| 0045069 | Brazoria County | No | Single Fmly | 2 | 38,851.11 | |
| 0039449 | Brazoria County | No | Single Fmly | 3 | 43,503.06 | |
| 0045227 | Brazoria County | No | Single Fmly | 2 | 12,194.03 | |
| 0044711 | Brazoria County | No | Single Fmly | 2 | 11,296.84 | |
| 0042669 | Brazoria County | No | Single Fmly | 2 | 23,195.62 | |
| 0002700 | Brazoria County | No | Single Fmly | 7 | 89,447.38 | |
| 0026824 | Brazoria County | No | Single Fmly | 2 | 21,754.08 | |

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|---------|-----------------|----|-------------|---|------------|----|
| 0044943 | Brazoria County | No | Single Fmly | 3 | 8,393.36 | |
| 0048431 | Brazoria County | No | Single Fmly | 2 | 2,597.46 | |
| 0045341 | Brazoria County | No | Single Fmly | 2 | 10,325.61 | |
| 0025216 | Brazoria County | No | Single Fmly | 3 | 66,055.89 | |
| 0026867 | Brazoria County | No | Single Fmly | 6 | 112,395.92 | VU |
| 0045167 | Brazoria County | No | Single Fmly | 2 | 10,687.78 | |
| 0068235 | Brazoria County | No | Single Fmly | 2 | 19,689.07 | |
| 0018638 | Brazoria County | No | Single Fmly | 2 | 13,400.00 | |
| 0025348 | Brazoria County | No | Single Fmly | 2 | 55,238.96 | |
| 0038750 | Brazoria County | No | Single Fmly | 2 | 17,041.72 | |
| 0025758 | Brazoria County | No | Single Fmly | 3 | 9,500.73 | |
| 0041510 | Brazoria County | No | Single Fmly | 2 | 17,218.96 | |
| 0026778 | Brazoria County | No | Single Fmly | 2 | 7,289.00 | |
| 0038506 | Brazoria County | No | Single Fmly | 2 | 6,481.31 | |
| 0044355 | Brazoria County | No | Single Fmly | 2 | 4,801.55 | |
| 0045525 | Brazoria County | No | Single Fmly | 2 | 10,620.01 | |
| 0017547 | Brazoria County | No | Single Fmly | 2 | 3,998.07 | |
| 0046054 | Brazoria County | No | Single Fmly | 2 | 20,273.22 | |
| 0025177 | Brazoria County | No | Single Fmly | 2 | 9,527.00 | |
| 0018491 | Brazoria County | No | Othr-Nonres | 2 | 4,827.25 | |
| 0026801 | Brazoria County | No | Single Fmly | 2 | 41,629.84 | |
| 0025952 | Brazoria County | No | Single Fmly | 2 | 24,735.20 | |
| 0018393 | Brazoria County | No | Single Fmly | 2 | 37,415.60 | |
| 0018385 | Brazoria County | No | Assmd Condo | 2 | 74,786.45 | |
| 0017358 | Brazoria County | No | Single Fmly | 2 | 36,125.90 | |
| 0026334 | Brazoria County | No | Single Fmly | 2 | 53,335.62 | PU |
| 0017583 | Brazoria County | No | Single Fmly | 3 | 32,787.84 | |
| 0026285 | Brazoria County | No | Single Fmly | 2 | 27,541.40 | |
| 0025475 | Brazoria County | No | Single Fmly | 2 | 34,370.30 | |
| 0043561 | Brazoria County | No | Single Fmly | 3 | 12,114.56 | |
| 0073452 | Brazoria County | No | Single Fmly | 2 | 24,505.54 | |
| 0003824 | Brazoria County | No | Single Fmly | 2 | 32,758.06 | |
| 0026001 | Brazoria County | No | Single Fmly | 3 | 44,873.92 | PU |
| 0068857 | Brazoria County | No | Single Fmly | 2 | 8,463.75 | |
| 0002845 | Brazoria County | No | Single Fmly | 2 | 41,346.98 | |
| 0017484 | Brazoria County | No | Single Fmly | 2 | 15,324.86 | |
| 0026847 | Brazoria County | No | Single Fmly | 2 | 47,652.64 | |
| 0045420 | Brazoria County | No | Single Fmly | 2 | 3,551.62 | |
| 0018514 | Brazoria County | No | Single Fmly | 2 | 20,585.44 | |
| 0097082 | Brazoria County | No | Single Fmly | 2 | 18,834.40 | |
| 0026831 | Brazoria County | No | Single Fmly | 3 | 35,853.68 | |
| 0042560 | Brazoria County | No | Single Fmly | 2 | 27,047.65 | |
| 0068848 | Brazoria County | No | Single Fmly | 2 | 32,405.73 | |
| 0018684 | Brazoria County | No | Single Fmly | 2 | 58,425.10 | |
| 0050856 | Brazoria County | No | Single Fmly | 2 | 8,475.83 | |
| 0045409 | Brazoria County | No | Single Fmly | 2 | 17,291.89 | |
| 0044654 | Brazoria County | No | Single Fmly | 3 | 8,034.50 | |
| 0016047 | Brazoria County | No | Single Fmly | 3 | 51,310.69 | |
| 0071775 | Brazoria County | No | Single Fmly | 3 | 35,188.37 | |
| 0068864 | Brazoria County | No | Single Fmly | 2 | 6,732.41 | |
| 0042523 | Brazoria County | No | Single Fmly | 4 | 46,661.21 | |
| 0044361 | Brazoria County | No | Single Fmly | 3 | 56,948.25 | |
| 0017564 | Brazoria County | No | Single Fmly | 2 | 6,677.66 | |
| 0017581 | Brazoria County | No | Single Fmly | 2 | 38,312.48 | |

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| 0025095 | Brazoria County | No | Single Fmly | 2 | 40,297.45 | |
| 0040997 | Brazoria County | No | Single Fmly | 2 | 13,465.77 | |
| 0068856 | Brazoria County | No | Single Fmly | 2 | 45,067.08 | |
| 0072004 | Brazoria County | No | Single Fmly | 2 | 7,318.92 | |
| 0018672 | Brazoria County | No | Single Fmly | 3 | 12,362.94 | |
| 0043697 | Brazoria County | No | Single Fmly | 2 | 18,299.65 | |
| 0241503 | Brazoria County | No | Single Fmly | 2 | 43,929.56 | |
| 0262102 | Brazoria County | Yes | Single Fmly | 2 | 155,934.70 | |
| 0013052 | Brazoria County | No | Single Fmly | 9 | 49,979.76 | VU |
| 0260270 | Brazoria County | Yes | Single Fmly | 2 | 73,253.85 | |
| 0120350 | Brazoria County | No | Single Fmly | 2 | 70,058.77 | |
| 0168658 | Brazoria County | No | Single Fmly | 2 | 97,238.94 | |
| 0168156 | Brazoria County | No | Single Fmly | 2 | 47,431.47 | |
| 0093357 | Brazoria County | No | Single Fmly | 2 | 14,995.66 | |
| 0262602 | Brazoria County | Yes | Single Fmly | 2 | 140,516.97 | |
| 0026240 | Brazoria County | No | Othr-Nonres | 3 | 16,298.19 | |
| 0044325 | Brazoria County | No | Othr-Nonres | 2 | 28,598.53 | |
| 0068019 | Brazoria County | No | Othr-Nonres | 2 | 9,599.73 | |
| 0168586 | Brazoria County | No | Single Fmly | 2 | 45,398.32 | |
| 0037444 | Brazoria County | Yes | Single Fmly | 3 | 79,953.55 | |
| 0262738 | Brazoria County | Yes | Single Fmly | 2 | 86,957.59 | |
| 0168908 | Brazoria County | Yes | Single Fmly | 2 | 43,487.07 | |
| 0119841 | Brazoria County | Yes | Single Fmly | 3 | 40,350.54 | |
| 0069988 | Brazoria County | No | Single Fmly | 2 | 59,311.90 | |
| 0044934 | Brazoria County | No | Single Fmly | 8 | 200,349.02 | VU |
| 0186065 | Brazoria County | No | 2-4 Family | 3 | 19,712.92 | |
| 0167357 | Brazoria County | Yes | Single Fmly | 3 | 92,345.11 | |
| 0069916 | Brazoria County | No | Single Fmly | 5 | 230,526.64 | VU |
| 0182795 | Brazoria County | No | Single Fmly | 2 | 73,558.03 | |
| 0068061 | Brazoria County | Sdf | Single Fmly | 5 | 120,663.84 | V |
| 0025142 | Brazoria County | No | Single Fmly | 8 | 246,124.12 | VU |
| 0038688 | Brazoria County | No | Single Fmly | 2 | 17,698.82 | |
| 0178178 | Brazoria County | Yes | Single Fmly | 2 | 6,225.12 | |
| 0119540 | Brazoria County | Yes | Single Fmly | 3 | 32,529.87 | |
| 0118722 | Brazoria County | No | Single Fmly | 3 | 12,060.11 | |
| 0016042 | Brazoria County | No | Othr-Nonres | 2 | 14,084.11 | |
| 0068020 | Brazoria County | Yes | Single Fmly | 4 | 19,735.82 | |
| 0097189 | Brazoria County | Yes | Single Fmly | 3 | 29,033.67 | |
| 0119333 | Brazoria County | No | Single Fmly | 3 | 14,860.57 | |
| 0259940 | Brazoria County | Yes | Single Fmly | 2 | 237,980.04 | |
| 0168895 | Brazoria County | No | Single Fmly | 2 | 116,058.87 | |
| 0026291 | Brazoria County | No | Assmd Condo | 2 | 7,482.14 | |
| 0186066 | Brazoria County | No | 2-4 Family | 2 | 7,045.01 | |
| 0260275 | Brazoria County | Yes | Single Fmly | 2 | 172,933.79 | |
| 0122421 | Brazoria County | No | Single Fmly | 4 | 42,801.28 | |
| 0077678 | Brazoria County | No | Single Fmly | 3 | 60,503.31 | |
| 0258537 | Brazoria County | Yes | Single Fmly | 2 | 5,703.35 | |
| 0119177 | Brazoria County | No | Single Fmly | 4 | 38,495.34 | |
| 0068977 | Brazoria County | Yes | Single Fmly | 5 | 104,681.32 | V |
| 0040416 | Brazoria County | Yes | Single Fmly | 5 | 245,157.72 | V |
| 0015957 | Brazoria County | No | Single Fmly | 2 | 3,529.35 | |
| 0025189 | Brazoria County | No | Single Fmly | 2 | 38,251.40 | |
| 0017763 | Brazoria County | Yes | Single Fmly | 2 | 9,049.74 | |
| 0009021 | Brazoria County | No | Single Fmly | 5 | 34,960.30 | |

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|---------|-----------------|-----|-------------|---|------------|----|
| 0003976 | Brazoria County | Sdf | Single Fmly | 8 | 734,139.66 | |
| 0044098 | Brazoria County | Yes | Single Fmly | 3 | 17,725.16 | |
| 0036865 | Brazoria County | Yes | Single Fmly | 4 | 230,169.47 | |
| 0025962 | Brazoria County | Yes | Single Fmly | 3 | 89,580.49 | |
| 0035344 | Brazoria County | No | Single Fmly | 2 | 17,451.70 | |
| 0258522 | Brazoria County | Yes | Single Fmly | 2 | 53,143.00 | |
| 0039696 | Brazoria County | No | Single Fmly | 2 | 7,558.95 | |
| 0245312 | Brazoria County | No | Single Fmly | 3 | 51,355.60 | |
| 0124920 | Brazoria County | No | Single Fmly | 3 | 44,806.73 | |
| 0018704 | Brazoria County | No | Single Fmly | 4 | 51,733.51 | |
| 0172737 | Brazoria County | Yes | Single Fmly | 2 | 28,655.37 | |
| 0025243 | Brazoria County | No | Single Fmly | 2 | 20,873.82 | |
| 0025347 | Brazoria County | No | Single Fmly | 2 | 5,015.28 | |
| 0124442 | Brazoria County | Yes | Single Fmly | 4 | 45,771.55 | |
| 0180875 | Brazoria County | Yes | Single Fmly | 2 | 39,958.61 | |
| 0183384 | Brazoria County | Yes | Single Fmly | 2 | 5,122.61 | |
| 0122388 | Brazoria County | Yes | Single Fmly | 3 | 27,373.89 | |
| 0005611 | Brazoria County | No | Single Fmly | 9 | 119,038.11 | VU |
| 0115671 | Brazoria County | No | Single Fmly | 2 | 61,259.55 | PU |
| 0026499 | Brazoria County | No | Single Fmly | 4 | 109,139.25 | |
| 0241961 | Brazoria County | No | Single Fmly | 3 | 60,723.02 | |
| 0116975 | Brazoria County | No | Single Fmly | 3 | 39,167.22 | |
| 0018756 | Brazoria County | No | Single Fmly | 2 | 45,853.41 | |
| 0017536 | Brazoria County | No | Single Fmly | 2 | 66,772.89 | |
| 0040017 | Brazoria County | No | Single Fmly | 4 | 70,099.66 | |
| 0068071 | Brazoria County | No | Single Fmly | 3 | 72,448.54 | PU |
| 0168434 | Brazoria County | No | Single Fmly | 3 | 99,885.23 | |
| 0180895 | Brazoria County | No | Single Fmly | 2 | 84,149.95 | |
| 0025299 | Brazoria County | No | Single Fmly | 3 | 21,345.53 | |
| 0013231 | Brazoria County | No | Single Fmly | 2 | 12,434.61 | |
| 0119178 | Brazoria County | Sdf | Single Fmly | 4 | 77,921.81 | V |
| 0178985 | Brazoria County | Yes | Single Fmly | 2 | 23,859.38 | |
| 0123765 | Brazoria County | No | Single Fmly | 3 | 34,656.48 | |
| 0071508 | Brazoria County | No | Single Fmly | 4 | 53,592.26 | |
| 0026729 | Brazoria County | No | Single Fmly | 2 | 3,082.88 | |
| 0069678 | Brazoria County | Yes | Single Fmly | 3 | 4,421.90 | |
| 0260231 | Brazoria County | Yes | Single Fmly | 2 | 66,790.60 | |
| 0045743 | Brazoria County | No | Single Fmly | 3 | 10,776.24 | |
| 0017409 | Brazoria County | No | Single Fmly | 2 | 33,774.18 | |
| 0258833 | Brazoria County | Yes | Single Fmly | 2 | 191,129.79 | |
| 0035941 | Brazoria County | No | Single Fmly | 2 | 34,191.54 | |
| 0017544 | Brazoria County | No | Single Fmly | 4 | 226,179.30 | VU |
| 0026837 | Brazoria County | No | Single Fmly | 7 | 34,938.83 | |
| 0258518 | Brazoria County | Yes | Single Fmly | 2 | 343,479.67 | |
| 0258834 | Brazoria County | Yes | Single Fmly | 2 | 204,824.07 | |
| 0260365 | Brazoria County | Yes | Single Fmly | 2 | 104,055.15 | |
| 0124439 | Brazoria County | Yes | Single Fmly | 3 | 97,343.14 | |
| 0033833 | Brazoria County | No | Single Fmly | 2 | 8,042.98 | |
| 0248779 | Brazoria County | Yes | Single Fmly | 2 | 50,245.44 | |
| 0196109 | Brazoria County | No | Single Fmly | 2 | 106,155.48 | |
| 0259609 | Brazoria County | Yes | Single Fmly | 2 | 106,103.46 | |
| 0213206 | Brazoria County | Yes | Single Fmly | 2 | 61,018.04 | |
| 0039567 | Brazoria County | No | Single Fmly | 2 | 31,751.04 | |
| 0026276 | Brazoria County | Yes | Single Fmly | 3 | 39,612.20 | |

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|---------|-----------------|-----|-------------|---|------------|----|
| 0017337 | Brazoria County | No | Single Fmly | 2 | 55,768.80 | |
| 0025692 | Brazoria County | No | Single Fmly | 2 | 11,006.83 | |
| 0025971 | Brazoria County | Yes | Single Fmly | 4 | 231,536.06 | |
| 0119188 | Brazoria County | No | Single Fmly | 3 | 87,258.58 | |
| 0185452 | Brazoria County | Yes | Single Fmly | 2 | 11,058.31 | |
| 0248121 | Brazoria County | Yes | Single Fmly | 2 | 107,750.64 | |
| 0097144 | Brazoria County | No | Single Fmly | 3 | 60,620.91 | |
| 0185461 | Brazoria County | Yes | Single Fmly | 2 | 63,948.44 | |
| 0249003 | Brazoria County | Yes | Single Fmly | 2 | 46,595.95 | |
| 0260170 | Brazoria County | Yes | Single Fmly | 2 | 86,726.66 | |
| 0172225 | Brazoria County | No | Single Fmly | 2 | 18,842.11 | |
| 0069864 | Brazoria County | No | Single Fmly | 2 | 18,716.66 | PU |
| 0039988 | Brazoria County | No | Othr-Nonres | 4 | 14,360.60 | |
| 0124434 | Brazoria County | No | Single Fmly | 3 | 53,867.72 | |
| 0124286 | Brazoria County | No | Single Fmly | 3 | 46,721.18 | |
| 0093930 | Brazoria County | Yes | Single Fmly | 4 | 162,206.35 | |
| 0259901 | Brazoria County | Yes | Single Fmly | 2 | 75,120.27 | |
| 0249917 | Brazoria County | Yes | Single Fmly | 2 | 335,203.86 | |
| 0185624 | Brazoria County | No | Single Fmly | 2 | 24,004.73 | |
| 0180345 | Brazoria County | No | Single Fmly | 2 | 64,273.40 | |
| 0182796 | Brazoria County | No | Single Fmly | 2 | 12,331.58 | |
| 0262689 | Brazoria County | Yes | Single Fmly | 2 | 34,734.29 | |
| 0118765 | Brazoria County | No | Single Fmly | 2 | 19,552.51 | |
| 0238039 | Brazoria County | Yes | Single Fmly | 3 | 76,201.57 | |
| 0072214 | Brazoria County | No | Single Fmly | 3 | 71,015.67 | |
| 0124248 | Brazoria County | No | Single Fmly | 2 | 14,500.43 | |
| 0018394 | Brazoria County | No | Single Fmly | 2 | 25,774.95 | |
| 0184085 | Brazoria County | Yes | Single Fmly | 3 | 101,437.92 | |
| 0214088 | Brazoria County | No | Single Fmly | 2 | 134,437.55 | |
| 0262691 | Brazoria County | Yes | Single Fmly | 2 | 84,002.26 | |
| 0262692 | Brazoria County | Yes | Single Fmly | 2 | 105,747.47 | |
| 0260241 | Brazoria County | Yes | Single Fmly | 2 | 191,336.66 | |
| 0168246 | Brazoria County | No | Single Fmly | 2 | 43,788.52 | |
| 0168245 | Brazoria County | No | Single Fmly | 2 | 76,323.56 | |
| 0119168 | Brazoria County | No | Single Fmly | 3 | 95,007.53 | |
| 0249284 | Brazoria County | Yes | Single Fmly | 2 | 62,007.65 | |
| 0197026 | Brazoria County | Sdf | Single Fmly | 5 | 217,742.03 | V |
| 0018346 | Brazoria County | No | Single Fmly | 6 | 70,849.54 | |
| 0068028 | Brazoria County | Yes | Single Fmly | 4 | 58,154.62 | |
| 0097717 | Brazoria County | No | Single Fmly | 3 | 64,741.16 | |
| 0068031 | Brazoria County | No | Single Fmly | 3 | 75,339.66 | |
| 0242964 | Brazoria County | No | Single Fmly | 2 | 25,605.36 | |
| 0257879 | Brazoria County | Yes | Single Fmly | 2 | 83,891.44 | |
| 0017523 | Brazoria County | No | Single Fmly | 2 | 32,452.23 | |
| 0249893 | Brazoria County | Yes | Single Fmly | 2 | 110,076.11 | |
| 0073818 | Brazoria County | No | Single Fmly | 5 | 56,843.06 | |
| 0259654 | Brazoria County | Yes | Single Fmly | 2 | 133,618.00 | |
| 0259907 | Brazoria County | Yes | Single Fmly | 2 | 154,214.25 | |
| 0242894 | Brazoria County | Yes | Othr-Nonres | 2 | 64,937.53 | |
| 0197031 | Brazoria County | Yes | Single Fmly | 2 | 9,574.65 | |
| 0250040 | Brazoria County | Yes | Single Fmly | 2 | 162,020.24 | |
| 0013265 | Brazoria County | No | Single Fmly | 4 | 32,882.05 | |
| 0071585 | Brazoria County | No | Single Fmly | 5 | 56,715.06 | VU |
| 0041764 | Brazoria County | No | Single Fmly | 2 | 6,504.96 | |

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| 0091182 | Brazoria County | No | Single Fmly | 3 | 59,847.50 | |
| 0036573 | Brazoria County | No | Single Fmly | 8 | 42,536.31 | VU |
| 0044887 | Brazoria County | Sdf | Single Fmly | 5 | 71,825.90 | V |
| 0052718 | Brazoria County | No | Othr-Nonres | 2 | 6,048.00 | |
| 0249202 | Brazoria County | No | Single Fmly | 2 | 123,245.66 | |
| 0182067 | Brazoria County | No | Single Fmly | 2 | 34,278.19 | |
| 0212801 | Brazoria County | Yes | Single Fmly | 3 | 182,823.75 | |
| 0043428 | Brazoria County | No | Single Fmly | 5 | 87,856.07 | VU |
| 0120629 | Brazoria County | No | Single Fmly | 2 | 21,501.64 | |
| 0017445 | Brazoria County | No | Single Fmly | 2 | 20,629.25 | |
| 0092100 | Brazoria County | No | Single Fmly | 2 | 63,626.86 | |
| 0191938 | Brazoria County | Yes | Single Fmly | 2 | 14,974.39 | |
| 0001452 | Brazoria County | No | Single Fmly | 4 | 23,475.89 | |
| 0026290 | Brazoria County | No | Single Fmly | 3 | 10,367.13 | |
| 0097801 | Brazoria County | No | Single Fmly | 5 | 30,883.72 | |
| 0017577 | Brazoria County | No | Single Fmly | 2 | 3,713.00 | |
| 0005681 | Brazoria County | Yes | Single Fmly | 6 | 113,190.44 | V |
| 0069945 | Brazoria County | No | Single Fmly | 2 | 12,151.41 | |
| 0002283 | Brazoria County | Yes | Single Fmly | 12 | 174,121.42 | V |
| 0071443 | Brazoria County | No | Single Fmly | 3 | 13,770.97 | |
| 0248119 | Brazoria County | No | Single Fmly | 3 | 44,093.12 | |
| 0005598 | Brazoria County | No | Single Fmly | 16 | 203,275.39 | VU |
| 0091481 | Brazoria County | No | Single Fmly | 4 | 14,669.18 | |
| 0008184 | Brazoria County | No | Single Fmly | 8 | 55,486.30 | VU |
| 0098456 | Brazoria County | No | Single Fmly | 2 | 39,575.14 | |
| 0250894 | Brazoria County | No | Single Fmly | 2 | 6,002.00 | |
| 0249347 | Brazoria County | Yes | Single Fmly | 2 | 59,362.85 | |
| 0089730 | Brazoria County | No | Single Fmly | 4 | 10,265.14 | |
| 0262776 | Brazoria County | Yes | Single Fmly | 2 | 43,650.73 | |
| 0038958 | Brazoria County | No | Single Fmly | 4 | 41,470.24 | |
| 0076993 | Brazoria County | No | Single Fmly | 2 | 7,259.60 | |
| 0259900 | Brazoria County | Yes | Single Fmly | 2 | 261,187.67 | |
| 0260208 | Brazoria County | Yes | Single Fmly | 2 | 8,368.34 | |
| 0025289 | Brazoria County | No | Single Fmly | 2 | 67,168.84 | |
| 0026686 | Brazoria County | No | Single Fmly | 2 | 26,678.03 | |
| 0118940 | Brazoria County | Yes | Single Fmly | 4 | 166,210.35 | |
| 0068834 | Brazoria County | Sdf | Single Fmly | 8 | 416,947.33 | V |
| 0259776 | Brazoria County | Yes | Single Fmly | 2 | 24,997.72 | |
| 0262778 | Brazoria County | Yes | Single Fmly | 2 | 19,252.91 | |
| 0260188 | Brazoria County | No | Single Fmly | 2 | 235,549.57 | |
| 0037865 | Brazoria County | Yes | Single Fmly | 3 | 52,466.97 | |
| 0070577 | Brazoria County | Yes | Single Fmly | 4 | 373,752.91 | V |
| 0125806 | Brazoria County | No | Single Fmly | 2 | 35,553.12 | |
| 0069911 | Brazoria County | No | Single Fmly | 2 | 34,220.67 | |
| 0094547 | Brazoria County | No | Single Fmly | 2 | 10,339.34 | |
| 0212735 | Brazoria County | No | Single Fmly | 2 | 43,624.25 | |
| 0103529 | Brazoria County | No | Single Fmly | 2 | 41,790.13 | |
| 0044343 | Brazoria County | No | Single Fmly | 2 | 20,034.80 | |
| 0260108 | Brazoria County | Yes | Single Fmly | 2 | 150,270.18 | |
| 0257770 | Brazoria County | Yes | Single Fmly | 2 | 40,232.12 | |
| 0250233 | Brazoria County | Yes | Single Fmly | 3 | 352,570.41 | P |
| 0045260 | Brazoria County | No | Single Fmly | 2 | 93,096.01 | PU |
| 0262693 | Brazoria County | Yes | Single Fmly | 2 | 109,372.97 | |
| 0002925 | Brazoria County | Sdf | Single Fmly | 14 | 325,253.70 | V |

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|---------|-----------------|-----|-------------|---|------------|----|
| 0186008 | Brazoria County | No | Single Fmly | 2 | 18,535.99 | |
| 0068840 | Brazoria County | No | Single Fmly | 2 | 12,031.41 | |
| 0073506 | Brazoria County | No | Single Fmly | 3 | 18,006.77 | |
| 0262777 | Brazoria County | Yes | Single Fmly | 2 | 30,067.61 | |
| 0182139 | Brazoria County | No | Single Fmly | 3 | 68,553.80 | |
| 0026535 | Brazoria County | No | Single Fmly | 2 | 9,153.85 | |
| 0258615 | Brazoria County | Yes | Single Fmly | 2 | 156,914.36 | P |
| 0185567 | Brazoria County | No | Single Fmly | 2 | 33,280.46 | |
| 0258665 | Brazoria County | Yes | Other Resid | 2 | 451,860.28 | |
| 0076297 | Brazoria County | Yes | Single Fmly | 5 | 81,192.19 | |
| 0117184 | Brazoria County | No | Single Fmly | 2 | 6,442.13 | |
| 0097191 | Brazoria County | No | Single Fmly | 2 | 8,511.17 | |
| 0119184 | Brazoria County | Yes | Single Fmly | 2 | 34,122.92 | |
| 0070550 | Brazoria County | No | Single Fmly | 2 | 9,051.93 | |
| 0249245 | Brazoria County | Yes | Single Fmly | 2 | 150,097.43 | |
| 0114145 | Brazoria County | No | Single Fmly | 3 | 46,689.08 | |
| 0262779 | Brazoria County | Yes | Single Fmly | 2 | 27,048.06 | |
| 0068033 | Brazoria County | No | Single Fmly | 6 | 76,509.03 | VU |
| 0241627 | Brazoria County | Yes | Single Fmly | 3 | 152,446.56 | |
| 0249327 | Brazoria County | Yes | Single Fmly | 3 | 225,632.60 | P |
| 0262775 | Brazoria County | Yes | Single Fmly | 2 | 128,300.15 | |
| 0214084 | Brazoria County | Yes | Single Fmly | 2 | 51,747.75 | |
| 0116490 | Brazoria County | No | Single Fmly | 4 | 16,444.55 | |
| 0098371 | Brazoria County | Yes | Single Fmly | 2 | 12,428.24 | |
| 0128227 | Brazoria County | Yes | Single Fmly | 2 | 4,650.70 | |
| 0025474 | Brazoria County | No | Single Fmly | 4 | 15,081.25 | |
| 0054508 | Brazoria County | No | Single Fmly | 2 | 3,906.55 | |
| 0069785 | Brazoria County | Sdf | Single Fmly | 8 | 336,611.36 | V |
| 0259217 | Brazoria County | Yes | Single Fmly | 2 | 5,214.56 | |
| 0186558 | Brazoria County | No | Single Fmly | 3 | 24,434.29 | |
| 0185429 | Brazoria County | No | Single Fmly | 2 | 11,227.27 | |
| 0262694 | Brazoria County | Yes | Single Fmly | 2 | 109,578.83 | |
| 0042450 | Brazoria County | No | Single Fmly | 2 | 66,512.01 | PU |
| 0048795 | Brazoria County | No | Single Fmly | 2 | 72,811.20 | |
| 0025663 | Brazoria County | No | Single Fmly | 2 | 33,226.36 | |
| 0018767 | Brazoria County | No | Single Fmly | 3 | 8,057.28 | |
| 0025145 | Brazoria County | Yes | Single Fmly | 3 | 234,160.43 | |
| 0056573 | Brazoria County | Sdf | Single Fmly | 9 | 167,324.94 | V |
| 0167757 | Brazoria County | No | Single Fmly | 3 | 72,023.69 | |
| 0069874 | Brazoria County | No | Single Fmly | 2 | 39,666.35 | |
| 0054704 | Brazoria County | No | Single Fmly | 3 | 17,362.23 | |
| 0068159 | Brazoria County | No | Single Fmly | 2 | 98,036.63 | |
| 0076942 | Brazoria County | No | Single Fmly | 2 | 44,611.06 | |
| 0069898 | Brazoria County | No | Single Fmly | 4 | 55,666.46 | |
| 0080412 | Brazoria County | No | Single Fmly | 2 | 68,015.63 | |
| 0125780 | Brazoria County | No | Single Fmly | 2 | 36,264.51 | |
| 0186662 | Brazoria County | No | Single Fmly | 3 | 32,483.27 | |
| 0005651 | Brazoria County | No | Single Fmly | 6 | 37,638.87 | VU |
| 0052447 | Brazoria County | No | Single Fmly | 2 | 11,740.67 | |
| 0018669 | Brazoria County | Sdf | Single Fmly | 5 | 57,353.88 | V |
| 0012841 | Brazoria County | No | Single Fmly | 2 | 46,518.89 | |
| 0098428 | Brazoria County | No | Single Fmly | 2 | 24,353.45 | |
| 0099052 | Brazoria County | No | Single Fmly | 3 | 16,119.84 | |
| 0073465 | Brazoria County | No | Single Fmly | 3 | 64,081.84 | |

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| 0017481 | Brazoria County | No | Single Fmly | 2 | 6,910.65 | |
| 0116829 | Brazoria County | No | Single Fmly | 2 | 42,916.30 | |
| 0186830 | Brazoria County | No | Single Fmly | 2 | 34,165.62 | |
| 0017295 | Brazoria County | No | Single Fmly | 4 | 16,487.94 | |
| 0035511 | Brazoria County | No | Single Fmly | 2 | 14,273.02 | |
| 0180670 | Brazoria County | No | Single Fmly | 3 | 18,819.63 | |
| 0177556 | Brazoria County | No | Single Fmly | 2 | 18,325.27 | |
| 0124278 | Brazoria County | No | Single Fmly | 3 | 22,514.81 | |
| 0016048 | Brazoria County | No | Single Fmly | 2 | 54,607.59 | |
| 0018614 | Brazoria County | No | Single Fmly | 2 | 7,364.94 | |
| 0186067 | Brazoria County | No | 2-4 Family | 2 | 42,964.76 | |
| 0182799 | Brazoria County | No | Single Fmly | 2 | 53,426.77 | |
| 0071431 | Brazoria County | Yes | Single Fmly | 5 | 88,202.72 | |
| 0124405 | Brazoria County | No | Othr-Nonres | 2 | 14,841.20 | |
| 0197136 | Brazoria County | No | Single Fmly | 2 | 28,313.07 | |
| 0071594 | Brazoria County | Yes | Single Fmly | 3 | 147,210.09 | |
| 0069745 | Brazoria County | No | Single Fmly | 3 | 65,339.66 | |
| 0069922 | Brazoria County | No | Single Fmly | 2 | 24,688.02 | |
| 0186750 | Brazoria County | No | Single Fmly | 3 | 17,795.63 | |
| 0184787 | Brazoria County | No | Single Fmly | 2 | 11,735.10 | |
| 0012880 | Brazoria County | No | Single Fmly | 4 | 46,422.45 | |
| 0099014 | Brazoria County | No | Single Fmly | 2 | 9,821.77 | |
| 0033684 | Brazoria County | No | Single Fmly | 2 | 17,202.90 | |
| 0044452 | Brazoria County | No | Single Fmly | 2 | 7,558.87 | |
| 0026788 | Brazoria County | No | Single Fmly | 2 | 3,648.06 | |
| 0037132 | Brazoria County | Yes | Single Fmly | 4 | 159,208.88 | |
| 0258622 | Brazoria County | Yes | Single Fmly | 2 | 187,637.39 | |
| 0258751 | Brazoria County | Yes | Busi-Nonres | 2 | 98,189.10 | |
| 0026860 | Brazoria County | No | Single Fmly | 2 | 10,015.42 | |
| 0260487 | Brazoria County | Yes | Single Fmly | 2 | 36,657.03 | |
| 0002662 | Brazoria County | No | Single Fmly | 2 | 52,740.16 | |
| 0002495 | Brazoria County | No | Othr-Nonres | 3 | 16,535.09 | |
| 0179784 | Brazoria County | No | Single Fmly | 4 | 242,060.99 | |
| 0068081 | Brazoria County | No | Single Fmly | 4 | 88,481.75 | |
| 0124860 | Brazoria County | No | Single Fmly | 2 | 15,395.17 | |
| 0168603 | Brazoria County | No | Single Fmly | 2 | 88,049.03 | |
| 0093925 | Brazoria County | No | Single Fmly | 2 | 26,588.55 | |
| 0244633 | Brazoria County | No | Single Fmly | 3 | 125,247.14 | |
| 0025796 | Brazoria County | No | Single Fmly | 2 | 2,240.64 | |
| 0262110 | Brazoria County | Yes | Single Fmly | 2 | 25,024.01 | |
| 0259692 | Brazoria County | Yes | Single Fmly | 2 | 36,787.12 | |
| 0026160 | Brazoria County | No | Single Fmly | 2 | 27,099.96 | |
| 0034529 | Brazoria County | Yes | Single Fmly | 2 | 27,644.71 | |
| 0049649 | Brazoria County | No | Single Fmly | 3 | 15,020.48 | |
| 0026127 | Brazoria County | No | Single Fmly | 2 | 2,927.45 | |
| 0016008 | Brazoria County | Sdf | Single Fmly | 7 | 321,717.10 | V |
| 0098922 | Brazoria County | No | Single Fmly | 2 | 25,727.34 | |
| 0119604 | Brazoria County | No | Single Fmly | 3 | 8,939.32 | |
| 0117416 | Brazoria County | No | Single Fmly | 2 | 5,535.68 | |
| 0037256 | Brazoria County | No | Single Fmly | 2 | 8,005.73 | |
| 0018561 | Brazoria County | No | Single Fmly | 2 | 15,373.80 | |
| 0250436 | Brazoria County | No | Single Fmly | 2 | 14,815.34 | |
| 0088274 | Brazoria County | No | Single Fmly | 4 | 57,807.29 | |
| 0178769 | Brazoria County | Yes | Single Fmly | 2 | 13,950.43 | |

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|---------|-----------------|-----|-------------|----|------------|----|
| 0098565 | Brazoria County | Yes | Single Fmly | 4 | 14,293.21 | |
| 0089795 | Brazoria County | No | Single Fmly | 4 | 71,899.30 | |
| 0123020 | Brazoria County | Yes | Single Fmly | 3 | 58,813.58 | |
| 0124018 | Brazoria County | Yes | Single Fmly | 3 | 24,128.71 | |
| 0125809 | Brazoria County | No | Single Fmly | 3 | 94,657.84 | |
| 0094862 | Brazoria County | No | Single Fmly | 2 | 21,803.39 | |
| 0127389 | Brazoria County | Yes | Single Fmly | 3 | 40,254.67 | |
| 0136023 | Brazoria County | Yes | Single Fmly | 3 | 107,707.01 | |
| 0183898 | Brazoria County | Yes | Single Fmly | 2 | 64,957.26 | |
| 0035850 | Brazoria County | Yes | Single Fmly | 9 | 178,671.55 | V |
| 0100533 | Brazoria County | No | Single Fmly | 4 | 61,310.13 | VU |
| 0246925 | Brazoria County | No | Single Fmly | 2 | 48,192.55 | |
| 0018727 | Brazoria County | No | Othr-Nonres | 3 | 44,747.27 | |
| 0250274 | Brazoria County | Yes | Single Fmly | 2 | 21,072.50 | |
| 0071586 | Brazoria County | Sdf | Single Fmly | 4 | 103,176.67 | V |
| 0185454 | Brazoria County | No | Single Fmly | 2 | 25,213.13 | |
| 0089736 | Brazoria County | Yes | Single Fmly | 2 | 58,710.51 | |
| 0186125 | Brazoria County | Yes | Single Fmly | 2 | 110,319.14 | |
| 0125810 | Brazoria County | No | Single Fmly | 2 | 31,907.79 | |
| 0037583 | Brazoria County | No | Single Fmly | 2 | 52,431.35 | |
| 0002672 | Brazoria County | No | Single Fmly | 3 | 23,107.18 | |
| 0168027 | Brazoria County | No | Single Fmly | 2 | 14,058.22 | |
| 0119307 | Brazoria County | No | Single Fmly | 2 | 28,008.65 | |
| 0068080 | Brazoria County | Yes | Single Fmly | 2 | 9,929.83 | |
| 0118378 | Brazoria County | No | Single Fmly | 4 | 58,432.69 | |
| 0039513 | Brazoria County | No | Single Fmly | 2 | 11,941.11 | |
| 0053985 | Brazoria County | No | Othr-Nonres | 2 | 7,293.46 | |
| 0068233 | Brazoria County | No | Single Fmly | 3 | 63,796.40 | |
| 0259912 | Brazoria County | Yes | Single Fmly | 2 | 272,003.39 | P |
| 0044725 | Brazoria County | No | Single Fmly | 2 | 14,335.83 | |
| 0070689 | Brazoria County | No | Assmd Condo | 4 | 118,950.22 | PU |
| 0168081 | Brazoria County | Yes | Single Fmly | 2 | 139,687.14 | |
| 0116568 | Brazoria County | No | Single Fmly | 2 | 89,626.94 | |
| 0026826 | Brazoria County | No | Single Fmly | 2 | 3,253.06 | |
| 0018674 | Brazoria County | No | Single Fmly | 2 | 5,383.34 | |
| 0256590 | Brazoria County | Yes | Single Fmly | 3 | 113,477.52 | |
| 0115890 | Brazoria County | No | Single Fmly | 2 | 42,538.79 | |
| 0180872 | Brazoria County | Yes | Single Fmly | 2 | 23,378.12 | |
| 0098377 | Brazoria County | Sdf | Single Fmly | 4 | 156,553.44 | V |
| 0260330 | Brazoria County | Yes | Single Fmly | 2 | 166,460.60 | |
| 0122026 | Brazoria County | No | Single Fmly | 2 | 11,129.47 | |
| 0068050 | Brazoria County | No | Single Fmly | 2 | 8,774.19 | |
| 0179400 | Brazoria County | Yes | Single Fmly | 3 | 140,098.38 | |
| 0025974 | Brazoria County | Sdf | Single Fmly | 16 | 386,608.14 | V |
| 0069923 | Brazoria County | Yes | Single Fmly | 4 | 180,594.94 | |
| 0073440 | Brazoria County | Yes | Single Fmly | 3 | 133,474.25 | |
| 0113228 | Brazoria County | Yes | Single Fmly | 3 | 107,253.56 | |
| 0114690 | Brazoria County | Yes | Single Fmly | 3 | 134,744.76 | |
| 0073441 | Brazoria County | Yes | Single Fmly | 4 | 141,990.78 | V |
| 0069610 | Brazoria County | Yes | Single Fmly | 2 | 101,225.31 | |
| 0101644 | Brazoria County | No | Single Fmly | 2 | 4,822.75 | |
| 0043106 | Brazoria County | No | Single Fmly | 2 | 20,482.87 | |
| 0180095 | Brazoria County | No | Single Fmly | 2 | 160,951.99 | VU |
| 0179052 | Brazoria County | No | Single Fmly | 2 | 41,072.57 | |

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|---------|-----------------|-----|-------------|----|------------|----|
| 0253470 | Brazoria County | Yes | Single Fmly | 2 | 213,325.20 | |
| 0250078 | Brazoria County | Yes | Single Fmly | 2 | 34,200.04 | |
| 0000932 | Brazoria County | No | 2-4 Family | 5 | 25,276.43 | |
| 0258547 | Brazoria County | Yes | Single Fmly | 2 | 163,270.72 | |
| 0180131 | Brazoria County | Yes | Single Fmly | 2 | 61,283.28 | |
| 0259944 | Brazoria County | Yes | Single Fmly | 2 | 27,548.96 | |
| 0260220 | Brazoria County | Yes | Single Fmly | 2 | 231,222.83 | |
| 0247192 | Brazoria County | Yes | Single Fmly | 3 | 131,460.61 | |
| 0257948 | Brazoria County | Yes | Assmd Condo | 2 | 194,844.66 | |
| 0262814 | Brazoria County | Yes | Single Fmly | 2 | 5,941.53 | |
| 0018521 | Brazoria County | Yes | Single Fmly | 2 | 45,976.62 | |
| 0002861 | Brazoria County | No | Single Fmly | 9 | 68,094.46 | VU |
| 0012901 | Brazoria County | No | Other Resid | 2 | 5,518.10 | |
| 0026060 | Brazoria County | No | Single Fmly | 2 | 5,792.89 | |
| 0045874 | Brazoria County | No | Single Fmly | 3 | 28,725.26 | PU |
| 0182964 | Brazoria County | Yes | Single Fmly | 2 | 58,145.18 | |
| 0178768 | Brazoria County | Yes | Single Fmly | 2 | 7,832.23 | |
| 0119731 | Brazoria County | Sdf | Single Fmly | 4 | 53,437.69 | V |
| 0119568 | Brazoria County | No | Single Fmly | 4 | 90,843.65 | VU |
| 0050733 | Brazoria County | No | Othr-Nonres | 2 | 6,236.72 | |
| 0113243 | Brazoria County | No | Single Fmly | 2 | 119,528.70 | |
| 0258716 | Brazoria County | Yes | Single Fmly | 2 | 179,838.10 | |
| 0259186 | Brazoria County | Yes | Single Fmly | 2 | 278,300.79 | |
| 0258240 | Brazoria County | Yes | Single Fmly | 2 | 314,291.13 | |
| 0045401 | Brazoria County | Yes | Single Fmly | 4 | 36,551.82 | |
| 0112890 | Brazoria County | Yes | Single Fmly | 3 | 89,558.97 | |
| 0258423 | Brazoria County | Yes | Single Fmly | 2 | 55,656.69 | |
| 0262815 | Brazoria County | Yes | Single Fmly | 2 | 336,603.93 | |
| 0070275 | Brazoria County | No | Single Fmly | 2 | 102,273.19 | |
| 0042514 | Brazoria County | No | Single Fmly | 4 | 72,681.91 | |
| 0045921 | Brazoria County | Sdf | Single Fmly | 5 | 335,247.69 | V |
| 0112974 | Brazoria County | Yes | Single Fmly | 3 | 161,614.89 | |
| 0017551 | Brazoria County | No | Single Fmly | 10 | 384,355.46 | VU |
| 0118755 | Brazoria County | No | Single Fmly | 3 | 83,861.33 | |
| 0070680 | Brazoria County | No | Single Fmly | 4 | 90,603.31 | |
| 0248077 | Brazoria County | No | Single Fmly | 2 | 12,891.94 | |
| 0025998 | Brazoria County | No | Single Fmly | 2 | 14,232.68 | |
| 0012996 | Brazoria County | Sdf | Single Fmly | 10 | 119,631.23 | V |
| 0026412 | Brazoria County | No | Single Fmly | 2 | 29,911.69 | |
| 0112967 | Brazoria County | No | Single Fmly | 3 | 133,680.58 | |
| 0068097 | Brazoria County | No | Single Fmly | 3 | 22,839.39 | |
| 0069942 | Brazoria County | Yes | Single Fmly | 3 | 38,558.61 | |
| 0115564 | Brazoria County | Yes | Single Fmly | 2 | 60,189.75 | |
| 0033980 | Brazoria County | No | Single Fmly | 5 | 67,913.27 | |
| 0068072 | Brazoria County | Sdf | Single Fmly | 4 | 97,604.33 | V |
| 0070114 | Brazoria County | Yes | Single Fmly | 3 | 81,778.86 | |
| 0072219 | Brazoria County | Yes | Single Fmly | 3 | 111,483.70 | |
| 0044789 | Brazoria County | No | Single Fmly | 3 | 8,496.51 | |
| 0026200 | Brazoria County | No | Single Fmly | 4 | 44,171.24 | |
| 0045013 | Brazoria County | Yes | Single Fmly | 5 | 91,474.84 | V |
| 0026741 | Brazoria County | No | Single Fmly | 2 | 41,883.78 | |
| 0119310 | Brazoria County | No | Single Fmly | 2 | 10,007.54 | |
| 0119170 | Brazoria County | No | Single Fmly | 4 | 61,512.90 | VU |
| 0119172 | Brazoria County | Yes | Single Fmly | 3 | 36,009.99 | |

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| 0119569 | Brazoria County | No | Single Fmly | 3 | 130,458.76 | |
| 0262104 | Brazoria County | Yes | Single Fmly | 2 | 23,913.33 | |
| 0244058 | Brazoria County | No | Single Fmly | 4 | 61,681.44 | VU |
| 0002693 | Brazoria County | No | Single Fmly | 2 | 8,826.11 | PU |
| 0014120 | Brazoria County | No | Single Fmly | 5 | 49,585.50 | VU |
| 0074646 | Brazoria County | No | Single Fmly | 2 | 26,871.00 | |
| 0002898 | Brazoria County | No | Single Fmly | 10 | 192,521.44 | VU |
| 0018450 | Brazoria County | No | Single Fmly | 2 | 36,763.76 | |
| 0026710 | Brazoria County | No | Single Fmly | 4 | 85,730.95 | |
| 0051941 | Brazoria County | Sdf | Single Fmly | 9 | 343,594.54 | V |
| 0026548 | Brazoria County | Yes | Single Fmly | 3 | 224,593.85 | |
| 0018677 | Brazoria County | Yes | Single Fmly | 3 | 52,123.64 | |
| 0026277 | Brazoria County | No | Single Fmly | 2 | 45,674.85 | |
| 0037534 | Brazoria County | Sdf | Single Fmly | 7 | 203,074.66 | V |
| 0018632 | Brazoria County | Sdf | Single Fmly | 8 | 251,790.27 | V |
| 0018320 | Brazoria County | No | Single Fmly | 12 | 210,095.88 | VU |
| 0017404 | Brazoria County | Yes | Single Fmly | 6 | 132,750.81 | V |
| 0262717 | Brazoria County | Yes | Single Fmly | 2 | 74,341.56 | |
| 0259854 | Brazoria County | Yes | Single Fmly | 2 | 174,435.40 | |
| 0260308 | Brazoria County | Yes | Single Fmly | 2 | 185,884.28 | |
| 0037756 | Brazoria County | Yes | Single Fmly | 4 | 141,378.48 | |
| 0038353 | Brazoria County | Yes | Single Fmly | 2 | 16,767.61 | |
| 0260310 | Brazoria County | Yes | Single Fmly | 2 | 286,075.44 | |
| 0258807 | Brazoria County | Yes | Single Fmly | 2 | 124,433.51 | |
| 0182281 | Brazoria County | No | Single Fmly | 2 | 9,670.34 | |
| 0118883 | Brazoria County | Yes | Single Fmly | 2 | 29,450.59 | |
| 0096880 | Brazoria County | No | Single Fmly | 4 | 68,885.74 | |
| 0123864 | Brazoria County | Yes | Single Fmly | 3 | 31,050.28 | |
| 0025201 | Brazoria County | Yes | Single Fmly | 4 | 25,072.12 | |
| 0119200 | Brazoria County | Yes | Single Fmly | 4 | 47,588.11 | |
| 0144558 | Brazoria County | Yes | Single Fmly | 3 | 37,943.71 | |
| 0124661 | Brazoria County | Yes | Single Fmly | 3 | 36,628.82 | |
| 0008288 | Brazoria County | Yes | Single Fmly | 3 | 284,820.45 | |
| 0038281 | Brazoria County | No | Single Fmly | 2 | 8,851.55 | |
| 0018336 | Brazoria County | No | Single Fmly | 2 | 64,494.21 | |
| 0070686 | Brazoria County | No | Single Fmly | 2 | 11,325.81 | |
| 0025593 | Brazoria County | No | Single Fmly | 2 | 6,422.75 | |
| 0025652 | Brazoria County | No | Single Fmly | 2 | 10,288.39 | |
| 0018639 | Brazoria County | No | Single Fmly | 2 | 3,920.19 | |
| 0025730 | Brazoria County | No | Single Fmly | 2 | 12,865.77 | |
| 0003492 | Brazoria County | Sdf | Single Fmly | 8 | 88,001.20 | V |
| 0117336 | Brazoria County | No | Assmd Condo | 3 | 169,640.29 | |
| 0190283 | Brazoria County | No | Single Fmly | 3 | 136,194.71 | |
| 0080808 | Brazoria County | No | Othr-Nonres | 4 | 85,320.25 | |
| 0041955 | Brazoria County | Sdf | Single Fmly | 10 | 125,331.24 | P |
| 0069672 | Brazoria County | Sdf | Single Fmly | 5 | 123,584.31 | V |
| 0025467 | Brazoria County | Yes | Single Fmly | 3 | 108,496.16 | |
| 0047306 | Brazoria County | No | Single Fmly | 7 | 171,717.36 | VU |
| 0076991 | Brazoria County | No | Single Fmly | 2 | 8,653.61 | |
| 0100354 | Brazoria County | No | Single Fmly | 2 | 10,553.61 | |
| 0008217 | Brazoria County | No | Single Fmly | 11 | 73,592.46 | VU |
| 0017503 | Brazoria County | No | Single Fmly | 2 | 33,054.36 | |
| 0017546 | Brazoria County | No | Single Fmly | 2 | 47,048.50 | |
| 0039931 | Brazoria County | No | Single Fmly | 2 | 22,423.00 | |

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|---------|-----------------|-----|-------------|---|------------|-----|
| 0080419 | Brazoria County | No | Single Fmly | 3 | 11,342.54 | |
| 0093914 | Brazoria County | No | Single Fmly | 4 | 65,834.14 | VU |
| 0096796 | Brazoria County | No | Single Fmly | 2 | 8,882.82 | |
| 0259500 | Brazoria County | Yes | Single Fmly | 2 | 135,007.63 | |
| 0069926 | Brazoria County | No | Single Fmly | 2 | 33,967.83 | |
| 0118910 | Brazoria County | No | Single Fmly | 2 | 9,778.55 | |
| 0073438 | Brazoria County | No | Single Fmly | 2 | 3,919.75 | |
| 0026757 | Brazoria County | No | Single Fmly | 2 | 20,933.07 | |
| 0097113 | Brazoria County | No | Single Fmly | 2 | 11,785.70 | |
| 0120643 | Brazoria County | No | Single Fmly | 2 | 43,628.18 | |
| 0117436 | Brazoria County | No | Othr-Nonres | 2 | 55,653.26 | PNU |
| 0098917 | Brazoria County | No | Single Fmly | 3 | 55,439.98 | |
| 0068847 | Brazoria County | No | Single Fmly | 4 | 34,648.16 | |
| 0068854 | Brazoria County | No | Single Fmly | 3 | 31,128.16 | |
| 0116879 | Brazoria County | No | Single Fmly | 2 | 37,661.91 | |
| 0035180 | Brazoria County | No | Single Fmly | 3 | 40,308.42 | PU |
| 0120553 | Brazoria County | No | Single Fmly | 2 | 25,937.74 | |
| 0114093 | Brazoria County | No | Single Fmly | 3 | 110,231.76 | |
| 0044665 | Brazoria County | No | Assmd Condo | 7 | 303,266.07 | PU |
| 0045182 | Brazoria County | No | Single Fmly | 3 | 40,730.02 | |
| 0018490 | Brazoria County | No | Single Fmly | 2 | 5,381.55 | |
| 0260331 | Brazoria County | Yes | Single Fmly | 2 | 202,901.78 | |
| 0260201 | Brazoria County | Yes | Single Fmly | 2 | 186,196.31 | |
| 0025852 | Brazoria County | No | Single Fmly | 2 | 24,035.71 | |
| 0026320 | Brazoria County | Yes | Single Fmly | 3 | 60,673.61 | |
| 0026497 | Brazoria County | No | Single Fmly | 2 | 15,949.37 | |
| 0026058 | Brazoria County | No | Single Fmly | 3 | 46,774.95 | |
| 0041433 | Brazoria County | No | Single Fmly | 3 | 117,361.17 | |
| 0025991 | Brazoria County | Yes | Single Fmly | 3 | 139,015.15 | |
| 0039095 | Brazoria County | Yes | Single Fmly | 3 | 155,381.19 | |
| 0017505 | Brazoria County | No | Single Fmly | 2 | 21,173.00 | |
| 0026166 | Brazoria County | Yes | Single Fmly | 3 | 91,910.30 | |
| 0039732 | Brazoria County | Yes | Single Fmly | 2 | 14,942.66 | |
| 0115588 | Brazoria County | Yes | Single Fmly | 3 | 18,430.11 | |
| 0259951 | Brazoria County | Yes | Single Fmly | 2 | 350,942.12 | |
| 0016053 | Brazoria County | No | Single Fmly | 5 | 55,034.28 | VU |
| 0180141 | Brazoria County | Yes | Single Fmly | 2 | 8,826.74 | |
| 0119792 | Brazoria County | Yes | Single Fmly | 2 | 15,477.31 | |
| 0017655 | Brazoria County | Yes | Single Fmly | 2 | 8,263.68 | |
| 0025851 | Brazoria County | No | Single Fmly | 4 | 13,944.34 | |
| 0182775 | Brazoria County | Yes | Single Fmly | 2 | 41,239.42 | |
| 0260102 | Brazoria County | Yes | Single Fmly | 2 | 88,119.03 | |
| 0177067 | Brazoria County | No | Single Fmly | 2 | 27,511.02 | |
| 0005813 | Brazoria County | No | Single Fmly | 4 | 55,382.62 | VU |
| 0045235 | Brazoria County | No | Single Fmly | 2 | 14,250.60 | |
| 0180126 | Brazoria County | No | Single Fmly | 3 | 72,516.93 | |
| 0262710 | Brazoria County | Yes | Single Fmly | 2 | 7,325.58 | |
| 0069969 | Brazoria County | No | Othr-Nonres | 2 | 13,865.96 | |
| 0002910 | Brazoria County | No | Single Fmly | 2 | 8,006.71 | |
| 0015953 | Brazoria County | No | Single Fmly | 5 | 27,704.26 | |
| 0257915 | Brazoria County | Yes | Single Fmly | 2 | 96,367.79 | |
| 0018645 | Brazoria County | No | Single Fmly | 3 | 12,964.20 | |
| 0119351 | Brazoria County | No | Single Fmly | 2 | 5,839.53 | |
| 0262806 | Brazoria County | Yes | Other Resid | 2 | 150,000.00 | |

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|---------|-----------------|-----|-------------|---|------------|----|
| 0118878 | Brazoria County | No | Single Fmly | 2 | 43,152.09 | |
| 0025818 | Brazoria County | No | Single Fmly | 2 | 20,009.92 | |
| 0260354 | Brazoria County | Yes | Single Fmly | 2 | 176,182.20 | P |
| 0003374 | Brazoria County | No | Single Fmly | 5 | 51,275.95 | VU |
| 0216653 | Brazoria County | No | 2-4 Family | 2 | 49,825.56 | |
| 0017515 | Brazoria County | No | Single Fmly | 2 | 40,190.81 | PU |
| 0018663 | Brazoria County | No | Single Fmly | 2 | 19,536.61 | PU |
| 0025679 | Brazoria County | No | Single Fmly | 5 | 204,997.84 | VU |
| 0118876 | Brazoria County | No | Single Fmly | 2 | 33,424.19 | |
| 0015971 | Brazoria County | No | Single Fmly | 2 | 30,601.54 | PU |
| 0071472 | Brazoria County | No | Single Fmly | 4 | 59,085.52 | VU |
| 0099013 | Brazoria County | No | Single Fmly | 2 | 75,360.96 | |
| 0069920 | Brazoria County | Yes | Single Fmly | 4 | 82,770.62 | |
| 0242698 | Brazoria County | Yes | Single Fmly | 3 | 10,936.91 | |
| 0070569 | Brazoria County | Sdf | Single Fmly | 8 | 169,476.50 | V |
| 0068083 | Brazoria County | No | Single Fmly | 5 | 75,960.75 | |
| 0179564 | Brazoria County | Sdf | Single Fmly | 4 | 91,018.06 | V |
| 0168802 | Brazoria County | Yes | Single Fmly | 2 | 147,933.52 | |
| 0114251 | Brazoria County | No | Single Fmly | 3 | 140,786.15 | |
| 0112240 | Brazoria County | Yes | Single Fmly | 4 | 135,594.78 | |
| 0069936 | Brazoria County | Sdf | Single Fmly | 5 | 234,767.30 | V |
| 0044313 | Brazoria County | No | Single Fmly | 2 | 9,966.09 | |
| 0049796 | Brazoria County | No | Single Fmly | 3 | 34,624.90 | |
| 0116885 | Brazoria County | No | Single Fmly | 2 | 9,414.50 | |
| 0008454 | Brazoria County | No | Single Fmly | 7 | 180,189.30 | VU |
| 0119171 | Brazoria County | Yes | Single Fmly | 2 | 18,698.05 | |
| 0039427 | Brazoria County | No | Single Fmly | 2 | 20,543.32 | |
| 0096794 | Brazoria County | Sdf | Single Fmly | 4 | 43,629.62 | V |
| 0257769 | Brazoria County | Yes | Single Fmly | 2 | 101,800.00 | |
| 0124246 | Brazoria County | No | Single Fmly | 2 | 5,625.80 | |
| 0112927 | Brazoria County | No | Single Fmly | 3 | 89,706.13 | |
| 0118459 | Brazoria County | No | Single Fmly | 2 | 25,493.78 | |
| 0119185 | Brazoria County | No | Single Fmly | 2 | 12,303.20 | |
| 0025789 | Brazoria County | No | Single Fmly | 2 | 15,414.32 | |
| 0025561 | Brazoria County | No | Single Fmly | 2 | 9,353.79 | PU |
| 0026827 | Brazoria County | No | Single Fmly | 4 | 43,771.25 | |
| 0013222 | Brazoria County | No | Single Fmly | 7 | 151,966.18 | VU |
| 0012991 | Brazoria County | No | Single Fmly | 7 | 94,499.76 | VU |
| 0097237 | Brazoria County | No | Single Fmly | 3 | 140,460.76 | |
| 0120525 | Brazoria County | No | Single Fmly | 2 | 8,615.19 | |
| 0026449 | Brazoria County | No | Single Fmly | 2 | 10,754.53 | |
| 0119542 | Brazoria County | No | Single Fmly | 2 | 9,225.36 | |
| 0068003 | Brazoria County | No | Single Fmly | 3 | 43,553.34 | |
| 0121552 | Brazoria County | No | Single Fmly | 2 | 14,989.53 | |
| 0025514 | Brazoria County | Yes | Single Fmly | 3 | 10,231.07 | |
| 0120647 | Brazoria County | No | Othr-Nonres | 2 | 57,981.01 | |
| 0124435 | Brazoria County | No | Othr-Nonres | 2 | 36,241.62 | |
| 0017608 | Brazoria County | No | Single Fmly | 2 | 66,349.63 | |
| 0117821 | Brazoria County | Yes | Single Fmly | 4 | 82,603.40 | |
| 0045236 | Brazoria County | No | Assmd Condo | 3 | 61,754.75 | |
| 0026384 | Brazoria County | No | Single Fmly | 2 | 33,003.90 | |
| 0112852 | Brazoria County | Yes | Single Fmly | 3 | 155,584.34 | |
| 0112962 | Brazoria County | No | Single Fmly | 2 | 46,525.66 | |
| 0073423 | Brazoria County | Sdf | Single Fmly | 4 | 259,366.45 | V |

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|---------|-----------------|-----|-------------|----|------------|-----|
| 0036666 | Brazoria County | No | Single Fmly | 2 | 19,468.49 | |
| 0026199 | Brazoria County | No | Single Fmly | 5 | 94,376.33 | VU |
| 0121969 | Brazoria County | No | Single Fmly | 2 | 9,566.64 | |
| 0088306 | Brazoria County | No | Single Fmly | 6 | 118,211.03 | VU |
| 0069992 | Brazoria County | No | Single Fmly | 4 | 53,619.02 | |
| 0048504 | Brazoria County | No | Single Fmly | 3 | 14,435.04 | |
| 0257779 | Brazoria County | Yes | Single Fmly | 2 | 61,411.18 | |
| 0259798 | Brazoria County | Yes | Single Fmly | 2 | 18,716.11 | |
| 0118932 | Brazoria County | Yes | Single Fmly | 2 | 25,357.18 | |
| 0119167 | Brazoria County | No | Single Fmly | 2 | 10,860.56 | |
| 0044114 | Brazoria County | Yes | Single Fmly | 3 | 33,221.67 | |
| 0002704 | Brazoria County | No | Single Fmly | 5 | 27,854.83 | |
| 0118922 | Brazoria County | No | Single Fmly | 3 | 110,641.57 | |
| 0168435 | Brazoria County | No | Single Fmly | 3 | 50,952.56 | |
| 0118646 | Brazoria County | No | Single Fmly | 2 | 31,306.08 | |
| 0018515 | Brazoria County | No | Single Fmly | 7 | 155,397.10 | VU |
| 0017252 | Brazoria County | No | Single Fmly | 3 | 14,910.33 | |
| 0069861 | Brazoria County | No | Single Fmly | 2 | 61,105.33 | |
| 0025804 | Brazoria County | No | Single Fmly | 2 | 9,414.51 | |
| 0026042 | Brazoria County | No | Othr-Nonres | 2 | 2,681.25 | |
| 0025104 | Brazoria County | No | Othr-Nonres | 2 | 50,420.27 | |
| 0025105 | Brazoria County | No | Single Fmly | 2 | 33,663.65 | PU |
| 0048666 | Brazoria County | No | Single Fmly | 3 | 18,394.75 | |
| 0018437 | Brazoria County | No | Single Fmly | 2 | 9,833.42 | |
| 0017488 | Brazoria County | No | Single Fmly | 2 | 8,516.00 | |
| 0044283 | Brazoria County | No | Single Fmly | 3 | 9,173.37 | |
| 0045237 | Brazoria County | No | Single Fmly | 4 | 54,570.24 | |
| 0025384 | Brazoria County | No | Single Fmly | 3 | 10,314.57 | |
| 0068844 | Brazoria County | No | Single Fmly | 2 | 59,397.44 | |
| 0003059 | Brazoria County | No | Other Resid | 2 | 30,053.52 | |
| 0017558 | Brazoria County | No | Single Fmly | 2 | 23,248.20 | |
| 0044611 | Brazoria County | No | Single Fmly | 3 | 49,053.60 | |
| 0048453 | Brazoria County | No | Othr-Nonres | 2 | 121,322.56 | |
| 0044302 | Brazoria County | No | Single Fmly | 2 | 26,209.26 | |
| 0026108 | Brazoria County | No | Single Fmly | 4 | 12,751.45 | |
| 0044865 | Brazoria County | No | Othr-Nonres | 4 | 98,235.93 | |
| 0001455 | Brazoria County | No | 2-4 Family | 3 | 32,860.54 | |
| 0017562 | Brazoria County | No | Single Fmly | 2 | 4,870.41 | |
| 0018474 | Brazoria County | No | Single Fmly | 5 | 155,565.14 | MVU |
| 0015995 | Brazoria County | No | Othr-Nonres | 3 | 41,027.66 | |
| 0115874 | Brazoria County | No | Othr-Nonres | 2 | 10,482.74 | |
| 0068099 | Brazoria County | No | Single Fmly | 5 | 241,745.22 | MVU |
| 0099153 | Brazoria County | No | Single Fmly | 2 | 9,495.36 | |
| 0097543 | Brazoria County | No | Single Fmly | 4 | 133,248.83 | |
| 0026012 | Brazoria County | No | Single Fmly | 3 | 65,363.46 | |
| 0050101 | Brazoria County | No | Single Fmly | 2 | 6,180.93 | |
| 0018726 | Brazoria County | No | Single Fmly | 8 | 353,082.01 | MVU |
| 0017559 | Brazoria County | No | Single Fmly | 14 | 496,501.26 | MVU |
| 0092099 | Brazoria County | No | Single Fmly | 2 | 27,400.00 | |
| 0044348 | Brazoria County | No | Single Fmly | 2 | 31,591.50 | |
| 0026836 | Brazoria County | No | Single Fmly | 2 | 27,696.74 | |
| 0071528 | Brazoria County | No | Single Fmly | 3 | 118,062.28 | |
| 0041346 | Brazoria County | No | Single Fmly | 2 | 17,503.00 | |
| 0018423 | Brazoria County | No | Single Fmly | 2 | 42,067.52 | |

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|---------|----------------------------|-----|-------------|----|------------|----|
| 0042610 | Brazoria County | Yes | Single Fmly | 6 | 146,550.94 | |
| 0074487 | Brazoria, City of | Sdf | Single Fmly | 4 | 95,778.50 | V |
| 0044973 | Brazoria, City of | Sdf | Single Fmly | 7 | 102,012.11 | V |
| 0249030 | Brazoria, City of | Yes | Single Fmly | 2 | 14,057.35 | |
| 0035273 | Brazoria, City of | No | Single Fmly | 3 | 4,494.36 | |
| 0119186 | Brazoria, City of | No | Single Fmly | 3 | 59,965.44 | |
| 0048874 | Brazoria, City of | No | Single Fmly | 2 | 2,717.42 | |
| 0168162 | Brazoria, City of | Yes | Single Fmly | 2 | 45,473.43 | |
| 0091965 | Brazoria, City of | Yes | Single Fmly | 3 | 43,525.71 | |
| 0080413 | Brazoria, City of | Yes | Single Fmly | 5 | 73,015.76 | |
| 0045287 | Brazoria, City of | Yes | Single Fmly | 3 | 21,918.98 | |
| 0119179 | Brazoria, City of | Yes | Single Fmly | 2 | 6,658.20 | |
| 0213229 | Brazoria, City of | Yes | Single Fmly | 4 | 42,111.48 | |
| 0093170 | Brazoria, City of | No | Single Fmly | 4 | 42,945.52 | |
| 0239616 | Brazoria, City of | Yes | Single Fmly | 3 | 74,007.36 | |
| 0093911 | Brazoria, City of | No | Single Fmly | 4 | 48,812.55 | |
| 0068030 | Brazoria, City of | No | Single Fmly | 3 | 13,101.43 | |
| 0118729 | Brazoria, City of | No | Single Fmly | 2 | 8,095.04 | |
| 0123800 | Brazoria, City of | No | Single Fmly | 2 | 61,286.24 | |
| 0048882 | Brazoria, City of | No | Single Fmly | 4 | 9,335.08 | |
| 0045259 | Brazoria, City of | No | Single Fmly | 3 | 6,326.91 | |
| 0168428 | Brazoria, City of | Yes | Single Fmly | 2 | 16,181.36 | |
| 0044886 | Brazoria, City of | No | Single Fmly | 3 | 15,060.39 | |
| 0039376 | Brazoria, City of | No | Single Fmly | 2 | 5,679.84 | |
| 0038629 | Brazoria, City of | Yes | Single Fmly | 4 | 9,517.08 | |
| 0112880 | Brookside Village, City of | Yes | Assmd Condo | 3 | 167,979.78 | |
| 0259975 | Brookside Village, City of | Yes | Single Fmly | 2 | 395,808.78 | |
| 0071471 | Brookside Village, City of | No | Single Fmly | 2 | 14,958.28 | |
| 0069944 | Brookside Village, City of | No | Single Fmly | 2 | 5,913.17 | |
| 0168026 | Brookside Village, City of | Yes | Single Fmly | 3 | 75,075.07 | |
| 0168137 | Brookside Village, City of | No | Single Fmly | 4 | 81,368.22 | |
| 0036827 | Brookside Village, City of | No | Single Fmly | 2 | 37,949.10 | |
| 0117784 | Brookside Village, City of | No | Single Fmly | 2 | 72,547.49 | |
| 0173724 | Brookside Village, City of | No | Single Fmly | 3 | 56,497.33 | |
| 0182797 | Brookside Village, City of | No | Single Fmly | 2 | 5,752.29 | |
| 0182798 | Brookside Village, City of | No | Single Fmly | 3 | 218,330.53 | |
| 0068067 | Brookside Village, City of | No | Single Fmly | 4 | 154,021.53 | VU |
| 0071481 | Brookside Village, City of | No | Single Fmly | 4 | 72,717.10 | |
| 0070927 | Brookside Village, City of | No | Single Fmly | 3 | 74,899.99 | |
| 0115799 | Brookside Village, City of | No | Single Fmly | 2 | 83,867.20 | |
| 0040015 | Brookside Village, City of | No | Single Fmly | 4 | 114,494.37 | |
| 0044773 | Brookside Village, City of | No | Single Fmly | 3 | 35,252.87 | |
| 0004477 | Brookside Village, City of | No | Single Fmly | 8 | 108,188.31 | VU |
| 0187054 | Brookside Village, City of | Yes | Single Fmly | 2 | 13,000.22 | |
| 0071430 | Brookside Village, City of | No | Single Fmly | 3 | 35,542.48 | |
| 0072209 | Brookside Village, City of | No | Single Fmly | 3 | 72,445.88 | |
| 0001459 | Brookside Village, City of | Sdf | Single Fmly | 9 | 249,064.62 | P |
| 0117731 | Brookside Village, City of | No | Single Fmly | 3 | 72,463.69 | |
| 0114986 | Brookside Village, City of | No | Single Fmly | 2 | 92,894.58 | |
| 0113277 | Brookside Village, City of | No | Single Fmly | 2 | 63,442.77 | |
| 0114739 | Brookside Village, City of | No | Single Fmly | 2 | 34,759.14 | |
| 0114608 | Brookside Village, City of | Yes | Single Fmly | 2 | 84,961.03 | |
| 0025090 | Brookside Village, City of | No | Single Fmly | 3 | 39,657.37 | |
| 0002814 | Brookside Village, City of | No | Single Fmly | 10 | 197,556.72 | VU |

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|---------|----------------------------|-----|-------------|---|------------|-----|
| 0112914 | Brookside Village, City of | Yes | Single Fmly | 2 | 55,415.02 | |
| 0025161 | Brookside Village, City of | Sdf | Single Fmly | 7 | 208,928.84 | V |
| 0113044 | Brookside Village, City of | No | Single Fmly | 2 | 106,241.01 | |
| 0112557 | Brookside Village, City of | Yes | Single Fmly | 2 | 89,938.32 | |
| 0241552 | Brookside Village, City of | Yes | Single Fmly | 2 | 47,299.74 | |
| 0001910 | Brookside Village, City of | No | Single Fmly | 5 | 158,193.83 | MVU |
| 0115985 | Brookside Village, City of | No | Single Fmly | 2 | 84,895.42 | |
| 0045116 | Clute, City of | No | Single Fmly | 2 | 5,772.06 | |
| 0119195 | Clute, City of | No | Single Fmly | 2 | 8,854.94 | |
| 0119583 | Clute, City of | No | Single Fmly | 2 | 16,124.55 | |
| 0119191 | Clute, City of | No | Othr-Nonres | 2 | 13,883.74 | |
| 0112956 | Clute, City of | Yes | Single Fmly | 4 | 16,246.69 | |
| 0018296 | Clute, City of | No | Single Fmly | 2 | 13,691.62 | |
| 0038851 | Clute, City of | No | Othr-Nonres | 4 | 33,999.86 | VNU |
| 0118914 | Clute, City of | Yes | Single Fmly | 2 | 61,172.54 | |
| 0095192 | Clute, City of | Yes | Single Fmly | 3 | 62,497.91 | |
| 0124195 | Clute, City of | No | Single Fmly | 2 | 10,036.85 | |
| 0068429 | Clute, City of | No | Single Fmly | 2 | 2,898.91 | |
| 0068430 | Clute, City of | Yes | Single Fmly | 4 | 57,985.39 | |
| 0026744 | Clute, City of | No | Single Fmly | 2 | 11,639.00 | |
| 0041418 | Clute, City of | No | Single Fmly | 7 | 32,038.87 | |
| 0026688 | Clute, City of | No | Assmd Condo | 2 | 9,612.40 | |
| 0097563 | Clute, City of | Sdf | Single Fmly | 8 | 151,901.08 | V |
| 0119181 | Clute, City of | No | Single Fmly | 2 | 4,931.40 | |
| 0035370 | Clute, City of | No | Othr-Nonres | 2 | 33,711.44 | |
| 0040207 | Clute, City of | No | Othr-Nonres | 3 | 19,259.82 | |
| 0096848 | Clute, City of | No | Single Fmly | 3 | 72,769.46 | |
| 0112465 | Clute, City of | No | Othr-Nonres | 3 | 115,534.18 | |
| 0260271 | Danbury, City of | Yes | Single Fmly | 2 | 85,349.29 | |
| 0025204 | Danbury, City of | No | Single Fmly | 2 | 11,341.33 | |
| 0258801 | Danbury, City of | Yes | Single Fmly | 2 | 113,452.84 | |
| 0118751 | Danbury, City of | No | Single Fmly | 2 | 30,836.22 | |
| 0096866 | Danbury, City of | Yes | Single Fmly | 3 | 31,461.19 | |
| 0100353 | Danbury, City of | No | Single Fmly | 2 | 18,754.11 | |
| 0257214 | Danbury, City of | Yes | Single Fmly | 2 | 149,178.02 | |
| 0118859 | Danbury, City of | No | Single Fmly | 2 | 12,866.68 | |
| 0119190 | Danbury, City of | Yes | Single Fmly | 3 | 89,986.13 | |
| 0015145 | Freeport, City of | No | Othr-Nonres | 3 | 65,382.86 | |
| 0038724 | Freeport, City of | No | Single Fmly | 2 | 7,918.18 | |
| 0067999 | Freeport, City of | No | Single Fmly | 6 | 55,794.76 | |
| 0118739 | Freeport, City of | No | Single Fmly | 4 | 10,457.30 | |
| 0068000 | Freeport, City of | No | Single Fmly | 2 | 4,391.78 | |
| 0068001 | Freeport, City of | Yes | Single Fmly | 3 | 16,008.42 | |
| 0120650 | Freeport, City of | No | Single Fmly | 2 | 20,762.62 | |
| 0169488 | Freeport, City of | No | Othr-Nonres | 2 | 19,708.76 | |
| 0044926 | Freeport, City of | No | Othr-Nonres | 2 | 5,733.65 | |
| 0118971 | Freeport, City of | Sdf | Othr-Nonres | 4 | 156,559.12 | VN |
| 0118888 | Freeport, City of | No | Single Fmly | 2 | 12,830.94 | |
| 0018564 | Freeport, City of | No | Single Fmly | 3 | 23,340.46 | |
| 0172115 | Freeport, City of | Sdf | Single Fmly | 6 | 127,378.17 | V |
| 0025590 | Freeport, City of | No | Single Fmly | 3 | 10,542.68 | |
| 0119548 | Freeport, City of | No | Single Fmly | 3 | 40,732.21 | |
| 0128027 | Freeport, City of | No | Single Fmly | 2 | 84,254.69 | |
| 0018720 | Freeport, City of | No | Single Fmly | 3 | 58,491.24 | |

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|---------|----------------------------|-----|-------------|---|------------|-----|
| 0119551 | Freeport, City of | No | Single Fmly | 2 | 23,413.72 | |
| 0254767 | Freeport, City of | Yes | Othr-Nonres | 2 | 210,684.47 | |
| 0026236 | Freeport, City of | No | Single Fmly | 2 | 51,480.22 | |
| 0182777 | Freeport, City of | Yes | Single Fmly | 2 | 71,492.93 | |
| 0026711 | Freeport, City of | No | Single Fmly | 2 | 5,340.77 | |
| 0068008 | Freeport, City of | Yes | Single Fmly | 2 | 44,385.57 | |
| 0118916 | Freeport, City of | No | Single Fmly | 2 | 17,141.41 | |
| 0119183 | Freeport, City of | No | Single Fmly | 2 | 5,775.25 | |
| 0118886 | Freeport, City of | Yes | Single Fmly | 3 | 65,068.74 | |
| 0124249 | Freeport, City of | Yes | Single Fmly | 3 | 37,595.11 | |
| 0043575 | Freeport, City of | No | Single Fmly | 2 | 3,093.64 | |
| 0041928 | Freeport, City of | No | Othr-Nonres | 2 | 4,653.00 | |
| 0068005 | Freeport, City of | No | Assmd Condo | 2 | 18,884.44 | |
| 0038996 | Freeport, City of | No | Single Fmly | 2 | 15,199.95 | |
| 0068010 | Freeport, City of | Yes | Single Fmly | 3 | 39,762.98 | |
| 0038133 | Freeport, City of | Yes | Single Fmly | 3 | 53,028.00 | |
| 0118889 | Freeport, City of | No | Single Fmly | 2 | 21,511.66 | |
| 0037909 | Freeport, City of | No | Single Fmly | 3 | 6,625.65 | |
| 0016077 | Freeport, City of | No | Othr-Nonres | 3 | 30,482.58 | |
| 0068011 | Freeport, City of | No | Other Resid | 2 | 11,460.97 | |
| 0018323 | Freeport, City of | No | Assmd Condo | 2 | 20,770.53 | |
| 0026090 | Freeport, City of | No | Single Fmly | 2 | 4,665.56 | |
| 0026147 | Freeport, City of | No | Single Fmly | 3 | 12,154.49 | |
| 0068013 | Freeport, City of | No | Single Fmly | 2 | 11,169.06 | |
| 0043786 | Freeport, City of | No | Single Fmly | 2 | 14,906.40 | |
| 0157859 | Freeport, City of | No | Single Fmly | 3 | 305,681.41 | MVU |
| 0068017 | Freeport, City of | No | Single Fmly | 2 | 7,927.30 | |
| 0041487 | Hillcrest Village, City of | No | Single Fmly | 2 | 8,254.14 | |
| 0017489 | Hillcrest Village, City of | No | Single Fmly | 2 | 14,956.29 | |
| 0026419 | Hillcrest Village, City of | No | Single Fmly | 2 | 25,202.95 | |
| 0017526 | Hillcrest Village, City of | No | Single Fmly | 2 | 17,237.97 | |
| 0068839 | Hillcrest Village, City of | No | Single Fmly | 7 | 47,962.71 | |
| 0026834 | Hillcrest Village, City of | No | Single Fmly | 2 | 34,157.43 | |
| 0258592 | Holiday Lakes, Town of | Yes | Single Fmly | 2 | 97,300.00 | P |
| 0071503 | Iowa Colony, City of | Yes | Single Fmly | 4 | 171,947.87 | V |
| 0115661 | Iowa Colony, City of | No | Single Fmly | 3 | 43,782.28 | |
| 0194832 | Iowa Colony, City of | No | Single Fmly | 2 | 61,034.14 | |
| 0168456 | Iowa Colony, City of | No | Single Fmly | 2 | 53,831.52 | |
| 0071470 | Iowa Colony, City of | No | Single Fmly | 8 | 225,486.74 | VU |
| 0125959 | Iowa Colony, City of | Yes | Single Fmly | 3 | 78,161.05 | |
| 0068014 | Jones Creek, Village of | No | Single Fmly | 3 | 21,389.25 | |
| 0122117 | Jones Creek, Village of | No | Single Fmly | 2 | 70,446.44 | |
| 0025677 | Jones Creek, Village of | Yes | Single Fmly | 5 | 27,333.54 | |
| 0038948 | Jones Creek, Village of | No | Single Fmly | 2 | 11,642.73 | |
| 0250744 | Jones Creek, Village of | Yes | Single Fmly | 3 | 157,447.50 | |
| 0252007 | Jones Creek, Village of | Yes | Single Fmly | 2 | 56,482.83 | |
| 0040361 | Jones Creek, Village of | No | Single Fmly | 2 | 10,855.32 | |
| 0043309 | Jones Creek, Village of | No | Single Fmly | 2 | 22,429.73 | |
| 0017575 | Jones Creek, Village of | Yes | Single Fmly | 2 | 31,198.14 | |
| 0068015 | Jones Creek, Village of | No | Single Fmly | 2 | 3,341.31 | |
| 0036431 | Jones Creek, Village of | No | Single Fmly | 2 | 4,866.04 | |
| 0040963 | Jones Creek, Village of | No | Single Fmly | 2 | 15,200.19 | PU |
| 0015139 | Jones Creek, Village of | No | Single Fmly | 5 | 95,938.88 | VU |
| 0017586 | Jones Creek, Village of | No | Single Fmly | 2 | 22,370.51 | PU |

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| 0045643 | Jones Creek, Village of | No | Single Fmly | 2 | 11,487.33 | |
| 0025664 | Jones Creek, Village of | No | Single Fmly | 2 | 10,986.69 | |
| 0017462 | Lake Jackson, City of | No | Single Fmly | 4 | 14,929.74 | |
| 0119858 | Lake Jackson, City of | Yes | Single Fmly | 2 | 19,633.38 | |
| 0259643 | Lake Jackson, City of | Yes | Single Fmly | 2 | 94,094.35 | |
| 0106780 | Lake Jackson, City of | No | Single Fmly | 3 | 11,723.38 | |
| 0025754 | Lake Jackson, City of | Yes | Single Fmly | 3 | 19,568.49 | |
| 0119194 | Lake Jackson, City of | No | Single Fmly | 2 | 44,042.08 | |
| 0168452 | Lake Jackson, City of | Yes | Single Fmly | 2 | 4,195.11 | |
| 0026758 | Lake Jackson, City of | Yes | Single Fmly | 4 | 21,998.72 | |
| 0088134 | Lake Jackson, City of | No | Single Fmly | 2 | 5,508.31 | |
| 0017508 | Lake Jackson, City of | No | Othr-Nonres | 3 | 18,385.24 | |
| 0044710 | Lake Jackson, City of | No | Single Fmly | 3 | 30,525.53 | |
| 0043556 | Lake Jackson, City of | No | Othr-Nonres | 2 | 21,287.90 | |
| 0046816 | Lake Jackson, City of | No | Single Fmly | 3 | 35,478.46 | |
| 0045242 | Lake Jackson, City of | No | Othr-Nonres | 2 | 12,084.23 | |
| 0040369 | Lake Jackson, City of | No | Single Fmly | 4 | 15,364.62 | |
| 0049728 | Lake Jackson, City of | Yes | Single Fmly | 3 | 10,499.62 | |
| 0025828 | Lake Jackson, City of | No | Single Fmly | 3 | 11,097.79 | |
| 0044504 | Lake Jackson, City of | No | Single Fmly | 2 | 9,832.78 | |
| 0045288 | Liverpool, City of | No | Single Fmly | 2 | 14,491.03 | |
| 0044125 | Liverpool, City of | Yes | Single Fmly | 2 | 17,008.00 | |
| 0123863 | Liverpool, City of | No | Single Fmly | 2 | 39,559.22 | |
| 0045103 | Liverpool, City of | No | Single Fmly | 2 | 19,224.77 | |
| 0034320 | Manvel, City of | No | Single Fmly | 2 | 11,537.70 | |
| 0113964 | Manvel, City of | Yes | Single Fmly | 3 | 44,401.14 | |
| 0069918 | Manvel, City of | No | Single Fmly | 2 | 11,429.82 | |
| 0121370 | Manvel, City of | No | Single Fmly | 2 | 29,600.60 | |
| 0116004 | Manvel, City of | No | Single Fmly | 2 | 19,469.65 | |
| 0242161 | Manvel, City of | Yes | Single Fmly | 3 | 76,454.03 | |
| 0116812 | Manvel, City of | No | Single Fmly | 3 | 43,433.95 | |
| 0017435 | Manvel, City of | Sdf | Single Fmly | 5 | 154,364.25 | V |
| 0116813 | Manvel, City of | Yes | Single Fmly | 3 | 64,767.24 | |
| 0168804 | Manvel, City of | Yes | Single Fmly | 2 | 71,770.74 | |
| 0083536 | Manvel, City of | No | Single Fmly | 3 | 115,009.07 | |
| 0081789 | Manvel, City of | No | Single Fmly | 4 | 104,351.99 | VU |
| 0005609 | Manvel, City of | No | Single Fmly | 3 | 28,411.65 | |
| 0069001 | Manvel, City of | No | Single Fmly | 2 | 16,920.62 | |
| 0115730 | Manvel, City of | No | Single Fmly | 4 | 49,163.31 | |
| 0045537 | Manvel, City of | No | Single Fmly | 6 | 265,874.07 | VU |
| 0116833 | Manvel, City of | No | Single Fmly | 3 | 65,597.68 | |
| 0026047 | Manvel, City of | No | Single Fmly | 5 | 53,529.20 | |
| 0115660 | Manvel, City of | No | Othr-Nonres | 3 | 55,492.42 | |
| 0114624 | Manvel, City of | Yes | Single Fmly | 2 | 45,729.99 | |
| 0071462 | Manvel, City of | Yes | Single Fmly | 4 | 235,670.65 | |
| 0026780 | Manvel, City of | No | Single Fmly | 7 | 169,215.30 | VU |
| 0169495 | Manvel, City of | Yes | Single Fmly | 2 | 94,575.53 | |
| 0071457 | Manvel, City of | No | Single Fmly | 2 | 10,134.35 | |
| 0258291 | Manvel, City of | Yes | Single Fmly | 2 | 139,468.63 | |
| 0038723 | Manvel, City of | Yes | Single Fmly | 3 | 35,781.48 | |
| 0043388 | Manvel, City of | No | Single Fmly | 2 | 36,752.39 | |
| 0038814 | Manvel, City of | No | Single Fmly | 2 | 17,929.48 | |
| 0124247 | Oyster Creek, City of | No | Assmd Condo | 2 | 218,139.46 | |
| 0121436 | Oyster Creek, City of | No | Single Fmly | 3 | 18,488.47 | |

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|---------|-------------------------|-----|-------------|---|------------|-----|
| 0119539 | Oyster Creek, City of | Yes | Single Fmly | 4 | 15,235.82 | |
| 0025696 | Oyster Creek, City of | No | Single Fmly | 2 | 7,528.31 | |
| 0016013 | Oyster Creek, City of | No | Single Fmly | 2 | 12,647.57 | |
| 0026118 | Oyster Creek, City of | No | Othr-Nonres | 2 | 8,697.51 | |
| 0025581 | Oyster Creek, City of | No | Othr-Nonres | 2 | 6,395.23 | |
| 0025363 | Oyster Creek, City of | No | Single Fmly | 2 | 8,169.53 | |
| 0181880 | Quintana, Town of | No | Single Fmly | 2 | 14,803.31 | |
| 0017261 | Richwood, City of | No | Single Fmly | 2 | 54,194.00 | |
| 0044101 | Richwood, City of | No | Single Fmly | 2 | 4,556.37 | |
| 0045839 | Richwood, City of | Sdf | Othr-Nonres | 6 | 84,780.62 | PN |
| 0040112 | Richwood, City of | No | Single Fmly | 2 | 4,414.86 | |
| 0045729 | Richwood, City of | No | Single Fmly | 7 | 69,719.97 | VU |
| 0018502 | Richwood, City of | Yes | Single Fmly | 4 | 32,091.63 | |
| 0128028 | Richwood, City of | Yes | Single Fmly | 4 | 87,207.94 | |
| 0244402 | Richwood, City of | No | Single Fmly | 2 | 11,602.69 | |
| 0183782 | Richwood, City of | No | Single Fmly | 2 | 7,189.92 | |
| 0017585 | Richwood, City of | No | Single Fmly | 7 | 79,630.85 | VU |
| 0048476 | Richwood, City of | No | Single Fmly | 3 | 16,320.09 | |
| 0183771 | Surfside Beach, City of | Yes | Single Fmly | 2 | 108,366.00 | |
| 0183772 | Surfside Beach, City of | No | Single Fmly | 2 | 88,098.48 | |
| 0186536 | Surfside Beach, City of | Yes | Single Fmly | 2 | 11,639.91 | |
| 0146331 | Surfside Beach, City of | Sdf | Single Fmly | 4 | 101,978.10 | V |
| 0179113 | Surfside Beach, City of | No | Single Fmly | 2 | 133,788.30 | |
| 0182772 | Surfside Beach, City of | Yes | Single Fmly | 2 | 135,556.81 | V |
| 0179186 | Surfside Beach, City of | No | Single Fmly | 2 | 235,742.49 | VU |
| 0177146 | Surfside Beach, City of | Yes | Single Fmly | 2 | 40,564.05 | |
| 0026214 | Surfside Beach, City of | No | Single Fmly | 4 | 11,234.86 | |
| 0178846 | Surfside Beach, City of | Yes | Single Fmly | 2 | 13,398.73 | |
| 0124243 | Surfside Beach, City of | No | Single Fmly | 2 | 4,337.48 | |
| 0124199 | Surfside Beach, City of | No | Single Fmly | 2 | 11,271.85 | |
| 0123745 | Surfside Beach, City of | No | Single Fmly | 3 | 40,345.81 | |
| 0124412 | Surfside Beach, City of | No | Single Fmly | 4 | 28,589.54 | |
| 0123939 | Surfside Beach, City of | Yes | Single Fmly | 3 | 25,589.92 | |
| 0179144 | Surfside Beach, City of | No | Single Fmly | 2 | 121,039.99 | VU |
| 0179071 | Surfside Beach, City of | Yes | Single Fmly | 2 | 38,447.21 | |
| 0178847 | Surfside Beach, City of | Yes | Single Fmly | 2 | 16,147.07 | |
| 0181073 | Surfside Beach, City of | No | Single Fmly | 2 | 3,595.00 | |
| 0124942 | Surfside Beach, City of | No | Single Fmly | 3 | 42,017.74 | |
| 0181197 | Surfside Beach, City of | Yes | Single Fmly | 2 | 14,617.30 | |
| 0068621 | Surfside Beach, City of | No | Othr-Nonres | 9 | 448,968.69 | PNU |
| 0123948 | Surfside Beach, City of | Yes | Single Fmly | 3 | 18,805.86 | |
| 0124313 | Surfside Beach, City of | No | Single Fmly | 3 | 51,876.65 | |
| 0181068 | Surfside Beach, City of | No | Othr-Nonres | 2 | 138,955.94 | |
| 0123949 | Surfside Beach, City of | Yes | Othr-Nonres | 2 | 20,036.99 | |
| 0119586 | Surfside Beach, City of | Sdf | Othr-Nonres | 4 | 229,942.97 | PN |
| 0162115 | Surfside Beach, City of | No | Other Resid | 2 | 19,212.80 | |
| 0132860 | Surfside Beach, City of | No | Single Fmly | 5 | 38,298.27 | |
| 0119838 | Surfside Beach, City of | Sdf | Single Fmly | 4 | 111,166.20 | V |
| 0124577 | Surfside Beach, City of | No | Single Fmly | 2 | 20,085.00 | |
| 0124214 | Surfside Beach, City of | No | Single Fmly | 2 | 10,192.00 | |
| 0182776 | Surfside Beach, City of | No | Single Fmly | 2 | 16,948.66 | |
| 0098410 | Surfside Beach, City of | No | Othr-Nonres | 4 | 293,530.78 | VNU |
| 0119315 | Surfside Beach, City of | No | Single Fmly | 3 | 12,279.14 | |
| 0124221 | Surfside Beach, City of | No | Single Fmly | 3 | 68,279.12 | |

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|---------|-------------------------|-----|-------------|---|------------|---|
| 0045738 | Surfside Beach, City of | Sdf | Othr-Nonres | 6 | 336,596.20 | |
| 0124345 | Surfside Beach, City of | No | Single Fmly | 2 | 13,396.43 | |
| 0181066 | Surfside Beach, City of | Yes | Single Fmly | 2 | 25,900.87 | |
| 0098357 | Surfside Beach, City of | No | Single Fmly | 4 | 59,261.97 | |
| 0132884 | Surfside Beach, City of | No | Single Fmly | 3 | 67,926.05 | |
| 0183053 | Surfside Beach, City of | No | Single Fmly | 2 | 35,728.78 | |
| 0123978 | Surfside Beach, City of | No | Single Fmly | 2 | 6,341.00 | |
| 0181827 | Surfside Beach, City of | No | Single Fmly | 2 | 122,096.60 | |
| 0048327 | Surfside Beach, City of | No | Single Fmly | 2 | 5,376.49 | |
| 0179695 | Surfside Beach, City of | Yes | Single Fmly | 2 | 26,239.99 | |
| 0181171 | Surfside Beach, City of | No | Single Fmly | 2 | 28,170.70 | |
| 0118915 | Surfside Beach, City of | No | Single Fmly | 3 | 38,409.75 | |
| 0182768 | Surfside Beach, City of | No | Othr-Nonres | 2 | 153,069.79 | |
| 0124408 | Surfside Beach, City of | No | Single Fmly | 2 | 50,778.81 | |
| 0123962 | Surfside Beach, City of | No | Single Fmly | 3 | 51,792.11 | |
| 0118747 | Surfside Beach, City of | No | Single Fmly | 3 | 22,116.97 | |
| 0254975 | Surfside Beach, City of | Yes | Single Fmly | 2 | 35,723.07 | |
| 0015175 | Surfside Beach, City of | Yes | Single Fmly | 5 | 25,410.73 | |
| 0181267 | Surfside Beach, City of | Yes | Single Fmly | 3 | 26,790.91 | |
| 0181732 | Surfside Beach, City of | Yes | Single Fmly | 2 | 10,600.84 | |
| 0124201 | Surfside Beach, City of | No | Single Fmly | 3 | 94,363.14 | |
| 0180876 | Surfside Beach, City of | No | Single Fmly | 2 | 18,348.40 | |
| 0124289 | Surfside Beach, City of | Yes | Single Fmly | 3 | 20,677.02 | |
| 0157057 | Surfside Beach, City of | No | Single Fmly | 2 | 42,782.51 | |
| 0121662 | Surfside Beach, City of | Yes | Othr-Nonres | 3 | 90,587.36 | |
| 0184358 | Surfside Beach, City of | Yes | Single Fmly | 2 | 19,498.18 | |
| 0181076 | Surfside Beach, City of | No | Single Fmly | 2 | 19,282.14 | |
| 0178982 | Surfside Beach, City of | No | Single Fmly | 2 | 13,935.77 | |
| 0182770 | Surfside Beach, City of | Yes | Single Fmly | 2 | 14,016.04 | |
| 0178845 | Surfside Beach, City of | No | Single Fmly | 2 | 10,521.10 | |
| 0026825 | Surfside Beach, City of | No | Othr-Nonres | 2 | 4,297.71 | |
| 0179062 | Surfside Beach, City of | Yes | Single Fmly | 3 | 54,989.88 | |
| 0181245 | Surfside Beach, City of | No | Single Fmly | 2 | 18,022.73 | |
| 0180243 | Surfside Beach, City of | Yes | Single Fmly | 2 | 17,217.73 | |
| 0184498 | Surfside Beach, City of | No | Single Fmly | 2 | 12,818.41 | |
| 0180196 | Surfside Beach, City of | No | Single Fmly | 2 | 20,340.72 | |
| 0181074 | Surfside Beach, City of | No | Single Fmly | 2 | 16,355.66 | |
| 0146325 | Surfside Beach, City of | No | Single Fmly | 2 | 32,396.36 | |
| 0124575 | Surfside Beach, City of | Yes | Single Fmly | 3 | 12,725.08 | |
| 0182962 | Surfside Beach, City of | No | Single Fmly | 2 | 20,371.95 | |
| 0181075 | Surfside Beach, City of | No | Single Fmly | 2 | 40,452.31 | |
| 0183235 | Surfside Beach, City of | Yes | Single Fmly | 2 | 5,591.27 | |
| 0180083 | Surfside Beach, City of | Yes | Single Fmly | 2 | 18,333.21 | |
| 0213522 | Surfside Beach, City of | No | Single Fmly | 2 | 95,306.64 | |
| 0178848 | Surfside Beach, City of | Yes | Single Fmly | 2 | 17,997.58 | |
| 0157071 | Surfside Beach, City of | Yes | Single Fmly | 3 | 27,215.20 | |
| 0044060 | Surfside Beach, City of | Sdf | Single Fmly | 5 | 49,744.35 | V |
| 0178966 | Surfside Beach, City of | Yes | Single Fmly | 2 | 28,607.98 | |
| 0123813 | Surfside Beach, City of | Yes | Single Fmly | 3 | 37,852.65 | |
| 0178994 | Surfside Beach, City of | No | Single Fmly | 2 | 12,904.98 | |
| 0123953 | Surfside Beach, City of | Yes | Single Fmly | 3 | 55,539.14 | |
| 0182965 | Surfside Beach, City of | No | Single Fmly | 2 | 27,651.10 | |
| 0124022 | Surfside Beach, City of | No | Single Fmly | 2 | 5,662.47 | |
| 0180093 | Surfside Beach, City of | No | Single Fmly | 2 | 42,939.23 | |

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| 0180148 | Surfside Beach, City of | No | Single Fmly | 2 | 33,508.92 | |
| 0124437 | Surfside Beach, City of | Sdf | Single Fmly | 4 | 50,925.06 | V |
| 0042831 | Surfside Beach, City of | Yes | Single Fmly | 6 | 34,125.81 | |
| 0016107 | Surfside Beach, City of | No | Single Fmly | 3 | 5,679.55 | |
| 0181414 | Surfside Beach, City of | No | Single Fmly | 2 | 52,969.15 | |
| 0178988 | Surfside Beach, City of | Yes | Single Fmly | 2 | 71,907.14 | |
| 0119166 | Surfside Beach, City of | No | Single Fmly | 4 | 27,126.08 | |
| 0177170 | Surfside Beach, City of | No | Single Fmly | 3 | 81,299.53 | |
| 0189639 | Surfside Beach, City of | Yes | Single Fmly | 2 | 19,710.15 | |
| 0124230 | Surfside Beach, City of | Yes | Single Fmly | 3 | 26,467.53 | |
| 0179059 | Surfside Beach, City of | No | Single Fmly | 2 | 72,904.44 | |
| 0026820 | Surfside Beach, City of | No | Assmd Condo | 5 | 145,196.64 | |
| 0182963 | Surfside Beach, City of | No | Single Fmly | 2 | 11,095.06 | |
| 0119169 | Surfside Beach, City of | No | Single Fmly | 3 | 124,441.35 | |
| 0025947 | Surfside Beach, City of | No | Single Fmly | 2 | 8,216.89 | |
| 0178983 | Surfside Beach, City of | Yes | Single Fmly | 2 | 23,464.34 | |
| 0178765 | Surfside Beach, City of | No | Single Fmly | 2 | 11,551.50 | |
| 0124245 | Surfside Beach, City of | No | Single Fmly | 2 | 11,044.41 | |
| 0181198 | Surfside Beach, City of | Yes | Single Fmly | 2 | 22,333.71 | |
| 0182767 | Surfside Beach, City of | No | Single Fmly | 2 | 5,528.24 | |
| 0182961 | Surfside Beach, City of | No | Single Fmly | 2 | 50,348.99 | |
| 0124372 | Surfside Beach, City of | No | Single Fmly | 3 | 38,543.24 | |
| 0181771 | Surfside Beach, City of | Yes | Single Fmly | 2 | 32,296.42 | |
| 0037907 | Surfside Beach, City of | No | Othr-Nonres | 2 | 17,536.10 | |
| 0038438 | Surfside Beach, City of | No | Assmd Condo | 3 | 28,024.00 | |
| 0046398 | Surfside Beach, City of | No | Single Fmly | 2 | 8,966.30 | |
| 0026192 | Surfside Beach, City of | No | Othr-Nonres | 3 | 32,579.50 | |
| 0048324 | Surfside Beach, City of | No | Othr-Nonres | 3 | 11,169.47 | |
| 0016111 | Surfside Beach, City of | No | Othr-Nonres | 2 | 31,692.88 | |
| 0026430 | Surfside Beach, City of | No | Single Fmly | 2 | 5,346.10 | |
| 0182164 | Surfside Beach, City of | No | Single Fmly | 2 | 72,015.36 | |
| 0124574 | Surfside Beach, City of | No | Single Fmly | 3 | 33,366.43 | |
| 0151758 | Surfside Beach, City of | No | Single Fmly | 2 | 28,150.67 | |
| 0119587 | Surfside Beach, City of | No | Single Fmly | 3 | 21,761.81 | |
| 0157854 | Surfside Beach, City of | No | Single Fmly | 3 | 146,124.03 | |
| 0025708 | Surfside Beach, City of | No | Single Fmly | 4 | 112,965.98 | |
| 0025460 | Surfside Beach, City of | No | Single Fmly | 6 | 38,288.90 | MVU |
| 0181072 | Surfside Beach, City of | No | Single Fmly | 2 | 193,965.11 | |
| 0191655 | Surfside Beach, City of | No | Single Fmly | 2 | 76,672.32 | |
| 0151760 | Surfside Beach, City of | No | Single Fmly | 2 | 60,574.59 | |
| 0111176 | Surfside Beach, City of | No | Single Fmly | 3 | 66,842.86 | |
| 0180870 | Surfside Beach, City of | No | Single Fmly | 2 | 57,958.90 | |
| 0124421 | Surfside Beach, City of | No | Single Fmly | 4 | 137,297.76 | |
| 0119801 | Surfside Beach, City of | No | Single Fmly | 3 | 151,870.78 | |
| 0124016 | Surfside Beach, City of | No | Othr-Nonres | 2 | 64,857.31 | |
| 0124200 | Surfside Beach, City of | No | Single Fmly | 3 | 115,543.81 | MVU |
| 0124463 | Surfside Beach, City of | No | Othr-Nonres | 3 | 548,942.69 | |
| 0184784 | Surfside Beach, City of | Yes | Single Fmly | 2 | 73,084.49 | |
| 0123952 | Surfside Beach, City of | No | Single Fmly | 4 | 14,151.98 | |
| 0005637 | Sweeny, City of | No | Single Fmly | 5 | 104,788.96 | VU |
| 0076282 | Sweeny, City of | Yes | Single Fmly | 4 | 57,125.85 | |
| 0068234 | Sweeny, City of | Sdf | Single Fmly | 5 | 103,772.84 | V |
| 0120587 | Sweeny, City of | Yes | Single Fmly | 4 | 259,322.43 | |
| 0042598 | Sweeny, City of | No | Single Fmly | 5 | 104,429.51 | VU |

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| 0195023 | Sweeny, City of | Yes | Single Fmly | 3 | 12,263.41 | |
| 0103528 | Sweeny, City of | No | Othr-Nonres | 3 | 53,012.05 | |
| 0239143 | West Columbia, City of | Yes | Assmd Condo | 2 | 87,761.65 | |
| 0097231 | West Columbia, City of | No | Single Fmly | 3 | 43,517.27 | |
| 0096730 | West Columbia, City of | No | Single Fmly | 2 | 53,860.71 | |
| 0026747 | West Columbia, City of | No | Single Fmly | 2 | 11,048.00 | |
| 0026123 | West Columbia, City of | No | Single Fmly | 2 | 38,123.01 | PU |
| 0001026 | West Columbia, City of | No | Single Fmly | 10 | 147,014.56 | VU |
| 0033821 | West Columbia, City of | No | Single Fmly | 4 | 53,837.13 | |
| 0119323 | West Columbia, City of | No | Single Fmly | 2 | 6,923.77 | |
| 0096729 | West Columbia, City of | No | Single Fmly | 2 | 9,630.81 | |
| 0118936 | West Columbia, City of | No | Single Fmly | 2 | 6,996.76 | |
| 0260848 | West Columbia, City of | Yes | Single Fmly | 2 | 55,425.58 | |
| 0195149 | West Columbia, City of | Sdf | Single Fmly | 5 | 52,285.54 | V |
| 0042422 | West Columbia, City of | No | Single Fmly | 3 | 8,146.47 | |
| 0098916 | West Columbia, City of | No | Single Fmly | 3 | 58,431.99 | |

Appendix E – Future Mitigation Strategies and Action Items

ORDINANCE NO. 24-515

AN ORDINANCE CANCELLING THE MAY 4, 2024 GENERAL ELECTION AND DECLARING EACH UNOPPOSED CANDIDATE ELECTED TO OFFICE; PROVIDING THAT THIS ORDINANCE SHALL BE CUMULATIVE OF ALL ORDINANCES; PROVIDING FOR A SEVERABILITY CLAUSE; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the City of Richwood, Texas, is a home-rule municipality located in Brazoria County, created in accordance with the provisions of Chapter 5, Article XI of the Constitution of Texas and defined by Section 1.005 of the Local Government Code; and

WHEREAS, in accordance with law a general election has been ordered for May 4, 2024 for the purpose of electing council members to serve on the City Council in the City of Richwood; and

WHEREAS, no proposition is to appear on the ballot in that election; and

WHEREAS, the City Secretary has certified in writing that each candidate on the ballot is unopposed for election to office; and

WHEREAS, the filing deadlines for placement on the ballot and declaration of write-in candidacy has passed; and

WHEREAS, in these circumstances Subchapter C of Chapter 2 of the Election Code authorizes a governing body to declare each unopposed candidate elected to office and cancel the election.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF RICHWOOD, TEXAS, THAT:

Section 1: The following candidates, who are unopposed in the May 4, 2024, general election are hereby elected to office and shall be issued a certificate of election:

- | | |
|-------------|-----------------|
| Position #1 | Paul Stallberg |
| Position #4 | William Yearsin |
| Position #5 | Jeremy Fountain |

Section 2: The City Secretary is directed to post a copy of this ordinance at each designated polling place on May 4, 2024.

Section 3: This ordinance shall be cumulative of all provisions of ordinances of the City of

Richwood, except where the provisions of this ordinance are in direct conflict with the provisions of such ordinances, in which event the conflicting provisions of such ordinances are hereby repealed.

Section 4: It is hereby declared to be the intention of the city council that the phrases, clauses, sentences, paragraphs, and sections of this ordinance are severable, and if any phrase, clause, sentence, paragraph, or section of this ordinance shall be declared unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs, and sections of this ordinance, since the city council would have enacted the same without the incorporation of this ordinance of any such unconstitutional phrase, clause, sentence, paragraph or section.

Section 5: This ordinance shall be in full force and effect from and after its passage, and it is so ordained.

PASSED AND APPROVED ON THIS 11th DAY OF MARCH 2024.

Michael Durham, Mayor

ATTEST:

Kirsten Garcia, City Secretary

**CERTIFICATION OF UNOPPOSED CANDIDATES FOR OTHER
POLITICAL SUBDIVISIONS (NOT COUNTY)
CERTIFICACIÓN DE CANDIDATOS ÚNICOS
PARA OTRAS SUBDIVISIONES POLITICAS (NO EL CONDADO)**

To: Presiding Officer of Governing Body
Al: Presidente de la entidad gobernante

As the authority responsible for having the official ballot prepared, I hereby certify that the following candidates are unopposed for election to office for the election scheduled to be held on May 4, 2024.

Como autoridad a cargo de la preparación de la boleta de votación oficial, por la presente certifico que los siguientes candidatos son candidatos únicos para elección para un cargo en la elección que se llevará a cabo el 4 de Mayo 2024.

List offices and names of candidates:
Lista de cargos y nombres de los candidatos:

| Office(s) Cargo(s) | Candidate(s) Candidato(s) |
|----------------------------------|----------------------------------|
| <i>Council Member Position 1</i> | <i>Paul Stallberg</i> |
| <i>Council Member Position 4</i> | <i>William Yearsin</i> |
| <i>Council Member Position 5</i> | <i>Jeremy Fountain</i> |



Signature (*Firma*)

Kirsten Garcia

Printed name (*Nombre en letra de molde*)

(Seal) (*sello*)

City Secretary

Title (*Puesto*)

02/27/2024

Date of signing (*Fecha de firma*)



In the name and by the authority of
The State of Texas

THIS IS TO CERTIFY, pursuant to Ordinance Number 515, adopted
March 11, 2024, cancelling the election that was scheduled to be held on
May 4, 2024.

Jeremy Fountain

was duly elected

City Council Position 5

In testimony whereof, I have hereunto signed my
name and caused the Seal of the City of Richwood
to be affixed this 11th day of March, 2024.

Michael Durham, Mayor



In the name and by the authority of
The State of Texas

THIS IS TO CERTIFY, pursuant to Ordinance Number 515, adopted
March 11, 2024, cancelling the election that was scheduled to be held on
May 4, 2024.

William Yearsin

was duly elected

City Council Position 4

In testimony whereof, I have hereunto signed my
name and caused the Seal of the City of Richwood
to be affixed this 11th day of March, 2024.

Michael Durham, Mayor



In the name and by the authority of
The State of Texas

THIS IS TO CERTIFY, pursuant to Ordinance Number 515, adopted
March 11, 2024, cancelling the election that was scheduled to be held on
May 4, 2024.

Paul Stallberg

was duly elected

City Council Position 1

In testimony whereof, I have hereunto signed my
name and caused the Seal of the City of Richwood
to be affixed this 11th day of March, 2024.

Michael Durham, Mayor

City of Richwood

— TEXAS —

Agenda Memorandum

Contact: Clif Custer

Subject: Vehicle and Equipment GPS Tracking

Summary: A priority of Public Works is the tracking of fleet vehicles and equipment for the purposes of theft protection, location, manner and time in which vehicles and equipment are operated, and for noting preventative maintenance milestones. Public Works feels it is imperative to employ a tracking system for the purposes of security and preventative maintenance practices to best protect the city's investment.

Background Information: Public works has researched a few different companies that fully encompass capabilities of tracking equipment and vehicles for both purposes of noting location and times that vehicles and equipment are being operated, as well as noting preventative maintenance actions based on OEM service manuals.

One Step GPS offers not only possesses capabilities of tracking vehicles and equipment location, but also allows the ability to generate reports noting when preventative maintenance is due, or service milestones have been reached. Software capabilities for vehicles include location, speed, idle time, start/stop times, breaking patterns, odometer readings, check engine light notifications, etc. Basic data entry for individual vehicles or heavy equipment allows staff to begin relying on software to provide reminders for necessary preventative maintenance in the form of oil changes, tire rotations, factory recommended maintenance milestones, etc. Baseline data entered into specific fields within the software updates in real time. Based on maintenance actions entered for mileage thresholds, the software will post notification when a given maintenance action is required. Other capabilities of the software offer setting of location boundaries and mobile device alerts.

Issue:

Fiscal Impact: One Step GPS has no initial costs for tracking equipment. Activation fees for any vehicle or piece of equipment include:

One-Time Fee

First Month Payment = \$13.95

Last Month Payment (Deposit – refunded upon termination of service) = \$13.95

Activation Fee = \$20.00

Recurring Fee

\$13.95 per month, per unit.

Richwood's fleet vehicles and equipment proposed for tracking include 7 vehicles, 1 skid steer, and 2 excavators.

Total Start-Up Costs = \$479.00

Recurring costs (Annual Basis) = \$1,674.00

Recommendation: I recommend that Council make a motion allowing Public Works to equip 7 vehicles and 3 pieces of heavy equipment with One Step GPS hardware.

2020 GPS FLEET TRACKING BUYERS GUIDE

This buyer's guide is designed with one purpose in mind: to help you find the best possible GPS fleet tracking system for your needs.

We hear many questions here at One Step GPS. "Are all GPS fleet tracking devices and companies the same?" "They all look the same, who do I pick?" "What sets one company apart from the next?" "Should I just buy the cheapest one?" "Should I buy the most expensive one?"

This guide is meant to empower you to find the best product FOR YOU, be it ours or another company.

In the following pages we'll discuss:

- How GPS tracking works
- Different types of devices
- Answers to common questions
- How to present GPS tracking to your employees

But first, let's dive into the factors that set different companies apart to provide you with a list of questions you can ask when shopping.

PART 1:

COMPARING GPS TRACKING COMPANIES

Not all devices GPS tracking devices and companies are created equal. There are many differences between companies, many of which don't exactly catch the eye of the untrained observer.

Upfront cost and monthly fee

This is not always readily available. Most companies don't put prices on their websites because they don't want to scare you away with how much it can cost. But we are going to come right out and say it: As of this writing in 2020, prices can range from \$15 to \$60 a month.

Some companies will require you to purchase equipment or pay large deposits to start. These can be daunting when you are implementing a system for the first time. While GPS tracking will save your company money in the long run, up front costs will make it take longer to break even on your investment.

Find a good company that offers what you need at an affordable price.

The actual cost of equipment

What is the cost of the GPS devices themselves? Do you have to purchase upgrades when technology is outdated? What if a device breaks? It is also important to find out the cost of replacement.

Is a contract required?

Contracts originally were used to safeguard the GPS company's resources, but they are coming to be a thing of the past. The problem is, technology moves fast, and markets and industries change even faster. If you're locked into a contract, you will most likely get stuck with old technology. GPS service contracts also decrease the necessity for a GPS company to provide superlative service. The thinking apparently goes that when you're under contract, you're stuck with them no matter what — so who cares about customer service? You're not going anywhere. Some contracts even state the company cannot guarantee that service will be uninterrupted, error-free ... or even accurate.

Another caution is companies that have contracts tend to have an automatic renewal 60 to 90 days before expiration. If you pick a company that has a contract, at least make sure it does not automatically renew. Circumstances can be much different by the time your contract is about to expire. You won't be locked into a contract at One Step GPS.

Installation cost

This can be tricky: the full cost of installation might not be apparent at first. Some GPS providers cover this cost if you sign a contract for a certain amount of time, but the tradeoff is that you are now locked in for a certain number of years. On top of that, it can take several months before they complete the installation, and you will still be paying for the service even though you aren't using it.

If the devices are cheap (as in, low-quality junk you might have to spend time or money to replace the device multiple times. Other GPS companies will only let their own staff touch the GPS devices, which can lead to logistical nightmares and unworkable schedules.

The bottom line: find a flexible solution that works for you. It might not always seem cheaper, but by asking the right questions you can determine what works best for you.

Money back guarantee

This is important because this is how you protect yourself and your money. What if the solution doesn't work as advertised? What if you realize there is something that you don't like, or the company can't install the devices, or they are not compatible with your vehicle? No matter how many questions you ask and how prepared you are, something can always go wrong. The best way to protect yourself is to find a company that has a Money Back Guarantee. We offer such a guarantee at One Step GPS.

Hardware Warranty

Is it **high-quality hardware**? Will it be problem free? There is one easy way to tell. Does it have a warranty, and if so, how long is the warranty? If not, forget it — the company doesn't stand behind their product. They know they will have warranty claims and lose money. The longer the warranty, the better, because a company that truly has a great product would warranty it forever. This is why we offer such a warranty.

Tracking update speed

This is how fast and how frequently new GPS coordinates are transmitted to your account for viewing and alerts. This lends a hand to how effective your system can be. In an extreme example, imagine if the device only updated once an hour — how would you know what people were doing? What if it was every 5 minutes: could you accurately see what roads they were taking, or how long they were stopped? And what about every 3 minutes? Think about how long 3 minutes is while you are driving. That's why you want the updates to be as close to real-time as possible.

How long is historic data available

Some companies only allow access to 60 to 90 days worth of data. That's not bad, but what if you need to look up something that happened four months ago? You don't know exactly when you will need the data, but you will sure wish you had it when something goes wrong. These companies will charge extra to provide data outside the 90 day window, and what you thought you were spending can suddenly increase.

Amount of time to get a representative on the phone

Your time is valuable. You shouldn't have to wait for customer service, period.

Cellular data provider

Most GPS companies rely on cellular data to transmit information from the device to your screen, but some companies will only use one network to provide service. This can create problems



because none of the major carriers cover the entire USA. If a company has access to two or three carriers, the odds dramatically increase that you will never see a lapse in coverage.

3G or 4G

Verizon has announced that they will decommission their 3G network on December 31st, 2019 while AT&T could follow suit by the end of 2021. If the company you rely on is using 3G devices, you could wind up having to pay extra to upgrade to new equipment as soon as this year. If a company utilizes 4G technology, it should be at least another 5 years before any devices will need to be upgraded.

Internal or External Antennas

The antennas on early GPS devices were so large that they had to be located outside the device. But cell phone technology has improved so much that antennas are now being placed inside GPS devices. Some companies have not evolved, so if you see an external antenna, you know you are using an older or cheaper device. More importantly, an external antenna is easier to interfere with, is more noticeable, and is harder to install. Seek out a company that uses the latest devices and save yourself a headache. At One Step GPS, we keep our devices updated with the latest technology at all times.

Allows Integrations (Open API)

This may not be important to you, but if it is, you will surely want access to it. API access allows companies to pull more sophisticated data and access the GPS information directly through custom-coded programming solutions. It can allow the program to work with things like fuel cards, maintenance platforms, dispatching, and more.

Complaints/Reviews

It is very easy to determine the quality of service and the type of company you are dealing with just by looking up their reviews on third-party sites like Google, Yelp, or the Better Business Bureau. Remember, most customers don't write reviews unless they've had an extremely bad or extremely good experience, so make sure to take individual reviews with a grain of salt. It's best to read a wide range of reviews to get an overall impression of what others have to say about the company.

Google Maps (Street, Satellite, live Traffic)

Google Maps has long been established as the industry standard in the mapping space. Not only is it the most widely used, it is also touted as the most accurate and highest-quality mapping system on the market. Any company using a free mapping system or their own proprietary system will not be as accurate as Google Maps.

Tamper/Disconnection Alerts

If your vehicle is being stolen, or someone doesn't want to be tracked, they will tamper with or disconnect the GPS. If this happens, you want to be notified immediately, as the sooner you can respond, the less potential for loss or harm will occur.

Does the company offer reports for important alerts?

The following alerts should minimally be offered: Speed & Unsafe driving alerts, Geofence/After Hours alerts, Idling Reports and Ignition ON/OFF Reports, DTC (Check engine light) alerts, Vehicle Maintenance & Reminders, Text and Email Alerts or Reports.

Mobile App (iOS and Android)

You will most likely want to be able to check in on GPS information when you are out of the office. Does the GPS service offer mobile apps that are compatible with the phones your company uses?

Unlimited users

How many people can view the system at the same time? And do you have to pay extra for this feature? It is better to know before you buy.

PART 2:

HOW GPS TRACKING WORKS

A GPS device is composed of a GPS receiver to get location, a cellular modem to transmit location, accelerometers to measure motion and driving behavior, and components which calculate and store data. A lot of data, in fact: it's possible to monitor how accurate the location is, whether the engine is on, off, or idling, current speed, fuel levels, check engine lights, and whether the device has been tampered with. There are even alerts for driving behavior such as harsh braking, fast acceleration, and unsafe cornering. This data can be accessed through a website, a phone app, or a desktop computer program.

GPS devices are typically installed under or behind the dash of a vehicle. The device is able to transmit the data to the GPS tracking companies' servers where it is processed by the company so it can be viewed, analyzed, put into reports and consumed easily to determine exactly where and what your employees are doing without having to leave your office. You no longer have to make phone calls asking where someone is or how long until they are done or even have to worry someone is not doing what they are supposed to be doing.



PART 3: DIFFERENT TYPES OF DEVICES

There are two main types of GPS devices for vehicles, and they each have benefits and drawbacks:

The Plug-in Device

This device plugs into the On Board Diagnostics II port, commonly known as the OBD-II. Installation is easy — just like charging a phone. The OBD-II plug is located underneath the dash, and all passenger and light commercial vehicles built after 1997 are federally mandated to have them within 3 feet of the steering wheel.

Some plug-in devices are more complex than others, with functionality to read fuel levels, throttle position, check engine lights, odometer, and much more.

Plug-in devices are common because they are easy to install. If you are concerned about employees removing the device, there are ways to make them less noticeable or more difficult to access. If the device is removed or disabled, it should immediately send an alert.



Pros:

- Quick and easy installation
- No wiring or electrical experience needed
- Tamper/disconnection alerts
- Engine diagnostics/check engine warnings

Cons:

- Can be easy to remove
- Can be noticeable
- Extra cables required to hide the device
- Small backup batteries

The Hardwired Device

This device is versatile because it can work with any power source. It doesn't matter what year it was made, and there are multiple places in the vehicle where it can be installed. This is generally used for a more discrete and tamper-proof installation or in vehicles that are not compatible with the OBD-II device.

Additionally, hardwired devices allow for add-ons that won't be found on plugin devices. These include features like driver identification, starter disable, Power Take Off monitoring (a way of monitoring when a component or accessory in a vehicle is activated or in use), and temperature sensors. They can come with internal or external antennas and a robust array of backup battery options.

Other than the additional work required for installation of a hardwired device, there are few differences between the hardwired and plug-in units unless you need the add-ons.



Pros:

- Tamper/Disconnection alerts
- More discrete, tamper-proof installation
- Larger backup battery
- Custom add-ons

Cons:

- More complex Installation
- Electrical experience required
- No engine diagnostic data
- Possible external antenna

Important data about GPS Devices

Not all devices are created equal. The cheap ones wear out and break down, causing more problems than they solve and costing you money. The only guarantee of accurate reliability is QUALITY.

Using a cheap device will lead to some if not all of the following:

- Disconnecting frequently
- Draining batteries
- Sending false alerts
- Appearing to be "offline" when the vehicle is moving
- Inaccurately reporting driving behavior
- Interfering with the vehicle computer system
- Breaking down quickly
- Simply not working at all

Our experience has shown that manufacturers with offices and headquarters in the United States tend to be more dependable. If your device fails or malfunctions, it's **much easier** to hold them accountable — so they want to make sure their product is solid. Make sure to find out if the manufacturer stands behind their product: Do they offer exchanges and returns? Do they have a warranty on the device? We uphold these standards ourselves at One Step GPS, and we encourage you to keep these points in mind when you are shopping for the best GPS solution.

PART 4:

ANSWERS TO COMMON QUESTIONS

Choosing the right GPS tracking platform is just as important as installing the right device. The platforms may appear to be similar, but using these systems reveals some important differences.

Like different types of phones or computers, GPS platforms share a lot of features: most customers need toolbars and maps, and every GPS system has these components. But what makes one better than another are benefits like speed, ease of access, the accuracy of data displayed, and the ability to configure and generate reports to get the information you need to run your business.

What are the benefits of GPS tracking?

With GPS tracking, businesses can monitor the routes their drivers take in order to minimize wasted time or reduce fuel costs. You might have a driver that takes longer routes, or one who drives in a way that consumes more fuel and leads to frequent repairs. Another factor to think with is the unauthorized use of company vehicles on nights and weekends. Maybe you don't mind if they take a quick trip to the grocery store on the way home from work, but what about abusing company equipment to hustle for side jobs on your dime? Plus some insurance companies will not cover company vehicles used for non-work related purposes. The point is this: with GPS tracking, you are in the know and you are in control.

Other benefits include:

- *Better customer service = improved customer retention.* When a customer calls and asks how long it will be until someone arrives, you can find out in an instant with GPS tracking. You don't need to call your employee and wait for them to answer - because you **already** have the data at your fingertips.
- *Efficient driver dispatching.* If you know exactly how much time someone has spent on a job, it is easy to find out how long it will be until a driver will be free — including which **driver** is closest — and you can view it all on a map which is easy to act on.

- *Reduction of unnecessary overtime.* if you have someone who makes an unauthorized stop at home or other places they shouldn't go, or if they take an extra-long lunch, this can extend the employee's day and artificially generate overtime.
- *Protection against false claims.* GPS tracking makes it effortless to prove to a customer how long you were at their location, when it was, and how often. This can prevent someone from saying you did not do the job you were paid to do.
- *Improved driver morale.* With your GPS tracking system in place, driver accountability is no longer an issue. You now have a tool to see when your employees are being productive, and you can act to reward good performance and increase production.

Good employees usually are reluctant to report on lazy or inefficient counterparts. More times than not, employees are aware of non-optimum behavior but are afraid to be a "snitch," and so they don't say anything. Because of this, good employees wind up carrying the majority of the workload, while the slackers get by without having to work. This has a negative effect on morale. But now you have the tool to improve unproductive workers.

Some employees fear GPS tracking because they don't want the scrutiny. But the truth of the matter is, in most cases GPS tracking is used to optimize efficiency, improve routes, ensure customer satisfaction and reduce liability. This also can allow you to have peace of mind about the whereabouts of your employees.



Does GPS tracking pay for itself?

Yes it does, and in more ways than one. Eliminating just one hour of unnecessary overtime per month can pay for the service. With improved efficiency, taking on that one extra job can be enough to shift your bottom line into the black. An accident avoided due to improved driving behavior can be worth an entire year of the service, recouping the outlay in an instant.

The success stories we have heard from our customers will help illustrate just some of the unexpected ways companies have saved money using GPS tracking.

For example, one company with a fleet of 20 vehicles saved \$8,000 in unnecessary payroll expenditure and over \$1,000 in fuel costs by eliminating unnecessary driving in just the first month!

Another customer recovered an expensive piece of equipment that had been stolen from a job site. When the police showed up at the location our GPS indicated, they were surprised to discover 14 additional stolen vehicles and pieces of equipment at a chop shop.

One Step GPS saved another customer \$6,000 he noticed that one of his vehicles was being driven two weekends in a row when it should have been parked. He decided to check it out, and when he arrived at the location, he found two of his employees doing a side job for a customer that should have gone to the company. On top of that, they were using company materials in the project and asking for cash.

One of our customers found a foreman of his taking several company employees to his own jobs — and the company was paying for it. He had “free” labor and the jobs the company was getting paid to do were taking longer to complete. That is, until our GPS tracking system exposed the fraud.

Finally, one company had an employee come in late one Monday. He said he had an accident on his way to work and totaled the vehicle on his way in. But when the company pulled up the GPS data to see what happened, it turned out that the vehicle had crashed the night before on the way home from a bar. Without that vital information, the same thing could have happened again, with no recourse for the company.



PART 5:

HOW TO PRESENT GPS TRACKING TO EMPLOYEES

Introducing GPS tracking to employees is a common concern for many businesses. By presenting the technology in the right way, employees will get a positive perception of the system when you explain how and why the technology will be used. This means having open conversations with employees, not leaving uncertainty in what might happen, and focusing on how it will actually benefit the employees themselves by protecting them from any dishonesty and fraud on the part of others.

One of the best ways to gain acceptance from employees is to discuss how GPS tracking actually benefits the employees themselves. It is important to show them how GPS tracking improves safety and makes operations much more efficient. And when a business operates at maximum efficiency, there is a direct impact on revenue — at which point higher pay, better working conditions and increased job security move into the realm of possibility. Implementation of a GPS tracking system can also be used to incentivize improvements to better serve your customers.

Inform your employees that your company is staying up on the current business technologies by instituting a new fleet management system that will allow the company to gain a competitive edge. The objective is to increase efficiency, resulting in a positive impact on customers and the company's bottom line.

Explaining how GPS tracking works

Describe the system and what it will record: engine status, location, speed, mileage, distance traveled, stop time, and what routes are taken. It's good to show an actual report generated on a day they drove a particular vehicle.

Next, provide them with an overview of the benefits the system will provide, from decreased insurance premiums to increased route management. If the subject of "big brother" comes up, don't avoid it — acknowledge it. Describe it as another tool used by company management to better run the company. GPS tracking is like a work order, time card, customer survey or any other tool to help run the business. It is a tool, nothing more, nothing less.

Here is an example of what one might say to introduce the system:

"Thank you all for joining me today. I would like to talk to you about a new system we are implementing in the next few days.



“In order to remain competitive and prosper in today’s market, it is important for us to monitor industry trends and stay ahead of the curve wherever we can. Electronic fleet management is changing and improving the way companies operate today. Because of this, we made an investment in a system that will ultimately help us be more efficient, have a positive impact on our customers, and hopefully improve our bottom line.

“The power of this system comes from the honesty and accountability it generates. Not just in the event that someone tries to take advantage of the rest of us from within our ranks — but what about clients and customers who lie and say you were late, when we all know you were there on time? The beauty of this GPS system is that it tells the truth, and as long as you do your job, you have job security here. Now if you have any questions or concerns, please let me know after this and we’ll get everything squared away and answered.”

It should not surprise your employees when they are held accountable for their behavior based on data gathered by the GPS tracking system. That is why it is a best practice to write policies for when and where GPS tracking will be used, and to share this information with your all your employees before taking any disciplinary actions. As long as employees understand what is expected and what will happen, there should be no backlash.



PART 6: COMPARISON CHECKLIST

You can use this checklist to compare the pros and cons of different GPS tracking companies.

| | One Step GPS | Second Option | Third Option |
|---|--------------|---------------|--------------|
| Price to start/monthly? | | | |
| Cost of equipment | | | |
| Contract(s) Required? | | | |
| Device update speed? | | | |
| Device Warranty? | | | |
| Money Back Guarantee? | | | |
| How long is history data stored? | | | |
| Time to get a representative on the phone | | | |
| Cell phone provider | | | |
| 3G or 4G | | | |
| Internal or External Antennas | | | |
| Allows Integrations (Open API) | | | |
| Reviews- ShopperApproved, Yelp, BBB, etc. | | | |
| Google Maps (Street, Satellite, live Traffic) | | | |
| Tamper/Disconnection Alerts. | | | |
| Speed, Geofence, After Hours Alerts | | | |
| Idling Reports and Ignition ON/OFF Reports | | | |
| Vehicle Maintenance & Reminders | | | |
| Text and Email Alerts | | | |
| Mobile App (iOS and Android) | | | |
| Unlimited user(s) | | | |
| Can be viewed from anywhere? | | | |