



JEFFERSON COUNTY DRAINAGE DISTRICT NO. 6 2016 HAZARD MITIGATION PLAN UPDATE

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EXECUTIVE SUMMARY

Jefferson County Drainage District No. Six (DD6) undertook development of this Mitigation Plan to protect public health, safety and welfare. The purpose of this Plan is to reduce or avoid the impacts of hazards by identifying and analyzing hazards and outlining mitigation actions that will help the District reach this goal. This Mitigation Plan is a single jurisdiction Plan. This Mitigation Plan also enables DD6 to apply for disaster mitigation funding sources that are otherwise unavailable without an approved Mitigation Plan.

DD6 staff has shown their commitment to hazard mitigation by writing a Hazard Mitigation Plan in 2005 and updating that plan in 2010. The 2010 Plan was approved by FEMA on June 26, 2011. DD6 staff further demonstrated their commitment to hazard mitigation by applying for and administering FEMA grants to complete numerous projects as well as self-funding projects that help protect public health, safety and welfare.

For this Mitigation Plan update, DD6 secured funding to hire a private firm to guide the planning process and Plan development. DD6 organized a Mitigation Planning Committee (MPC) consisting of members from DD6, Jefferson County and the City of Beaumont. The MPC is comprised of both members from the previous MPCs as well as new members.

The majority of this Plan is focused on the flood hazard because DD6's mission and jurisdictional authority are explicitly limited to activities related to controlling floods (although DD6 does have the authority to complete actions to protect and mitigate damage to its own facilities, assets and protect personnel).

The Plan has been prepared in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended; The National Flood Insurance Act of 1968 (NFIA), as amended; and Title 44 Code of Federal Regulations Section 201.6 (44 CFR 201.6).

SECTION 1 – THE PLANNING PROCESS

INTRODUCTION

Jefferson County Drainage District No. Six (DD6) undertook development of the original Hazard Mitigation Plan because of increasing awareness that natural and man-made hazards, especially flood hazards, may affect people and property in the area. The Hazard Mitigation Plan was written to find District vulnerabilities to hazards and outline mitigation actions that help to reduce or avoid the impacts of hazards. To help reach those goals, mitigation funds are made available to jurisdictions with updated Hazard Mitigation Plans.

In accordance with 44 Code of Federal Regulations (CFR) 201.6(d)(3), local mitigation plans must be “reviewed, revised if appropriate, and resubmitted for approval within five years in order to continue to be eligible for... grant project funding.”

In this update, the Mitigation Planning Committee looked at what has changed in the District since the last version of the plan was approved and what new actions need to be taken based on those changes.

AUTHORITY

Jefferson County Drainage District No. Six (DD6) is a conservation and reclamation district and a political subdivision of the State of Texas. DD6 was established January 21, 1920, after a favorable vote on January 10, 1920. It was extended and enlarged (Vol. 63, P.478) according to the authority of the 57th Legislature, Chapter 349, and Chapter 7, Title 128, Revised Civil Statutes of Texas, Art. 8129. Enlargement came about in 1961 through legislation (HB 1063), which also established DD6 as a Conservation and Reclamation District under Section 59, Article XVI, Texas Constitution. DD6 was created primarily to provide drainage of overflow lands within DD6. DD6 is governed by a five-member Board of Directors, appointed by the County Commissioners Court of Jefferson County, Texas.

Authority for the preparation of the Hazard Mitigation Plan is derived from Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended; The National Flood Insurance Act of 1968 (NFIA), as amended; and Title 44 Code of Federal Regulations Section 201.6 (44 CFR 201.6). These required State and local governments to develop and formally adopt Hazard Mitigation Plans in order to be eligible for certain disaster mitigation grant funding sources.

In June, 2003 Drainage districts within the State of Texas were granted additional authority via Chapter 49.211 of the Texas Water Code and House Bill 919. Specifically, Chapter 49.211 of the Texas Water Code required districts to adopt master plans before they can adopt rules relating to review and approval of proposed development drainage plans. Further, HB 919 granted districts the authority to require developers to submit drainage plans for approval during the

platting process. The bill also provided legal authority for DD6 to halt subdivision plans based on floodplain development control and regulation. DD6 was created primarily to provide drainage of over flow lands within DD6, including the construction and maintenance of drains, ditches and levees, and other improvements of the District.

Emergency response is the responsibility of the City of Beaumont and Jefferson County. The City owns and maintains several roadside ditches, however DD6 owns the majority of ditches within DD6 and is responsible for routine maintenance. After an event, it is a cooperative effort between the City, County Precincts, and DD6 to identify ditches that need cleaning (as well as crossings). There are known problem areas that are regularly checked during and after an event.

Both the City and the County have early warning capability. Citizens in the area rely mostly on local weather, which is reported to be very capable. DD6 has over 59 stream and rainfall gauges throughout DD6. These stream gauges provide data that is used by DD6 and the Lake Charles branch of the National Weather Service to predict potential flooding. DD6 uploads stream gauge data to the National Weather Service every 15 minutes.

Further discussion on existing policies and programs are addressed in “review and incorporation of existing plans, studies, reports and technical information”.

THE PLANNING PROCESS

The process used to develop this Plan was guided by a Mitigation Planning Committee (MPC), which carried out most of the planning duties. The MPC determined that in addition to the small committee that would steer the planning process, a larger group of interested individuals called Stakeholders would be included in the planning process to review drafts and provide comments at critical points in the plan development. At the first Plan update meeting held on February 25, 2016, the MPC finalized who would comprise the MPC (below). The MPC Meeting Minutes can be found in Appendix 1 of this Plan. The MPC was responsible for data collection and update, review and update each section of the plan, provide status of the mitigation actions from the previous plan and provide any new actions for review by the Stakeholders and the public. The Stakeholders group was larger and comprised of individuals and organizations from both inside and outside Jefferson County DD6. The MPC was comprised of the following individuals:

Table 1 – Mitigation Planning Committee

Team Member	Job Title	Organization
Ms. Karen Stewart	Business Manager-Purchasing Agent, Grant Manager, Director of HR & Risk Management	DD6
Mr. Doug Canant	District Engineer	DD6
Mr. Chuck Oakley	CFO	DD6

Ms. Adina Ward	Floodplain Administrator	City of Beaumont
Mr. Thomas Gill	Streets and Drainage Manager	City of Beaumont
Mr. Don Rao	Jefferson County Engineering Director	Jefferson County
Mr. Jeff Ward	Mitigation Planning Consultant	JSWA
Mr. Dan Ward	Mitigation Planning Consultant	JSWA

As drafts of the Updated Plan were prepared, the MPC used email to distribute them to Stakeholders, and requested that they provide comments. Stakeholders were also invited to public meetings and were requested to provide feedback through email or by telephoning Jefferson County DD6 or a member of the consultant team. When the final draft was completed by the MPC, the Stakeholders were notified by mail and provided a website to download and review the plan for any updates or comments. The consultant was responsible for archiving the comments and including them in edited versions of the Plan update. The Stakeholders Group was comprised of the following individuals and entities:

Table 2 – Stakeholders Group Members

Group Member	Job Title	Organization
Mr. Richard LeBlanc	General Manager	DD6
Mr. Gilbert Ward	C.P.G. Hydrologist Water Resources Planning Water Supplies Section	Texas Water Development Board
Mr. Randall Reese	General Manager	Sabine Neches Navigation District
Dr. John W. Frossard	Beaumont Independent School District Superintendent	Beaumont Independent School District
Mr. Shannon Holmes	Hardin Jefferson Independent School District Superintendent	Hardin Jefferson Independent School District
Ms. Pamela Lechler	Hamshire Fannett Independent School District Superintendent	Hamshire Fannett Independent School District
Dr. Kenneth Evans	President	Lamar University
Dr. Paul J. Szuch	President	Lamar Institute of Technology
Ms. Kim Moncla	Executive Director - Foundation, Baptist Hospitals of Southeast Texas	Baptist Beaumont Hospital
Mr. Paul Trevino	CEO, Christus Southeast Texas	Christus St. Elizabeth Hospital
Mr. Phil Kelley	Manager	Jefferson County Drainage District 7
Mr. Leroy Mc Call Jr	Manager	Jefferson County Drainage District 3

Mr. Kenneth Wiemers P.E.	Area Engineer Beaumont	Texas Department of Transportation
Mr. Scott Hall, P.E.	General Manager	Lower Neches Valley Authority
Mr. Patrick Trahan	Government Relations Director	Exxon Mobil Oil Corporation
Mr. Michael Lockwood	Plant Manager	Goodyear Tire and Rubber
Ms. Sue Landry	Homeland Security Director	Southeast Texas Regional Planning Commission
Mr. Kerry Abney	Mayor	City of Nome, TX
Mr. John Walker	Mayor	City of China, TX
Ms. Becky Ford	Mayor	City of Bevil Oaks, TX

PUBLIC INVOLVEMENT

Consistent with DD6's standard objective to inform and involve citizens, and to fulfill the public involvement requirements of the mitigation planning programs, during the plan development process, DD6 notified and invited residents to review the document and attend two public meetings. For the first public meeting, a public notice was published informing the public about the Hazard Mitigation Planning process and urged the public to be involved in this process.

The first public meeting was held on April 14, 2016 to review and comment on a preliminary draft of the Plan update. In accordance with legal requirements, DD6 published public notices about the presentation in the Beaumont Enterprise prior to the meeting (See Appendix 2, Public Notice Documents). The notice explained the purpose of the meeting and provided the date, time, and location of the meeting. The meeting minutes (and attendee lists) for the public meeting is included in Appendix 2 of the Plan update.

The public had a second opportunity to review the final draft Plan when the document was posted on the Jefferson County DD6 website at www.dd6.org/plan.pdf and placed at the City of Beaumont's City Hall and at DD6's office on Walden Rd. Prior to placing the document online, DD6 announced the availability of the final draft plan for review and provided a way for the public to provide comments. The public notice in the Beaumont Enterprise and the letters to all stakeholders explaining that the District's Hazard Mitigation Plan update was in the final draft stages and available for review are attached in Appendix 2). The stakeholder and public comments were incorporated and the plan was presented at the second public meeting on June 28th for final review and comment before submission. No one from the public attended either meeting.

REVIEW AND INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

A wide variety of existing plans, studies, reports and technical information were reviewed and incorporated into this Hazard Mitigation Plan. The following Plans are available: The Jefferson County DD6 Drainage and Flood Damage Reduction Plan (Master Drainage Plan), Drainage Regulations; Jefferson County Drainage District No. 6, Drainage Criteria Manual for Drainage District No. 6 and the Texas State Mitigation Plan. In addition, Flood Insurance Rate Maps (FIRM) and Flood Insurance Study were reviewed, though no changes were made since the last version of the Plan. The specific Plans, Studies and Reports are listed below along with a discussion on how they were incorporated into the Plan update.

- **Jefferson County DD6 Drainage and Flood Damage Reduction Plan (Master Drainage Plan).** Jefferson County DD6 prepared the Flood Damage Reduction Plan to examine how development is reviewed and to satisfy the requirements of HB 919 so that DD6 could develop, adopt, implement, and enforce regulations relating to its review and approval of development proposals. DD6 meets on an annual basis to review this plan, specifically to select the best way to expand on the District's capability to enforce development restrictions throughout the service area. The District completes periodic reviews of the Master Drainage Plan to identify mitigation actions that can be incorporated in the Hazard Mitigation Plan.
- **Drainage Regulations; Jefferson County Drainage District No. 6,** Jefferson County DD6 completed Drainage Regulations within DD6. The regulations were adopted by DD6 to protect, maintain and enhance public health, safety and general welfare, and to minimize the impacts of increases in stormwater runoff and flooding. The District completes periodic reviews of the Drainage Regulations to identify mitigation actions that can be incorporated in the Hazard Mitigation Plan. DD6 meets on an annual basis to review these regulations, specifically to identify ways to enhance and/or tighten drainage regulations to further minimize impacts of increases in stormwater runoff and flooding.
- **Drainage Criteria Manual for Drainage District No. 6,** DD6 completed the Drainage Criteria Manual. This manual was completed to support the Master Drainage Plan and Drainage Regulations that were adopted by Jefferson County DD6 pursuant to the authority set forth in the Texas Water Code §49.211. The purpose of the Drainage Criteria Manual is to outline criteria and guidance to be used by developers, engineers, and land surveyors in the design of drainage measures to manage runoff. The District completes periodic reviews of the Criteria Manual to identify mitigation actions that can be incorporated in the Hazard Mitigation Plan. DD6 meets on an annual basis to review these regulations, specifically to identify ways to expand criteria and guidance to be used by developers, engineers, and land surveyors in the design of drainage measures to manage runoff.

- **2013 State of Texas Mitigation Plan Update.** The mitigation strategies and goals from the State Plan were reviewed. This plan also incorporated useful tables, figures and information from the State of Texas Mitigation Plan.
- **Flood Protection Planning Study; City of Beaumont and Jefferson County Texas;** This study focuses on the Hillebrandt Bayou Watershed and shares some of the same actions and potential projects as this Hazard Mitigation Plan.
- **Jefferson County Flood Insurance Rate Map (FIRM).** The Flood Insurance Rate Maps (FIRMs) prepared by FEMA offer the best overview of flood risks. FIRMs are used to regulate new development and to control the substantial improvement and repair of substantially damaged buildings. The Jefferson County and City of Beaumont FIRMs were reviewed and included in the Plan update to develop a floodplain map identifying the 100-year floodplain within DD6.
- **Jefferson County and the City of Beaumont Flood Insurance Study (FIS).** The most recent FIS's for both the City of Beaumont and Jefferson County are dated August 6, 2002. These studies were reviewed again as part of the Plan update.
- **Jefferson County Hazard Mitigation Plan.** The plan is currently undergoing its update but reviewed the actions and risk assessment.

INCORPORATION OF THE HAZARD MITIGATION PLAN INTO OTHER PLANNING MECHANISMS

As part of the original HMP development, DD6 integrated components of the Plan into other planning mechanisms. In addition to incorporating some of the Plan requirements in the DD6 Master Drainage Plan, elements of the previous versions of this Plan have been incorporated into the Flood Protection Planning Study; as well as City of Beaumont and Jefferson County Texas hazard mitigation plan. The MPC is currently reviewing the plans listed above and looking for opportunities where components of this HMP update can be integrated into these other plans and studies as well as new plans or studies. Mitigation Plan requirements have been incorporated into DD6's annual project planning and budgeting process. A member from DD6 attends Planning Committee Meetings for both the City and Beaumont and Jefferson County. During these meetings hazard mitigation projects, goals and priorities identified in the DD6 HMP are discussed and then considered by all Planning Committee Members for incorporation into both the City and county level HMP's. Many of the goals and priorities identified in this HMP are similar to the goals and priorities for the City of Beaumont and Jefferson County which will help to ensure this plan is incorporated into those planning mechanisms.

PLAN MAINTENANCE AND CONTINUED PUBLIC INVOLVEMENT

Upon adoption of this Plan update, the public will be notified of any substantial changes to the document between 2016 and the next scheduled Plan update in 2021. Any changes

proposed by the MPC considered significant will be distributed to the list of Stakeholders. The Stakeholders will be encouraged to review the changes and provide comments on any proposed plan revisions.

DD6 will involve the public in the plan maintenance process and during the next Plan Update in 2021, using the same methods as the plan development. The public will be notified when the revision process is started and provided the opportunity to review and comment on changes to the plan and priority action items. It is expected that a combination of informational public meetings, draft documents posted on the web site, and public Board of Director meetings will be undertaken.

The DD6 Hazard Mitigation Plan update will be posted on the District's Web site and notices of its availability will be distributed to the federal and State agencies that were notified and invited to participate in Plan development, Jefferson County, City of Beaumont, City of Bevil Oaks, City of Nome, City of China, adjacent counties and cities, Citizens who attended public meetings and provided contact information; and the organizations, agencies, and elected officials who received notices of public meetings.

PLAN MONITORING, EVALUATING AND UPDATING

The Mitigation Planning Committee determined that progress would be best monitored by annual meetings of the MPC. Upon adoption in 2016, the MPC will meet on an annual basis to discuss the status of the Plan and determine if any significant changes are warranted. As part of the meeting, the Business Manager of DD6 will note progress made on the prior mitigation action items listed in Table 30. To this end, the Business Manager may convene a meeting of the appropriate District, City of Beaumont and Jefferson County Departments to discuss and determine progress, and to identify obstacles to progress, if any.

In addition to annual meetings, the Business Manager will convene meetings after damage-causing natural hazard events to review the effects of such events. Based on those effects, adjustments to the mitigation priorities listed in Table 30 may be made or additional event-specific actions identified.

DD6 will initiate Plan reviews and updates based on the following:

1. On the recommendation of the Business Manager or on its own initiative, DD6 Board may initiate a Plan review at any time.
2. At approximately the one-year anniversary of the Plan's re-adoption, and every year thereafter.
3. After natural hazard events that appear to significantly change the apparent risk to District assets, operations and/or citizens.

4. When activities of DD6, County, or the State significantly alter the potential effects of natural hazards on District assets, operations and/or citizen. Examples include completed mitigation projects that reduce risk, or actions or circumstances that increase risk.
5. When new mitigation opportunities or sources of funding are identified.

In addition to the circumstances listed above, revisions that warrant changing the text of this Plan or incorporating new information may be prompted by a number of circumstances, including identification of specific new mitigation projects, completion of several mitigation actions, or requirements for qualifying for specific funding.

Major comprehensive review of and revisions to this Hazard Mitigation Plan update will be considered on a five-year cycle. To be adopted in 2016, the Plan will enter its next review cycle sometime in 2021. The Mitigation Planning Committee will be convened to conduct the comprehensive evaluation and revision.

The 2021 Update of this plan will begin 2 years prior to expiration of this plan. The Mitigation Planning Committee will begin by reviewing the meeting notes from the Annual review and evaluation meetings that will be taking place throughout the next five years. The planning committee will also review any changes in development and disasters that have occurred within the District since the last version of this Plan. This information will help determine hazards to be included in the Update of this plan and possibly identify mitigation actions needed to address hazards based on the changes in new development. The next Update will follow the same planning process to allow the public input on hazards and prioritization of actions.

SECTION 2 – HAZARD ASSESSMENT

INTRODUCTION

DD6 is a conservation and reclamation district and a political subdivision of the State of Texas. DD6 was established January 21, 1920, after favorable vote on January 10, 1920. It was created primarily to provide drainage of over flow lands within DD6, including the construction and maintenance of drains, ditches and levees, and other improvements of the District.

Although DD6 is subject to a range of hazards typical of the northern Gulf Coast, for the reasons outlined below, DD6 has determined that the most appropriate and useful approach to developing its mitigation plan is to eliminate certain hazards from detailed risk assessment in its Hazard Mitigation Plan. There are three reasons for this: (1) DD6's mission and jurisdictional authority is explicitly limited to activities related to controlling floods (although the organization does have the authority to complete actions to protect and mitigate damage to its own facilities); (2) non-DD6 assets and populations that are potentially exposed to hazards are part of another mitigation plan, and hence including them in the present document would be redundant and serve no meaningful purpose – Jefferson County and the City of Beaumont have both the authority and the responsibility to sponsor mitigation activities for their constituent populations and communities, and; (3) the hazards were determined not to affect District Facilities. DD6 will continue to coordinate with the County and City to ensure that mitigation actions are developed and implemented in a rational manner, reducing or eliminating conflict and overlap between the jurisdictions.

During the Crosswalk review process in the 2010 version of this Plan, the FEMA reviewer highlighted the confusion and inconsistency of addressing a hazard and completing a risk assessment for a hazard that DD6 had no jurisdictional authority to mitigate against and that has no impact on DD6 owned facilities. As opposed to removing any discussion of the hazard, which would have warranted an entire re-write of the plan, it was agreed to provide a narrative discussion for each of these hazard indicating that there is no negative impact to DD6 operations or facilities. As such, it has been determined that the planning area, based on DD6 jurisdictional authority, and DD6 owned facilities will not be negatively impacted from the below hazards. For this reason, the hazards listed below have been eliminated from further consideration and there are no mitigation action items associated with them.

- Extreme Heat – This hazard does not affect District-owned facilities and DD6 has no authority to mitigate against this hazard.
- Drought – This hazard does not affect District owned facilities and DD6 has no authority to mitigate against this hazard.
- Winter Storm – While winter storm can cause pipes to freeze, the need for ice and snow to be removed, and downed power lines, the District facilities have been built to insulate the pipes, have backup generators for downed power lines and have the

necessary equipment to remove ice and snow. This hazard does not affect District owned facilities and DD6 has no authority to mitigate against this hazard.

- Earthquake – Due to the extremely low probability of an earthquake within the planning area, and the fact that there is no record of any historical building damage as a result of seismic activity in the planning area, this hazard does not affect District owned facilities and DD6 has no authority to mitigate against this hazard.
- Land Subsidence – Due to the extremely low probability of a land subsidence within the planning area and the fact that there is no record of any historical occurrences of land subsidence in the planning area, this hazard does not affect District owned facilities and DD6 has no authority to mitigate against this hazard.
- Wildfire – Due to the low probability of Wildfire in the Planning area and the fact that DD6 owned facilities are located in an urban area, this hazard does not affect District owned facilities and DD6 has no authority to mitigate against this hazard.
- Coastal Erosion – Jefferson County, not DD6, maintains beaches and dune systems and the District has no authority to mitigate against this hazard.
- Expansive Soils – Severe damage from expansive soils is not well documented so its occurrence as catastrophically damaging is not documented. This hazard does not affect District owned facilities and DD6 has no authority to mitigate against this hazard.
- Hailstorms – DD6 buildings are built to withstand hail damage and the District has covered parking garages and storage areas to protect all assets from hail damage. This hazard does not affect District owned facilities and DD6 has no authority to mitigate against this hazard.
- Lightning – DD6 facilities are all built to be protected from lightning and therefore, lightning does not affect District owned facilities and DD6 has no authority to mitigate against this hazard.
- Dam/Levee Failure – FEMA and the U.S. Army Corps of Engineers (USACE) maintain the National Inventory of Dams, a database of high and significant hazard dams. For the most part, data are provided by State agencies responsible for regulation and inspection of dams or by the USACE. Based on that inventory, there are no high hazard dams that affect the watersheds in or draining through DD6.

The hazards that DD6 will address as part of this plan update are:

- Tornado
- Thunderstorm/High Wind
- Hurricane and Tropical Storm
- Flood

GEOGRAPHY, CLIMATE, AND POPULATION

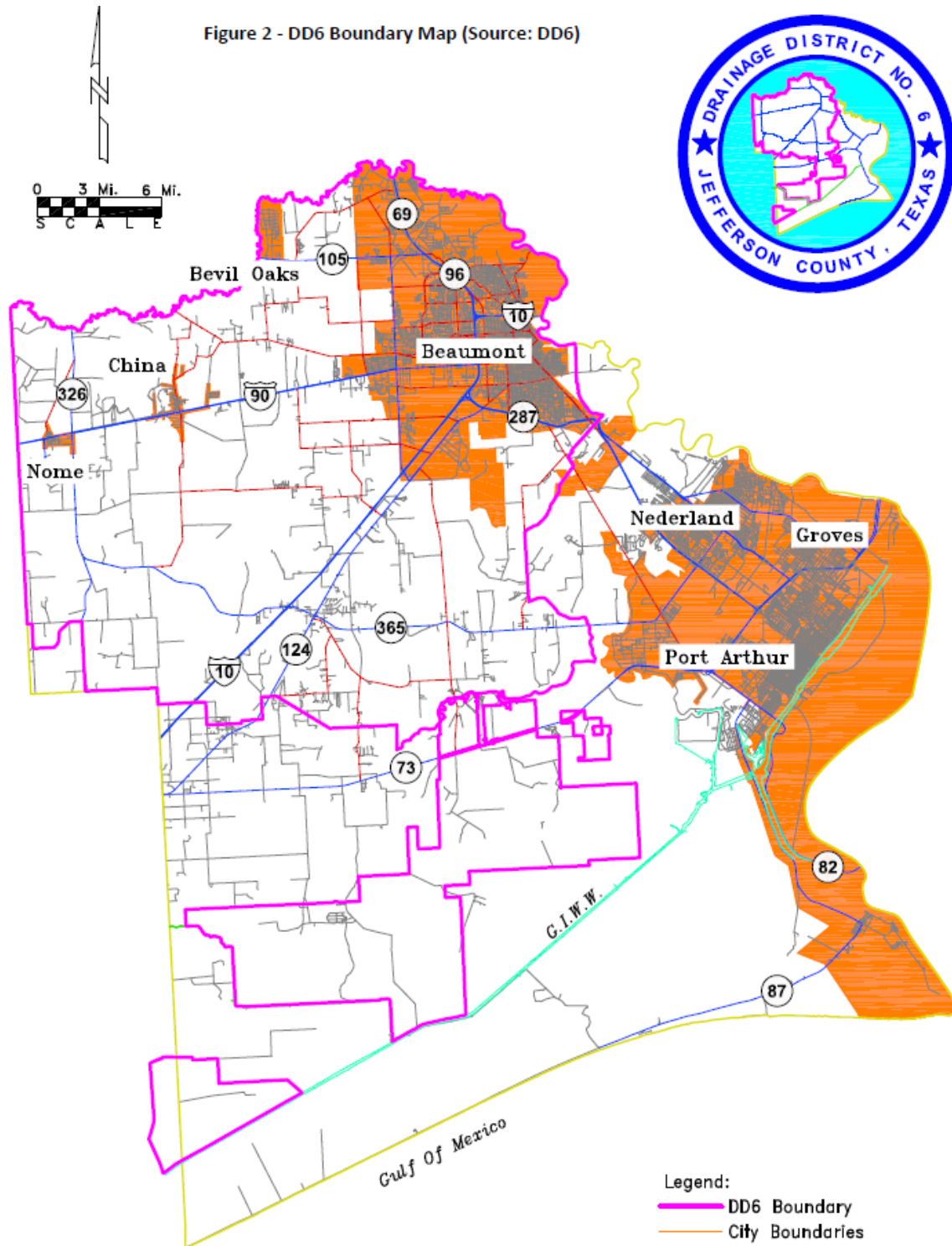
The area covered by Jefferson County Drainage District No. Six (DD6) is located in southeast Texas. The City of Beaumont is the County seat and the largest City of Jefferson County. The City is situated approximately 85 miles east of Houston, approximately 70 miles northeast of Galveston, and 275 miles southeast of Dallas (Figure 1). Ground surface elevations across DD6 vary from 37 feet to 3 feet above mean sea level. The topography is described as nearly flat prairie and the geologic structure is nearly flat strata. The bedrock types are comprised of deltaic sands and muds. Data from the Bureau of Economic Geology, at the University of Texas at Austin, identifies the land as “expansive clay and mud – locally silty, locally calcareous, flat to low; hilly prairie; commonly tilled”.

Figure 1 - Vicinity Map: State of Texas (Source: Mapquest)



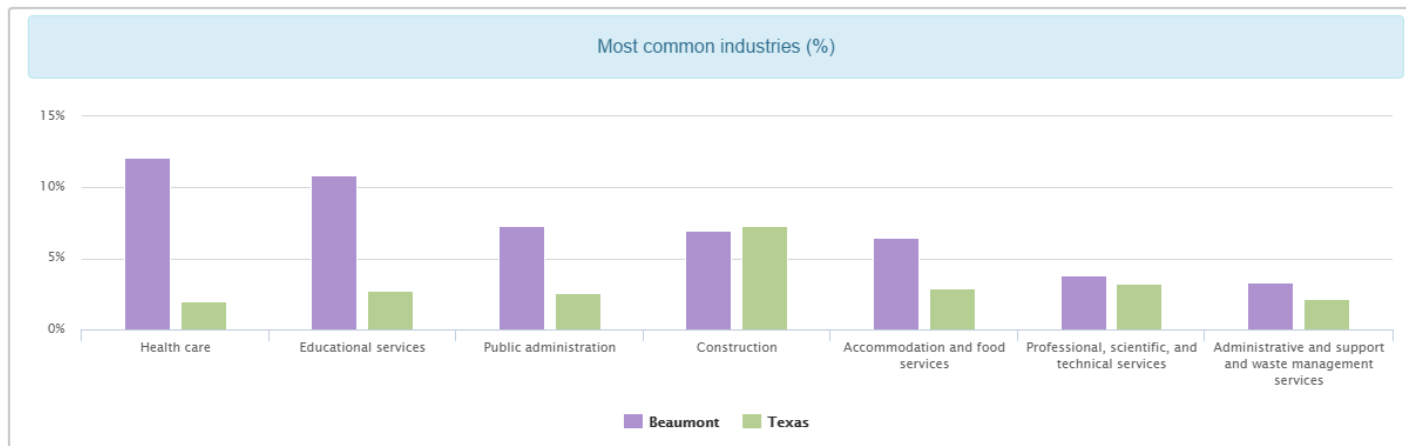
The climate of the region is humid subtropical, with warm summers and moderate winters. Rainfall is abundant and on the average, evenly distributed throughout the year. The heaviest rains usually occur during the hurricane season, which extends from June through October. Average annual precipitation for the area is approximately 56 inches and the average annual temperature is about 69 degrees.

Jefferson County Drainage DD6 consists of approximately 487 square miles and lies entirely within Jefferson County and the City of Beaumont. Figure 2 is a map identifying the boundary area (shown in pink) for Jefferson County DD6. The DD6 Hazard Mitigation Plan Update is prepared for the entire District.



According to the United States Census Bureau, Jefferson County as a whole had an estimated total population of 252,235 in 2014. This is a 3.7 percent increase from the 2008 census data, which estimated the Jefferson County population at 243,090. In 2014, the population of the labor force in Jefferson County was 109,639, approximately a one percent increase from the estimated labor force in year 2000. The original Plan indicated the top three industries in the County were education, health, and social services. As of 2013, the top three industries were health care, educational services and public administration as indicated by Table 3.

Table 3 – Most Common Industries, Beaumont, Texas (Source: www.city-data.com)



Jefferson County includes both incorporated and unincorporated areas. The population totals for the eight incorporated areas within the County are identified in Table 4. As indicated in the table, the cities of Beaumont, Bevil Oaks, China, and Nome are located within Jefferson County DD6. The population of the four cities within the planning area consists of over half the County population. The remaining incorporated areas are located outside of the planning area. The population of unincorporated Jefferson County totals 31,562.

Table 4 - Incorporated Areas of Jefferson County (Source: US Census Bureau, 2014 - Estimates)

City	Overall Population	Within DD6 Planning Area	Population within Planning area
Beaumont	117,585	Yes	117,585
Bevil Oaks	1,244	Yes	1,244
China	1,127	Yes	1,127
Nome	561	Yes	561
Groves	15,753	No	N/A
Nederland	17,108	No	N/A
Port Arthur	54,540	No	N/A
Port Neches	12,755	No	N/A
Total	220,673		120,517

The City of Beaumont is the largest municipality in the planning area and as of 2014 had an estimated population of 117,585.

Table 5 identifies the total number and estimated value of buildings/infrastructure within Jefferson County DD6. The table indicates there are 50,266 residential buildings and 7,666 commercial buildings. As shown in Table 4 of the Plan update, the total population of the incorporated areas within DD6 is 120,517. The total population in DD6 is slightly higher than this figure when considering the additional residents living within the unincorporated areas. The data in Table 4 is used periodically throughout this section to identify the overall District-wide exposure for certain hazards that equally impact the entire planning area such as hurricanes/tropical storms.

Table 5 – Buildings/Infrastructure within Jefferson County Drainage District Six (Sources: Jefferson County Central Appraisal District)

Type	Number of Structures	Estimated Value
Residential Buildings*	50,266	\$4,933,674,187
Commercial Buildings*	7,666	\$16,065,585,012
District owned Buildings or structures**	19	\$3,342,142
Total	57,951	\$21,202,601,341

* – Value and number of structures based on percent of County population in the Planning Area.

** –Value based on insured value of District owned structures

OVERVIEW OF RISKS

Numerous federal agencies maintain a variety of records regarding losses associated with natural hazards. Unfortunately, no single source is considered to offer a definitive accounting of all losses. FEMA maintains records on federal expenditures associated with declared major disasters. The U.S. Army Corps of Engineers (USACE) and the Natural Resources Conservation Service collect data on losses during the course of some of their ongoing projects and studies. National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC) database is another source where data statistics such as injuries, deaths, and damage estimates are maintained for a variety of natural hazards. The data is maintained at the county-wide level, with more recent entries listing the specific location within the county. Although not always specific to DD6, this county-wide hazard data from the NCDC is often the best available resource for documenting historical events. For the hazards profiled, the query results from the NCDC database are provided in the hazard specific subsections.

In the absence of definitive data on some of the natural hazards that may occur in DD6, illustrative examples are useful. Table 6 provides brief descriptions of particularly significant natural hazard events occurring in DD6's recent history. This list is not meant to capture every

event that has affected the area, rather lists one or two examples of the types of events that have affected the area in the past.

Data on Presidential Disaster Declarations characterize some natural disasters that have affected the area. In 1965, the federal government began to maintain records of events determined to be significant enough to warrant declaration of a major disaster by the President of the United States. Presidential Disaster Declarations are made at the county level and are not specific to any one city or sub-area, such as DD6. Given that DD6 is responsible for drainage in a large portion of Jefferson County, it is likely that a disaster declaration for Jefferson County affected DD6 in some way. Between 1965 and 2009 twelve such disasters have been declared in Jefferson County and are identified in Table 6. In addition to the declared events, the table also includes several incidents which did not receive a Presidential Disaster Declaration. Since the last update, while the State of Texas has received 9 more Presidential Disaster Declaration, none of those have impacted or included Jefferson County.

Table 6 –Natural Hazard Events and Declared Major Disasters in Jefferson County

(Sources: Public Entity Risk Institute (PERI) website, FEMA, NCDIC database)

Date & Disaster (DR)	Nature of Event
November 7, 1957	TORNADO (F3) – An F3 tornado touched down in Jefferson County. This tornado was 200 yards wide and stayed on the ground for 4 miles causing \$2.5M in damages, 2 deaths, and 59 injuries.
June 29, 1973 (DR-393)	SEVERE STORMS AND FLOODING – a massive storm hit the Houston Texas area dumping 10 – 15 inches of rain. In total the storm resulted in 10 deaths and over \$50M in damage.
April 26, 1979 (DR-580)	SEVERE STORMS, TORNADOES, AND FLOODING – (Nearly 300 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over \$2.8 M in payments). Rainfall reported in amounts between 9.56 to 10.7 inches in the Beaumont area and 11.5 inches in Bevil Oaks are, flooded many communities along the Neches river and Taylor, Pine Island, and Hillebrandt Bayous. Pine Island crested at 34.29 feet at Sour Lake, surpassing a record 31 feet set in 1917. Many homes, businesses and roads in the area were damaged.

Date & Disaster (DR)	Nature of Event
July 28, 1979 (DR-595)	STORMS AND FLASH FLOODS - (Over 100 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over \$700K in payments). Tropical Storm Claudette formed in the Central Atlantic the morning of July 15, 1979. It never reached hurricane intensity as it wandered across the northern Caribbean, and the Gulf of Mexico 10 days, making landfall near Port Arthur the evening of the 24th. Rainfall was estimated at 11 inches in the Beaumont area. The area suffered severe wind damage to utilities.
September 26, 1980 (DR-632)	TROPICAL STORM DANIELLE - (Over 200 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over \$1.5M in payments). Rains of 8-9 in. fell on most of Texas. Particularly hard hit were Fisher, Mitchell, Nolan, and Scurry Counties.
May 31, 1989 (DR-828)	SEVERE STORMS, TORNADOES AND FLOODING - (28 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over \$500K in payments). Widespread rains caused flooding that resulted in five deaths and total damages of about \$50 million. The storm dumped between 10 and 15 inches of rain in the southeast Texas area. Homes in Bevil Oaks flooded.
July 18, 1989 (DR-836)	TROPICAL STORM ALLISON - (Over 400 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over \$3.8M in payments). Tropical Storm Allison caused torrential rains of 10-15 in. from Houston to Beaumont. Houston Intercontinental Airport recorded 10.34 in. during 24 hours. The storm resulted in three deaths and over \$60M in damages.
November 15, 1994 (DR-1041)	SEVERE THUNDERSTORMS AND FLOODING - (Over 200 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over \$5.5M in payments). A tropical, mid-latitude rainfall of unusual proportion on a 30- to 35-county area of southeast Texas resulted in catastrophic flooding. The intense rainfalls totaled more than 25 in. at several locations and more than 8 in. on much of southeast Texas. The storm resulted in 18 deaths and an estimated \$700M in damages.

Date & Disaster (DR)	Nature of Event
May, 1996	DROUGHT - Drought conditions continued across southeast Texas. Rainfall totals from January through May averaged 10 to 15 inches below normal. The main areas affected include farming and fire protection. Crop damage across the entire region exceeded 1 million dollars.
August 12, 1996	SEVERE LIGHTNING - As many as 9,000 lightning strikes this evening resulted in one man injured, one house fire, and several telephone poles damaged.
January 14, 1997	ICE STORM - A record ice storm paralyzed southeast Texas and southwest Louisiana. Around 90,000 electric customers across southeast Texas were without power for up to six days. Emergency shelters were opened for several nights due to the cold weather following the ice storm. More trees and power lines were knocked down in this ice storm than what came down during Hurricane Bonnie in 1986. Hundreds of homes received minor damage due to trees or tree limbs falling on roofs. Several house fires were directly or indirectly related to the ice storm, but fortunately there were only no injuries. Numerous traffic accidents attributed to icy roads led to several minor injuries. One death was indirectly attributed to the ice storm. Two men were electrocuted on Tuesday, January 21st, while doing cleanup work for a local electric company. One 48 year old man died, and a 19 year old man was seriously injured in the accident
August, 26 1998 (DR-1239)	TROPICAL STORM CHARLEY – (Limited damage in Jefferson County) Up to 16 in. of rainfall in south-central Texas caused flooding in many counties, to include Jefferson
October, 14 1998 (DR-1245 & 1257)	HURRICANE GEORGES - (23 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over \$200K in payments). Tropical Storm Frances, and a localized thunderstorm that followed later in the same month, resulted in widespread flooding.
August 31, 2000	EXTREME HEAT - Record heat occurred in late August across southeast Texas. At the Southeast Texas Regional Airport, the all-time record high of 108 was tied on August 31st. Previously it had been achieved on July 14 1902.

Date & Disaster (DR)	Nature of Event
June 9, 2001 (DR-1379)	TROPICAL STORM ALLISON - (Nearly 500 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over \$12 M in payments). Tropical Storm Allison produced flooding throughout Southeast Texas, Louisiana, and across the eastern United States. Damages were estimated at \$5 Billion and prompted a Presidential disaster declaration for 30 counties in Texas.
October 29, 2002 (DR-1439)	SEVERE STORMS, TORNADOES AND FLOODING – (Over 400 Jefferson County/City of Beaumont policy holders filed flood claims resulting in over \$8.7M in payments). This unnamed storm produced heavy rains, causing flooding throughout Jefferson County.
September, 24, 2005 (DR-1606)	HURRICANE RITA – Hurricane Rita made landfall just east of the Texas-Louisiana border. Along the coast of Jefferson County, storm surges near 10 feet occurred near Sabine Pass, where over 90 percent of the homes were severely damaged or destroyed. The storm surge backed up the Sabine River, and flooded a small section of downtown Orange with around four to five feet of storm surge. High winds estimated at over 100 mph snapped and uprooting trees, and damaged over 125,000 homes and businesses.
September 13, 2008 (DR-1791)	HURRICANE IKE - Ike delivered a 17.5-foot storm surge on Jefferson County's coastal plain and dropped anywhere from 6 to 20 inches of rain, depending on where in the County it was measured. The surge caused flooding in the county's sparsely developed coastal areas, though no flooding occurred as a result of heavy rain. In total, at least 4,000 homes were flooded in Jefferson County. Within DD6, the event caused no flood related property damages, mainly due to recently completed mitigation efforts.

Jefferson County Drainage District Six has the authority to mitigate tornadoes, hurricanes and thunderstorm/high winds when they threaten DD6 buildings and assets. They also have the authority to mitigate against the flood hazard in all aspects. The National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC) collects and maintains certain hazard data in summary format, indicating injuries, deaths, and estimated damages.

For each hazard profiled in the present section, the planning team assigned a highly likely, likely, occasional or unlikely probability of future occurrences. The hazard probability was assigned in accordance with table 7 below.

Table 7 – Frequency of Hazard Occurrence

Frequency of Occurrence: <input type="checkbox"/> Highly likely; Event probable in next year. <input type="checkbox"/> Likely; Event probable in next three years <input type="checkbox"/> Occasional; Event possible in next five years <input type="checkbox"/> Unlikely; Event possible in next ten years

To deduce which hazards leave DD6 most vulnerable, the MPC ranked each hazard the potential to cause damage, disrupt continuity of operations or shutdown facilities by providing a classification. Definitions for overall vulnerability are subjective based primarily on future probability, impact and severity, with additional considerations for potential impacts locations of buildings, critical facilities and infrastructure. Vulnerability classification criteria are general and involve some degree of overlap amongst classes. Definitions for overall vulnerability classifications used are listed in Table 8.

Table 8 – Level of Vulnerability

Level of Vulnerability	Description
Very High	High probability of future occurrence and potential catastrophic severity
High	Moderate/high probability of future occurrence and potential critical severity
Moderate	Moderate probability of future occurrence and limited potential severity
Low	Low/moderate probability of future occurrence and limited/negligible potential severity

TORNADO

A tornado is defined as a rapidly rotating vortex or funnel of air extending ground-ward from a cumulonimbus cloud. Most of the time, vortices remain suspended in the atmosphere and are visible as a funnel cloud. However, when the lower tip of a vortex touches the ground, the tornado becomes a force of destruction.

TORNADO LOCATION

Figure 3 – Vicinity Map: State of Texas (Source: Mapquest)

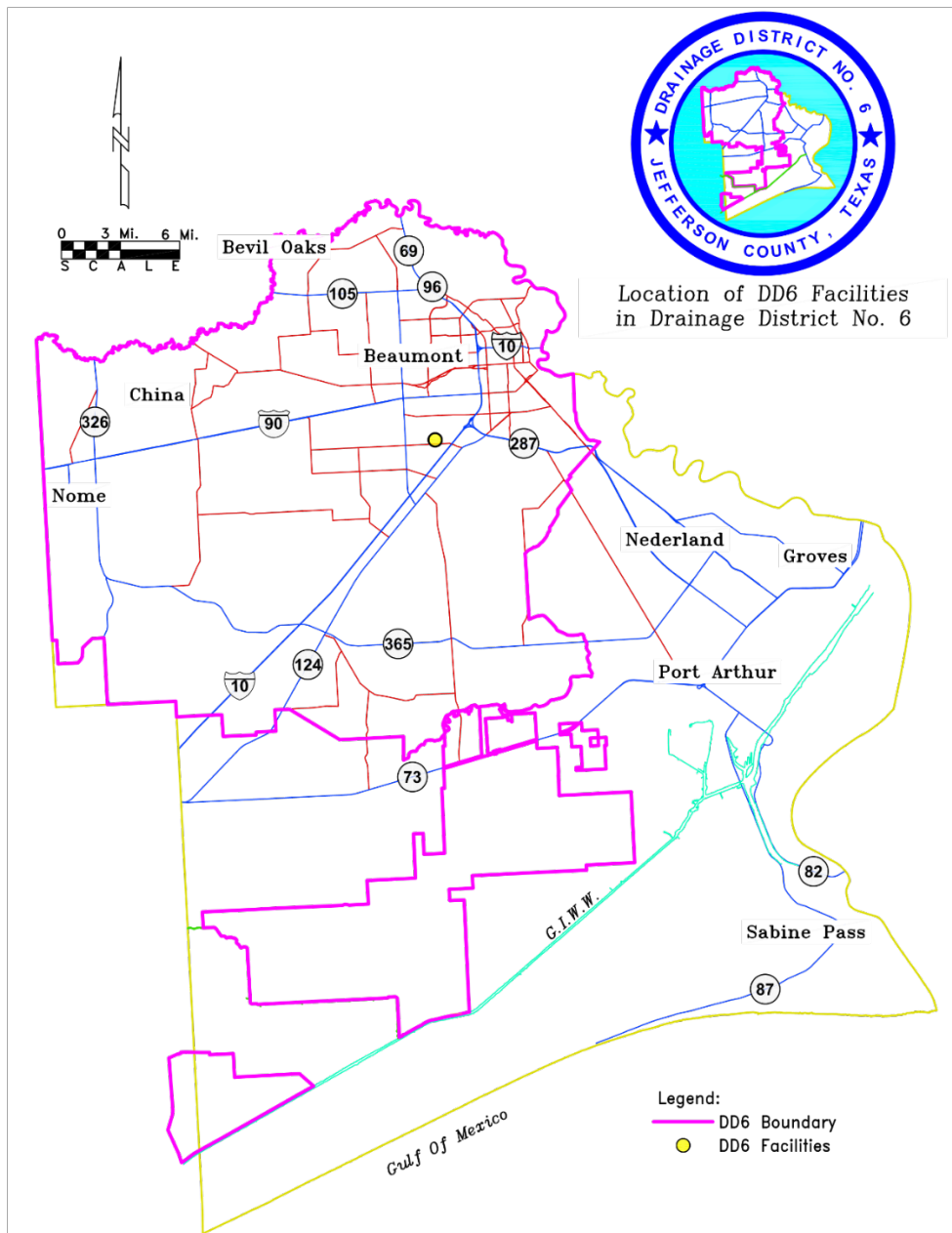
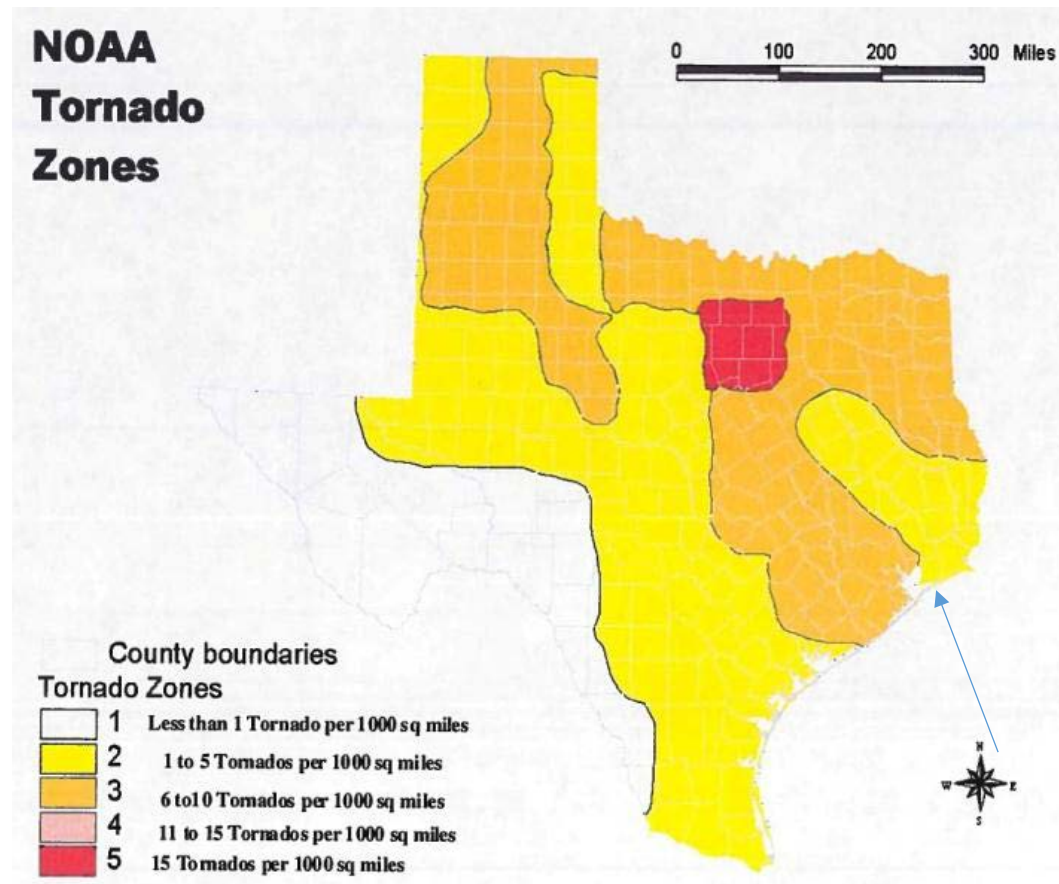


Figure 4 illustrates the frequency of tornado strikes in Texas per 1,000 square miles. Texas is considered the U.S. “tornado capital.” While Texas tornadoes can occur in any month and at all hours of the day or night, they occur with greatest frequency during the late spring and early summer months during late afternoon and early evening hours. Northern Texas is most vulnerable, but the area around DD6 experiences 1 – 5 tornadoes per 1,000 square miles. The tornado hazard affects the entire planning area equally.

Figure 4 – Tornado Activity in the U.S. (Source: NOAA – Storm Prediction Center)



TORNADO EXTENT

Tornado damage severity is measured by the Enhanced Fujita Tornado Scale (EF-Scale). The Enhanced Fujita Scale assigns numerical values based on wind speed and categorizes tornadoes from zero to five representing increased degrees of damage. Tornadoes are related to larger vortex formations, and therefore often form in convective cells such as thunderstorms or in the right forward quadrant of a hurricane or tropical storm, far from the hurricane eye. Table 9 describes the categories for the Enhanced Fujita Tornado Scale. We can expect to experience a tornado ranging from EF0 to EF5 in the planning area.

Table 9 – Enhanced Fujita (EF) Scale

Enhanced Fujita (EF) Scale		
Enhanced Fujita Category	Wind Speed (mph)	Potential Damage
EF0	65-85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd); high-rise buildings have significant structural deformation; incredible phenomena will occur.

PREVIOUS OCCURRENCES OF TORNADO

According to the NCDC database, Jefferson County experienced 101 tornadoes (42 F0s, 29 F1s, 2EF1s, 20 F2s, and 6 F3s) between 1950 and 2016 (experiencing just one event since the last planning effort was underway). There is not specific data for just Jefferson County DD6, but the hazard is reasonably predicted to have uniform probability of occurrence across the entire planning area. Note that prior to 2007, the Fujita (F) Scale was used. Again, note that the boundaries of the DD6 planning area do not correspond exactly to Jefferson County, which is the reporting area for the NCDC, so the figure should be regarded as a general indication of event history area-wide. For these events, the NCDC database reported three deaths, 142 injuries and just \$55.979 Million in damages. Table 10 summarizes the 31 tornadoes that resulted in at least \$50,000 in damages.

Table 10 – Tornado Events in Jefferson County with at Least \$50,000 in Property Damage (Source: NCDC Storm Events Database)

Location	County/ Zone	St	Date	Time	T.Z.	Mag	Dth	Inj	PrD
Totals:							3	142	55.979M
GILLBURG	JEFFERSON CO.	TX	08/18/2009	12:57	CST-6	EF1	0	10	20.000M
GROVES	JEFFERSON CO.	TX	04/03/2000	03:20	CST	F1	0	0	3.000M
JEFFERSON CO.	JEFFERSON CO.	TX	11/07/1957	21:15	CST	F3	2	59	2.500M
JEFFERSON CO.	JEFFERSON CO.	TX	10/11/1970	14:47	CST	F2	0	0	2.500M
JEFFERSON CO.	JEFFERSON CO.	TX	10/11/1970	15:30	CST	F3	0	19	2.500M
JEFFERSON CO.	JEFFERSON CO.	TX	11/13/1972	05:25	CST	F2	0	0	2.500M
JEFFERSON CO.	JEFFERSON CO.	TX	06/11/1973	21:05	CST	F1	0	0	2.500M
JEFFERSON CO.	JEFFERSON CO.	TX	10/22/1979	04:44	CST	F2	0	0	2.500M
JEFFERSON CO.	JEFFERSON CO.	TX	01/31/1983	14:00	CST	F3	0	1	2.500M
JEFFERSON CO.	JEFFERSON CO.	TX	05/20/1983	13:15	CST	F0	0	0	2.500M
JEFFERSON CO.	JEFFERSON CO.	TX	05/20/1983	13:40	CST	F0	0	0	2.500M
JEFFERSON CO.	JEFFERSON CO.	TX	05/20/1983	13:45	CST	F2	1	9	2.500M
JEFFERSON CO.	JEFFERSON CO.	TX	05/20/1983	14:01	CST	F1	0	3	2.500M

BEAUMONT	JEFFERSON CO.	TX	10/13/2001	03:55	CST	F1	0	0	1.000M
NOME	JEFFERSON CO.	TX	01/01/1999	23:45	CST	F3	0	5	500.00K
CHINA	JEFFERSON CO.	TX	10/16/2006	05:00	CST-6	F1	0	0	300.00K
JEFFERSON CO.	JEFFERSON CO.	TX	11/07/1957	21:23	CST	F3	0	1	250.00K
JEFFERSON CO.	JEFFERSON CO.	TX	08/05/1964	18:20	CST	F2	0	6	250.00K
JEFFERSON CO.	JEFFERSON CO.	TX	07/15/1969	16:10	CST	F1	0	0	250.00K
JEFFERSON CO.	JEFFERSON CO.	TX	05/12/1972	07:23	CST	F2	0	2	250.00K
JEFFERSON CO.	JEFFERSON CO.	TX	07/29/1972	15:00	CST	F1	0	0	250.00K
JEFFERSON CO.	JEFFERSON CO.	TX	05/26/1973	03:45	CDT	F2	0	3	250.00K
JEFFERSON CO.	JEFFERSON CO.	TX	10/28/1974	13:55	CST	F2	0	3	250.00K
JEFFERSON CO.	JEFFERSON CO.	TX	09/05/1980	16:45	CST	F1	0	0	250.00K
JEFFERSON CO.	JEFFERSON CO.	TX	04/23/1981	11:15	CST	F2	0	2	250.00K
JEFFERSON CO.	JEFFERSON CO.	TX	04/10/1984	23:30	CST	F0	0	0	250.00K
JEFFERSON CO.	JEFFERSON CO.	TX	02/18/1987	04:50	CST	F1	0	0	250.00K
HAMSHIRE	JEFFERSON CO.	TX	04/03/2000	03:08	CST	F1	0	1	100.00K
BEAUMONT	JEFFERSON CO.	TX	11/18/2003	01:00	CST	F0	0	0	100.00K
NOME	JEFFERSON CO.	TX	06/09/2010	04:32	CST-6	EF1	0	0	100.00K
PORT ARTHUR	JEFFERSON CO.	TX	07/14/1997	15:05	CST	F0	0	3	50.00K

TORNADO PROBABILITY

Though Jefferson County DD6 has experienced 101 tornadoes between 1950 and 2016, many of these events reported occurred on the same day and are considered part of the same storm system. Most of the tornado events are from EF0 to EF2, with the catastrophic tornado events occurring with far less chance. An average of damaging tornadoes across the planning area provides the probability. With 31 significantly damaging events over 66 years, the frequency of an event is:

Table 11 – Frequency of Tornado Occurrence

Frequency of Occurrence:

- ☐ Highly likely; Event probable in next year
- ☒ Likely; Event probable in next three years
- ☐ Occasional; Event possible in next five years
- ☐ Unlikely; Event possible in next ten years

It should be noted that due to DD6's missions and jurisdictional authority being explicitly limited to activities related to controlling floods, they only have the authority to mitigate the effect of tornadoes on District owned facilities and personnel.

TORNADO IMPACT AND VULNERABILITY

DD6's missions and jurisdictional authority being explicitly limited to activities related to controlling floods, they only have the authority to mitigate the effect of tornadoes on District owned facilities and personnel. The FEMA software used for assessing tornado risk is based exclusively on life safety. Since the last version of the plan, DD6 built a 3,000 sq. ft. tornado shelter built to house District Staff during a tornado event, in accordance with FEMA 361 - Design and Construction Guidance for Community Shelters. This building can easily house all 150 employees for the duration of a tornado event.

Considering the analysis is based entirely on avoided injuries and fatalities, the tornado risk for DD6 is considered \$0. Even though District facilities and personnel are not vulnerable to tornadoes, based on our analysis, other District assets such as tractors, bulldozers, dump trucks, excavators and many other vehicles totaling to \$18,551,880 in insured value, may still have some risk of being damaged by tornadoes either while in storage or on project sites. However, the size and number of vehicles owned by the District make trying to protect all of them from tornadoes infeasible. The District's vulnerability is considered Low as defined in Table 8.

HURRICANES AND TROPICAL STORMS

Hurricanes, tropical storms, and typhoons, collectively known as tropical cyclones, are among the most devastating naturally occurring hazards in the United States. They present flooding, storm surge, and high wind hazards to the communities that they impact.

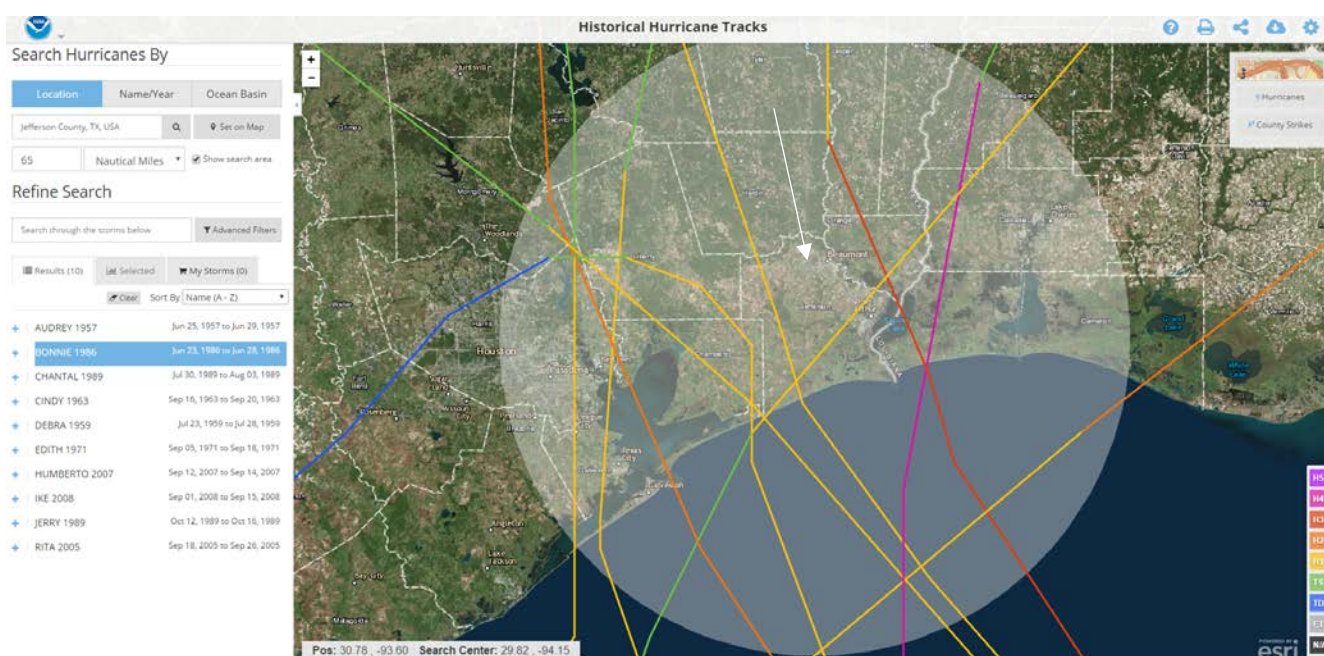
A hurricane is defined as a low-pressure area of closed circulation winds that originates over tropical waters.

Hurricanes bring high winds and heavy rains and are usually accompanied by high storm surge; a rapid rise of offshore water elevation primarily caused by the combination of extremely high winds over a large stretch of open water and low barometric pressure which accompany a hurricane, together working to create a dome of water near the eye of the hurricane. As the hurricane nears land, its winds push the dome toward the shore while the slope of the sea floor blocks the water's escape and it comes ashore as a rising surge.

HURRICANE AND TROPICAL STORM LOCATION

A hurricane or tropical storm occurs every year during hurricane season which begins in May and ends in November. Some of these storms dissipate before making landfall, but have the chance of striking anywhere on the Gulf Coast or eastern seaboard. According to the National Hurricane Center's Historical Hurricane Tracker, from 1950 to 2016, there have been ten hurricanes and 11 tropical storms within a 65 nautical mile radius of Jefferson County Texas. Figure 5 shows the planning area, indicated by the white arrow, and the ten hurricanes that came within 65 nautical miles. As shown by the figure, there were six H1s, two H2s, one H3 and one H4.

Figure 5 – Historical Hurricane Tracks for Jefferson County TX (National Hurricane Center)



HURRICANE AND TROPICAL STORM EXTENT

A hurricane begins as a tropical depression with wind speeds below 39 mph. As it intensifies, it may develop into a tropical storm, with further development producing a hurricane. Hurricane winds blow in a large spiral around a relative calm center known as the "eye." The "eye", the storm's core, is an area of low barometric pressure and is generally 20 to 30 miles wide. The storm may extend outward 100 - 400 miles in diameter. As a hurricane approaches, the skies will begin to darken and winds will grow in strength. As a hurricane nears land, it can bring torrential rains, high winds, storm surges, and severe flooding. Table 12 and Table 13 below identify the criteria for each stage of development. The Saffir / Simpson Hurricane Scale is used to classify storms by numbered categories. Hurricanes are classified as Categories 1 through 5 based on central pressure, wind speed, storm surge height, and damage potential. We can

expect to experience a storm ranging from a tropical depression to a category 5 hurricane in the planning area.

Table 12 – Classification of Tropical Cyclones

Stage of Development	Criteria
Tropical Depression (development)	Maximum sustained surface wind speed is < 39 mph
Tropical Storm	Maximum sustained wind speed ranges 39 - <74 mph
Hurricane	Maximum sustained surface wind speed 74 mph+
Tropical Depression (dissipation)	Decaying stages of a cyclone in which maximum sustained surface wind speed has dropped below 39 mph

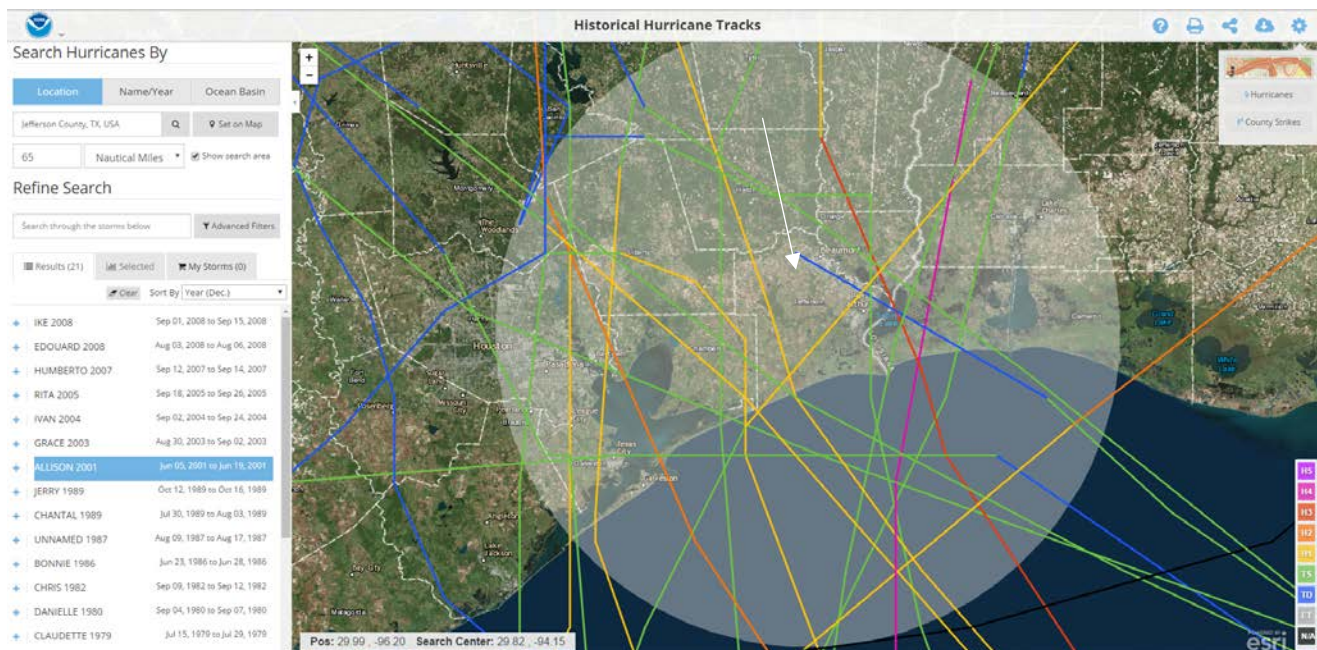
Table 13 – Saffir/Simpson Hurricane Scale

Storm Category	Central Pressure	Sustained Winds	Storm Surge	Potential Damage
1	> 980 mbar	74 - 95 mph	4 – 5 ft	Minimal
2	965 – 979 mbar	96 - 110 mph	6 – 8 ft	Moderate
3	945 – 964 mbar	111 – 130 mph	9 – 12 ft	Extensive
4	920 – 944 mbar	131 – 155 mph	13 – 18 ft	Extreme
5	< 920 mbar	> 155 mph	> 18 ft	Catastrophic

PREVIOUS OCCURRENCES OF HURRICANES AND TROPICAL STORMS

The NCDC database was queried for previous events, but only six were shown, so the National Hurricane Center's (NHC) Historical Hurricane Tracker was used. This hurricane tracker showed ten hurricanes and 11 tropical storms within 65 nautical miles of Jefferson County between 1950 and 2016. There have been no hurricanes or tropical storms experienced by DD6 since the last version of this plan. There is not specific data for just DD6, but it is reasonable to assume that if a hurricane or tropical storm effected the county, it would also effect DD6 because of the size and magnitude of the hazard. The six events shown on the NCDC database were from 1998 to 2008 and caused \$1.255 Billion in property damage. The 21 events from the NHC are shown below in Figure 6.

Figure 6 – Historical Hurricane Tracks for Jefferson County TX (National Hurricane Center)



HURRICANE AND TROPICAL STORM PROBABILITY

DD6 has experienced 21 tropical storms and hurricanes between 1950 and 2016. Even though DD6 has not experienced a hurricane or tropical storm in over seven years, it is reasonable to assume that one such storm will affect the planning area once every three years or so.

Table 14 – Frequency of Tropical Storm and Hurricane Occurrence

Frequency of Occurrence:	
<input type="checkbox"/>	Highly likely; Event probable in next year
<input checked="" type="checkbox"/>	Likely; Event probable in next three years
<input type="checkbox"/>	Occasional; Event possible in next five years
<input type="checkbox"/>	Unlikely; Event possible in next ten years

It should be noted that due to DD6's missions and jurisdictional authority being explicitly limited to activities related to controlling floods, they only have the authority to mitigate the flood portion of the hurricane and tropical storm hazard except where it is related to District owned facilities and property.

HURRICANE AND TROPICAL STORM IMPACT AND VULNERABILITY

DD6's missions and jurisdictional authority being explicitly limited to activities related to controlling floods, they only have the authority to mitigate the effect of hurricanes and tropical storms on District owned facilities and personnel. The FEMA software used for assessing hurricane and tropical storm wind risk is based exclusively on life safety. Since the last version of the plan, DD6 built a 3,000 sq. ft. tornado and hurricane shelter built to house District Staff

during a tornado or hurricane event, in accordance with FEMA 361 - Design and Construction Guidance for Community Shelters. DD6 also installed hurricane shutters on their administrative building and their engineering building. Hurricane and tropical storm events have a very long warning time, so when an event is expected to hit, all employees will be evacuated other than essential personnel. That essential personnel can easily stay within the hurricane shelter throughout the duration of an event. Considering the analysis is based entirely on avoided injuries and fatalities, the hurricane risk for DD6 is considered \$0. Even though District facilities and personnel are not vulnerable to hurricanes, based on our analysis, other District assets such as tractors, bulldozers, dump trucks, excavators and many other vehicles totaling to \$18,551,880 in insured value, may still have some risk of being damaged by hurricanes either while in storage or on project sites. However, the size and number of vehicles owned by the District make trying to protect all of them from hurricanes infeasible. DD6 closely monitors the weather and takes proactive steps, when possible, to move vulnerable equipment to higher ground when equipment is being operated or staged in a floodprone area. The District's vulnerability is considered Low as defined in Table 8.

SEVERE THUNDERSTORMS AND HIGH WINDS

Several meteorological conditions can result in winds severe enough to cause property damage. High winds have been associated with extreme hurricanes traveling inland, tornadoes, and locally strong thunderstorms. Thunderstorms are the by-products of atmospheric instability, which promotes vigorous rising of air particles. A typical thunderstorm may cover an area three miles wide. The National Weather Service considers a thunderstorm "severe" if it produces tornadoes or winds of 58 miles per hour or more. Structural wind damage may imply the occurrence of a severe thunderstorm.

SEVERE THUNDERSTORM AND HIGH WIND LOCATION

Figure 7 - Vicinity Map: State of Texas (Source: Mapquest)

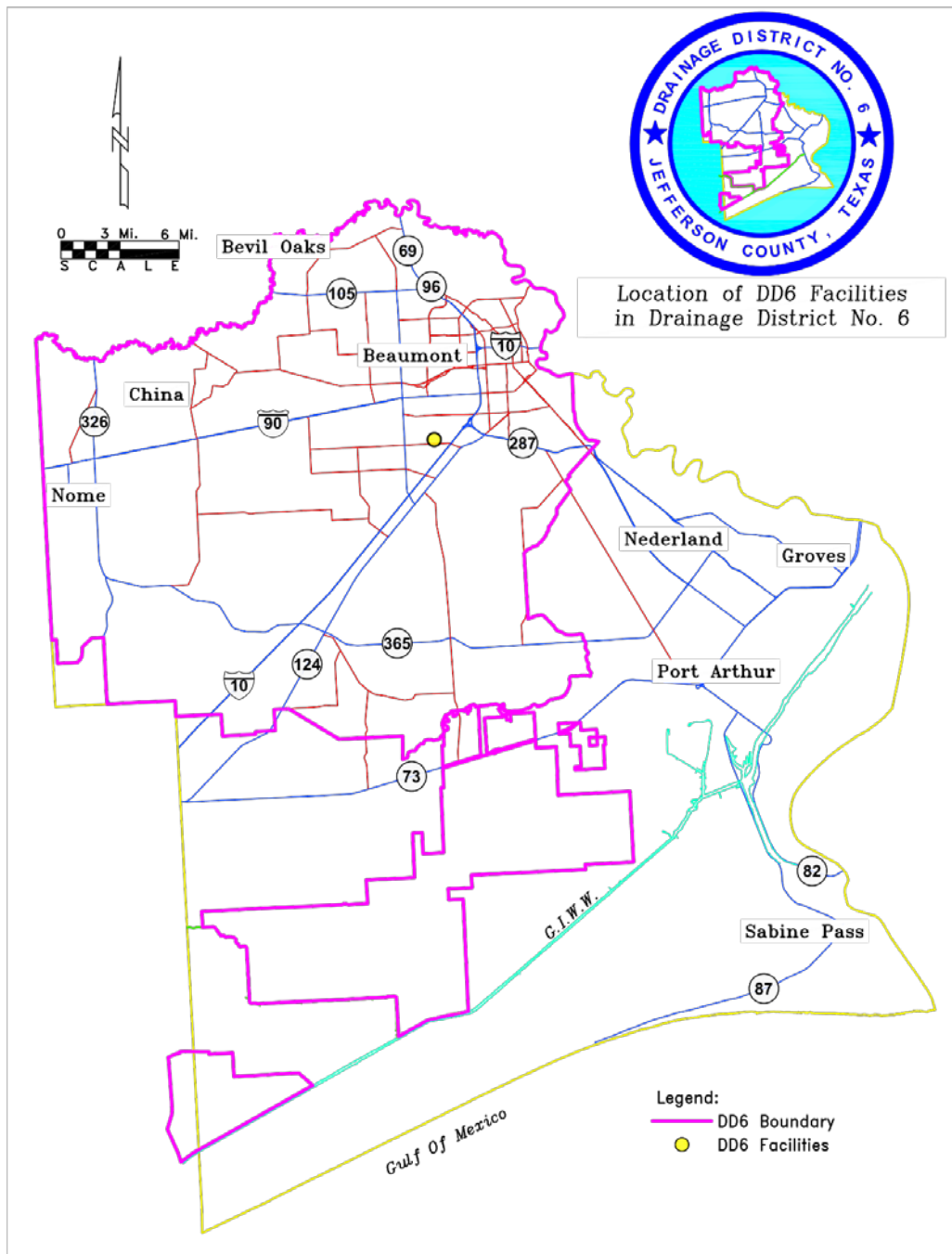


Figure 8 illustrates the minimum wind speed that buildings should be designed to withstand for buildings in Texas according to the International Building Code. As you can see below, new construction in DD6 should be built to withstand three-second gusts up to at least 140 MPH in some places and 150 MPH in others.

Figure 8 – Basic Design Wind Speed (Source: International Building Code)



Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
5. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00143, MRI = 700 Years).

SEVERE THUNDERSTORM AND HIGH WIND EXTENT

The most widely accepted extent scale for wind is the Beaufort Wind Scale. The table below shows the force of the storm and the wind speed, classification and appearance that that is associated with each force. In the planning area we can expect to experience wind events ranging from light winds to hurricane force winds.

Table 15 – Beaufort Wind Scale (Source: National Oceanic and Atmospheric Administration)

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced	

SEVERE THUNDERSTORM AND HIGH WIND PREVIOUS OCCURRENCE

According to the NCDC database, Jefferson County experienced 201 events between 1950 and 2016, 83 of which had wind above 50 kts (experiencing 11 such events since the last planning effort was underway). There is not specific data for just Jefferson County DD6, but the hazard is reasonably predicted to have uniform probability of occurrence across the entire planning area. For these events, the NCDC database reported one death, 12 injuries and just \$3.128 Million in damages. There have been 83 events over 50 kts and 21 events that resulted in at least \$25,000 in property damage. Table 16 summarizes the 21 events that resulted in at least \$25,000 in damages.

Table 16 – Severe Thunderstorm and High Wind Events in Jefferson County with at Least \$25,000 in Property Damage (Source: NCDC Storm Events Database)

Location	County/Zone	Date	Type	Mag	Dth	Inj	PrD
Totals:					1	12	3.128M*
GROVES	JEFFERSON CO.	07/16/2002	Thunderstorm Wind	65 kts. E	0	0	1.500M
JEFFERSON (ZONE)	JEFFERSON (ZONE)	10/09/2009	High Wind	56 kts. EG	0	0	200.00K
CHINA	JEFFERSON CO.	07/14/1998	Thunderstorm Wind		0	0	150.00K
PORT ARTHUR	JEFFERSON CO.	03/16/1998	Thunderstorm Wind		0	0	100.00K
BEAUMONT	JEFFERSON CO.	05/10/1999	Thunderstorm Wind		0	0	100.00K
GROVES	JEFFERSON CO.	08/03/1999	Thunderstorm Wind		0	0	100.00K
JEFFERSON (ZONE)	JEFFERSON (ZONE)	12/16/2000	High Wind		0	0	100.00K
BEAUMONT	JEFFERSON CO.	08/14/1998	Thunderstorm Wind		1	1	75.00K
Port Arthur	JEFFERSON CO.	03/13/1995	Thunderstorm Wind	70 kts.	0	2	70.00K
Beaumont	JEFFERSON CO.	03/09/1994	Thunderstorm Wind	0 kts.	0	0	50.00K
NEDERLAND	JEFFERSON CO.	12/03/1997	Thunderstorm Wind		0	1	50.00K
BEAUMONT	JEFFERSON CO.	08/29/1998	Thunderstorm Wind		0	0	50.00K
BEAUMONT	JEFFERSON CO.	08/20/1999	Thunderstorm Wind		0	0	50.00K

HAMSHIRE	JEFFERSON CO.	04/29/2006	Thunderstorm Wind	50 kts. EG	0	0	50.00K
BEAUMONT	JEFFERSON CO.	08/31/1999	Thunderstorm Wind		0	0	25.00K
NOME	JEFFERSON CO.	02/28/2001	Thunderstorm Wind		0	0	25.00K
LA BELLE	JEFFERSON CO.	05/17/2002	Thunderstorm Wind		0	0	25.00K
BEAUMONT	JEFFERSON CO.	08/26/2002	Thunderstorm Wind		0	0	25.00K
BEAUMONT	JEFFERSON CO.	05/11/2004	Thunderstorm Wind	50 kts. EG	0	0	25.00K
BEAUMONT	JEFFERSON CO.	05/29/2005	Thunderstorm Wind	50 kts. EG	0	0	25.00K
BEAUMONT	JEFFERSON CO.	08/16/2010	Thunderstorm Wind	52 kts. EG	0	1	25.00K
Totals:					1	12	3.128M*

*Property damage total is the total for all events, not just those with at least \$25,000 worth of damage.

SEVERE THUNDERSTORM AND HIGH WIND PROBABILITY

Jefferson County DD6 has experienced 201 severe thunderstorm and high wind events between 1950 and 2016, 83 of which had wind speeds of at least 50 kts. With so many events occurring, a severe thunderstorm or high wind event is:

Table 17 – Frequency of Severe Thunderstorms and High Wind

Frequency of Occurrence:

- ☒ Highly likely; Event probable in next year
- ☐ Likely; Event probable in next three years
- ☐ Occasional; Event possible in next five years
- ☐ Unlikely; Event possible in next ten years

It should be noted that due to DD6's missions and jurisdictional authority being explicitly limited to activities related to controlling floods, they only have the authority to mitigate high wind on District owned facilities and property.

SEVERE THUNDERSTORM AND HIGH WIND IMPACT AND VULNERABILITY

DD6's missions and jurisdictional authority being explicitly limited to activities related to controlling floods, they only have the authority to mitigate the effects of severe thunderstorms and high wind on District owned facilities and personnel. The FEMA software used for assessing

high wind risk is based exclusively on life safety. Since the last version of the plan, DD6 built a 3,000 sq. ft. tornado and hurricane shelter built to house District Staff during a tornado or other high wind event, in accordance with FEMA 361 - Design and Construction Guidance for Community Shelters. DD6 also installed hurricane shutters on their administrative building and their engineering building. Between these three buildings, all District staff can remain inside and safe during a severe thunderstorm or high wind event. Considering the analysis is based entirely on avoided injuries and fatalities, the severe thunderstorm and high wind risk for DD6 is considered \$0. Even though District facilities and personnel are not vulnerable to severe thunderstorms and high winds, based on our analysis, other District assets such as tractors, bulldozers, dump trucks, excavators and many other vehicles totaling to \$18,551,880 in insured value, may still have some risk of being damaged by severe thunderstorms and high winds either while in storage or on project sites. However, the size and number of vehicles owned by the District make trying to protect all of them from severe thunderstorms and high winds infeasible. The District's vulnerability is considered Low as defined in Table 8.

FLOOD

Flooding is the accumulation of water within a water body (e.g., stream, river, lake, or reservoir) and the overflow of excess water onto adjacent floodplains. Floodplains are usually lowlands adjacent to water bodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected. Nationwide, hundreds of floods occur each year, making them one of the most common hazards in the U.S.

Floods result from rain events, whether short and intense, or long and gentle. Flood hazards are categorized as follows:

- Flash floods not only occur suddenly, but also involve forceful flows that can destroy buildings and bridges, uproot trees, and scour out new channels. Most flash flooding is caused by slow-moving thunderstorms, repeated thunderstorms in a local area, or heavy rains from hurricanes and tropical storms. Although flash flooding occurs often along mountain streams, it is also common in urban areas, where much of the ground is covered by impervious surfaces and drainage ways are designed for smaller flows. Flood Insurance Rate Maps typically show the 1%-annual-chance (100-year) floodplain for waterways with at least 1 square mile of drainage area. The flood hazard areas for waterways with less than one square mile of drainage area typically are not shown.
- Riverine floods are a function of precipitation levels and water runoff volumes, and occur when water rises out of the banks of the waterway. Flooding along waterways that drain larger watersheds often can be predicted in advance, especially where it takes 24 hours or more for the flood crest (maximum depth of flooding) to pass. In Jefferson County, riverine flooding is caused by large rainfall systems and thunderstorm activity associated with seasonal cold fronts. These systems can take as long as a day to pass,

giving ample opportunity for large amounts of rain to fall over large areas. The Flood Insurance Rate Maps show the 1%-annual-chance floodplains.

- Urban drainage flooding occurs where development has altered hydrology through changes in the ground surface and modification of natural drainage ways. Urbanization increases the magnitude and frequency of floods by increasing impervious surfaces, increasing the speed of drainage collection, reducing the carrying capacity of the land, and, occasionally, overwhelming sewer systems. Localized urban flooding is not usually shown on the Flood Insurance Rate Maps in areas with less than one square mile of contributing drainage area.

The Flood Insurance Rate Maps (FIRMs) prepared by FEMA offer the best overview of flood risks. FIRMs are used to regulate new development and to control the substantial improvement and repair of substantially damaged buildings. Flood Insurance Studies (FISs) are often developed in conjunction with FIRMs. The FIS typically contains a narrative of the flood history of a community and discusses the engineering methods used to develop the FIRMs. The study also contains flood profiles for studied flooding sources and can be used to determine Base Flood Elevations for some areas.

The revised FIS' for both the City of Beaumont and Jefferson County are dated August 6, 2002. These FIS' compile all previous flood information and include data collected on numerous waterways. Both FIS' indicate that riverine flooding results primarily from overflow of the streams and drainage ditches caused by rainfall runoff, ponding, and sheet flow. Storms occurring during the summer months are often associated with tropical storms moving inland from the Gulf of Mexico. Thunderstorms are common throughout the spring, summer, and fall months. The frequent hurricanes and tropical storms interrupt the summer with high winds, heavy rainfalls, and high storm surges. FIRM maps for the City of Beaumont and Jefferson County show flood zones:

- AE Zones along rivers and streams for which detailed engineering methods were used to determine Base Flood Elevations (BFEs). AE Zones (or A1-30 Zones) are shaded in gray.
- A Zones, which are areas inundated by the 100-year flood for which BFEs and Flood Hazard Factors (FHF) have not been determined
- AH Zones, which are areas inundated by types of 100-year shallow flooding where depths are between one and three feet, and for which BFEs are shown, but no FHF are determined.
- V Zones are areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards associated with storm-induced waves. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
- VE Zones are areas subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. Base Flood

Elevations (BFEs) derived from detailed hydraulic analyses are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

- B Zones and Shaded X Zones, which are areas of “moderate” flood hazard, typically associated with the 500-year flood (or 0.2% annual chance).
- C Zones and Unshaded X Zones are areas of “minimal” flood hazard, typically considered to be “out of the floodplain.” Although local drainage problems and ponding may still occur, these minor flood problems typically are not shown on the FIRM.

FLOOD LOCATION

Figure 9 identifies the 100-year floodplain (shaded light blue) for Jefferson County DD6. The map shows the 100-year floodplain is predominately found along the southern half of DD6 near the Gulf of Mexico, the western edge of Sabine Lake and the tributaries leading into the Gulf.

Figure 9 – Jefferson County DD6 – 100-year Floodplain Map (Source: FEMA National Flood Insurance Program (NFIP) December 2009)

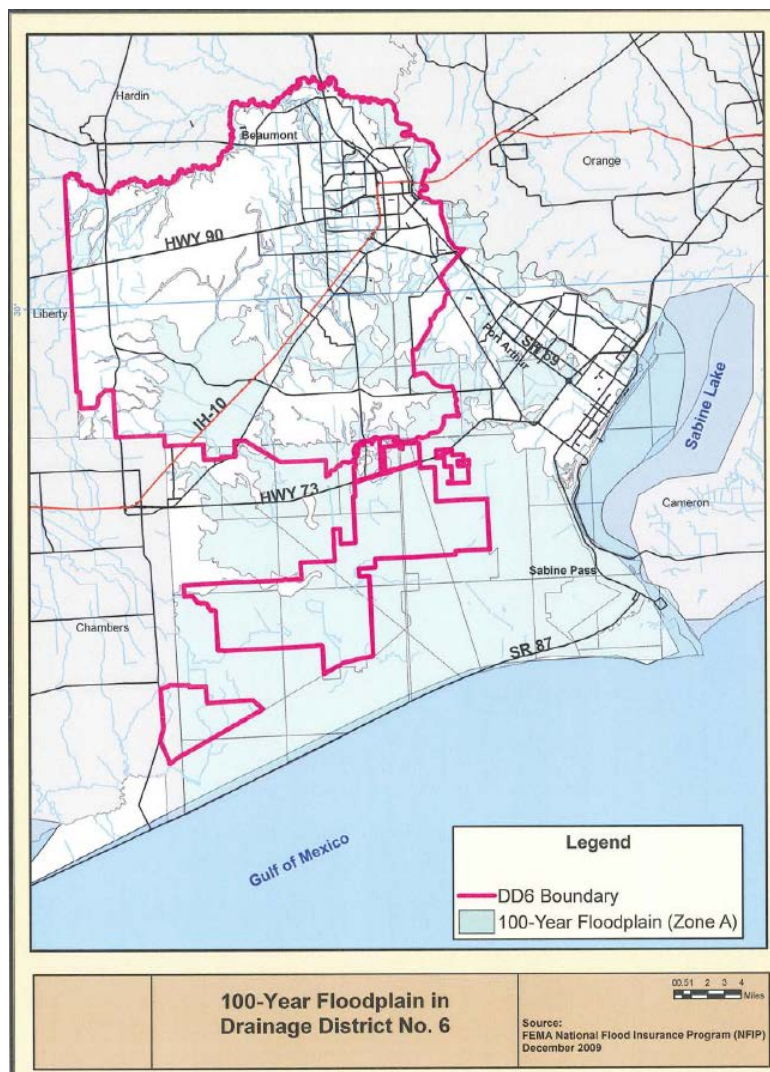
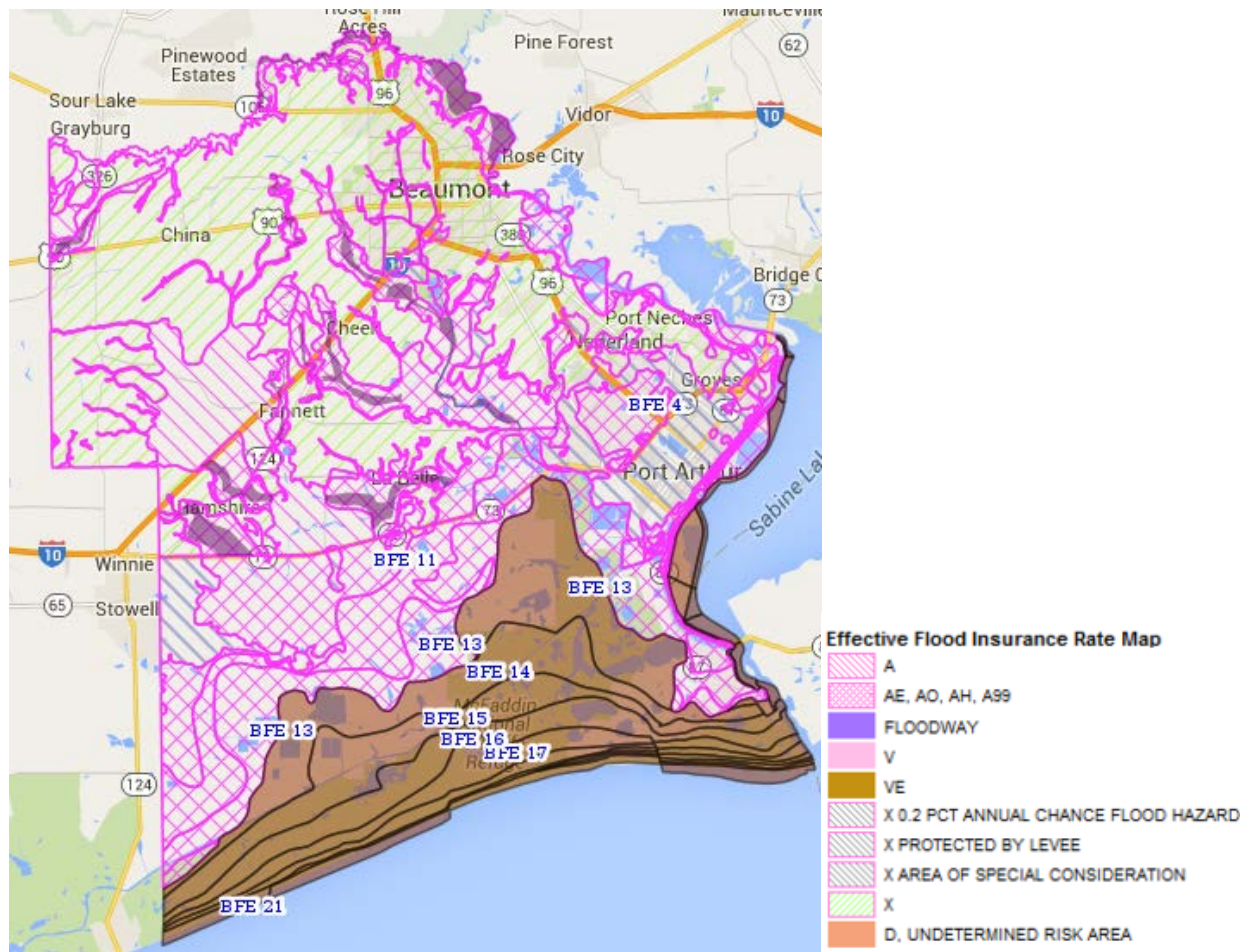


Figure 10 – Jefferson County TX Effective Flood Insurance Rate Map (Source: RiskMap6 Effective FIRM)



FLOOD EXTENT

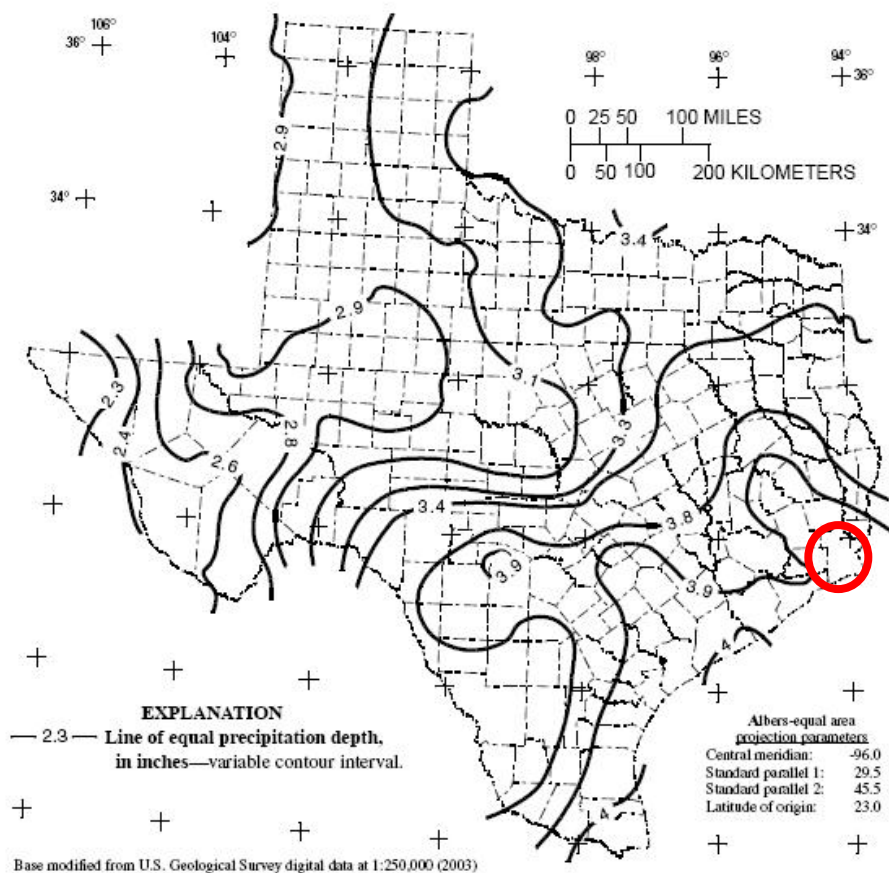
Flood severity is measured in various ways, including frequency, depth, velocity, duration and contamination, among others. In DD6, characterizing the severity of the flood hazard depends on what part of the District is being considered, but generally speaking the issues relate to how often floods occur. Historically, floods are and continue to be the most frequent, destructive, and costly natural hazard facing the State of Texas. This is also the case within the District.

In DD6, the kind of rainfall that causes flash flooding almost always comes from the south. This area receives the second greatest frequency of thunderstorms in the United States and is also favorable to frequent heavy rainfall, supporting an annual rainfall of approximately 60 inches. The flooding problems in the County are considered severe in some areas. The flat terrain and clay soils (which do not readily absorb water) found in this area contribute to the flood problem. In the District, there are nearly 8,000 active flood insurance policies, many of which sit within the floodplain.

Flooding can occur during any month of the year in DD6; however, the greatest likelihood of the occurrence is mid-summer to early winter. Mid-summer flooding (July, August, and September) is most likely to result from tropical storm and hurricane development. Flooding in the fall to early winter (October, November and December) usually results from stationary weak cold fronts.

DD6 has been actively pursuing projects to reduce the severity of flooding in the area. The majority of these projects have been drainage projects including detention basins, ditch improvements and floodwater diversions. Many of these projects have already reduced the 100-year flood levels in the project areas.

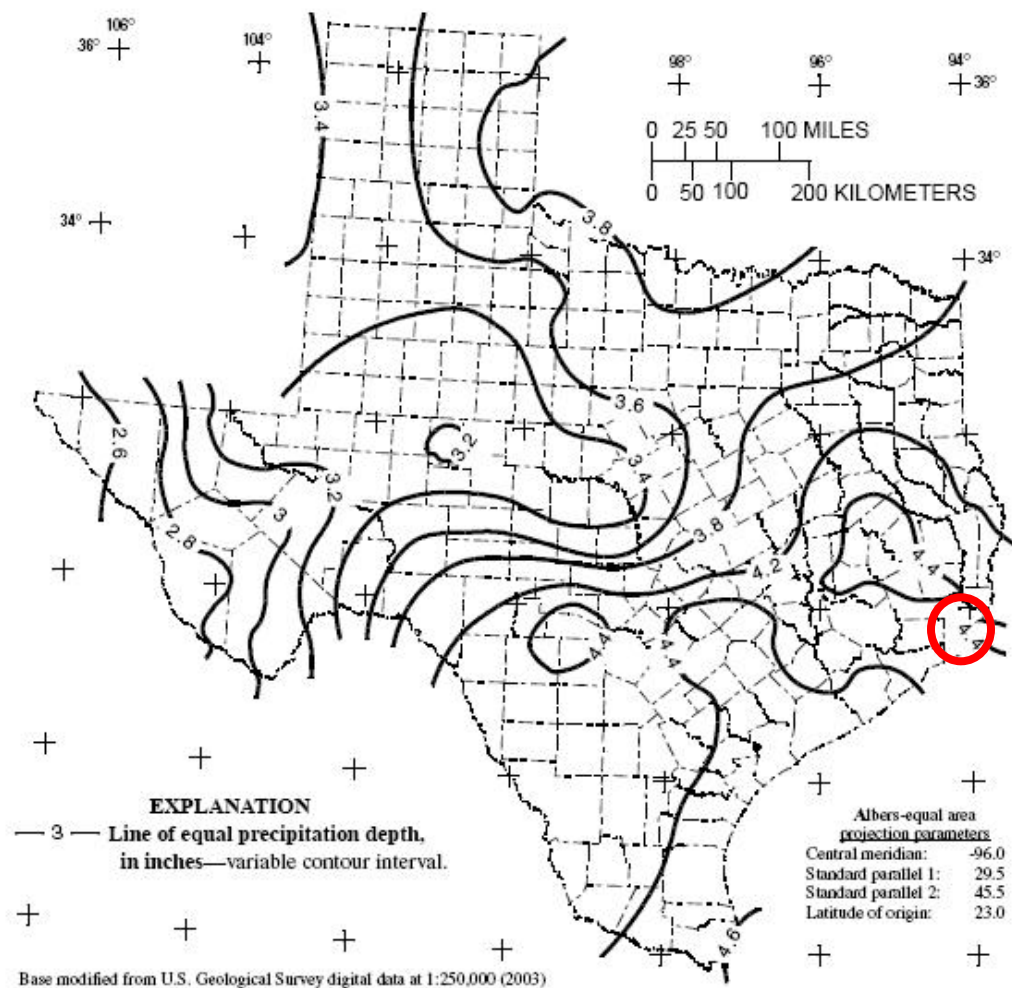
Figure 11 – Depth of Precipitation for 50-year Storm for 1-hour duration in Texas (Source: United States Geological Survey (USGS))



Depth of precipitation for 50-year storm for 1-hour duration in Texas.

Based on the above USGS map, the planning (in the red circle) area can expect, on average, an increase of 4.0" of water in one hour on the ground in a 50-year event.

Figure 12 – Depth of Precipitation for 100-year Storm for 1-hour duration in Texas (Source: USGS)



Depth of precipitation for 100-year storm for 1-hour duration in Texas.

Based on the above USGS map, the planning area (in the red circle) can expect, on average, an increase of 4.4" of water in one hour on the ground in a 100-year event.

FLOOD PREVIOUS OCCURRENCE

The NCDC indicates that Jefferson County and DD6 have experienced 61 flood events between 1996 and 2016. Of this total, 23 flood events have occurred since the last planning effort was underway. The NCDC database provides no indication as to why there are no events prior to 1996, although presumably occurrences follow the same pattern and frequency as shown in the NCDC list. Property damages for these events totaled just over \$18.504 million. The NCDC reported two deaths and no injuries from the 61 flood events. The 23 flood events that have occurred since the last planning effort was under way are listed below.

Table 18 – Jefferson County Flood Events since Last Planning Effort (Source: NCDC Storm Events Database)

Location	County/Zone	Date	Type	Mag	Dth	Inj	PrD
Totals:					2*	0	18.504M*
CHINA	JEFFERSON CO.	01/04/2009	Flash Flood		0	0	5.00K
FANNETT	JEFFERSON CO.	04/18/2009	Flash Flood		0	0	20.00K
(BPT)BEAUMONT-PT ART	JEFFERSON CO.	04/27/2009	Flash Flood		0	0	5.00K
GILLBURG	JEFFERSON CO.	09/09/2009	Flood		0	0	0.00K
GILLBURG	JEFFERSON CO.	10/22/2009	Flash Flood		0	0	100.00K
FT ACRES	JEFFERSON CO.	10/22/2009	Flash Flood		0	0	10.00K
AMELIA	JEFFERSON CO.	10/26/2009	Flood		0	0	10.00K
GUFFEY	JEFFERSON CO.	08/17/2010	Flash Flood		0	0	1.00K
PEAR RIDGE	JEFFERSON CO.	07/19/2011	Flash Flood		0	0	10.00K
GUFFEY	JEFFERSON CO.	01/25/2012	Flash Flood		0	0	1.00K
BEVIL OAKS	JEFFERSON CO.	03/20/2012	Flash Flood		0	0	10.00K
GALLOWAY	JEFFERSON CO.	07/13/2012	Flash Flood		0	0	2.00K
HOLLYWOOD	JEFFERSON CO.	01/09/2013	Flash Flood		0	0	0.00K
GILLBURG	JEFFERSON CO.	05/10/2013	Flash Flood		0	0	50.00K
GILLBURG	JEFFERSON CO.	10/31/2013	Flash Flood		0	0	50.00K
PORT NECHES	JEFFERSON CO.	07/18/2014	Flash Flood		0	0	0.00K
(BPT)BEAUMONT-PT ART	JEFFERSON CO.	03/21/2015	Flash Flood		0	0	15.00K
FT ACRES	JEFFERSON CO.	04/16/2015	Flash Flood		0	0	0.00K
BEAUMONT	JEFFERSON CO.	05/12/2015	Flash Flood		0	0	10.00K
AMELIA	JEFFERSON CO.	05/21/2015	Flash Flood		0	0	5.00K
AMELIA	JEFFERSON CO.	05/27/2015	Flash Flood		0	0	0.00K

GUFFEY	JEFFERSON CO.	06/17/2015	Flash Flood		0	0	1.00K
PORT ARTHUR	JEFFERSON CO.	11/07/2015	Flash Flood		0	0	0.00K
Totals:					2*	0	18.504M*

*Property damage and death total is the total for all events, not just those since the last planning effort.

FLOOD PROBABILITY

Jefferson County and DD6 have experienced 61 floods between 1996 to 2016. With so many events occurring, future probability of a flood is:

Table 19 – Flood Frequency of Occurrence

<p>Frequency of Occurrence:</p> <p><input checked="" type="checkbox"/> Highly likely; Event probable in next year</p> <p><input type="checkbox"/> Likely; Event probable in next three years</p> <p><input type="checkbox"/> Occasional; Event possible in next five years</p> <p><input type="checkbox"/> Unlikely; Event possible in next ten years</p>
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FLOOD IMPACT AND VULNERABILITY

To develop more specific data about flood-prone buildings, as part of the original Plan development DD6 worked with Jefferson County Engineering, Jefferson County Appraisal District (JCAD) and the City of Beaumont, who have access to a Geographic Information System (GIS) database. The tool that makes this possible is the GIS computer software application that relates physical features on the ground in mapping applications and analyses. The number of flood-prone residential and commercial buildings was re-evaluated in January, 2010, and again in April 2016. Updated figures are included in the building characterizations described below.

Flood insurance policies and claims information can be used to identify buildings in mapped floodplains (where lenders require insurance) and where flooding has occurred (where owners are sufficiently concerned that they purchase flood insurance even if not required). This characterization of flood risk is described below.

Data provided by FEMA indicate that as of January 1, 2016, federal flood insurance policies were in-force on 7,896 buildings in the City of Beaumont, Bevil Oaks, Nome, China and unincorporated Jefferson County. These insurance policies are administered by the National Flood Insurance Program (NFIP). Of those 7,896 buildings with NFIP policies still in force (active policies), 61 are Repetitive Loss structures and 19 (there are 37 SRLs in total but only 19 are currently insured) are Severe Repetitive Loss structures. The District's vulnerability to flood is considered very high according to table 8.

NFIP REPETITIVE LOSS PROPERTIES

In recent years, FEMA has focused considerable attention on the Repetitive Loss (RL) subset of insured buildings. These properties have received two or more claim payments of at least \$1,000 over a ten-year period. FEMA's database identifies 293 properties as Repetitive Loss properties in DD6 (this number includes properties with active flood insurance policies as well as those with inactive policies). Collectively, they had received claim payments of almost \$20 million (includes payments for building damage and contents damage).

As of January 1, 2016, repetitive loss statistics for areas within DD6 (including unincorporated Jefferson County as a whole) showed 293 Repetitive Loss properties. Of this total, 264 were categorized as residential properties and 29 were non-residential.

The RL data for Jefferson County was broken down by eliminating the properties located in the incorporated areas outside of DD6. Although it is not possible to extract only the Jefferson County DD6 RL properties, by removing the incorporated areas outside DD6 this leaves only the properties located within the incorporated areas of DD6 and the unincorporated areas for all of Jefferson County. The population data indicates that the majority of the population within Jefferson County is located within DD6, and therefore this approach provides the closest method for estimating the RL properties in DD6. Table 20 summarizes the residential and non-residential properties for each municipality within DD6.

Table 20 - Summary of Residential and Non-Residential NFIP Repetitive Loss Statistics, Jefferson County DD6, ordered by Municipality (Source: FEMA NFIP query January 1, 2016)

Municipality	Properties	Building	Contents	Total	# of claims	Average
Beaumont	191	\$7,713,913.72	\$2,791,355.04	\$10,505,459.76	620	\$16,944.29
Bevil Oaks	11	\$1,193,123.49	\$499,684.68	\$1,692,819.17	33	\$51,297.22
Jefferson County	91	\$4,806,661.38	\$1,661,362.53	\$6,468,023.91	327	\$19,780.17
Grand Total	293	\$13,713,698.59	\$4,952,402.25	\$18,666,393.84	980	\$19,047.34

As indicated above, it is estimated there are 264 residential RL properties in Jefferson County DD6. Table 21 summarizes the RL claims data by municipality. The table shows that the majority of the residential RL properties are located within the City of Beaumont. As of January 1, 2016, claim payments for all 264 residential properties totaled over \$13 million.

Table 21 - Summary of Residential NFIP Repetitive Loss Statistics, Jefferson County DD6, ordered by Municipality (Source: FEMA NFIP query January 1, 2016)

Municipality	Properties	Building	Contents	Total	# of claims	Average
Beaumont	167	\$4,288,851.97	\$1,116,889.52	\$5,405,741.49	513	\$6,278.45
Bevil Oaks	11	\$1,193,123.49	\$499,684.68	\$1,692,808.17	33	\$51,297.22
Jefferson County	86	\$4,583,726.25	\$1,546,725.90	\$6,130,452.15	315	\$19,461.75
Grand Total	264	\$10,065,701.71	\$3,163,300.10	\$13,229,001.81	861	\$15,364.69

Table 22 - Summary of Non-Residential NFIP Repetitive Loss Statistics, Jefferson County DD6, ordered by Municipality (Source: FEMA NFIP query January 1, 2016)

Municipality	Properties	Building	Contents	Total	# of claims	Average
Beaumont	24	\$3,425,059.75	\$1,674,465.52	\$5,099,525.27	67	\$76,112.32
Jefferson County	5	\$222,935.13	\$114,646.63	\$337,571.76	12	\$28,130.98
Grand Total	29	\$3,647,994.88	\$1,789,102.15	\$5,437,097.03	119	\$45,689.89

The RL claims can be further broken down from listing by municipality to focusing on individual street level data. Table 23 provides a summary of residential repetitive flood insurance claims for individual streets within Jefferson County DD6 that include two or more repetitive loss properties. The data displayed in the table summarizes the NFIP repetitive loss data for 37 individual streets in DD6 that include two or more repetitive loss property. For each street, the building, contents, and total claims data has been combined. Note that by selecting only streets with two or more repetitive loss properties, the table only includes 146 of the 264 residential RL properties estimated within Jefferson County DD6.

The table shows that for these 146 RL properties, claim payments totaled approximately \$9.5 million as of January 1, 2016. The data shows that Crow Road clearly has the street with the most repetitive loss properties in Jefferson County DD6. Address data about individual sites is omitted for reasons of confidentiality.

**Table 23 – Summary of Residential NFIP Repetitive Loss Statistics, Jefferson County DD6,
ordered by number of Properties on Each Street (Source: FEMA NFIP query January 1, 2016)**

Street Name	Municipality	Properties	Building	Contents	Total	# of Claims	Average (Per Claim)
Alford Oaks Dr	Jefferson County	3	\$415,867.20	\$155,164.83	\$571,032.03	15	\$38,068.80
Blossom Dr	Beaumont, TX	3	\$24,165.48	\$11,160.40	\$35,325.88	8	\$4,415.74
Brockman St	Beaumont, TX	3	\$121,898.90	\$42,397.59	\$164,296.49	10	\$16,429.65
CARNAHAN PL	Beaumont, TX	3	\$54,773.31	\$9,550.02	\$64,323.33	11	\$5,847.58
Central Blvd	Jefferson County	10	\$322,946.58	\$165,295.43	\$488,242.01	26	\$18,778.54
Cherokee Ln	Beaumont, TX	3	\$127,952.86	\$55,199.47	\$183,152.33	8	\$22,894.04
Concord Rd	Beaumont, TX	2	\$26,965.30	\$10,019.50	\$36,984.80	5	\$7,396.96
Coolidge St	Beaumont, TX	7	\$329,727.28	\$51,969.70	\$381,696.98	26	\$14,680.65
Crow Rd	Beaumont, TX	24	\$427,472.08	\$11,860.89	\$439,332.97	60	\$7,322.22
Downs Rd	Beaumont, TX	2	\$19,443.27	\$0	\$19,443.27	4	\$4,860.82
Elinor St	Beaumont, TX	2	\$62,496.90	\$15,299.51	\$77,796.41	8	\$9,724.55
FM 365	Jefferson County	2	\$127,160.97	\$29,679.21	\$156,840.18	4	\$39,210.05
Folsom Dr	Beaumont, TX	2	\$67,453.36	\$7,914.05	\$75,367.41	6	\$12,561.24
Forsythe St	Beaumont, TX	2	\$43,262.55	\$18,734.76	\$61,997.31	6	\$10,332.89
Galveston St	Beaumont, TX	4	\$128,254.58	\$29,126.32	\$157,380.90	16	\$9,836.31
Heartfield Ln	Beaumont, TX	2	\$37,001.13	\$1,564.62	\$38,565.75	4	\$9,641.44
Hillebrandt Acres	Jefferson County	11	\$624,102.15	\$310,498.36	\$934,600.51	70	\$13,351.44
Jerry Dr	Jefferson County	3	\$405,481.89	\$151,959.96	\$557,441.85	9	\$61,937.98
Kenner Rd	Jefferson County	2	\$64,365.35	\$2,827.20	\$67,192.55	4	\$16,798.14
Madison St	Jefferson County	2	\$51,468.59	\$20,847.34	\$72,315.93	7	\$10,330.85
Marsh Rd	Jefferson County	3	\$259,317.65	\$92,517.30	\$351,834.95	13	\$27,064.23

Street Name	Municipality	Properties	Building	Contents	Total	# of Claims	Average (Per Claim)
N 2 nd Ave	Jefferson County	2	\$95,624.21	\$25,484.44	\$121,108.65	4	\$30,277.16
N Killarney Dr	Jefferson County	2	\$65,395.25	\$4,485.73	\$69,880.98	10	\$6,988.10
Park St	Beaumont, TX	8	\$232,030.82	\$88,930.65	\$320,961.47	29	\$11,067.64
Phelan Blvd	Beaumont, TX	2	\$13,914.07	\$2,308.37	\$16,222.44	6	\$2,703.74
Pipkin St	Beaumont, TX	2	\$62,685.20	\$20,832.14	\$83,517.34	7	\$11,931.05
Rainbow Ln	Jefferson County	2	\$182,443.62	\$48,343.30	\$230,786.92	6	\$38,464.49
Redwood Dr	Beaumont, TX	2	\$45,184.68	\$6,772.04	\$51,956.72	4	\$12,989.18
River Bend Dr	Bevil Oaks, TX	6	\$1,040,460.30	\$392,753.84	\$1,433,214.14	21	\$68,248.29
River Rd	Bevil Oaks, TX	2	\$111,927.91	\$59,805.04	\$171,732.95	4	\$42,933.24
Roberts St	Beaumont, TX	4	\$129,777.03	\$59,057.41	\$188,834.44	10	\$18,883.44
Rockwell St	Beaumont, TX	6	\$135,719.39	\$44,328.45	\$180,047.84	17	\$10,591.05
S Major Dr	Beaumont, TX	2	\$47,396.22	\$9,263.98	\$56,660.20	8	\$7,082.53
Thomas Rd	Beaumont, TX	2	\$37,802.92	\$550	\$38,352.92	5	\$7,670.58
Vernon St	Jefferson County	3	\$207,742.50	\$40,615.91	\$248,358.41	18	\$13,797.69
W Euclid St	Beaumont, TX	4	\$157,623.00	\$79,591.79	\$237,214.79	15	\$15,814.32
W Lucas Dr	Beaumont, TX	2	\$18,008.74	\$0	\$18,008.74	4	\$4,502.19
Total		146	\$6,325,313.24	\$2,076,709.55	\$8,402,022.79	488	\$17,217.26

FLOOD RISK TO RESIDENTIAL REPETITIVE LOSS PROPERTIES

Jefferson County DD6 has an extensive history of repetitive loss flood claims, so it is possible to perform a relatively simple statistical risk assessment using average annual losses and a present value coefficient calculation to project losses over a planning horizon. Residential flood risk is calculated by a simple methodology that uses the FEMA default present-value coefficients from the benefit-cost analysis software modules. To perform this calculation, the repetitive loss data were reviewed to determine an approximate period over which the claims occurred. This method should not be used for risk assessments for individual properties because of the generalizations that are used, but the method is appropriate for larger numbers of properties and policies that are spread over an entire jurisdiction. It is presumed that more accurate

figures would be somewhat higher because the underlying statistics are for properties that had flood insurance, were flooded, and had paid claims. There are nearly always some properties in a jurisdiction that are flooded in big events, and do not have flood insurance (or did not make claims), and are thus not represented in the sample.

Most of the flood claims in this query occurred between 1979 and 2015, a period of 36 years. As shown in Table 24, there have been 901 claims in the 36-year period, for an average number of 25.03 claims per year. Based on a 100-year horizon and a present value coefficient of 14.27 (the coefficient for 100 years using the mandatory Office of Management and Budget (OMB) discount rate of 7.0 percent), the projected flood risk to these properties is shown at the bottom of the table. It must be understood that individuals can obtain and cancel flood insurance policies, and the flood hazard depends on many variables, including the weather, so this projection is simply an estimate of potential damages. Nevertheless, it offers a useful metric that can be used in assessing the potential cost effectiveness of mitigation actions.

Table 24 – Projected 100-year Flood Risk in Jefferson County DD6 Repetitive Loss Areas
(Source: FEMA NFIP query January 1, 2016)

Data	Value
Period in years	36
Number of claims	901
Average claims per year	25.03
Total value of claims	\$14,335,517.19
Average value of claims per year	\$398,208.81
Projected risk, 100-year horizon	\$5,682,439.73

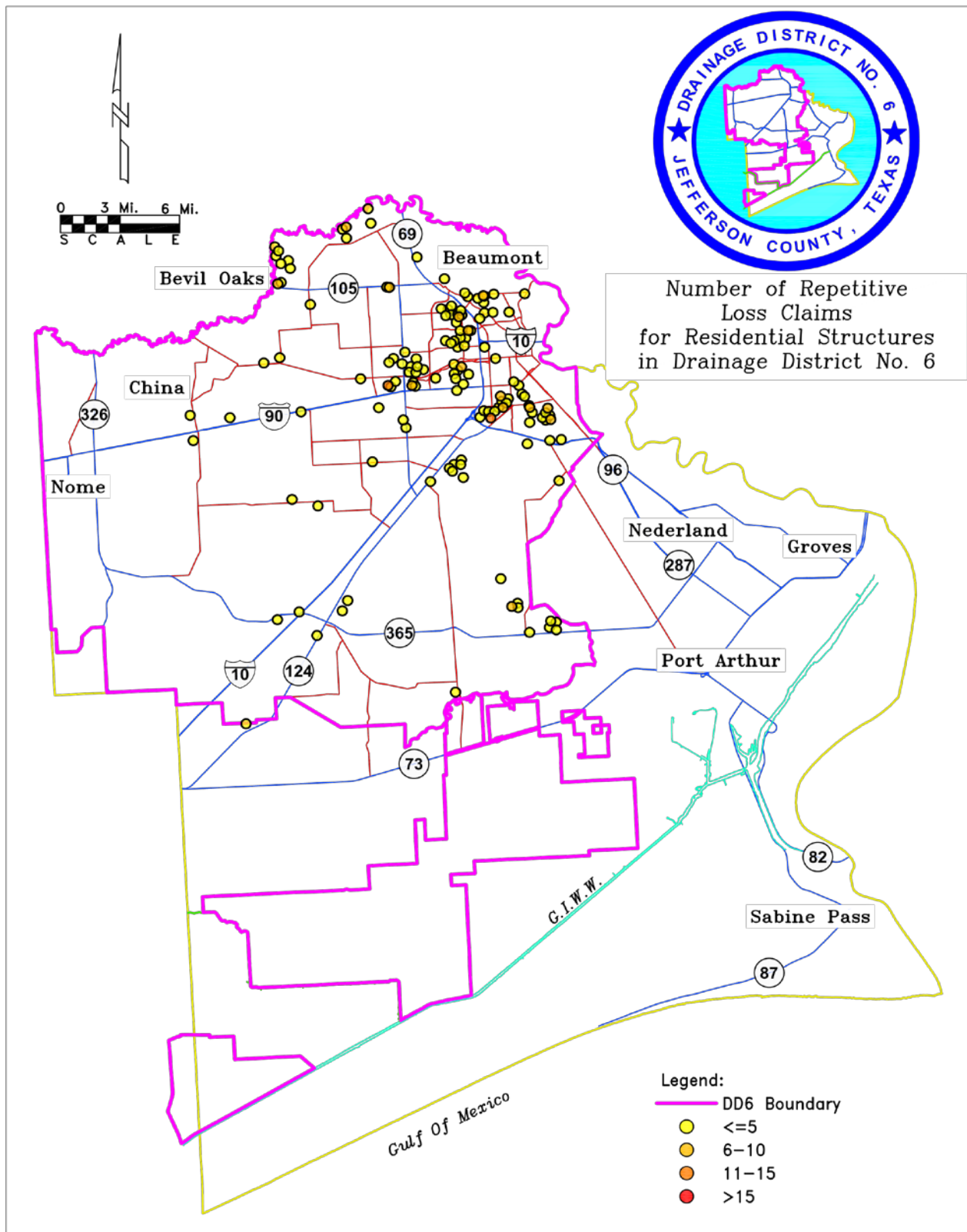
The risk assessment for residential repetitive loss properties can be further broken down to the street level. Streets in Jefferson County with ten or more repetitive loss claims were considered to have sufficient claims history to perform a risk assessment. Table 25 displays the annual and 100-year risk for streets in Jefferson County with ten or more NFIP claims. The table shows that Hillebrandt Acres in Jefferson County is the street with the highest number of claims. Although Hillebrandt Acres has the highest number of claims, River Bend Dr in Bevil Oaks has the highest 100-year risk totaling \$568,110.16.

Table 25 – Projected Future Damages (Risk) to NFIP Repetitive Flood Loss Properties in Jefferson County DD6, ordered by 100-year Risk (Source: FEMA NFIP query January 1, 2016)

Street Name	Municipality	Properties	# of Claims	Total Paid	Average (Per Policy)	Annual Risk	100-year Risk
Alford Oaks Dr	Jefferson County	3	15	\$571,032.03	\$38,068.80	\$15,862.00	\$226,350.75
Anita St	Beaumont, TX	1	12	\$155,860.06	\$12,988.34	\$4,329.45	\$61,781.20
Brockman St	Beaumont, TX	3	10	\$164,296.49	\$16,429.65	\$4,563.79	\$65,125.30
Carnahan Pl	Beaumont, TX	3	11	\$64,323.33	\$5,847.58	\$1,786.76	\$25,497.05
Central Blvd	Jefferson County	10	26	\$488,242.01	\$18,778.54	\$13,562.28	\$193,533.71
Coolidge St	Beaumont, TX	7	26	\$381,696.98	\$14,680.65	\$10,602.69	\$151,300.44
Crow Rd	Beaumont, TX	24	60	\$439,332.97	\$7,322.22	\$12,203.69	\$174,146.71
Galveston St	Beaumont, TX	4	16	\$157,380.90	\$9,836.31	\$4,371.69	\$62,384.04
Hillebrandt Acres	Jefferson County	11	70	\$934,600.51	\$13,351.44	\$25,961.13	\$370,465.26
Josey St	Beaumont, TX	1	11	\$69,926.81	\$6,356.98	\$1,942.41	\$27,718.21
Marsh Rd	Jefferson County	3	13	\$351,834.95	\$27,064.23	\$9,773.19	\$139,463.46
N Kilarney	Jefferson County	2	10	\$69,880.98	\$6,988.10	\$1,941.14	\$27,700.04
Park St	Beaumont, TX	8	29	\$320,961.47	\$11,067.64	\$8,915.60	\$127,225.56
River Bend Dr	Bevil Oaks, TX	6	21	\$1,433,214.14	\$68,248.29	\$39,811.50	\$568,110.16
Roberts St	Beaumont, TX	4	10	\$188,834.44	\$18,883.44	\$5,245.40	\$74,851.87
Rockwell St	Beaumont, TX	6	17	\$180,047.84	\$10,591.05	\$5,001.33	\$71,368.96
Vernon St	Jefferson County	3	18	\$248,358.41	\$13,797.69	\$6,898.84	\$98,446.51
W Euclid St	Beaumont, TX	4	15	\$237,214.79	\$15,814.32	\$6,589.30	\$94,029.31
Total		103	390	\$6,457,039.11	\$16,556.51	\$179,362.20	\$2,559,498.56

Figure 13 shows the locations of the residential repetitive loss properties in Jefferson County DD6. The map highlights the total number of residential repetitive loss flood insurance claims per property in DD6. The map shows that the residential RL properties in DD6 are mainly concentrated within the City of Beaumont.

Figure 13 – Number of NFIP Flood Insurance Claims Per Residential Repetitive Loss Property in Jefferson County DD6 (Source: FEMA/NFIP, Query January 1, 2016; Plotted by DD6)



NON-RESIDENTIAL REPETITIVE LOSS PROPERTIES

As noted earlier, as of January 1, 2016, Jefferson County DD6 had an estimated 29 non-residential repetitive loss properties in the NFIP database. Table 26 provides a summary of non-residential repetitive loss claims for individual streets in Jefferson County with at least five claims. The building, contents, and total claims data has been combined for streets that include more than one repetitive loss property. Similar to the residential repetitive loss data, address data about individual sites is omitted for reasons of confidentiality.

The Table shows that Calder and 11th Streets have the most non-residential repetitive losses in Jefferson County DD6. The data shows that these two streets rank highest in total paid claims (both building and contents combined) and number of past claims, indicating a significant history of flooding at these sites. Jefferson County DD6 has completed a drainage improvement project in the Hillebrandt Bayou watershed that includes areas of Calder Street and is nearing completion of a drainage improvement project on 11th St. Upon completion, the future risk in this area will be substantially reduced. Additional details about this project can be found in later in this Plan.

Table 26 – Projected 100-year Flood Risk, Non-Residential Repetitive Loss Properties in Jefferson County DD6 (Source: FEMA NFIP query January 1, 2016)

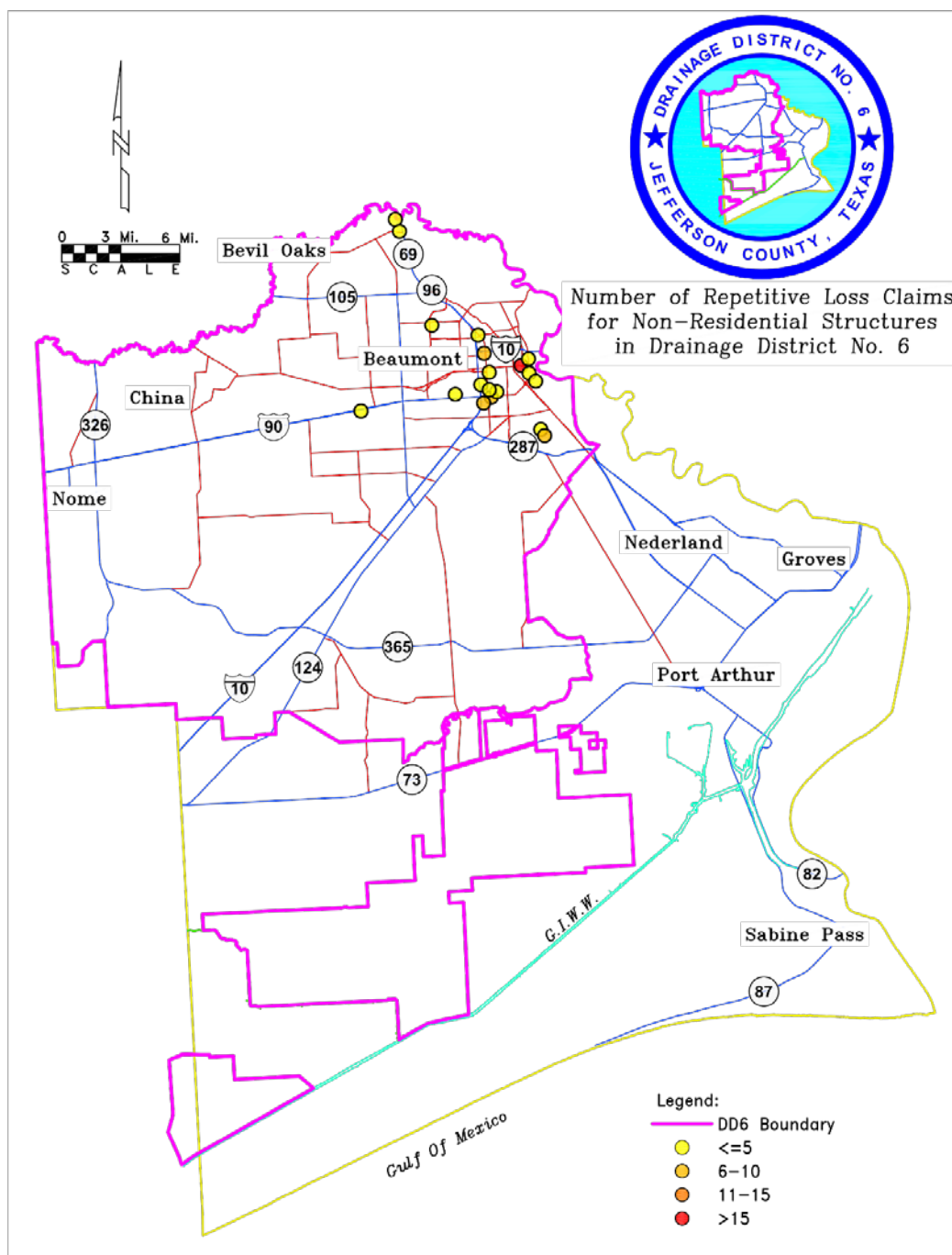
Street Name	Municipality	Claims	Properties	Total Claims (\$)	Annual Risk	100-year risk
College St	Beaumont, TX	6	1	\$37,456.78	\$1,040.47	\$14,847.45
Calder St	Beaumont, TX	26	1	\$1,464,159.10	\$40,671.09	\$580,376.40
Milam St	Beaumont, TX	6	1	\$60,751.68	\$1,687.55	\$24,081.29
Park St	Beaumont, TX	5	1	\$24,201.32	\$672.26	\$9,593.13
N 11 th St	Beaumont, TX	19	3	\$1,461,014.50	\$40,583.74	\$579,129.91
Cheek St	Beaumont, TX	5	1	\$300,016.08	\$8,333.78	\$118,923.04
Woodrow St	Beaumont, TX	6	1	\$247,669.06	\$6,879.70	\$98,173.26
Total		73	9	\$3,595,268.52	\$99,868.57	\$1,425,124.49

It should be noted that some of the non-residential properties on this list may be at far greater flood risk than indicated, because there may have been periods where the owner(s) did not carry flood insurance, with the result that they may have been damaged but there is no record of it. This type of analysis is not totally conclusive. It would be possible to perform relatively simple engineering studies to better assess risks for properties with just a few claims, but where data suggests that sites may be vulnerable to additional flood-related losses.

The information in this section should be used for planning purposes only, i.e. as the basis for additional steps in risk assessment, and eventually (where warranted) targeted mitigation

actions to reduce the risk. For example, a property that has received a number of claim payments not much higher than \$1,000 would be considered an unlikely candidate for mitigation using public funds. It may, however, be an excellent candidate for damage-reduction actions taken by the owner.

Figure 14 – Number of NFIP Flood Insurance Claims Per Non-Residential Repetitive Loss Property in Jefferson County DD6 (Source: FEMA/NFIP, Query January 1, 2016; Plotted by DD6)



NFIP SEVERE REPETITIVE LOSS PROPERTIES

In 2004 FEMA began to develop the Severe Repetitive Loss (SRL) Grant Program in an effort to reduce or eliminate flood damages to residential properties that met certain minimum requirements. FEMA initiated the program early in 2008. The SRL Grant Program has since been included in the FMA Grant Program, with SRL properties being a top priority. An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or
- for which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

SRL properties are a subset of the RL list and include only residential structures. As of January 1, 2016, Jefferson County had 37 properties on the SRL list all of which are located in either unincorporated Jefferson County, the City of Beaumont or the City of Bevil Oaks.

Table 27 provides loss estimates for SRL properties in DD6 summarized at the street level, as calculated by FEMA and the NFIP. The table shows that within Jefferson County, Hillebrandt Acres has the highest number of SRL properties.

Table 27 – Projected 100-year Flood Risk, Severe Repetitive Loss Properties in Jefferson County DD6 (Source: FEMA/NFIP, Query January 1, 2016)

Street Name	Municipality	Claims	Properties	Total Claims (\$)	Annual Risk	100-year risk
Alford Oaks Dr	Jefferson County	9	1	\$368,135.66	\$10,225.99	\$145,924.89
Anita St	Beaumont, TX	12	1	\$155,860.06	\$4,329.45	\$61,781.20
Boussard St	Beaumont, TX	6	1	\$120,317.15	\$3,342.14	\$47,692.38
Brockman St	Beaumont, TX	8	2	\$157,817.39	\$4,383.82	\$62,557.06
Cherokee Ln	Beaumont, TX	4	1	\$103,456.78	\$2,873.80	\$41,009.12
Coolidge St	Beaumont, TX	6	1	\$127,564.16	\$3,543.45	\$50,565.02
Corley St	Beaumont, TX	7	1	\$100,985.69	\$2,805.16	\$40,029.61
Crow Rd	Jefferson County	4	1	\$43,251.86	\$1,201.44	\$17,144.56

Elinor St	Beaumont, TX	5	1	\$54,052.98	\$1,501.47	\$21,426.00
Euclid St	Beaumont, TX	7	1	\$67,212.73	\$1,867.02	\$26,642.38
Galveston St	Beaumont, TX	6	1	\$49,013.39	\$1,361.48	\$19,428.36
Gross St	Beaumont, TX	4	1	\$78,260.48	\$2,173.90	\$31,021.58
Highway 105	Jefferson County	5	1	\$84,857.66	\$2,357.16	\$33,636.63
Hillebrandt Acres	Jefferson County	51	5	\$739,156.93	\$20,532.14	\$292,993.59
Iola St	Beaumont, TX	6	1	\$41,589.97	\$1,155.28	\$16,485.80
Josey St	Beaumont, TX	11	1	\$69,926.81	\$1,942.41	\$27,718.21
Marsh Rd	Jefferson County	4	1	\$142,388.59	\$3,955.24	\$56,441.25
N 23Rd	Beaumont, TX	7	1	\$100,269.41	\$2,785.26	\$39,745.68
N Kilarney	Jefferson County	8	1	\$66,827.36	\$1,856.32	\$26,489.62
Ogden Ave	Beaumont, TX	7	1	\$64,850.79	\$1,801.41	\$25,706.13
Park St	Beaumont, TX	11	2	\$221,265.97	\$6,146.28	\$87,707.37
Pinkstaff	Beaumont, TX	2	1	\$96,334.04	\$2,675.95	\$38,185.74
River Bend	Bevil Oaks, TX	15	3	\$1,178,926.34	\$32,747.95	\$467,313.30
Roberts St	Beaumont, TX	3	1	\$101,464.40	\$2,818.46	\$40,219.36
Saratoga Cir	Beaumont, TX	4	1	\$49,100.82	\$1,363.91	\$19,463.02
Sour Lake	Jefferson County	5	1	\$78,867.25	\$2,190.76	\$31,262.10
Stratton Ln	Jefferson County	6	1	\$166,605.66	\$4,627.94	\$66,040.63
W Lynwood	Beaumont, TX	4	1	\$49,085.19	\$1,363.48	\$19,456.82

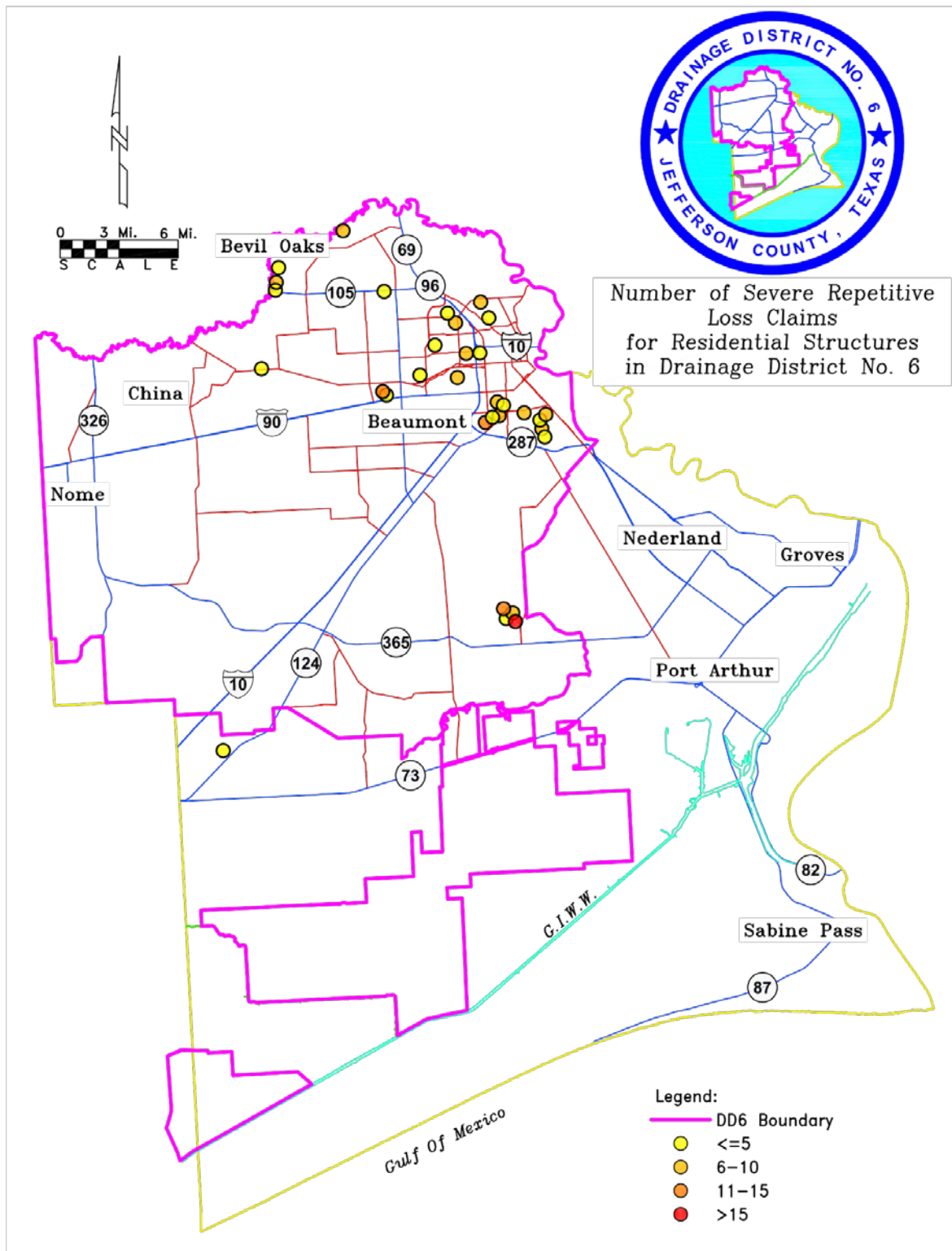
Westmoreland St	Beaumont, TX	5	1	\$101,539.25	\$2,820.53	\$40,249.03
Total		232	37	\$4,778,984.77	\$132,749.58	\$1,894,336.46

It should be noted that some of the properties on this list may be at far greater flood risk than indicated, because there may have been periods where the owner(s) did not carry flood insurance, with the result that they may have been damaged but there is no record of it. This type of analysis is not totally conclusive. It would be possible to perform relatively simple engineering studies to better assess risks for properties with just a few claims, but where data suggests that sites may be vulnerable to additional flood-related losses.

The information in this section should be used for planning purposes only, i.e. as the basis for additional steps in risk assessment, and eventually (where warranted) targeted mitigation actions to reduce the risk.

The SRL properties can also be mapped to identify the floodprone areas of DD6. Figure 15 highlights the total number of NFIP severe repetitive loss flood insurance claims per property in Jefferson County DD6. The map shows that the SRL properties in DD6 are mainly concentrated within the City of Beaumont.

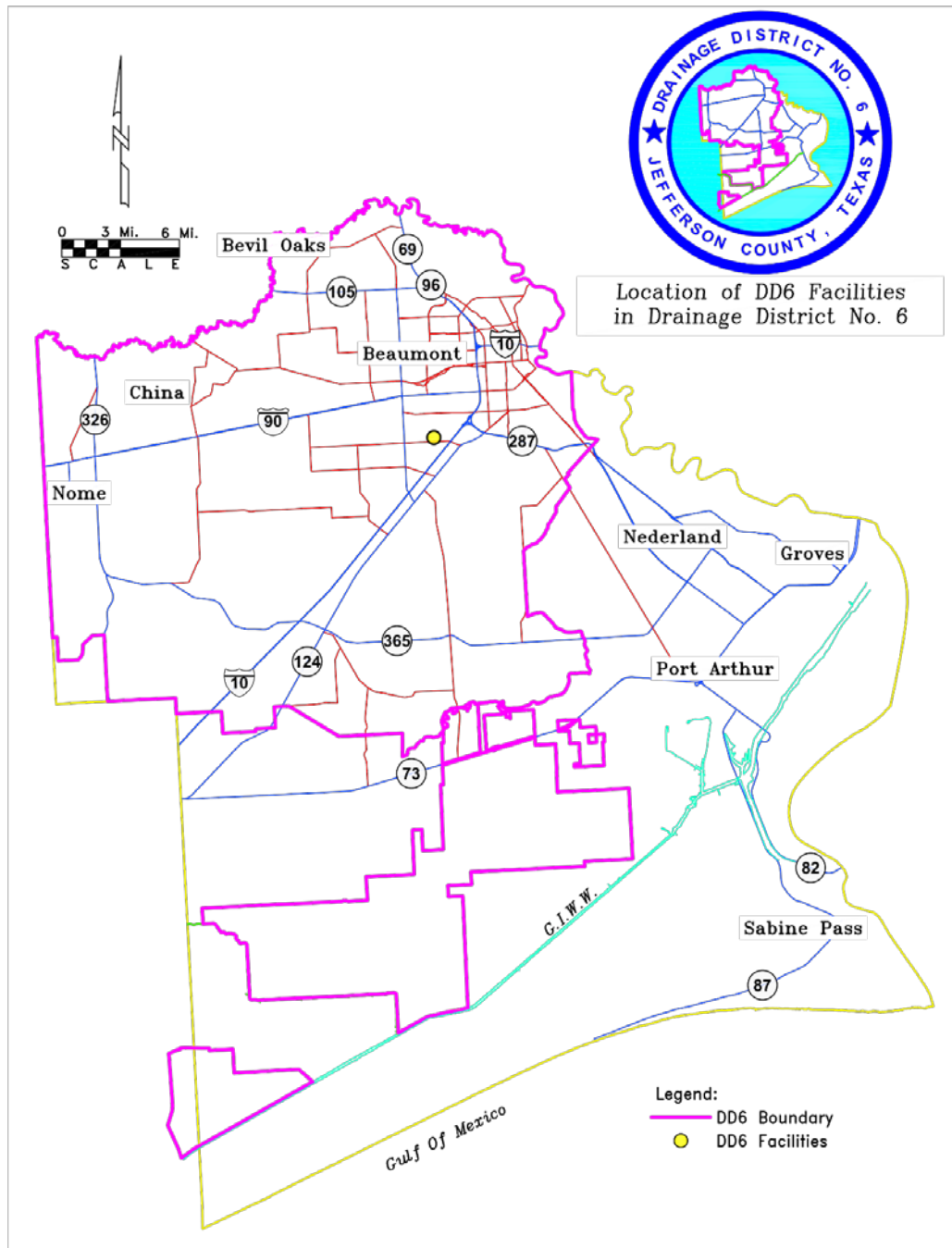
Figure 15 – Number of NFIP Flood Insurance Claims Per Severe Repetitive Loss Property in Jefferson County DD6 (Source: FEMA/NFIP, Query January 1, 2016; Plotted by DD6)



FLOOD RISKS – PUBLIC BUILDINGS

DD6 owns just one complex of buildings, on Walden Road. These buildings are not located in the Special Flood Hazard Area and have never experienced flooding. The other plotted structure is a salt water intrusion.

Figure 16 – DD6 Owned Facilities



Public Schools. The Beaumont Independent School District (BISD) owns all of the areas 32 public schools. A review of the FIRM indicates none of these are in the mapped floodplain. As part of the 2016 Plan update, the FIRM maps were again reviewed and verified that none of the 32 schools within the BISD are located within the floodplain.

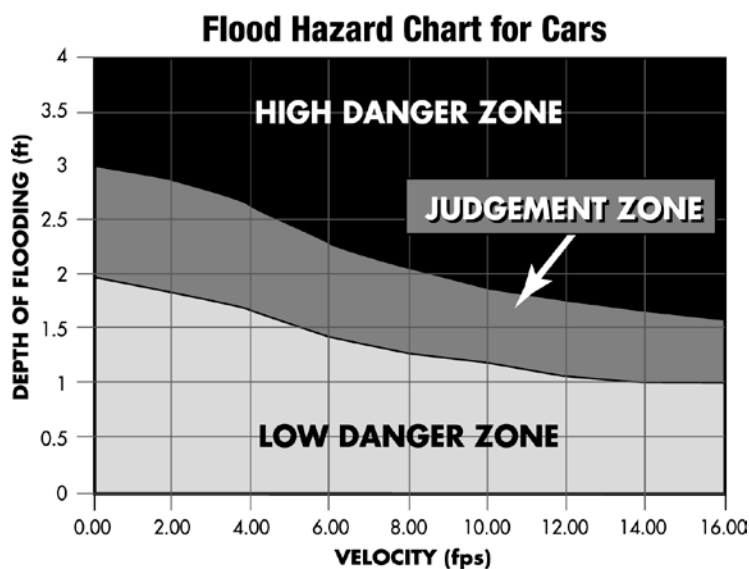
FLOOD RISKS – DISTRICT ASSESTS

Aside from District facilities, DD6 also owns other assets such as tractors, bulldozers, dump trucks, excavators and many other vehicles totaling to \$18,551,880 in insured value. Those vehicles are mainly stored on District property, far from the floodplain. However, some of these vehicles are often in use and at various project sites that may sit in a floodprone area. DD6 closely monitors the weather and takes proactive steps, when possible, to move vulnerable equipment to higher ground when equipment is being operated or staged in a floodprone area. **FLOOD RISKS – ROADS**

Nationwide, flooded roads pose the greatest threat to people during floods. Most of the more than 200 people who die in floods each year are lost when they try to drive across flooded roads. Driving into water is the number one weather-related cause of death in Central Texas. Statewide, between 1960 and 1996, 76% of flood-related deaths were vehicle-related.

As illustrated in Figure 17, flood hazards for cars vary with both velocity and depth of floodwaters. Many cars will float in less than 24 inches of water. Fast-moving water can quickly wash cars off the road or wash out a low section of road.

Figure 17 – Flood Hazard Chart for Cars (Source: Downstream Hazard Classification Guidelines)



SOURCE: USBR, "Downstream Hazard Classification Guidelines," 1988

Although most roads in the area are unlikely to have deep or fast-moving water during flood conditions up to the level of the 100-year flood, many are still known to flood regularly. Within the City of Beaumont and Jefferson County there are approximately 1,165 miles of roads (750 miles within the City, and 415 within the County).

The Texas Department of Transportation (TXDOT) maintains the freeways that run through the City and County. These major roadways include the following

- Cardinal
- I-10
- East Tex
- College (90) – (from I-10 to the west)
- Fannett Rd (from Cardinal to the west)
- Martin Luther King (from I-10 to the south)

Due to the extensive and common road flooding in DD6, it would be nearly impossible to generate a list of flood-prone roads. Members of the planning committee responded to the question of which roads in the area are flood-prone with the answer, “all of them”. Due to this reason, the City and County do not close roads due to flooding. However, the City does close major underpasses where water tends to get much deeper. This is accomplished by waiting until the water is deep enough to warrant the closure. There are water depth signs at these major underpasses.

When building new State roads or upgrading existing roads, TXDOT considers the NFIP’s floodplain and floodway requirements to evaluate the impact of new and replacement structures. The City and County consider floodplain and floodway impacts in its planning and design for area roads. Within the City of Beaumont, developers must satisfy the City’s drainage criteria and other aspects of road designs in order for the City to accept ownership.

Replacing roads and bridges damaged or washed out by floods costs millions of dollars each year. If the damage is caused by a Presidentially-declared disaster, FEMA may pay up to 75% of the repair or replacement costs, with the remaining 25% covered by the State and local governments. The full costs of a damaging event that is not declared a major disaster must be borne by the State and local communities.

TXDOT inspects State bridges for structural integrity and to determine if erosion is a risk. Where erosion has been identified, stabilization measures have been put into place.

Roads and drainage structures in the area have sustained limited erosion damage due to flooding. Damage has occurred to two bridges in area, the bridge on Phelan, and the Bridge on Longhorn Rd. Staff interviews resulted in the following characterizations of past road flooding:

- Most roads in the area are designed to carry water and, therefore, flood even in small events.

- The worst street flooding tends to be on feeder roads.

FLOOD RISKS – LOCAL DRAINAGE

Many areas and streets experience accumulations of rainfall that are slow to drain away, which may cause disruption of normal traffic, soil erosion, and water quality problems. Local drainage problems contribute to the frequency of flooding, increase ditch maintenance costs, and are perceived to adversely affect the quality of life in some neighborhoods.

Many areas prone to shallow, local drainage flooding are not shown on the City or County's Flood Insurance Rate Maps. One measure of the magnitude of this problem is the number of flood insurance policies in-force on buildings that are outside of the mapped floodplain. Local drainage flooding throughout some subdivisions in DD6 is a problem, even during frequent rainstorms. It is a concern because access for emergency services (fire, emergency medical) can be limited. While the depth of water generally is relatively shallow, a number of homes have been flooded repetitively and are identified by FEMA as repetitive loss properties.

SECTION 3 – MITIGATION STRATEGY

DD6’S MITIGATION GOALS

State and federal guidance and regulations pertaining to mitigation planning require the development of a mitigation goal statement that is consistent with other goals, mission statements and vision statements. To do so, the MPC reviewed FEMA’s national mitigation goals, several examples of goal statements from other states and communities, and the State of Texas’ Mitigation Goal. The committee also considered information about natural hazards that may occur in the area and their potential consequences and losses.

As part of the Plan update, DD6’s mitigation goal statement from the previous HMP was reviewed by the MPC during the initial meeting held on February 26, 2016. The MPC determined that the mitigation goal statement remains current as is with no changes or modifications. The mitigation goal statement remains as follows:

DD6’S MITIGATION GOAL STATEMENT

The mitigation goals of DD6 are:

- To protect public health, safety, and welfare;
- To reduce losses due to hazards by identifying hazards, minimizing exposure of citizens and property to hazards, and increasing public awareness and involvement;
- To facilitate the development review and approval process to accommodate growth in a practical way that recognizes existing stormwater and floodplain problems while avoiding creating new problems or worsening existing problems; and
- To seek solutions to existing problems.

STATE OF TEXAS MITIGATION GOALS

The Texas Division of Emergency Management (TDEM) is designated by the Governor as the state’s coordinating agency for disaster preparedness, emergency response, and disaster recovery assistance. TDEM also is tasked to coordinate the state’s natural disaster mitigation initiatives and administer grant funding provided by FEMA. A key element in that task is the preparation of the State of Texas Hazard Mitigation Plan. The State’s 2007 plan includes a series of mitigation goals. As part of the 2013 State of Texas HMP update, the goals from the previous State Plan were re-assessed by the planning committee. TDEM reviewed the goals and added Goal 5 and Goal 6 to their Plan Update.

Goal 1 Reduce or eliminate hazardous conditions that may cause loss of life

Goal 2 Reduce or eliminate hazardous conditions that may inflict injuries

Goal 3 Reduce or eliminate hazardous conditions that can cause property damages

Goal 4 Reduce or eliminate hazardous conditions that degrade important natural resources

Goal 5 Reduce or eliminate repetitive losses due to frequent probability of occurrence

Goal 6 Lessen economic impact within communities when hazards occur

FEMA'S MITIGATION GOAL

FEMA's mitigation strategy is set forth in a document originally prepared in the late 1990s. This strategy is the basis on which FEMA implements mitigation programs authorized and funded by the U.S. Congress. The national mitigation goal Statement is as follows:

To engender fundamental changes in perception so that the public demands safer environments in which to live and work; and

To reduce, by at least half, the loss of life, injuries, economic costs, and destruction of natural and cultural resources that result from natural disasters.

IDENTIFYING PRIORITY ACTIONS

The 2011 DD6 Plan had 26 mitigation actions. At the time of this Plan Update, many of those actions have been completed and their statuses are listed below. As part of this Plan update, the mitigation actions items from the 2011 Plan were updated to reflect DD6's current priorities for specific activities to achieve the goals discussed above. Each action item identifies an appropriate lead person for each action, cost effectiveness, a schedule for completion and suggested funding sources. For this Plan update, the MPC kept the same priorities and used the (STAPLEE) methodology to prioritize mitigation actions. STAPLEE assesses actions based on six general criteria: Social, Technical, Administrative, Political, Legal, Economic, and Environmental. Table 28 describes the criteria used in the STAPLEE methodology.

Table 28 – STAPLEE Methodology Criteria

STAPLEE	Criteria Explanation
S – Social	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community’s social and cultural values.
T – Technical	Mitigation actions are technically most effective if they provide long- term reduction of losses and have minimal secondary adverse impacts.
A – Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P – Political	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
L – Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economic	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.
E - Environmental	Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community’s environmental goals, have mitigation benefits while being environmentally sound.

The Mitigation Planning Committee members developed and prioritized the actions using the STAPLEE criteria. As part of the Plan update, the action tables from the 2011 version were distributed to the MPC and members were requested to update and provide comments. The updates and comments received were integrated into the Action Table for the Plan update. The updated high priority action items in Table 29 were prioritized by the MPC based on the STAPLEE criteria and their potential to reduce risk to DD6, including its operations, and physical

assets. The highest priority actions are generally those that are most effective in reducing risks to multiple assets simultaneously.

The Planning Committee defined High, Medium, and Low priorities in the Action Plan as follows:

- High: Meets five of the seven STAPLEE criteria
- Medium: Meets four of the seven STAPLEE criteria
- Low: Meets three of the seven STAPLEE criteria

These priorities were applied to update the action items. In addition, new actions were identified. The STAPLEE criteria to prioritize also was used but they were not incorporated into the existing list as those projects are completed or ongoing. The new action were prioritized, ranked, with an estimated cost and impact on new buildings and infrastructure (Table 30). The items were sorted by high, medium and low priority. A key criterion in DD6's prioritization of actions was the cost-effectiveness of actions and projects. Cost effectiveness will continue to be central to DD6's decision-making processes in identifying and funding mitigation actions.

DD6'S CURRENT MITIGATION ACTIONS

Table 29 – Status of Mitigation Actions from the 2011 Plan

No.	Action Item Description / Benefits	Hazard	Status as of 2016
1	Work with National Weather Service to augment and perfect Pine Island Bayou Modeling.	Flood	Complete. DD6 coordinated closely with the NWS to correlate known flood water surfaces in Bevil Oaks to the NWS forecasting station in Sour Lake. The NWS now has a monitoring station on their website that uses DD6 data at Bevil Oaks which is the populated area affected. Additionally, DD6 has installed a site gauge accessible to the residents to aid in their interpretation of the NWS forecast.
2	Hurricane Shutters DD6 desires to harden their administration and engineering building to make a safe harbor for any person that so chooses to stay in these buildings during an event.	Hurricanes and tropical Storms, Thunderstorms/High Winds	Complete.
3	Tyrell Park Drainage Project The proposed project is to construct two small detention basins (14 acre feet), and increase the size of a road crossing. The net result of this effort will be a lower 100-year water surface in the area, and a significant reduction in flooding.	Flood	Complete.

4	<p>Lawhon Detention</p> <p>In order to relieve flooding, a detention basin is proposed to be constructed along Bayou Din.</p>	Flood	Complete.
5	Hillebrandt Floodwater Diversion Under Calder	Flood	Complete.
6	Replace 10 wooden flood gates at the very bottom of Taylor's Bayou watershed with 4 concrete and steel tainter gates.	Flood	Complete. In addition, four additional tainter gates have been added to an existing seven gate structure. This brings the capacity of the total outfall conveyance structures up to the capacity of the receiving streams (19 gates and a navigation lock).
7	<p>Improvements on Ditch 100-D (Cartwright Corley Area)</p> <p>This mitigation project will remove the existing box culverts and excavate two detention basins on the land that the box culverts cross and adjacent lands. In addition, in order to bring water more efficiently to the new detention basins, an existing man-made ditch will be enlarged, a culvert will be bored under an existing crossing, and a 2,600-foot culvert will be placed along Corley Street.</p>	Flood	Complete.
8	Ditch 104B Improvement Project (Park St. and Saxe Ave. of the City of Beaumont and surrounding subdivisions)	Flood	Complete.

	This mitigation alternative is to bore two 84" pipes under an existing crossing and enlarge 7,200 linear feet of an existing man-made ditch for erosion control.		
9	Ditch 104 Detention Basin – (Highland Park Addition and surrounding subdivisions) This mitigation project is to construct a detention basin project whereby 117 acre-feet of detention will be excavated in a series of basins that are connected by culverts.	Flood	Complete.
10	Upgrade / Repair Floodgates at Taylors Bayou Navigation District Facility.	Flood	Complete. Addressed as part of item 6.
11	Construction of Disaster Shelter at DD6 Facility This shelter will be 3,000 sf in area, house up to 30 people and will be built in accordance with FEMA 361 - Design and Construction Guidance for Community Shelters.	Flood, hurricanes and tropical storms, and, tornado	Complete.
12	Control/Shelter Room at the Flood Control Gates on Taylors Bayou.	Flood	Complete. The Sabine Neches Navigation District has constructed state of the art computer operated controls on all 19 gates and the navigation lock which are housed in a hurricane proof elevated room. Emergency back-up power is included. The SNND is currently working to install a fiber optic line to their office whereby all of the gates can be remotely operated from there also.

13	Implement 800 MHz radio system District-wide.	Hurricanes and Tropical Storms, Tornadoes, Thunderstorms/High Winds	Complete.
14	Enhance DD6's internal GIS capabilities.	Flood and Hurricanes/ Tropical Storms	Ongoing. The District has been researching the best, most cost effective way to enhancing our GIS capabilities. They have purchased approximately \$20,000.00 worth of scanner and computer equipment to scan maps and begin our GIS database. They are currently researching programs and hardware options.
15	Greenpond Gully Drainage Project Ditch 600 needs to be widened in order to convey the flood flows delivered by the fields and tributaries, and the crossings need to be replaced with longer bridges that are constructed up and out of the flood flows.	Flood	Almost Complete. A \$13.5 million FMA grant was awarded. Construction on this very complicated project has been going well, and the project will be completed this August. This project will help protect approximately 100 homes, thousands of acres of farmland, and miles of roads.
16	Create severe weather action plan, conduct drills, identify and promulgate evacuation and sheltering options.	Floods, Hurricanes and Tropical Storms, Tornadoes, Severe Thunderstorms/High Winds	Ongoing. A 2,800 sq. ft. building has been constructed at Jefferson County Drainage District No. 6's facility. This building was constructed using all concrete construction that will withstand 150 mph winds. The building will be the team evacuation shelter and used as a command point to work from immediately after hurricanes and storm events. Storm shutters have been installed on all the operation buildings, a diesel generator has been purchased and installed to run all operations during time of power

			outages. This generator will also power the underground fuel tanks.
17	Increase coordination with the City and County regarding flood predictions and post event recovery.	Flood	Ongoing. Started to coordinate in 2015. DD6 coordinated with the Jefferson County Emergency Management during a flood in Bevil Oaks last summer in order to plan relief efforts and warning.
18	Increase flood predictive capability for streams and creeks that affect DD6 (stream gauges, to include adding prior flood levels to current gauges).	Flood	Ongoing. At least 20 ALERT stations have been added throughout our Jefferson County Drainage District No. 6's district to monitor rainfall and water levels. Jefferson County Drainage District No. 6 has also worked with the National Weather Service to help citizens of the Bevil Oaks community better understand the flood warnings and predictions.
19	Develop distribution centers in local libraries, DD6 facilities, DD6 website and other public buildings where information and safety guidance on natural and manmade hazards as well as ways to mitigate hazards can be provided to citizens	Flood, Hurricanes and Tropical Storms, Tornadoes, and Severe Thunderstorms/High Winds	To be completed.
20	Ditch No. 901 Re-routing	Flood	Ongoing. Subdivision road flooding. The City of Beaumont study is underway for this and other area flooding to determine how best to mitigate. Once the study is complete, will work with City to determine next steps for a project.
21	Periodically perform engineering and structural surveys on DD6 Facilities (e.g. command and control facilities) to ensure		Ongoing. Structures are surveyed after an event comes through if there are issues, they are fixed to continue to protect against the effects of wind and rain.

	that they are sufficiently protected from effects of hazards		
22	Undertake periodic informational mailings to at risk property owners (flood insurance, maintain drainage, flood safety, easy mitigation measures, permit requirements) Include information on other relevant hazards as appropriate	Flood, Hurricanes and Tropical Storms, Tornadoes, and Severe Thunderstorms/High Winds	Remove. Will be removed from actions in the next plan update. DD6 determined that this work should be Cities and not Drainage District outreach.
23	Conduct homeowner workshops on retrofitting and low cost measures	Flood, Hurricanes and Tropical Storms, Tornadoes, and Severe Thunderstorms/High Winds	Remove. Will be removed from actions in the next plan update. DD6 determined that this work should be Cities and not Drainage District outreach.
24	Collect sunny day data for at risk buildings	Flood	Remove. Will be removed from actions in the next plan update. Specific project identifications calls for this kind of data collection and there are not enough resources to collect data for every building, rather when a building is to be included in a project.
25	Identify whether hazardous materials handlers/waste sites are in mapped flood plain; notify company and encourage protective measures	Flood	Remove. Will be removed from actions in the next plan update. DD6 determined that this work should be Cities, County or private entities responsibility and not Drainage District outreach.

26	Formalize procedures on DD6 roles and responsibilities before, during and after a hazard event.	Flood, Hurricanes and Tropical Storms, Tornadoes, and Severe Thunderstorms/High Winds	Ongoing. Determining SOPs and roles and responsibilities are extremely helpful when an event occurs. DD6 will continue to work on formalizing SOPs and roles and responsibilities to be ready before, during and after a hazard event.
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Table 30 – DD6 NEW 2016 Mitigation Actions

No	Action Item Description / Benefits	Lead Manager	Schedule and Staplee Priority	Hazard	Est. Cost and Rank	Cost Benefit and Effect on Hazard on Existing or New Buildings and Infrastructure
1	<p>Detention project to help mitigate flooding on Delaware Street</p> <p>Implementation lead: DD6</p> <p>Funding Sources: DD6 operating budget, grants, City support</p>	DD6 Engineering/ Administration	<p>Schedule 2016-2018</p> <p>Staplee High/Medium</p>	Flood and hurricanes and tropical storms	Very Cost Effective	<p>The last major rainfall highlighted an area of Delaware Street that suffers flooding and a detention project is being considered, along with the City of Beaumont, in a City park known as Wuthering Heights Park.</p> <p>High level engineering indicates very cost effective and would help protect structures on Delaware Street and in the Park which includes 50 homes, apartments, schools, a church, and approximately 10 businesses.</p>

No	Action Item Description / Benefits	Lead Manager	Schedule and Staplee Priority	Hazard	Est. Cost and Rank	Cost Benefit and Effect on Hazard on Existing or New Buildings and Infrastructure
2	<p>Ditch 609 (South China Relief)</p> <p>20,000 linear feet of open channel is planned to be enlarged as well as replacement of six crossings including an inverted siphon for a major Lower Neches Valley Authority (LNVA) canal. Also, a portion of a canal will be relocated to provide space for a much needed drainage ditch.</p> <p>Funding Sources: DD6 operating budget, grants</p>	DD6 Engineering	<p>Schedule 2017 - four years to complete</p> <p>Staplee High</p>	Flood and hurricanes and tropical storms	Very Cost Effective	<p>Ditch No. 609 S. China Relief has now been studied in great detail, with project plans nearly completed, and a project cost estimate of \$5,235,015.00 has been finalized. A Flood Mitigation Assistance(FMA) Grant Application has been completed and will be submitted this year. If the grant application is not successful, Jefferson County Drainage District No. 6 will attempt to complete this project over the next four years.</p> <p>Would protect 68 homes and some businesses.</p>

No	Action Item Description / Benefits	Lead Manager	Schedule and Staplee Priority	Hazard	Est. Cost and Rank	Cost Benefit and Effect on Hazard on Existing or New Buildings and Infrastructure
3	<p>Ditch 100 A (East Calwood)</p> <p>2,200 feet of unmaintainable channel is planned to be retrofitted with an underground culvert to allow for shaping and resizing the ditch to allow for continued maintenance.</p> <p>Funding Sources: DD6 operating budget, grants</p>	DD6 Engineering	<p>Schedule 2016-2017</p> <p>Staplee High</p>	Flood and hurricanes and tropical storms	Cost Effective	<p>Right-of-way tracts have been purchased for the channel work, as well as an access and work area. This is an estimated \$300,000.00 project that will begin this year and completed next year.</p> <p>Would protect approximately 40 homes and a Church.</p>
4	<p>Amelia Cutoff Diversion</p> <p>Funding Sources: DD6 operating budget, grants</p>	DD6 Engineering	<p>Schedule 2018</p> <p>Staplee Medium</p>	Flood and hurricanes and tropical storms	Cost Effective	<p>This \$2.4 million project has been planned and is waiting environmental permitting and funding. Since this project has environmental permitting issues, it has been tabled while other permit applications are processed. This project will be reinstated in 2018.</p> <p>Would protect approximately 408 homes.</p>

No	Action Item Description / Benefits	Lead Manager	Schedule and Staplee Priority	Hazard	Est. Cost and Rank	Cost Benefit and Effect on Hazard on Existing or New Buildings and Infrastructure
5	Taylor's Bayou Funding Sources: DD6 operating budget, grants	DD6 Engineering	Schedule 2017 Staplee High	Flood and hurricanes and tropical storms,	Cost Effective	This \$13 million project has been permitted through the U.S. Army Corps of Engineers, 80% of the necessary right-of-way has been purchased, and a grant application has been submitted and will be resubmitted this year. If we are unsuccessful in obtaining a grant, Jefferson County Drainage District No. 6 will begin this 3-year project next year. Would protect approximately 227 homes and many businesses.
6	Ditch 607 Channel work and crossings Funding Sources: DD6 operating budget, grants	DD6 Engineering	Schedule 2019 Staplee Medium	Flood and hurricanes and tropical storms	Cost Effective	This \$1.5 million estimated project is a rural project for the not too distant future, and it will likely begin in 2019. Would protect approximately 10 homes and many acres of agricultural land the miles of roads.

No	Action Item Description / Benefits	Lead Manager	Schedule and Staplee Priority	Hazard	Est. Cost and Rank	Cost Benefit and Effect on Hazard on Existing or New Buildings and Infrastructure
7	<p>Whites Ranch outfall structures four @ \$250,000 each. One a year for four years.</p> <p>Funding Sources: DD6 operating budget, grants</p>	DD6 Engineering/ Administration	<p>Schedule 2016</p> <p>Staplee High</p>	Flood and hurricanes and tropical storms	Cost Effective	<p>An engineering firm has been hired to design these structures for \$50,000.00. The design is underway. One structure will be installed this year and three additional structures will be installed in the next three years.</p> <p>Would protect valuable agricultural land and miles of roadways.</p>
8	<p>Ditch 119 Drossings at Yount and Edson</p> <p>Funding Sources: DD6 operating budget, grants, City</p>	DD6 Engineering	<p>Schedule 2017</p> <p>Staplee Medium/ High</p>	Flood and hurricanes and tropical storms	Cost Effective	<p>This will be a joint project with the City of Beaumont. The City will purchase the box culverts and Jefferson County Drainage District No. 6 will install them, along with the erosion control. Then, the City of Beaumont will reconstruct the street over the box culverts. The City of Beaumont's Engineering Department is currently considering eliminating the Yount Street crossing altogether and leaving an open channel with dead-end cul-de-sacs on each side. The City is performing traffic analysis and taking public input. This project will begin in 2017 and is currently estimated at \$340,000.00. Would protect approximately 50 homes as well as help make a dangerous road that floods significantly become safer.</p>

No	Action Item Description / Benefits	Lead Manager	Schedule and Staplee Priority	Hazard	Est. Cost and Rank	Cost Benefit and Effect on Hazard on Existing or New Buildings and Infrastructure
9	JD Murphree Outfall Funding Sources: DD6 operating budget, grants	DD6 Engineering/ Administration	Schedule 2016-2017 Staplee High	Flood and hurricanes and tropical storms	Cost Effective	This project has required a tremendous amount of coordination with landowners, Texas Parks & Wildlife Department, US Fish & Wildlife Service, Ducks Unlimited, and Jefferson County. All agreements have been finalized and a \$1 million grant has been obtained by Ducks Unlimited. A consulting engineer has been hired to design the structure for \$80,000.00. The terms of the Ducks Unlimited grant state that the project will be completed by the summer of 2017, so this project is on the fast-track to be designed, a contractor hired, and construction completed by that time. Would protect thousands of acres of fresh water marshland that is drowning from the floods.
10	Enhance DD6's internal GIS capabilities.	DD6 Engineering	Began in 2015. STAPLEE High	Flood and Hurricanes / Tropical Storms	Cost Effective	Much thought has been given and research has been accomplished to obtain a direction with regard to enhancing our GIS capabilities. We have purchased approximately \$20,000.00 worth of scanner and computer equipment to scan maps and begin our GIS database. We are currently researching programs and hardware options.

No	Action Item Description / Benefits	Lead Manager	Schedule and Staplee Priority	Hazard	Est. Cost and Rank	Cost Benefit and Effect on Hazard on Existing or New Buildings and Infrastructure
11	<p>Greenpond Gully Drainage Project</p> <p>Ditch 600 needs to be widened in order to convey the flood flows delivered by the fields and tributaries, and the crossings need to be replaced with longer bridges that are constructed up and out of the flood flows.</p>	DD6 Engineering	<p>Began in 2015.</p> <p>STAPLEE</p> <p>High</p>	Flood	2.9 BCA	<p>A \$13.5 million FMA grant was awarded. Construction on this very complicated project has been going well, and the project will be completed this August.</p>
12	<p>Create severe weather action plan, conduct drills, identify and promulgate evacuation and sheltering options.</p>	DD6 Administration	<p>2016</p> <p>STAPLEE</p> <p>High</p>	Floods, Hurricanes and Tropical Storms, Tornadoes, Severe Thunderstorms/High Winds	Cost effective	<p>A 3,000 sq. ft. building has been constructed at Jefferson County Drainage District No. 6's facility. This building was constructed using all concrete construction that will withstand 150 mph winds. The building will be the team evacuation shelter and used as a command point to work from immediately after hurricanes and storm events. Storm shutters have been installed on all the operation buildings, a diesel generator has been purchased and installed to run all operations during time of power outages. This generator will also power the underground fuel tanks.</p>

No	Action Item Description / Benefits	Lead Manager	Schedule and Staplee Priority	Hazard	Est. Cost and Rank	Cost Benefit and Effect on Hazard on Existing or New Buildings and Infrastructure
13	Increase coordination with the City and County regarding flood predictions and post event recovery.	DD6 Administration	Began in 2015. High	Flood	Cost Effective	Ongoing. DD6 coordinated with the Jefferson County Emergency Management during a flood in Bevil Oaks last summer in order to plan relief efforts and warning.
14	Increase flood predictive capability for streams and creeks that affect DD6 (stream gauges, to include adding prior flood levels to current gauges).	DD6 Engineering	Began in 2015. High	Flood	Cost Effective	At least 20 ALERT stations have been added throughout our Jefferson County Drainage District No. 6's district to monitor rainfall and water levels. Jefferson County Drainage District No. 6 has also worked with the National Weather Service to help citizens of the Bevil Oaks community better understand the flood warnings and predictions.

No	Action Item Description / Benefits	Lead Manager	Schedule and Staplee Priority	Hazard	Est. Cost and Rank	Cost Benefit and Effect on Hazard on Existing or New Buildings and Infrastructure
15	Develop distribution centers in local libraries, DD6 facilities, DD6 website and other public buildings where information and safety guidance on natural and manmade hazards as well as ways to mitigate hazards can be provided to citizens	DD6 Administration	Six months from beginning. STAPLEE High	Flood, Hurricanes and Tropical Storms, Tornadoes, and Severe Thunderstorms/High Winds	Cost Effective	To be completed.
16	Procurement of NOAA All Hazard Radios and distribute them to key personnel	DD6 Administration	Six months from beginning. STAPLEE High	Flood, Hurricanes and Tropical Storms, Tornadoes, and Severe Thunderstorms/High Winds	Cost Effective	Acquiring NOAA All Hazard Radios will allow the District to prepare for and respond to hazards as efficiently as possible.

In addition to the actions above, after Hurricane Harvey, additional actions have been added:

Table 30-A– Post Harvey – Additional New Action Items

<p>* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development Action #17</p>			
Title: Borley Heights Outfall Channelization and NLVA canal crossing addition			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Project will accelerate the floodwater out of the Borley Heights subdivision and across the Lower Neches Valley Authority BI Canal and into Griffin Ditch which was improved with an FMA grant (all of GD ditches were widened and all of its crossing enlarged)	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: \$6,000,000 Funding: Grants and general operating budget	2020-2025	H	A
Cost and Benefits Considerations			
There are 250 homes in the area that have flooded in the past and this project could help mitigate future flooding. However, a full BCA would need to be done to determine costs and benefits.			
Action #18			
Title: Neches River Diversion Project			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Divert flood flows out of the City of Beaumont and the Hillbrant watershed into the Neches River to relieve flooding in Beaumont and relieve Hillebrant Bayou downstream.	JCDD6 and City of Beaumont	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: 500,000,000 Funding: Federal Grants (e.g., CDBG/FEMA HMGP)	2020-2025	H	A/B
Cost and Benefits Considerations			
This will protect half of the entire City of Beaumont from repetitive flooding.			

* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development Action #19				
Title: The Bayou Dinn Detention Basin				
Hazard	Description/Issue		Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Detain floodwater on Hillebrant Bayou and its tributaries to relieve flooding downstream and allow channelization projects upstream. This would include detention on Bayou Dinn as identified in the Bernard Johnson Incorporated Master Drainage Plan 1986.		JCDD6 and Jefferson County	
Cost Estimate/Funding		Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: \$70,000,000 Funding: Federal Grants (e.g., CDBG/FEMA HMGP)		2020-2025	H	A/B
Cost and Benefits Considerations				
Many houses will benefit in the south end of the Beaumont Texas as well as the rural area Fannett, Labelle, and Cheek.				

Action #20				
Title: Nome Relief				
Hazard	Description/Issue		Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Detain floodwaters on Taylors Bayou tributaries 804B and 804D to relieve flooding downstream and allow channelization projects upstream to relieve flooding in Nome Texas. Will include a detention basin.		JCDD6	
Cost Estimate/Funding		Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: \$6,000,000 Funding: Grants and general operating budget		2020-2025	H	A
Cost and Benefits Considerations				
Relieves the frequency of flooding in the City of Nome. BCA would need to be completed.				

* A= Actions reducing risk to existing buildings and infrastructure * B= Actions reducing risk to new development Action #21			
Title: China Relief			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Detain floodwaters on Taylors Bayou tributaries 600 and 609 to relieve flooding downstream and allow channelization projects upstream to relieve flooding in China Texas. Will include a detention basin.	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: \$10,000,000 Funding: Grants and general operating budget	2020-2025	H	A
Cost and Benefits Considerations			
Relieves the frequency of flooding in the City of China. BCA would need to be completed.			

Action #22			
Title: Study Ditch 505 Detention			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Detain floodwaters on Taylors Bayou tributary ditch 505 in order to provide flood relief downstream and allow channelization projects to relieve flooding in the Fannet area	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: \$25,000,000 Funding: Grants and general operating budget	2020-2025	H	A
Cost and Benefits Considerations			
Relieves the frequency of flooding in Fannet. BCA would need to be completed.			

* A= Actions reducing risk to existing buildings and infrastructure

* B= Actions reducing risk to new development

Action #23

Title: Concrete line ditch assessment and repair			
Hazard	Description/Issue	Implementing Department	
Flood Hurricane/Tropical Storms Severe Thunderstorm/High Winds	Evaluate and characterize concrete lined ditch damage throughout the district to estimate repair costs and pursue opportunities for funding for rehabilitation of these channels in order to provide improved flood flow conveyance	JCDD6	
Cost Estimate/Funding	Time Frame	Priority	Risk Focus (A/B) *
Cost Estimate: \$100,000,000 Funding: Grants, operating budget	2020-2025	H	A/B
Cost and Benefits Considerations			
Will provide additional capacity to remove floodwaters out the populated areas of the City of Beaumont.			

CONTINUED COMPLIANCE WITH THE NFIP

Participation in the National Flood Insurance Program (NFIP) is important to DD6 and its residents. This is evidenced by the Cities in the planning area, and the County's commitment to regulating development and redevelopment, by adoption of provisions that exceed the minimum requirements, and by its active pursuit of mitigation opportunities. The Cities and Jefferson County, with support from DD6, are firmly committed to continued compliance with the NFIP. It is important to note that DD6 cannot participate in the NFIP as Cities and Counties do. It cannot not apply for NFIP (Cities and County do) or CRS (Cities and County do) status. However, it supports the communities within its planning area in any way it can to keep its standing in the NFIP and CRS.

DD6 is a conservation and reclamation district and a political subdivision of the State of Texas. Considering DD6 is a separate entity and does not directly participate in the NFIP, specific actions will be determined by representatives and officials with the incorporated areas and Jefferson County within DD6. With this in mind, DD6 did not identify and prioritize NFIP actions as part of the planning process. DD6 will continue to work closely with the cities and Jefferson County to identify and recommend actions that will ensure continued compliance with the NFIP.

The City of Beaumont satisfied requirements for initial participation in the NFIP and joined the Emergency Program and ultimately the regular program in 1970. The City of China satisfied requirements for initial participation in the NFIP and joined the Emergency Program and ultimately the regular program in 2008. The City of Bevil Oaks satisfied requirements for initial participation in the NFIP and joined the Emergency Program and ultimately the regular program in 1983. The City of Nome satisfied requirements for initial participation in the NFIP and joined the Emergency Program and ultimately the regular program in 1990.

Jefferson County satisfied requirements for initial participation in the NFIP and joined the Emergency Program. Upon issuance and final approval of the Flood Insurance Rate Map in June of 1983, the County joined the Regular Program. The effective Flood Insurance Rate Map for the County has been revised a number of times to reflect more detailed information and changes to the floodplain, and is now used as the minimum flood hazard area within which development must conform to floodplain management regulations.

As mentioned at the beginning of this Section, DD6 is a conservation and reclamation district and a political subdivision of the State of Texas. Considering DD6 is a separate entity and does not directly participate in the NFIP, specific actions will be determined by representatives and officials with the incorporated areas and Jefferson County within DD6. With this in mind, GCCDD did not identify and prioritize NFIP actions as part of the planning process. DD 6will continue to work closely with the Cities and County to identify and recommend actions that will ensure continued compliance with the NFIP.

CHANGES IN DEVELOPMENT AND REVIEW OF LOCAL REGULATION AND DD6 RESOURCES

DD6 has no direct responsibility for oversight of development in the floodplain. When development is proposed within the Cities or County, within the floodplain, DD6 is asked to review and comment on the subdivision plans. The Cities have strong development and permitting requirements for development in and out of the floodplain. Since 2011, DD6 has reviewed approximately ten proposals.

Since the last plan, The City of China has passed a new permit ordinance, effective April 2016.

Construction permits. Table 31 lists the amount of building permits received by jurisdiction, by type of building (commercial/residential) demolition or construction.

Table 30 Permits

Beaumont Permits						
Type	2011	2012	2013	2014	2015	2016
Residential Building Permit	298	209	162	358	204	76
Commercial Building Permit	42	36	35	44	35	23
Demolition Residential Permit	39	320	120	342	351	73
Demolition Commerical Permit	282	32	20	36	24	9
China						2016
Residential						1
Commercial						0
Demolition						0
New Permit Ordinance effective April 2016						
Bevil Oaks						
Type	2011	2012	2013	2014	2015	2016
Residential Building Permit	3	2	4	3	3	0
Commerical Buildng Permit	0	0	0	0	1	0
Demolition Residential	1	0	0	1	1	0
Demolition Commerical	0	0	0	0	0	0

Inspections. DD6 has no inspectors and has no jurisdiction over inspection. However, DD6 relies on the Cities to provide the necessary inspections. To manage development in the floodplain, DD6 relies on the City engineers.

Per the US Census Bureau Quick Facts, the population percent change from 2010 until 2015 have gone up 0.7% in Beaumont and 0.8% in Jefferson County. The Census Bureau quick facts

only reports for cities with a population of 5,000 or more, so China and Bevil Oaks were not reported. Reviewing the population change with the permits, the development trend for the planning areas is only slightly growing and the Cities have strong development and permitting requirements for development in and out of the floodplain.

DD6 is comprised of Engineering, Operations and Administration. Through these departments, the master drainage plan is administered to protect the area. DD6 has GIS capabilities, engineering capabilities, financial and grant capabilities and operational and equipment capabilities to either complete projects completely or largely with its own resources. It has a close working relationship with the Cities and Counties to help get needed resources and projects complete to help protect the residents, infrastructure, businesses and property from future flooding.

These small changes in development along with the Jurisdictions' permitting processes and the many projects that DD6 has engaged in, have led to a decrease in the overall flood vulnerability to the Jurisdiction. The majority of these projects have been drainage projects including detention basins, ditch improvements and floodwater diversions. Many of these projects have already reduced the 100-year flood levels in the project areas.

APPENDIX 1 – MITIGATION PLANNING COMMITTEE MEETING MINUTES

Jefferson County Drainage District 6

MPC Meeting Minutes

February 25, 2016

Agenda for the February 25, 2016 Mitigation Planning Committee (MPC) meeting

MPC Meeting Number 1

Introductions

Karen Stewart Business Manager – DD6

Chuck Oakley CFO – DD6

Doug Canant District Engineer – DD6

Thomas Gill – City of Beaumont Streets and Drainage Manager and Debris Remover

Jeff Ward – JSWA

Dan Ward – JSWA

Don Rao – Engineering Director for Jefferson County

Background and purpose of mitigation planning

Updating the HMP has two purposes, it keeps us eligible for FEMA mitigation grant funds and it helps us to understand risk and think through the planning process as well as come up with other mitigation project ideas.

The original HMP written in 2005 and updated in 2010. The 2010 update was approved by FEMA on 6/26/2011. The current plan expires on 6/26/2016.

The plan update process

The Plan update will follow the same process as before. Things that have changed within the District must be accounted for like the new admin building which is not in current plan. We need to address how was it built and any risk that comes with the new building and how to mitigate that risk.

We will take the old plan and look at new FEMA requirements. We have to look at any changes in planning area and assets at risk over the past five years as well as any actions to protect those areas.

We have to look at any hazards that have occurred over the past five years.

We will have to look at the status of old action items and add new actions that were not in the plan previously. We also want to involve anyone that interfaces with the district and may have input in what actions should be taken

The following are the Tasks to be followed/completed as part of this planning process:

Task 1: Determine the Planning Area and Resources

Task 2: Build the Planning Team

Task 3: Create an Outreach Strategy

Task 4: Review Community Capabilities - update previous and make sure it hasn't changed

Task 5: Conduct a Risk Assessment – look at any changes to the planning area like new population, new buildings and what has changed

Task 6: Develop a Mitigation Strategy -

Task 7: Keep the Plan Current

Task 8: Review and Adopt the Plan

Communications – communications between the team will occur via email and/or phone

Schedule

Task	Start Date	Completion Date
1st Committee Meeting	2/25/2016	2/25/2016
Data Collection	3/1/2016	5/1/2016
Draft plan development	3/1/2016	5/1/2016
Public Presentation	Mar-16	Mar-16
2nd Committee Meeting	May/June 2016	May/June 2016
Rough Draft Complete	6/1/2016	6/1/2016
Draft for Committee to review	6/1/2016	6/1/2016
3rd Committee Meeting	Mid June 2016	Mid June 2016
Committee comments incorporated	6/25/2016	6/25/2016
Submit to the State/FEMA for review	6/30/2016	6/30/2016
Final Public Meeting - associated with a board meeting		TBD

To Dos:

Verify point of contact for the mitigation plan:

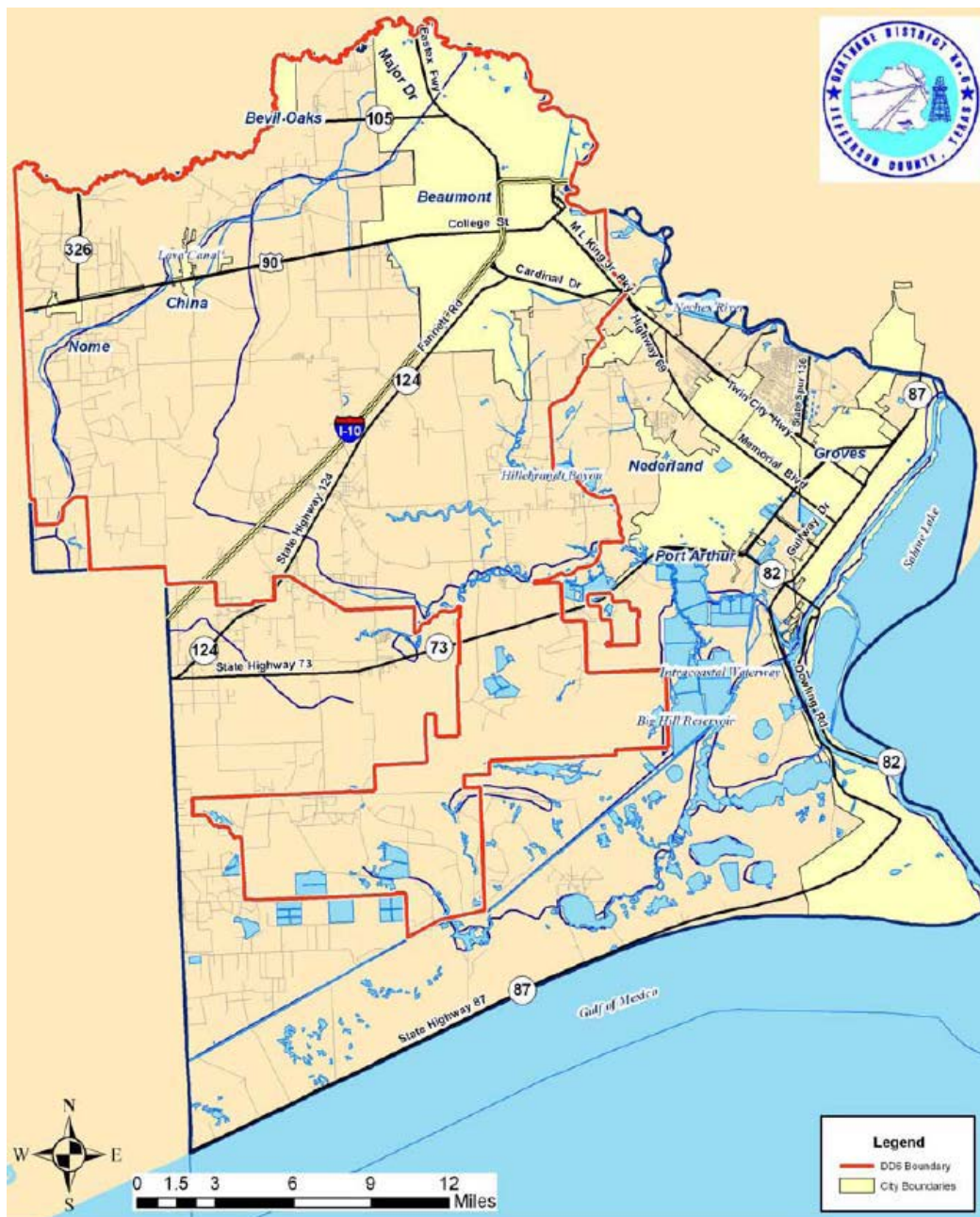
Karen Stewart will be the point of contact for the District.

Verify authority for plan development. The authority for plan development/update is the same.

The status as a drainage district and their authorities have not changed.

Verify no change to planning area

ACTION: Karen needs to send an update to the map with a current color version of the planning area showing the City, County and District boundaries. – revised map provided on 2/26/16



Verify and update planning committee membership

Mitigation Planning Committee

- Ms. Karen Stewart, Jefferson County Drainage District 6
- Mr. Doug Canant, Jefferson County Drainage District 6
- Ms. Adina Ward, City of Beaumont
- Thomas Gill, City of Beaumont
- Mr. Chuck Oakley, Jefferson County Drainage District 6
- Other Jefferson County Drainage District 6?
- Don Rao - Jefferson County Engineering Department

Verify Stakeholders Group

- Mr. Richard LeBlanc, Jefferson County Drainage District 6
- Other Members of Jefferson County Drainage District 6
- Mr. Gilbert Ward, Texas Water Development Board
- Sabine Neches Navigation District
- Texas Department of Emergency Management
- BISD, Harden Jefferson ISD (HJISD); Hamshire Fannett ISD (HFISD);
- Lamar University
- Lamar Institute of Technology
- Baptist Memorial Hospital; Christus St. Elizabeth Hospital
- Industry – ACTION to Karen and Doug to follow up on whether there is we should include a certain industry as a stakeholder
- Jefferson County Drainage District 3
- TXDOT
- LNVA (Lower Neches Valley Authority)

Check updates to FIS/FIRMs:

The FIS and FIRMs have the same effective date as the previous Plan.

Public involvement

Previously we sent out surveys with the Water Bill, getting about 5,000 responses the first time, but far less last time. The data this time from a survey will not be as useful as previously, so we will not send one out.

Set First public meeting

We have to set a public meeting and advertise in the newspaper and on the District Website when and where the public meeting will be held.

ACTION – Jeff to propose to Karen some dates for a public meeting.

Review and re-verify mitigation goal is current

DD6's Mitigation Goal Statement

The mitigation goals of DD6 are:

- To protect public health, safety, and welfare;
- To reduce losses due to hazards by identifying hazards, minimizing exposure of citizens and property to hazards, and increasing public awareness and involvement;
- To facilitate the development review and approval process to accommodate growth in a practical way that recognizes existing stormwater and floodplain problems while avoiding creating new problems or worsening existing problems; and
- To seek solutions to existing problems.

The Mitigation Goals are still current and will be kept as is.

We will need an update on the number of buildings. Building permits issued by Jefferson County and the City of Beaumont will help us get an accurate number. ACTION – We need the number of permits issued by the County and the City for new construction in the past 5 years; residential and commercial.

Talk to Boyd Meyer about permits in the City of Beaumont

ACTION – Find the number of permits for demolished buildings

ACTION – Jeff to call City of China and Bevil Oaks for building permits issued for new construction and demolition.

Verify Jefferson Co and Beaumont still submit subdivision proposals to DD6 – how many? Beaumont only submits proposals for subdivisions and commercial buildings.

Change in local ordinances and/or procedures related to building permits/floodplain.

There have been no changes in local ordinances and/or procedures related to building permits/floodplain

Any recent CAVs

ACTION – check with City of Beaumont on recent Community Assisted Visit – JW spoke with AW on 2/26/16 - None in the past 5 years.

Any recent mitigation projects completed since update?

ACTION work with Doug/Chuck/Karen on a list of recent mitigation projects completed since the last update

New projects currently being contemplated?

ACTION work with Doug/Chuck/Karen on a list of new projects being contemplated.

Status of prior actions

ACTION – Karen work with Doug to send written response of status of actions from last plan. – DC provided a response on 2/25/16

ACTION – Jeff provide to Doug a list of completed Mitigation Projects since last plan

DD6 is completing a new project; there should be an action relating to this in the plan.

ACTION – Jeff send Doug entire repetitive loss list including properties that have been mitigated. – Sent to DC on 2/25/16

Status of prior actions

1. Continue to pursue cost effective mitigation projects; apply for federal funding, as appropriate. For flood mitigation projects, focus on areas known to be flood-prone/Repetitive Loss areas. For other hazard mitigation projects, coordinate with Jefferson County and incorporated areas within DD6 as they will be required to take the lead on non-flood related projects.
2. Formalize procedures on DD6 roles and responsibilities before, during, and after a hazard event
3. Work with National Weather Service to augment and perfect Pine Island Bayou Modeling.
4. Undertake periodic informational mailings to at-risk property owners (flood insurance, importance of maintaining drainage, flood safety, easy mitigation measures, permit requirements). Include information on other relevant hazards, as appropriate.
5. Enhance DD6's internal GIS capabilities
6. Hurricane Shutters - DD6 desires harden their administration and engineering building to make a safe harbor for any person that so chooses to stay in these buildings during an event.
7. Greenpond Gully Drainage Project - Ditch 600 needs to be widened in order to convey the flood flows delivered by the fields and tributaries, and the crossings need to be replaced with longer bridges that are constructed up and out of the flood flows.
8. Tyrell Park Drainage Project - The proposed project is to construct two small detention basins (14 acre feet), and increase the size of a road crossing. The net result of this effort will be a lower 100-year water surface in the area, and a significant reduction in flooding.
9. Lawhon Detention - In order to relieve flooding, a detention basin is proposed to be constructed along Bayou Din.
10. Hillebrandt Floodwater Diversion Under Calder
11. Replace 10 wooden flood gates at the very bottom of Taylor 's Bayou watershed with 4 concrete and steel tainter gates.

12. Improvements on Ditch 100-D (Cartwright Corley Area) - This mitigation project will remove the existing box culverts and excavate two detention basins on the land that the box culverts cross and adjacent lands. In addition, in order to bring water more efficiently to the new detention basins, an existing man-made ditch will be enlarged, a culvert will be bored under an existing crossing, and a 2,600 foot culvert will be placed along Corley Street.
13. Ditch 104B Improvement Project (Park St. and Saxe Ave. of the City of Beaumont and surrounding subdivisions) - This mitigation alternative is to bore two 84" pipes under an existing crossing and enlarge 7,200 linear feet of an existing man-made ditch for erosion control
14. Ditch 104 Detention Basin – (Highland Park Addition and surrounding subdivisions) - This mitigation project is to construct a detention basin project whereby 117 acre-feet of detention will be excavated in a series of basins that are connected by culverts
15. Upgrade / Repair Floodgates at Taylors Bayou Navigation District Facility
16. Construction of Disaster Shelter at DD6 Facility - This shelter will be 3,000 s.f. in area, house up to 30 people and will be built in accordance with FEMA 361 - Design and Construction Guidance for Community Shelters.
17. Ditch No. 901 Re-routing
18. Control/Shelter Room at the Flood Control Gates on Taylors Bayou
19. Periodically perform engineering and structural surveys of DD-6 facilities (in particular, command and control facilities) to ensure that they are sufficiently protected from effects of hazards, especially wind
20. Create severe weather action plan, conduct drills, identify and promulgate evacuation and sheltering options.
21. Implement 800 MHz radio system District-wide
22. Conduct homeowner workshops on retrofitting & low cost measures
23. Increase coordination with the City and County regarding flood predictions and post event recovery
24. Increase flood predictive capability for streams and creeks that affect DD6 (stream gages).
25. Collect "sunny day" data for at-risk buildings (photographs, elevation information/certificates)
26. Identify whether hazardous materials handlers/waste sites are in the mapped floodplain; if flood-prone, notify company and encourage protective measures.

Action Item	Owner
Jeff to revise the submittal date so the plan is submitted to the State before 6/28/16	JW
Karen needs to send an update to the map with a current color version of the planning area showing the City, County and District boundaries.	KS
Follow up on whether there is we should include a certain industry as a stakeholder	MPC
Jeff to propose to Karen some dates for a public meeting	JW
We need the number of permits issued by the County and the City for new construction in the past 5 years; residential and commercial	MPC
Talk to Boyd Meyer about permits in the city of Beaumont	JW
Find the number of permits for demolished buildings	MPC
Jeff to call City of China – 409-752-5403 and Bevil Oaks for building permits issued for new construction and demolition.	JW
check with Adina on City of Beaumont on recent Community Assisted Visit	JW
Jeff to work with Doug/Chuck/Karen on a list of recent mitigation projects completed since the last update	JW, DC, CO, KS
Jeff to work with Doug/Chuck/Karen on a list of new projects being contemplated	JW, DC, CO, KS
Karen work with Doug to send written response of status of actions from last plan	KS, DC
Jeff provide to Doug a list of completed Mitigation Projects since last plan	JW
Jeff send Doug entire repetitive loss list including properties that have been mitigated.	JW

Jefferson County Drainage District 6

MPC Meeting Minutes

May 25, 2016

JCDD6 Hazard Mitigation Planning Committee (MPC) Meeting 2

May 25, 2016

AGENDA

1. Confirm MPC attendees on Call
2. Review remaining data needs
3. Review draft mitigation action status from 2011 plan
4. Review mitigation action plans
5. Revised schedule:

Task	Start Date	Completion Date
1st Committee Meeting	2/25/2016	2/25/2016
Data Collection	3/1/2016	6/1/2016
Draft plan development	3/1/2016	6/15/2016
Public Presentation	4/14/2016	4/14/2016
2nd Committee Meeting	5/25/2016	5/25/2016
Rough Draft Complete	6/6/2016	6/6/2016
Public Notice for Public to review draft	5/27/2016	6/20/2016
Stakeholders requested to Review	5/27/2016	6/20/2016
Committee comments/stakeholder comments incorporated	6/6/2016	6/22/2016
3rd Committee Meeting	6/23/2016	6/23/2016
Public Presentation - Board meeting	6/28/2016	6/28/2016
Submit to State/FEMA for review	6/28/2016	6/28/2016
Final Public Meeting for approval of plan	TBD	TBD

6. Review Draft letter to stakeholders
 - a. Who can place draft plan on DD6 website and can it be placed on for 6-6-16?
 - b. MPC must review and provide comments back by 6-20-16 for incorporation by 6-25-16.
7. Next call will be June 23rd at 10 am for final review of draft
8. Second public meeting will be at JCDD6's Board meeting on draft plan to be submitted to State, 10 am June 28th.
9. JCDD6 to overnight plan to TDEM on June 28th for the review to begin

Introductions

Karen Stewart Business Manager – DD6

Chuck Oakley CFO – DD6

Doug Canant District Engineer – DD6

Kristen Thatcher – JSWA

Dan Ward – JSWA

Review remaining data needs

The RL and SRL maps with properties plotted within the district, decide on new mitigation actions and complete risk assessment.

Review draft mitigation action status from 2011 plan

Doug to review the list of ongoing actions and give a status summary.

Review mitigation action plans

The new mitigation actions were reviewed and agreed upon.

Review Draft letter to stakeholders

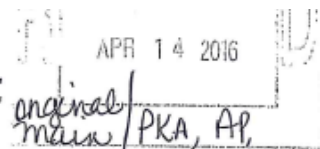
The draft letter to stakeholders was reviewed and six new stakeholders added .Letters will be mailed out and the draft plan needs to be put up on the District website by 6/6/16.

The next MPC meeting will be June 23rd at 10 am for final review of draft

APPENDIX 2 – PUBLIC MEETINGS AND PRESENTATION

DD6 held a public meeting on April 14, 2016. Information about this meeting was put in the Beaumont Enterprise, however, no one from the public attended. The publisher's affidavit and the notice in the Beaumont Enterprise are included below.

Publishers Affidavit



Acct #089393102 Job #199717601 Tear Sheet Attached
Name JEFFERSON COUNTY DRAINAGE DI 3910673 B24270750

STATE OF TEXAS
COUNTY OF JEFFERSON

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED

Victoria Bond

WHO BEING BY ME DULY SWORN, DEPOSES AND SAYS THAT HE/SHE IS A NEWSPAPER REPRESENTATIVE
FOR THE BEAUMONT ENTERPRISE; THAT SAID NEWSPAPER REGULARLY PUBLISHED IN JEFFERSON COUNTY
CIRCULATED IN JEFFERSON, HARDIN, TYLER, NEWTON, ORANGE, JASPER, LIBERTY, SABINE, CHAMBERS,
SAN AUGUSTINE, ANGELINA AND GALVESTON COUNTY(COUNTIES), TEXAS; THAT THE ATTACHED NOTICE

IN SAID NEWSPAPER ON THE FOLLOWING DATE(S), TO WIT:
04-07-16

Victoria Bond
NEWSPAPER REPRESENTATIVE

SWORN AND SUBSCRIBED TO BEFORE ME, THIS 8TH DAY OF APRIL 2016,

TO CERTIFY WHICH WITNESS MY HAND AND SEAL OF OFFICE.



Veronica M Tyrone
NOTARY PUBLIC IN AND FOR
THE STATE OF TEXAS

Veronica M Tyrone
PRINT OR TYPE NAME OF NOTARY PUBLIC
MY COMMISSION EXPIRES 02-10-2020

Legal Notices

matter has been set for a final hearing on, Thursday, May 12, 2016 at 9 o'clock a.m. in Room 330 of the Pulaski County Court House located at 401 West Markham, Little Rock, AR.

In Witness Whereof, I have hereunto set my hand and seal as Clerk of the Court on this 25th day of March, 2016.

Larry Crane, Circuit Clerk

By: /s/ Nancy Sadler
Deputy Clerk

Prepared by:
Jimmy C. Morris, Jr.
Attorney for Plaintiff
AR Bar No. 2007134
2020 S. Broadway
Little Rock, AR 72206
Phone: (501) 319-7647
Fax: (501) 353-0287
Email:
j.c.morrisatty@gmail.com

Notice of Plan Availability
for Public Review and
Comment
Jefferson County Drainage
District No. Six (DD6)
Hazard Mitigation Plan

The public is invited to a meeting where DD6 will present an overview of a planning process recently started by the District to update DD6's current Hazard Mitigation

Legal Notices

Plan. This planning process will lead to an updated plan of action to reduce the long-term impacts of flooding that impact citizens residing in the DD6 planning area and other hazards that impact DD6 owned facilities. Members of the public are encouraged to attend, especially those with property located in flood-prone areas.

This meeting will be held on April 14, 2016 at 4:00 PM, at DD6 Offices located at:

6550 Walden Road
Beaumont, TX 77707-5510

The plan update is required by the Federal Emergency Management Agency (FEMA) for DD6 to remain eligible for certain types of federal grants. The plan update will provide an overview of natural hazards in the District, a summary of past hazard events, and describe how the District recognizes and addresses

Legal Notices

hazards in the development process along with other District functions. The actions identified in this plan are intended to reduce the long-term impact of flooding on the District and its citizens. Members of the public will be encouraged to comment on the draft plan update as it progresses.

Once the plan update is complete, the final hazard mitigation plan will be presented to the DD6 Board for adoption later this year. Any additional public meetings will be scheduled before then to present the draft recommendations and request additional comment from interested citizens.

Questions about the plan should be directed to Mitigation Plan Consultant, Jeff Ward at 888-208-6695 or jward@rstarmail.com. You can also contact Karen J. Stewart at (409) 842-1818.

SERVICE DIRECTORY

Yellow Pages of the State of Arkansas
Arkansas Yellow Pages

Public Presentation

Jefferson County DD6 Hazard Mitigation Plan Update

April 14, 2016

Purpose of a Hazard Mitigation Plan

- .Maintains eligibility for FEMA mitigation grants
- .Keeps understanding of risk current
- .Helps identify new mitigation projects
- .FEMA requires updates every 5 years

Mitigation Plan Update

Risk assessment – Flooding and all hazards that could impact DD6 owned facilities

Establish priorities for actions and projects to reduce risk

A quick summary of what's in the plan

Executive Summary
Background
Approval and Adoption
Planning Process
Hazard Identification
Risk Assessment
Mitigation Strategy
Plan Monitoring and Maintenance
Appendices

Plan Update Process

Form team

Update Hazard Assessment

Update Risk Assessment

Provide status of prior mitigation actions

Generate new mitigation actions

Prioritize Actions

Invite public review and comment

This is why we are here tonight

DATE	FEDERAL DISASTER #	DISASTER DESCRIPTION	HAZARD MITIGATION GRANT AMOUNT
3/19/2016	4266	Severe Storms and Flooding	<\$10M
2/9/2016	4255	Severe Storms and Flooding	<\$10M
11/25/2015	4245	Severe Storms and Flooding	<\$10M
5/29/2015	4223	Severe Storms and Flooding	<\$10M
12/20/2013	4159	Severe Storms and Flooding	<\$10M
8/2/2013	4136	Explosion	<\$10M
9/9/2011	4029	Wildfires	<\$10M
7/1/2011	1999	Wildfires	<\$10M
8/3/2010	1931	Hurricane Alex	\$ 6,200,000.00
9/13/2008	1791	Hurricane Ike	\$ 400,266,164.00
7/24/2008	1780	Hurricane Dolly	\$ 15,535,593.00
10/2/2007	1730	Tropical Storm Erin	\$ 800,367.00
6/29/2007	1709	Severe Storms and Flooding	\$ 13,119,696.00
5/1/2007	1697	Severe Storms and Tornadoes	\$ 2,003,052.00
8/15/2006	1658	Flooding	\$ 1,164,959.00
1/11/2006	1624	Extreme Wildfire Threat	\$ 3,731,248.00
9/24/2005	1606	Hurricane Rita	\$ 103,449,143.00
7/17/2003	1479	Hurricane Claudette	\$ 2,644,965.00
11/5/2002	1439	Severe Storms and Flooding	\$ 7,879,153.00
9/26/2002	1434	Tropical Storm Fay	\$ 2,080,994.00
7/4/2002	1425	Severe Storms and Flooding	\$ 11,388,366.00
6/9/2001	1379	Allison	\$ 231,827,393.00
1/8/2001	1356	Severe Winter Storm	\$ 5,523,264.00
		Total	Approx \$900M

Statistics for insured properties and losses

- *In the Jefferson County and Cities within*
 - *9,000 insured properties*
 - *>\$91M in paid claims*
- 600 RL properties (2 or more claims)
 - \$41M in paid claims
- 85 SRL properties (4 or more claims)
 - \$15M in paid claims

What is a Mitigation Project?

Reduces risk from natural hazards

Other FEMA criteria (later)

Projects potentially
funded through one of
FEMA's grant programs

Project Types

(focus on wind and flooding)

- Flood control projects (improved drainage, pumping, etc.)
 - Primary DD6 projects
- Acquisition/Demolition
- Elevation
- Mitigation-reconstruction

Project Types

(focus on wind and flooding)

- Window protection (shutters, filming, etc.)
- Improved connections between mechanical equipment/non-structural elements and structure
- Roof and structural load path improvements

Progress to date

- Planning Grant awarded
- Contract in place
- Initial Structure of revised plan drafted
- Request for Information provided
 - Will provide data for the plan
- Public outreach initiated
 - Today's meeting is the first
 - One more closer to when draft is complete

Path forward...

- Finalize drafts
- Continued Public outreach (draft to be made available)
- Notify stakeholders
- Submit draft to state and FEMA
- Incorporate changes
- Resubmit
- Adopt in final

Questions and Comments

STATE OF TEXAS
COUNTY OF JEFFERSON

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED Victoria Bond
WHO BEING BY ME DULY SWORN, DEPOSES AND SAYS THAT HE/SHE IS A NEWSPAPER REPRESENTATIVE
FOR THE BEAUMONT ENTERPRISE; THAT SAID NEWSPAPER REGULARLY PUBLISHED IN JEFFERSON COUNTY
CIRCULATED IN JEFFERSON, HARDIN, TYLER, NEWTON, ORANGE, JASPER, LIBERTY, SABINE, CHAMBERS,
SAN AUGUSTINE, ANGELINA AND GALVESTON COUNTY(COUNTIES), TEXAS; THAT THE ATTACHED NOTICE
IN SAID NEWSPAPER ON THE FOLLOWING DATE(S), TO WIT:
05-27-16

Victoria Bond
NEWSPAPER REPRESENTATIVE

SWORN AND SUBSCRIBED TO BEFORE ME, THIS 30TH DAY OF MAY 2016,

TO CERTIFY WHICH WITNESS MY HAND AND SEAL OF OFFICE



Erika Acevedo
NOTARY PUBLIC IN AND FOR
THE STATE OF TEXAS

ERIKA ACEVEDO
PRINT OR TYPE NAME OF NOTARY PUBLIC
MY COMMISSION EXPIRES MAY 16, 2020

Apts Furnished

950 Ave. B, 1 bdr apt, furn., utilities pd, a/c, cable, \$500/mh + dep. 833-4729 or cell 720-9138.

Apts Unfurnished

Accepting Applications Senior Citizens 62 & up or handicapped. Low Income. Efficiency & 1 bedroom apartments. Apply at 3030 French Rd. Call (409) 892-0196 Raintree Tower Apts Equal Housing Opportunity

CURRENTLY ACCEPTING APPLICATIONS SENIOR CITIZENS 62 OR OLDER

Section 8 Efficiency Apartments. Rent includes Utilities. Apply: 930 Calder or call (409) 833-9660 Handicap Accessibility SENIOR CITIZENS Y HOUSE Equal Housing Opportunity

Near Lamar, Hacienda Apt, 1 bedroom start \$500, 2 bedroom start \$600, 409-832-0034.

Homes Unfurnished

5276 Bigner Rd. 3/1/1, \$850/mh 409-782-2746 or 409-658-2670

Mobile Homes

For rent, 2/1, furnished, call 409-246-3770.

Jewelry

LOST gold Masonic ring, name engraved. Lost 3/26/16. BMT REWARD 409-791-4495

Miscellaneous

One owner white appliances, bedroom suite (all solid wood), two side by side door refrigerators \$450 & \$200, Whirlpool electric washer and dryer \$150 each, microwave hood combo (wall mount) \$75, electric coil burner stove (slide in) \$150, bedroom suite (all solid wood), king tall poster bed, two chests, two night stands, dresser and mirror \$500, king mattress set available, two nice wheelchairs, and fishing rods & reels. Call 898-2590 (serious callers only)

Livestock

POND STOCKING CRAPPIE, BLUEGILL, BASS & CATFISH. FREE Delivery!! Discount prices!! www.parkersfishfarm.com 1-800-362-3390

Recreational Vehicles

'15 Montecarlo, 40' Park model, 3 slides, w/d, dual air, 1 place, \$37,500. 337-366-4690 or 615-260-5283. Free delivery.

Ford

'11 Ford Explorer XLT 4X4, 60,500, white, excellent cond, \$21,500. 409-893-1238 or 409-291-9911.

Want To Buy

CASH PAID for Junk Cars and Pick-Ups. Free Towing: 409-540-3344

Clean car or pickup, prefer compact. 409-781-1630

Top Dollar Paid for Junked or wrecked cars & trucks. ★(409) 856 6835★

Legal Notices

IN THE CIRCUIT COURT OF PULASKI COUNTY, ARKANSAS 16th DIVISION 6th CIRCUIT

CASE NO:60DR-03-5226

MONDARROW L. BARNUM PLAINTIFF VS. MISTY M. JONES-LEWIS DEFENDANT

WARNING ORDER To: Misty M. Jones-Lewis You are hereby notified that a Motion for Change of Custody and an Amended Motion for Change of Custody has been filed in the Circuit Court of Pulaski County, Arkansas, which may affect your rights. You are hereby warned to file an Answer or other responsive pleading to the Motion or to appear in the Court within thirty (30) days from the date this Warning Order is first published.

Upon your failure to do so, the Motion filed herein will be deemed to be admitted and you will face entry of judgment by default or be otherwise barred from asserting your interest.

You or any person desiring to be heard concerning this action are hereby notified. You are also notified that this

Legal Notices

matter has been set for a final hearing on, Thursday, May 12, 2016 at 9 o'clock a.m. in Room 330 of the Pulaski County Court House located at 401 West Markham, Little Rock, AR.

In Witness Whereof, I have hereunto set my hand and seal as Clerk of the Court on this 25th day of March, 2016.

Larry Crane, Circuit Clerk By: Jol Nancy Sadler Deputy Clerk

Prepared by: Jimmy C. Morris, Jr. Attorney for Plaintiff AR Bar No. 2007134 2020 S. Broadway Little Rock, AR 72206 Phone: (501) 319-7647 Fax: (501) 353-0287 Email: j.c.morrisatty@gmail.com

Notice of Plan Availability for Public Review and Comment Jefferson County Drainage District No. Six (DD6) Hazard Mitigation Plan

The public is invited to a meeting where DD6 will present an overview of a planning process recently started by the District to update DD6 current Hazard Mitigation



Beaumont

GARAGE SALE Sat. 8am-until 9595 College St. Bmt. Tons of clothes, furniture, tools, & etc.

HILL'S ESTATE SALES April 7th, 8th & 9th 9am-3pm 865 Heather Ln. Bmt. 409-289-3765 www.hillsstatesales.net

Huge Moving Garage Sale. 1650 S. 23rd. Btwn Washington & College Larry's Plumbing Co. Thurs. 8-6pm, Fri. 7:30-5pm, Sat. 7:30am-1 Furniture, clothing, toys, house hold & lots of misc. items.

Legal Notices

Plan. This planning process will lead to an updated plan of action to reduce the long-term impacts of flooding that impact citizens residing in the DD6 planning area and other hazards that impact DD6 owned facilities. Members of the public are encouraged to attend, especially those with property located in flood-prone areas.

This meeting will be held on April 14, 2016 at 4:00 PM, at DD6 Offices located at:

6550 Walden Road Beaumont, TX 77707-5510

The plan update is required by the Federal Emergency Management Agency (FEMA) for DD6 to remain eligible for certain types of federal grants. The plan update will provide an overview of natural hazards in the District, a summary of past hazard events, and describe how the District recognizes and addresses

Legal Notices

hazards in the development process along with other District functions. The actions identified in this plan are intended to reduce the long-term impact of flooding on the District and its citizens. Members of the public will be encouraged to comment on the draft plan update as it progresses.

Once the plan update is complete, the final hazard mitigation plan will be presented to the DD6 Board for adoption later this year. Any additional public meetings will be scheduled before then to present the draft recommendations and request additional comment from interested citizens.

Questions about the plan should be directed to Mitigation Plan Consultant, Jeff Ward at 888-208-6695 or jward@rstarmall.com. You can also contact Karen J. Stewart at (409) 842-1818.

SERVICE DIRECTORY

Carpet Cleaning

JL Maintenance, Carpet Cleaning, Pressure Washing, Tile & sofa cleaning 338-4313

Concrete Work

Concrete Construction Driveways, patios, foundations, sidewalks Bonded & Insured • Local. Call 409-658-2802

General Contractors

Complete home remodeling & interior/exterior painting, carpentry, drywall & tile Wrought iron fences. 409-433-3663, 409-960-4027

Landscaping

MOBILE MOWER REPAIR Specialized riding mowers & tillers. Why Wait 2-3 weeks? "We go to U" (409)540-1785

Land/Yard Service

FireHouse Lawn Care. Full mowing services provided. Pressure washing available as well 409-748-9961

Tree Service

GOODWINS TREE Trim & Removals 409-350-9918

TO SUBSCRIBE TO THE BEAUMONT ENTERPRISE CLASSIFIEDS CALL 409-838-2888

FOR JOBS! CALL ROBERT 409-838-2879



1 PG
NPM

2016009951

Notice of Plan Availability for Public Review and Comment
Jefferson County Drainage District No. Six (DD6)
Hazard Mitigation Plan

The public is invited to a meeting where DD6 will present an overview of a planning process recently started by the District to update DD6's current Hazard Mitigation Plan. This planning process will lead to an updated plan of action to reduce the long-term impacts of flooding that impact citizens residing in the DD6 planning area and other hazards that impact DD6 owned facilities. Members of the public are encouraged to attend, especially those with property located in flood-prone areas.

This meeting will be held on April 14, 2016 at 4:00 PM, at DD6 Offices located at:

6550 Walden Road
Beaumont, TX 77707-5510

The plan update is required by the Federal Emergency Management Agency (FEMA) for DD6 to remain eligible for certain types of federal grants. The plan update will provide an overview of natural hazards in the District, a summary of past hazard events, and describe how the District recognizes and addresses hazards in the development process along with other District functions. The actions identified in this plan are intended to reduce the long-term impact of flooding on the District and its citizens. Members of the public will be encouraged to comment on the draft plan update as it progresses.

Once the plan update is complete, the final hazard mitigation plan will be presented to the DD6 Board for adoption later this year. Any additional public meetings will be scheduled before then to present the draft recommendations and request additional comment from interested citizens.

Questions about the plan should be directed to Mitigation Plan Consultant, Jeff Ward at 888-208-6695 or jward@rstarmail.com. You can also contact Karen J. Stewart at (409) 842-1818.

Return To:

KAREN J. STEWART
6550 WALDEN RD
BEAUMONT TX 77707

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS

Carolyn L. Guidry

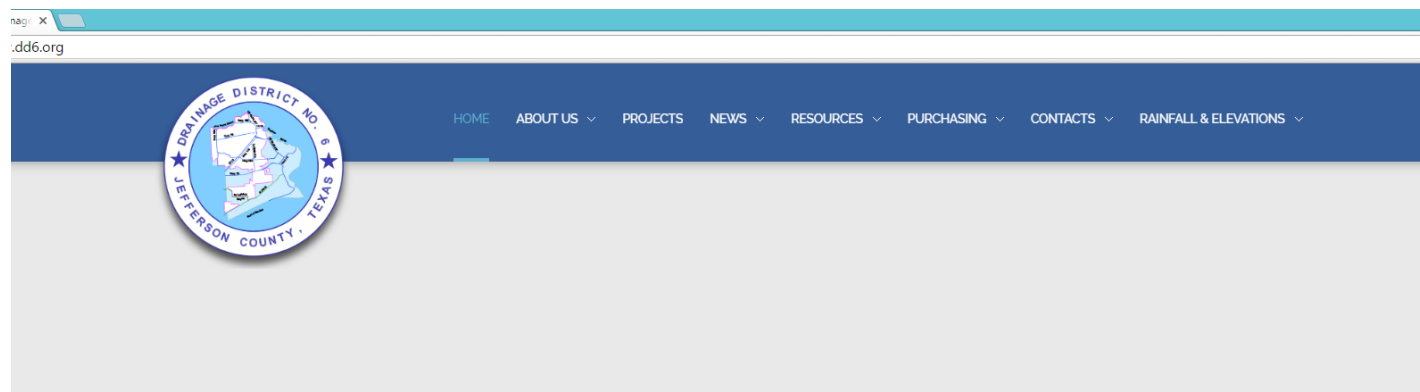
Carolyn L. Guidry, County Clerk
Jefferson County, Texas

March 31, 2016 02:41:58 PM

FEE: \$0.00 COLBERT

2016009951

Marketplace



WELCOME TO THE JEFFERSON COUNTY DD6 WEBSITE

It is short for Jefferson County Drainage District Number Six. Established in 1920, DD6 serves Beaumont, Bevil Oaks, China, Nome and the communities of Fannett, Northwest Forest, Hillebrandt Acres, Cheek and LaBelle as well as farm and timber land in between. DD6 controls storm and flood waters from rivers, streams and ditches, and drains and reclaims overflowed lands. Drainage District Six services about 40% of northern Jefferson County, an area almost 1/2 the size of the state of Rhode Island.

Within this area are from 750 to 900 linear miles of streams, ditches and outfalls, all under the jurisdiction and control of DD6. Since the inception of the District, Jefferson County has relinquished most of its flood control and drainage activities to DD6 for those properties located within the District boundaries. All incorporated and unincorporated areas rely heavily on DD6 to provide outfall drainage and flood relief.

2016 HAZARD MITIGATION PLAN UPDATE

Jefferson County Drainage District No. Six (DD6) undertook development of this Mitigation Plan to protect public health, safety and welfare. The purpose of this Plan is to reduce or avoid the impacts of hazards by identifying and analyzing hazards and outlining mitigation actions that will help the District reach this goal. This Mitigation Plan also enables DD6 to apply for disaster mitigation funding sources that are otherwise unavailable without an approved Mitigation Plan.

[Download the Full PDF - Click Here](#)



APPENDIX 3 – CORRESPONDENCE WITH STAKEHOLDERS

Jefferson County
Drainage District No. 6
6550 Walden Rd., Beaumont, Texas 77707
Telephone (409) 842-1818
Fax (409) 842-2729
Established in 1920

Board of Directors:
Joshua W. Allen, Sr.
James D. McNicholas
William F. Miranda
Charles "Chuck" Guillory
Miriam K. Johnson

Richard P. LeBlanc, Jr.
General Manager
Jim Broussard
Operations Manager
Doug S. Canant, Jr., PE, RPLS, CFM
Engineer
Chuck Oakley, CPA
Chief Financial Officer
Karen J. Stewart, MBA, CTP
Business Manager
Andrew J. Jones
Superintendent

May 26, 2016

Mr. Richard LeBlanc
General Manager
Jefferson County Drainage District 6
6550 Walden Road
Beaumont, TX 77707
Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Mr. Richard LeBlanc :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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Thank you very much for considering this request. It is important that stakeholders and the public have an opportunity to review and comment.

Sincerely,



Karen J. Stewart, MBA, CTP
Business Manager-JCDD6

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Superintendent

May 26, 2016

Mr. Gilbert Ward
Team Leader, State Flood Protection Planning Program
Texas Water Development Board
1700 North Congress Avenue
Austin, TX 78701
Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Mr. Gilbert Ward :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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Superintendent

May 26, 2016

Mr. Randall Reese
General Manager
Sabine Neches Navigation District
8180 Anchor Drive
Port Arthur, TX 77642
Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Mr. Randall Reese :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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May 26, 2016

Dr. John W. Frossard
Superintendent
Beaumont Independent School District
3395 Harrison Avenue
Beaumont, TX 77706
Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Dr. John W. Frossard :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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Superintendent

May 26, 2016

Ms. Shannon Holmes
Superintendent
Hardin - Jefferson ISD
520 W. Herring Street
Sour Lake, TX 77659

Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Ms. Shannon Holmes :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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Business Manager-JCDD6

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Andrew J. Jones
Superintendent

May 26, 2016

Ms. Pamela Lechler
Superintendent
Hamshire Fannett ISD
P.O. Box 223
Hamshire, TX 77622

Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Ms. Pamela Lechler :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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Andrew J. Jones
Superintendent

May 26, 2016

Dr. Kenneth Evans
President
Lamar University
4400 MLK Boulevard, PO Box 10009
Beaumont, TX 77710
Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Dr. Kenneth Evans :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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Andrew J. Jones

Superintendent

May 26, 2016

Dr. Paul Sszuch

President

Lamar Institute of Technology

855 East Lavaca

Beaumont, TX 77705

Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Dr. Paul Sszuch :

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May 26, 2016

Ms. Kim Moncla
Executive Director - Foundation
Baptist Hospitals of Southeast Texas
3080 College Street
Beaumont, TX 77702

Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Ms. Kim Moncla :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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May 26, 2016

Mr. Paul Trevino

CEO

Christus St. Elizabeth Hospital

2830 Calder Street

Beaumont, TX 77702

Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Mr. Paul Trevino :

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May 26, 2016

Mr. Phil Kelley
Manager
JCDD7
4401 9th Avenue
Port Aruthur, TX 0
Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Mr. Phil Kelley :

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May 26, 2016

Mr. Leroy McCall Jr.
Manager
JCDD3

1149 Pearl Street
Beaumont, TX 77701

Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Mr. Leroy McCall Jr. :

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May 26, 2016

Mr. Kenneth Wiemers P.E.

Area Engineer Beaumont

TXDOT

8350 Eastex Freeway

Beaumont, TX 77708

Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Mr. Kenneth Wiemers P.E. :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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Thank you very much for considering this request. It is important that stakeholders and the public have an opportunity to review and comment.

Sincerely,



Karen J. Stewart, MBA, CTP

Business Manager-JCDD6

Jefferson County
Drainage District No. 6
6550 Walden Rd., Beaumont, Texas 77707
Telephone (409) 842-1818
Fax (409) 842-2729
Established in 1920

Board of Directors:
Joshua W. Allen, Sr.
James D. McNicholas
William F. Miranda
Charles "Chuck" Guillory
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Doug S. Canant, Jr., PE, RPLS, CFM
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Karen J. Stewart, MBA, CTP
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Andrew J. Jones
Superintendent

May 26, 2016

Mr. Scott Hall, P.E.
General Manager
Lower Neches Valley Authority
7850 Eastex Freeway
Beaumont, TX 77708
Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Mr. Scott Hall, P.E. :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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May 26, 2016

Mr. Patrick Trahan
Government Relations Director
Exxon Mobil Oil Corporation
1795 Burt Steet
Beaumont, TX 77701
Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Mr. Patrick Trahan :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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May 26, 2016

Mr. Michael Lockwood
Plant Manager
Goodyear Tire and Rubber
11357 I-10
Beaumont, TX 77705

Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Mr. Michael Lockwood :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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May 26, 2016

Ms. Sue Landry
Homeland Security Director
Southeast Texas Regional Planning Commission
2210 Eastex Freeway
Beaumont, TX 77703
Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Ms. Sue Landry :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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Business Manager-JCDD6

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Andrew J. Jones
Superintendent

June 1, 2016

Ms. Becky Ford
Mayor
City of Bevil Oaks
7525 Sweetgum Road
Beaumont, TX 77713

Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Ms. Becky Ford :

As you may be aware, Jefferson County Drainage District 6 (the District) is currently in the process of updating its FEMA Hazard Mitigation Plan. FEMA requires local jurisdictions to update their plans every five years, and one of the update and re-approval requirements is to have a stakeholder group and the public review and provide input to the plan. Members of a stakeholder group are individuals or organizations that are affected by a mitigation action or policy and can provide specific information on a topic or provide input from a different point of view in the community. These organizations should include business, academia and other private and non-profit interests.

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Business Manager JCDD6

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Superintendent

June 1, 2016

Mr. John Walker
Mayor
City of China
P.O. Box 248
China, TX 77613

Re: Jefferson County Drainage District 6, Hazard Mitigation Plan Update

Dear Mr. John Walker :

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Karen J. Stewart, MBA, CTP
Business Manager JCDD6

APPENDIX 4 – SOURCES

Figure 1 - Vicinity Map: State of Texas (Source: www.Mapquest.com)

Figure 2 – DD6 Boundary Map (Source: DD6)

Table 3 – Most Common Industries, Beaumont, Texas (Source: www.City-data.com)

Table 4 - Incorporated Areas of Jefferson County (Source: US Census Bureau, 2014 - Estimates)

Table 5 – Buildings/Infrastructure within Jefferson County Drainage District Six (Sources: Jefferson County Central Appraisal District)

Table 6 –Natural Hazard Events and Declared Major Disasters in Jefferson County (Sources: Public Entity Risk Institute (PERI) website, FEMA, NCDC database)

Table 9 – Tornado Events in Jefferson County with at Least \$50,000 in Property Damage (Source: NCDC Storm Events Database)

Figure 4 – Historical Hurricane Tracks for Jefferson County TX (National Hurricane Center)

Figure 5 – Historical Hurricane Tracks for Jefferson County TX (National Hurricane Center)

Figure 6 – Basic Design Wind Speed (Source: International Building Code)

Table 14 – Beaufort Wind Scale (Source: National Oceanic and Atmospheric Administration)

Table 15 – Severe Thunderstorm and High Wind Events in Jefferson County with at Least \$25,000 in Property Damage (Source: NCDC Storm Events Database)

Figure 7 – Jefferson County DD6 – 100-year Floodplain Map (Source: FEMA National Flood Insurance Program (NFIP) December 2009)

Figure 8 – Jefferson County TX Effective Flood Insurance Rate Map (Source: RiskMap6 Effective FIRM)

Figure 9 – Depth of Precipitation for 50-year Storm for 1-hour duration in Texas (Source: USGS)

Figure 10 – Depth of Precipitation for 100-year Storm for 1-hour duration in Texas (Source: USGS)

Table 17 – Jefferson County Flood Events since Last Planning Effort (Source: NCDC Storm Events Database)

Table 19 - Summary of Residential and Non-Residential NFIP Repetitive Loss Statistics, Jefferson County DD6, ordered by Municipality (Source: FEMA NFIP query January 1, 2016)

Table 20 - Summary of Residential NFIP Repetitive Loss Statistics, Jefferson County DD6, ordered by Municipality (Source: FEMA NFIP query January 1, 2016)

Table 21 - Summary of Non-Residential NFIP Repetitive Loss Statistics, Jefferson County DD6, ordered by Municipality (Source: FEMA NFIP query January 1, 2016)

Table 22 – Summary of Residential NFIP Repetitive Loss Statistics, Jefferson County DD6, ordered by number of Properties on Each Street (Source: FEMA NFIP query January 1, 2016)

Table 23 – Projected 100-year Flood Risk in Jefferson County DD6 Repetitive Loss Areas (Source: FEMA NFIP query January 1, 2016)

Table 24 – Projected Future Damages (Risk) to NFIP Repetitive Flood Loss Properties in Jefferson County DD6, ordered by 100-year Risk (Source: FEMA NFIP query January 1, 2016)

Figure 11 – Number of NFIP Flood Insurance Claims Per Residential Repetitive Loss Property in Jefferson County DD6 (Source: FEMA/NFIP, Query January 1, 2016; Plotted by DD6)

Table 25 – Projected 100-year Flood Risk, Non-Residential Repetitive Loss Properties in Jefferson County DD6 (Source: FEMA NFIP query January 1, 2016)

Figure 12 – Number of NFIP Flood Insurance Claims Per Non-Residential Repetitive Loss Property in Jefferson County DD6 (Source: FEMA/NFIP, Query January 1, 2016; Plotted by DD6)

Table 26 – Projected 100-year Flood Risk, Severe Repetitive Loss Properties in Jefferson County DD6 (Source: FEMA/NFIP, Query January 1, 2016)

Figure 13 – Number of NFIP Flood Insurance Claims Per Severe Repetitive Loss Property in Jefferson County DD6 (Source: FEMA/NFIP, Query January 1, 2016; Plotted by DD6)

Figure 14 – Flood Hazard Chart for Cars (Source: Downstream Hazard Classification Guidelines)

APPENDIX 5 – ADOPTION RESOLUTION

APPENDIX 6 – FEMA AND OR TDEM APPROVAL LETTER