

Amended 2023 Lower Red-Sulphur-Cyprus Regional Flood Plan - Project Narrative

Project Name: Anderson Creek Wastewater Treatment Plant Levee Improvements
FMP ID: 023000004
Project Sponsor: City of De Kalb
Date: 7/12/2023

BACKGROUND INFORMATION:

As part of the Amended 2023 Lower Red-Sulphur Cyprus Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. The Anderson Creek Wastewater Treatment Plant Flood Study (FME ID 021000026) was conducted as part of Task 12. This project is in Bowie County, south of the City of De Kalb (see **Figure 1-1**).

The project area is southeast of the intersection of East Front Street and Interstate-259 on mostly undeveloped land. This WWTP is within the southern portion of Anderson Creek floodplain and is currently classified as a FEMA Zone A; thus, no base flood elevations (BFEs) are readily available. The purpose of further developing this study is to determine and evaluate whether the existing berm can provide a 100-year level of flood protection and evaluate the potential need for sump pumps and lift station.

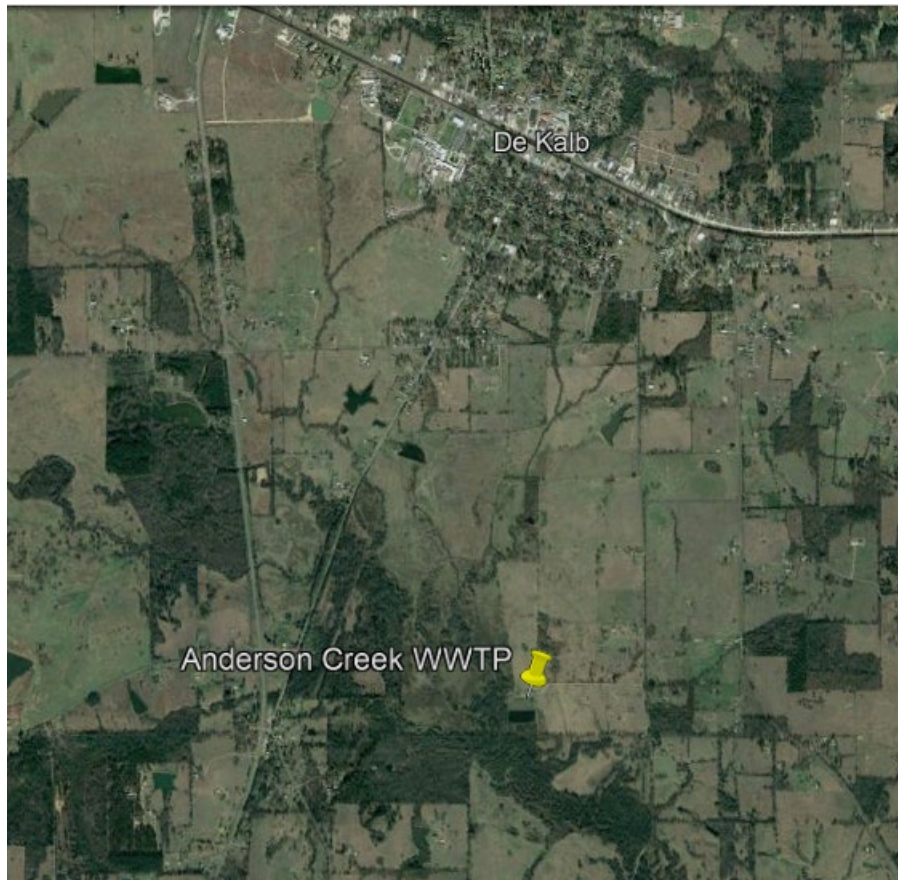


Figure 1-1. Anderson Creek WWTP Location Map

METHODOLOGY FOR FMP ANALYSIS

A HEC-HMS hydrologic model was developed for this area to simulate storm events and generate the associated runoff hydrographs for the 100-year storm (**Figure 1-2**). These hydrographs were input into a one-dimensional (1D) HEC-RAS hydraulic model. The watershed area and length of Anderson Creek included in the models are approximately 1.95-square miles and 9.3-linear miles, respectively. The 1D hydraulic model (**Figure 1-3**) was used to analyze existing flooding conditions, determine flood levels within the vicinity of the WWTP, determine

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the level of service (LOS) provided by the current ring levee, develop a feasible flood mitigation alternative, and evaluate the impact(s) of the proposed improvements.

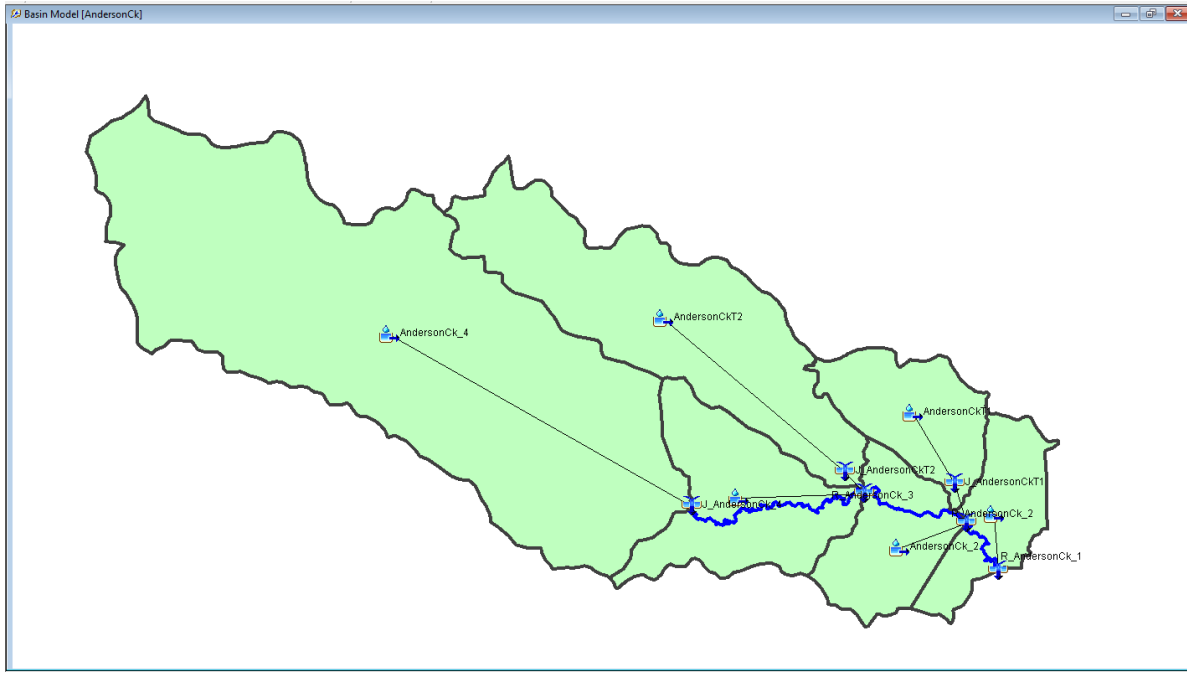


Figure 1-2. HEC-HMS Model Setup

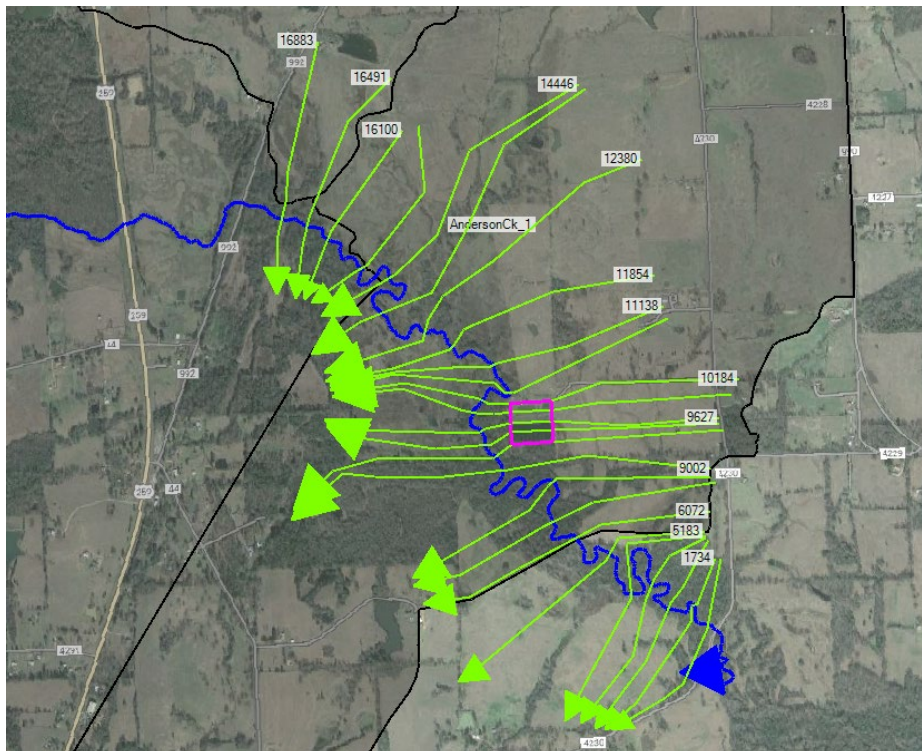


Figure 1-3. HEC-RAS Model Setup

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HYDRAULIC ANALYSIS RESULTS – EXISTING CONDITIONS

The profile line at river station 10184, which is at the most upstream point of the berm around the WWTP has an existing elevation of 346.05 ft, while the resulting maximum inundation depth for the 100-year storm is 345.52 ft. The difference in elevation is greater than 0.5ft, which is a clear indication of the berm providing more than the required level of service for the structure of interest. Additionally, river station 9213, which is at the most downstream point of the existing berm, has an elevation of 344.97 ft, with a maximum inundation depth of 344.54ft for the 100-year storm. The difference in elevation is 0.43 ft. **Figure 1-4** and **Figure 1-5** illustrate this finding. Therefore, based on the existing conditions evaluation, both upstream and downstream of the study area, no further analysis was necessary as part of this FME.

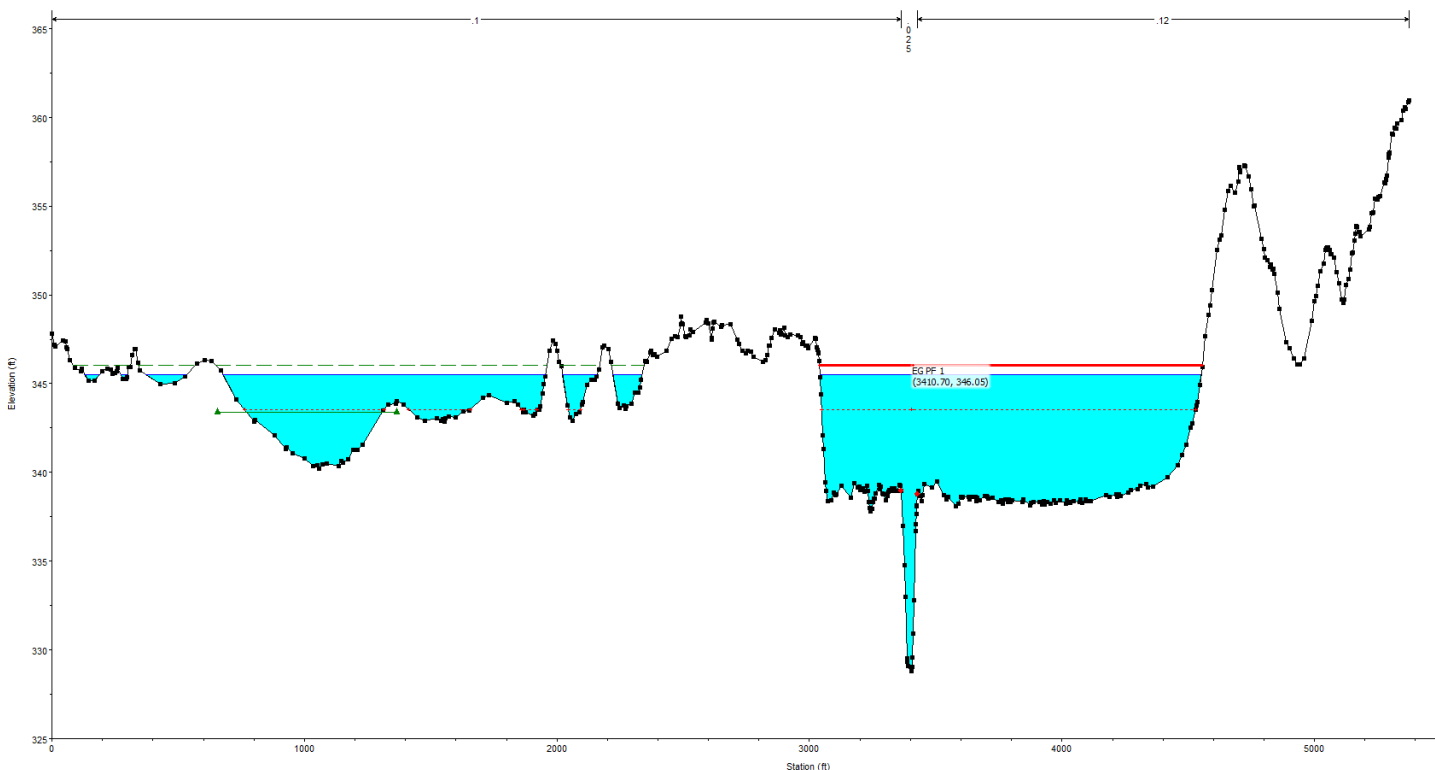


Figure 1-4. 100-year Existing Conditions at Cross Section 10184 - Upstream of WWTP

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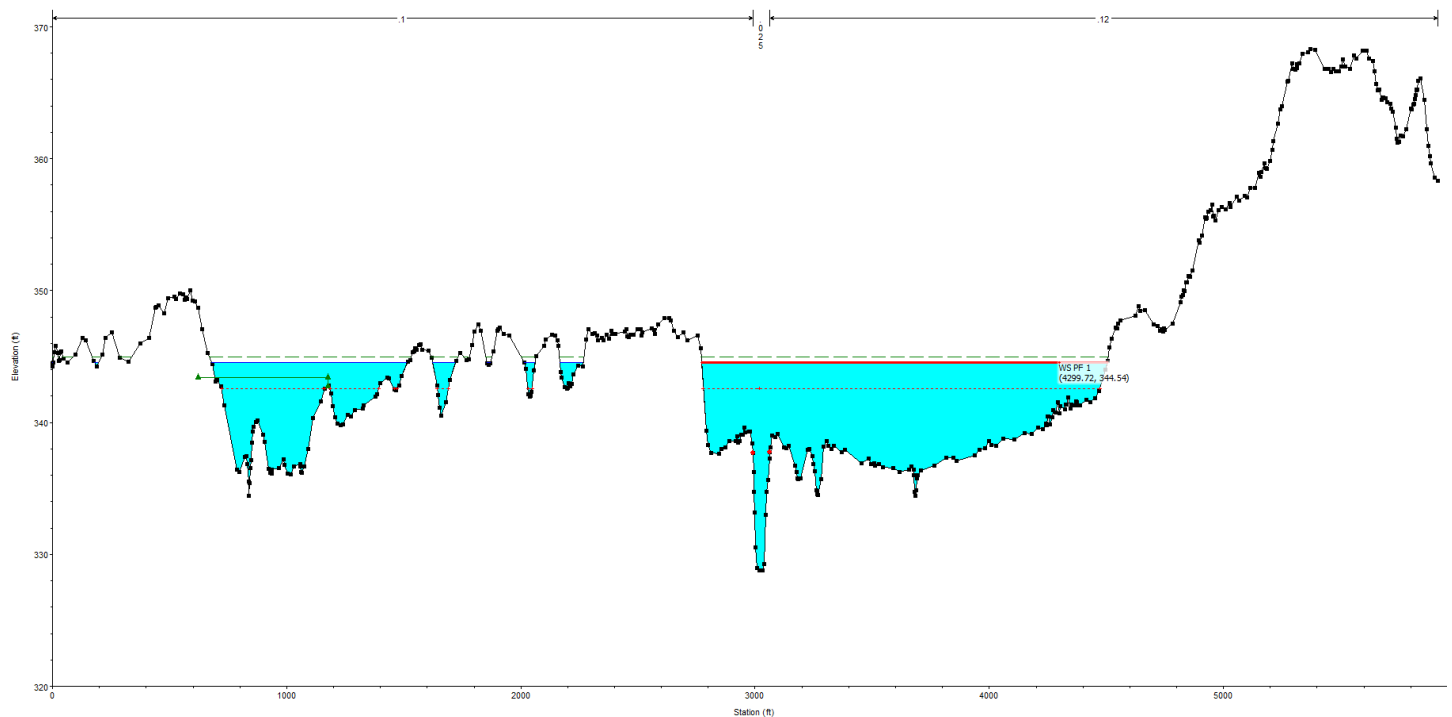


Figure 1-5. 100-year Existing Conditions at Cross Section 9213 - Downstream of WWTP

REASON FOR NOT RECOMMENDING

The original thought for this FMP proposed retrofitting and elevating the existing ring levee to properly protect the WWTP and ultimately provide a 100-year LOS. However, the Task 12 hydrologic and hydraulic analysis results demonstrated that the existing levee would not be overtopped during the 100-year flood event, and even the lowest points within the WWTP facility would not experience flooding. Nearly all property adjacent to the channel is open space. Based on the comparative assessment performed for this FMP, the existing study area requires no further improvements, and it was not deemed necessary to develop a flood mitigation project for inclusion in the Amended Plan.

Amended 2023 TWDB Region 2 Flood Plan - Project Narrative

Project Name: City of Paris Big Sandy Creek Tributaries 4 & 6 Improvements
FME ID: 021000041
Project Sponsor: The City of Paris
Date: 6/30/2023

BACKGROUND INFORMATION:

The Texas Water Development Board (TWDB) Region 2 Flood Plan, Task 12 expands on previously identified prone flood risk areas from the Cobb, Fendley & Associates, Inc. study, dated March 24th, 2017. Big Sandy Creek Tributaries 4 & 6 flow through the city of Paris and currently are causing high flood risk even in lower event storms. This causes multiple road closures and flooded structures. The project, City of Paris Big Sandy Creek Tributaries 4 & 6 Improvements, was proposed to reduce flood risks along these reaches. The project is being sponsored by the City of Paris.

The existing floodplain model obtained from the City, HEC-RAS version 4.1.0, was utilized to model the proposed conditions. A combination of channel improvements, culvert improvements and detention were investigated to maximize the decrease in flooding impacts. The projects are conceptual in nature and generally consistent with the City of Paris Design Guidelines. A downstream assessment developed in HEC-HMS version 4.6.1 for each proposed alternative project was completed to demonstrate that there are no adverse flooding impacts downstream of the study area.

No adverse impacts per the City of Paris drainage criteria are:

- No increase in the fully developed 100-year discharges.
- No increase in the 100-year water surface elevation.
- Post-development channel velocities are not increased by more than 5% above pre-proposed velocities.

PROPOSED PROJECT CONSIDERATIONS

Five conceptual alternative projects were evaluated to mitigate flooding for the fully developed 100-year frequency storm in the two tributaries, Tributary 6 and 4 of Big Sand Creek.

Alternative 1 consists of the following improvements:

Downstream of Clarksville, the existing earthen channel would be regraded to a 25-foot-wide grass lined channel with 4:1 side slope at the existing depth. The channel upstream of Clarksville Avenue up to and including the confluence with Tributary 6 would be replaced with a 15-foot-wide concrete channel with vertical walls, cut three to four feet deeper, wherever allowed. All existing culverts would be replaced to match the proposed deeper channel flowline and increased in size where needed to pass the 100-year frequency storm. The upper portion of Tributary 4 would be improved. The channel would be improved from the confluence upstream to Lamar Avenue with 15-foot-wide concrete channel improvements with vertical walls and deepened from one to four feet. In this scenario, upstream of Lamar Avenue, no channel improvements need to be made. Tributary 6 would also be widened to a 25-foot-wide, vertical wall concrete channel. The culvert along Tributary 6 would need to be replaced with bridges unless additional right-of-way is acquired. Two proposed detention storage areas were also modeled in Alternative 1 to provide additional storage along the reach of Tributary 6 and help alleviate any increases in discharges downstream on the project area. The first proposed storage area was modeled at Wade Park at the corner of 22nd St and E Price St to provide approximately 2 acre-ft of additional storage. The second proposed storage area was modeled at an open space at the corner of Clarksville St. and S Collegiate Dr to provide approximately 2 acre-ft of additional storage. The following figure shows in red the location of the proposed ponds.

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Project Name: City of Paris Big Sandy Creek Tributaries 4 & 6 Improvements
FME ID: 021000041
Project Sponsor: The City of Paris
Date: 6/30/2023



The proposed Alternative 1 would reduce the water surface elevations in many places along Tributary 6 and Tributary 4; however, it caused increases water surface elevations in some places and in discharges downstream of the project area, so it was not considered a viable option.

Alternative 2 consists of the following improvements:

Alternative 2 was based on Alternative 1 improvements. To remove the increases in discharges downstream in it was decided to reduce the scale of the proposed improvements. All the improvements in Tributary 4 were modeled similarly to Alternative 1 but the proposed improvements in Tributary 6 were reverted to the Revised Existing conditions. Also, a third proposed detention storage was modeled at the very downstream end of the corner of Northeast Texas Trail and S Collegiate Dr. to provide approximately 4 acre-ft of additional storage. The following figure shows in red the location of the proposed pond.

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Project Name: City of Paris Big Sandy Creek Tributaries 4 & 6 Improvements
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This Alternative 2 was also not considered a viable option since it was not able to remove the increases in downstream discharges.

Alternative 3 consists of the following improvements:

Alternative 3 was based on Alternative 2 improvements. The scale of the project was reduced further to try to prevent downstream impacts. All the improvements in Upper Tributary 4 were modeled similarly to Alternative 1 but the proposed improvements in Lower Tributary 4 and Tributary 6 were reverted to the Revised Existing conditions.

This Alternative 3 was also not considered a viable option since it would still result in increases in downstream discharges.

Alternative 4 consists of the following improvements:

Alternative 4 was also based on Alternative 2 improvements. All the improvements in Lower Tributary 4 were modeled similarly to Alternative 1, but the proposed improvements in Upper Tributary 4 and Tributary 6 were reverted to the Revised Existing conditions.

This Alternative 4 was also not considered a viable option since it would still result in increases in downstream discharges.

Alternative 5 consists of the following improvements:

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Project Name: City of Paris Big Sandy Creek Tributaries 4 & 6 Improvements
FME ID: 021000041
Project Sponsor: The City of Paris
Date: 6/30/2023

In Alternative 5, as a final option it was decided to remove all the proposed hydraulic improvements and investigate results of just modeling the first proposed detention storage area at Wade Park at the corner of 22nd St and E Price St. This was the only option that did not result in adverse impacts downstream, but decreases in water surface elevations along Tributary 4 and 6 were minimal.

Due to potential adverse downstream impacts, no FMP is being proposed at this time

PROPOSED PROJECT SCOPING COST

The analysis did not progress to this stage.

PROPOSED PROJECT BENEFITS

The analysis did not progress to this stage.

IMPACT ANALYSIS

The analysis did not progress to this stage.

PROJECT RISKS

ROW/Real Estate Acquisition:
Not Applicable

Utilities Coordination:
Not Applicable
Permitting/Environmental:
Not Applicable
Stakeholder coordination:
Not Applicable

MITIGATION OF RISKS

Permitting/Environmental:
Not Applicable

NATURE BASED SOLUTION (NBS) CONSIDERATION

There are no proposed nature-based solutions.

INTERRELATED PROJECTS

There are no interrelated projects.

Amended 2023 Lower Red-Sulphur-Cyprus Regional Flood Plan - Project Narrative

Project Name: Pig Branch Watershed Culvert Improvements
FMP ID: 023000013
Project Sponsor: City of Bonham
Date: 7/12/2023

BACKGROUND INFORMATION:

As part of the Amended 2023 Lower Red-Sulphur Cyprus Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. The Pig Branch Watershed Culvert Improvements (FME ID 021000066) was conducted as part of Task 12. This project is in Fannin County, south of the City of Bonham. The project area is bounded by U.S. Highway 82 in the north, State Highway 121 to the west, West 10th Street to the south, and the main stem of Pig Branch generally flows west to east until it meets the east side of Bonham at Bois d'Arc Creek. The majority of the area contributing flow to the Pig Branch watershed is in developed areas of the city.

Pig Branch watershed and its tributaries are approximately 3.75 square miles and 7.4 miles, respectively. The main stem of Pig Branch is approximately 4 linear miles, beginning at State Highway 121, generally flowing east through the developed areas of the city, and ending at Nancy Lea Road before its confluence with Bois d'Arc Creek east of Bonham as depicted in **Figure 1-1**.

An existing Preliminary Engineering Report (PER), completed by Hayter Engineering, Inc. (December 2017), was available for the study area and served as a starting point for the Task 12 analysis. The purpose of further developing this study is to determine the existing inundation extents; and evaluate if the proposed infrastructure improvements indicated in the existing PER would provide the expected level of service (LOS) as indicated in that study.



Figure 1-1. Location Map

Amended 2023 Lower Red-Sulphur-Cyprus Regional Flood Plan - Project Narrative

Project Name: Pig Branch Watershed Culvert Improvements
FMP ID: 023000013
Project Sponsor: City of Bonham
Date: 7/12/2023

METHODOLOGY FOR FMP ANALYSIS

The findings from the Hayter Engineering, Inc. PER were utilized as the basis for this hydrologic and hydraulic analysis. Hayter Engineering implemented several data collection, field reconnaissance for thirteen (13) culvert crossings, and topographic survey into their analysis to obtain a better understanding of the existing conditions. All traditional parameters such as drainage areas, time of concentration, land use and zoning, runoff coefficients, time of concentrations, and rainfall data were developed in their hydrologic analysis to eventually be input into the hydraulic model. HY-8 (version 7.30) was utilized for the hydraulic analysis of the 13 previously identified crossings. The previous H&H model inputs and methodologies were taken into consideration and used as the basis of the additional analysis that was performed. Revisions, such as an updated land use layer, were made to represent the existing conditions more accurately since development has taken place over the past 5+ years.

As part of Task 12, a HEC-HMS hydrologic model was developed for this area to simulate multiple storm events and generate the associated runoff hydrographs for the 2-, 5-, 10-, 25-, 50-, and 100-year storms. These hydrographs were input into a two-dimensional (2D) rain-on-mesh (ROM) HEC-RAS hydraulic model. The ROM was used for overland and channel flow, while the HEC-HMS inputs for urban (storm drain) areas implemented the data from the previous study. The 2D hydraulic model was used to analyze existing flooding conditions, determine the severity of flooding risks, establish the LOS of existing drainage infrastructure, evaluate potential solutions to reduce flooding risks, establish a preliminary basis for design of the improvements, and evaluate the impact(s) of the proposed improvements. The model primarily focuses on culvert crossing upgrades and proposed channel improvements within the 2D flow area. **Figure 1-2** and **Figure 1-3** show the HMS and RAS model set ups, respectively.

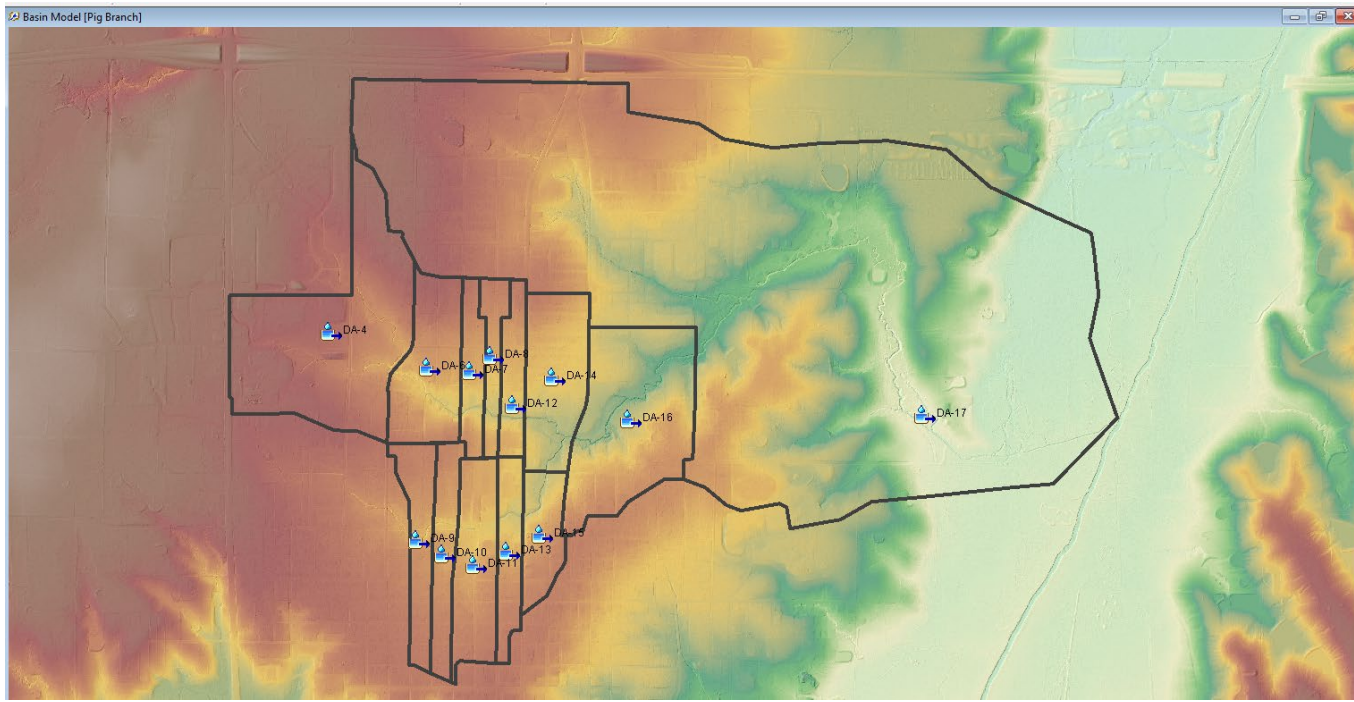


Figure 1-2. HEC-HMS Model Setup

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Project Name: Pig Branch Watershed Culvert Improvements

FMP ID: 023000013

Project Sponsor: City of Bonham

Date: 7/12/2023

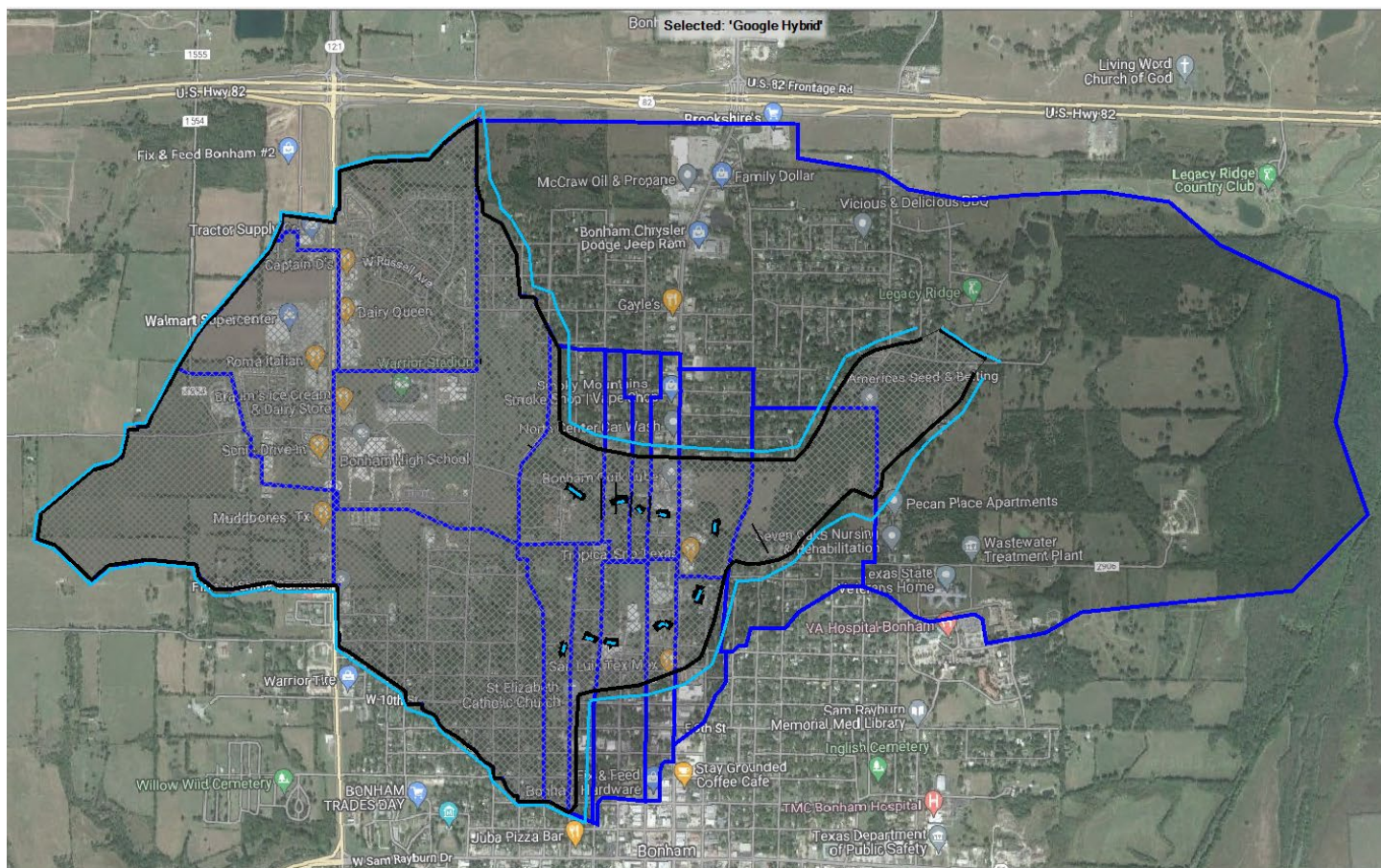


Figure 1-3. HEC-RAS Model Setup

EVALUATED ALTERNATIVES

The existing PER demonstrated that eight (8) of the thirteen (13) analyzed culvert crossings have a LOS less than a 2-year storm event – a handful of which experience roadway overtopping and inundation in existing conditions. The remaining crossings have a LOS of less than or equal to the 5-year storm event, and one has a 50-year LOS. It is important to note the intention(s) of this analysis is not necessarily to upsize the crossings to pass the 100-year storm event, but rather, improve the overall flood protection in the study area. Reaching a 10- or 25-year LOS would be considered an acceptable improvement in terms of flood risk reduction. An outline of the HY-8 results from the PER is provided in **Table 1-1**. The culvert dimensions recommended in the PER (**Table 1-2**) were incorporated into the HEC-RAS alternatives model as a first test of the LOS that could be achieved at each crossing.

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Project Name: Pig Branch Watershed Culvert Improvements
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Crossing	Culverts	Roadway Elevation	25-Year Event Headwater Elevation	Flood Protection
Albert Broadfoot St.	(4) 30" HDPE	607.25	608.01	5 Year
Cedar St.	(2) 6' x 6.5' CBC	600.37	599.61	50 Year
Franklin Ave. N	(3) 38" x 57" CMP	591.37	592.53	None
Oriental St.	12.33' x 6.25' Bridge	587.56	588.83	2 Year
SH 78 North	(2) 6' x 7' CBC	588.23	588.69	10 Year
Poplar St.	(2) 38" x 57" CMP	597.84	598.93	None
W. 12th St.	(2) 60" CMP	596.66	597.28	None
Maple St.	(2) 8' x 3' CBC	593.97	594.88	None
Franklin Ave. S	(2) 54" CMP	593.93	594.17	None
Main St. S	(2) 60" RCP	592.54	592.84	None
SH 78 South	(3) 6' x 5.5' CBC	588.19	588.44	2 Year
E. 15th St.	(4) 42" RCP	583.76	584.32	None
Pecan St.	(3) 48" x 63" CMP	571.28	572.70	None

Table 1-1. Existing Culvert LOS (Hayter Engineering, Inc., 2017)

Crossing	Existing Culvert	Existing Year Storm Event Passed	Proposed Culvert	Proposed Year Storm Event Passed
Albert Broadfoot St.	(4) 30" HDPE	5 Year	(3) 38"x57" CMP	25 Year
Cedar St.	(2) 6' x 6.5' CBC	50 Year	(2) 6' x 6.5' CBC	50 Year
Franklin Ave. N	(3) 38" x 57" CMP	None	(2) 7'x6' CBC	50 Year
Oriental St.	12.33' x 6.25' Bridge	2 Year	(3) 6'x6' CBC	25 Year
SH 78 North	(2) 6' x 7' CBC	10 Year	(2) 7'x7' CBC	25 Year
Poplar St.	(2) 38" x 57" CMP	None	(1) 12'x5' CBC	10 Year
W. 12th St.	(2) 60" CMP	None	(2) 60" CMP	None
Maple St.	(2) 8' x 3' CBC	None	(2) 8' x 3' CBC	None
Franklin Ave. S	(2) 54" CMP	None	(2) 7'x6' CBC	10 Year
Main St. S	(2) 60" RCP	None	(2) 8'x6' CBC	25 Year
SH 78 South	(3) 6' x 5.5' CBC	2 Year	(3) 8'x6' CBC	5 Year
E. 15th St.	(4) 42" RCP	None	(2) 9'x5' CBC	2 Year
Pecan St.	(3) 48" x 63" CMP	None	(2) 9'x6' CBC	None

Table 1-2. Proposed Culvert LOS (Hayter Engineering, Inc., 2017)

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Project Name: Pig Branch Watershed Culvert Improvements
FMP ID: 023000013
Project Sponsor: City of Bonham
Date: 7/12/2023

Hydraulic results from the 2D ROM model demonstrated that the proposed culvert improvements from the 2017 PER are not sufficient to increase the LOS at all crossings to the levels indicated in **Table 1-2**. For example, comparing **Figure 1-4** to **Figure 1-5**, there is no significant effect on the inundation depths and overall flooding conditions between existing and proposed conditions for the 25-year storm event. Similar results were observed for the other storm events.

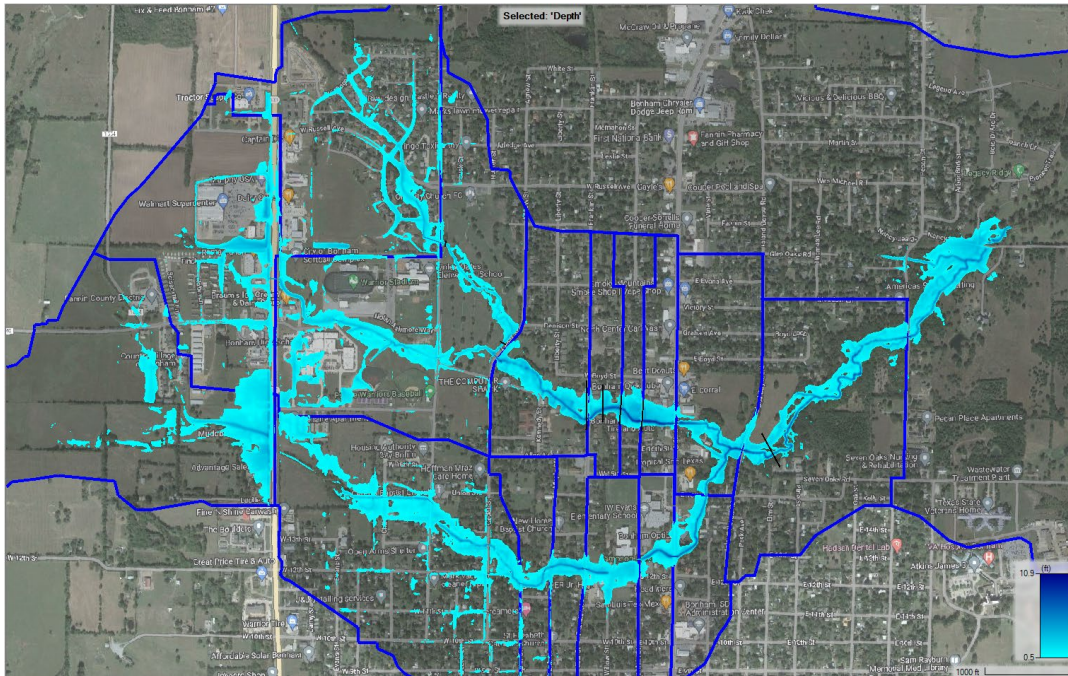


Figure 1-4. 25-year Existing Inundation Depths

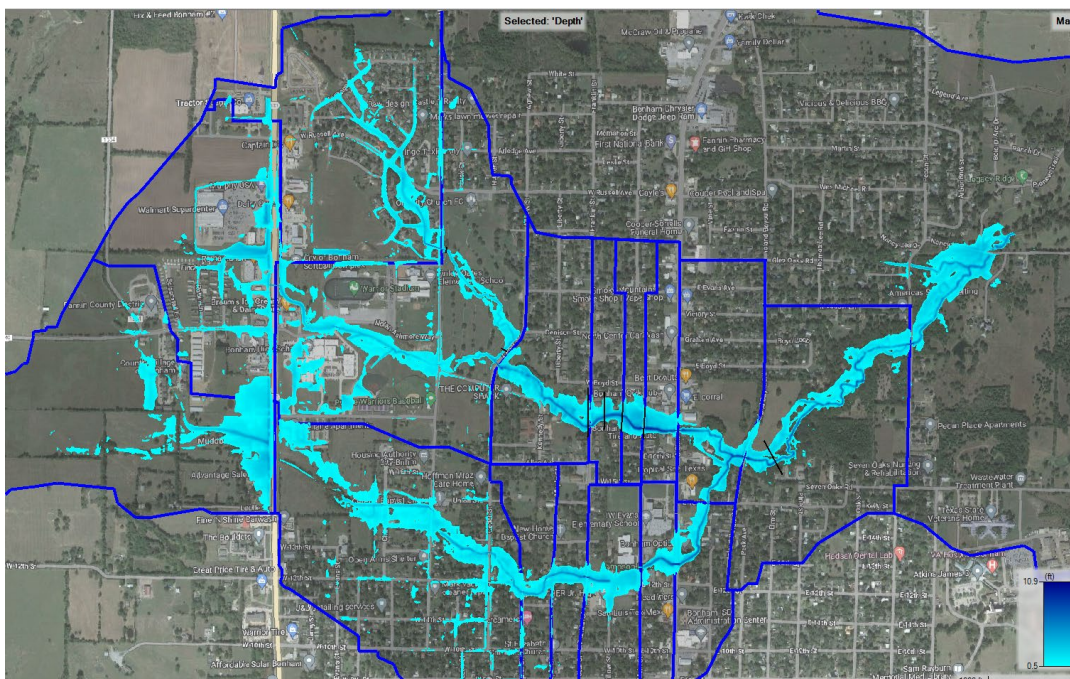


Figure 1-5. 25-year Proposed Inundation Depths

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Project Name: Pig Branch Watershed Culvert Improvements
FMP ID: 023000013
Project Sponsor: City of Bonham
Date: 7/12/2023

Due to the limited timeframe to perform Task 12, no feasible alternatives were fully completed as part of this analysis. There are several pending factors that need to be taken into consideration such as prioritizing the LOS for high-traffic crossings over low-traffic crossings, investigating the feasibility of channel improvements, investigating potential detention options, and the overall benefits and cost(s) of the alternatives. There is certainly a potential for developing feasible projects for selected locations in the future, but a comprehensive alternative analysis is required.

REASON FOR NOT RECOMMENDING

The feasibility of this FMP is still pending due to unknowns such as: the level of service at each culvert crossing, the level of service for the entire project area, project benefits (or lack thereof), and a no negative impacts determination. Therefore, this project does not currently meet TWDB flood mitigation project criteria as outlined in the Exhibit C technical guidelines. The limited timeframe to perform Task 12 did not allow for the full-scale, in-depth analysis that needed to take place to find feasible solutions for all culvert crossings of concern. The project benefits could be substantial, and further investigation and analysis is recommended. Therefore, the RFPG determined that the best course of action is to keep this study as a recommended FME in the Amended Plan.

Amended 2023 TWDB Region 2 Flood Plan - Project Narrative

Project Name: TexAmericas Detention Pond #1
FME ID: 023000005
Project Sponsor: TexAmericas Center
Date: 07/05/23

BACKGROUND INFORMATION:

As a part of the amended Texas Water Development Board (TWDB) Region 2 Flood Plan, Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. City of Hooks Infrastructure, FME ID 021000030, was investigated and expanded upon during Task 12. This project is sponsored by the TexAmericas Center.

The City of Hooks experiences frequent flooding from the Unnamed Tributary to Panther Creek that flows through the center of Hooks. 31 structures are in the 100-year floodplain of the Unnamed Tributary to Panther Creek within Hooks city limits, and an estimated 0.5 miles of city streets are at risk of flooding from the 100-year storm in this area.

Rather than widening ditches, as was originally identified in FME ID 021000030, construction of an in-line detention pond is proposed just south of Hooks city limits. The result of this proposed project is 24 structures removed from the 100-year floodplain and an estimated 0.28 miles of city streets removed from 100-year flood risk. No downstream negative impacts are expected to occur for the 100-year storm event.

METHODOLOGY:

A Base Level Engineering (BLE) HEC-RAS model was obtained from the TWDB for this stream. Six culverts and one bridge that were missing from the model were added, along with additional cross sections necessary to properly model these structures. In general, model updates were limited to within city limits. Field survey data was gathered and as-builts were obtained to determine approximate structure flowlines and culvert sizes. Parameters such as bank station placement, Manning's n values, and ineffective flow areas were updated as was deemed necessary. This model was also updated from version 4.1 to version 6.3.

Discharges in the BLE hydraulic model were calculated using regional regression equations. In order to adequately model detention, a HEC-HMS model was created from scratch using the SCS Curve Number method, SCS Unit Hydrograph method, and Muskingum Cunge routing. The Unnamed Tributary to Panther Creek was analyzed upstream of its intersection with Interstate Highway 30 (I-30). Revised existing discharges were generated and input into a revised existing HEC-RAS model.

A proposed detention pond on the TexAmericas center, just south of Hooks city limits, was modelled in a proposed HEC-HMS model. This pond was sized to utilize all anticipated available space, based on conceptual development plans provided by TexAmericas. The pond was designed on a conceptual level such that it could contain the 100-year storm with at least one foot of freeboard. Discharges from this proposed HEC-HMS model were added to a proposed HEC-RAS model, which was used to create floodplain maps that were used in the benefit cost analysis.

Models were limited in detail, and further study will be necessary to design the ponds and fully determine their impacts to the stream and floodplain in more detail.

PROPOSED PROJECT SCOPE

This proposed project is an in-line detention pond with an approximately 31-acre footprint designed to contain the 100-year storm with at least 1 foot of freeboard. The proposed detention pond would be located south of

Amended 2023 TWDB Region 2 Flood Plan - Project Narrative

Project Name: TexAmericas Detention Pond #1
FME ID: 023000005
Project Sponsor: TexAmericas Center
Date: 07/05/23

Hooks city limits. It would be bordered by E Avenue A and an existing railroad to the north and south and would be approximately 2,230 feet in length measured east to west. This is property that is owned by the TexAmericas Center. The TexAmericas Center has plans to develop the surrounding area, so this location would need to be reserved for detention. This detention pond will reduce flooding risk to downstream structures and roads.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan for documented assumptions and methodologies on project costs.

The estimated project cost for TexAmericas Detention Pond #1 is \$9,545,000. This was calculated using 2023 prices. This cost includes mobilization, a construction contingency, engineering fees, permitting costs, a design contingency, and other materials necessary to construct this detention pond. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

The 10- and 100-year benefits that were evaluated for this project include residential structures removed from the floodplain, commercial structures removed from the floodplain, benefits to flooded streets, and removal of low water crossings. The resulting benefit cost ratio was 0.3. **Table 1** below summarizes the components calculated using the TWDB BCA Tool.

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Project Name: TexAmericas Detention Pond #1
FME ID: 023000005
Project Sponsor: TexAmericas Center
Date: 07/05/23

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit		
Project Useful Life	30	
Event Damages	Baseline	Project
10 - year storm	\$649,651	\$210,083
100 - year storm	\$5,035,824	\$292,703
Total Benefits from BCA Toolkit	\$2,593,146	
Other Benefits (Not Recreation)	\$374,998	
Recreation Benefits	\$0	
Total Costs	\$9,786,258	
Net Benefits	-\$6,818,115	
Final BCR	0.3	

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

Discharges downstream of the proposed pond were analyzed at two different locations. Decreases for all frequency storms analyzed decreased between revised existing and proposed conditions. These results are summarized in **Table 2: Pre- and Post- Project Discharges**

Table 2: Pre- and Post- Project Discharges (cfs)

Downstream of Proposed Pond		
	Revised Existing	Proposed
10 Year	606	295
100 Year	1021	481
Upstream of I-30		
10 Year	863	560
100 Year	1304	942

Amended 2023 TWDB Region 2 Flood Plan - Project Narrative

Project Name: TexAmericas Detention Pond #1
FME ID: 023000005
Project Sponsor: TexAmericas Center
Date: 07/05/23

The result of this proposed project is 24 structures removed from the 100-year floodplain and an estimated 0.28 miles of city streets removed from 100-year flood risk. The pre-project level of service of this stream is less than 2-year, and the post project level of service of this stream is 2-year.

PROJECT RISKS

ROW/Real Estate Acquisition:

No, as TexAmericas Center already owns the land and will be the project sponsor.

Utilities Coordination:

No, currently there are no evident utility conflicts. During the design phase, utility conflicts should be further evaluated.

Permitting/Environmental:

Permits will be required as wetlands and other Waters of the U.S. will likely be impacted.

Stakeholder coordination:

No, as the sponsor is the primary stakeholder involved.

MITIGATION OF RISKS

Utility Coordination:

If utility conflicts are found, the utility coordinator will need to closely work with the affected utility companies to ensure timely completion of the proposed project.

Permitting/Environmental:

Coordination and permitting process should be started early on to avoid schedule delays.

Stakeholder Coordination:

Public meetings and flyers will help communicate impacts to affected businesses of any service interruption or inconvenience. The businesses near the project limits should be notified several weeks before the construction start date.

NATURE BASED SOLUTION (NBS) CONSIDERATION

Not considered.

INTERRELATED PROJECTS

FME ID 023000006 TexAmericas Detention Pond #2.

Amended 2023 TWDB Region 2 Flood Plan - Project Narrative

Project Name: TexAmericas Detention Pond #2
FME ID: 023000006
Project Sponsor: TexAmericas Center
Date: 07/05/23

BACKGROUND INFORMATION:

As a part of the amended Texas Water Development Board (TWDB) Region 2 Flood Plan, Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. City of Hooks Infrastructure, FME ID 021000030, was investigated and expanded upon during Task 12. This project is sponsored by the TexAmericas Center.

The City of Hooks experiences frequent flooding from Jones Creek that flows through a residential area. 69 structures are in the 100-year floodplain of Jones Creek within Hooks city limits, and an estimated 1.3 miles of city streets are at risk of flooding from the 100-year storm in this area.

Rather than widening ditches, as was originally identified in FME ID 021000030, construction of an in-line detention pond is proposed just south of Hooks city limits on TexAmericas Center property. The result of this proposed project is 67 structures removed from the 100-year floodplain and an estimated 1.2 miles of city streets removed from 100-year flood risk. No downstream negative impacts are expected to occur for the 100-year storm event.

METHODOLOGY:

A Base Level Engineering (BLE) HEC-RAS model was obtained from the TWDB for this stream. Four culverts and two bridges that were missing from the model were added, along with additional cross sections necessary to properly model these structures. In general, model updates were limited to within city limits. Field survey data was gathered and as-builts were obtained to determine approximate structure flowlines and culvert sizes. Parameters such as bank station placement, Manning's n values, and ineffective flow areas were updated as was deemed necessary. This model was also updated from version 4.1 to version 6.3.

Discharges in the BLE hydraulic model were calculated using regional regression equations. In order to adequately model detention, a HEC-HMS model was created from scratch using the SCS Curve Number method, SCS Unit Hydrograph method, and Muskingum Cunge routing. Jones Creek was analyzed upstream of its intersection with Interstate Highway 30 (I-30). Revised existing discharges were generated and input into a revised existing HEC-RAS model.

A proposed detention pond on the TexAmericas Center, just south of Hooks city limits, was modelled in a proposed HEC-HMS model. This pond was sized to utilize all anticipated available space, based on conceptual development plans provided by TexAmericas. The pond was designed on a conceptual level such that it could contain the 100-year storm with at least one foot of freeboard. Discharges from this proposed HEC-HMS model were added to a proposed HEC-RAS model, which was used to create floodplain maps that were used in the benefit cost analysis.

Models were limited in detail, and further study will be necessary to design the ponds and fully determine their impacts to the stream and floodplain in more detail.

PROPOSED PROJECT SCOPE

This proposed project is an in-line detention pond with an approximately 68-acre footprint designed to contain the 100-year storm with at least 1 foot of freeboard. The proposed detention pond would be located south of

Amended 2023 TWDB Region 2 Flood Plan - Project Narrative

Project Name: TexAmericas Detention Pond #2
FME ID: 023000006
Project Sponsor: TexAmericas Center
Date: 07/05/23

Hooks city limits. It would be bordered by E Avenue A and an existing railroad to the north and south and would be approximately 4,530 feet in length measured east to west. This is property that is owned by the TexAmericas Center. The TexAmericas Center has plans to develop the surrounding area, so this location would need to be reserved for detention. This detention pond will reduce flooding risk to downstream structures and roads.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan for documented assumptions and methodologies on project costs.

The estimated project cost for TexAmericas Detention Pond #2 is \$20,539,000. This was calculated using 2023 prices. This cost includes mobilization, a construction contingency, engineering fees, permitting costs, a design contingency, and other materials necessary to construct this detention pond. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

The 10- and 100-year benefits that were evaluated for this project include residential structures removed from the floodplain, commercial structures removed from the floodplain, benefits to flooded streets, and removal of low water crossings. The resulting benefit cost ratio was 0.3. **Table 1** below summarizes the components calculated using the TWDB BCA Tool.

Amended 2023 TWDB Region 2 Flood Plan - Project Narrative

Project Name: TexAmericas Detention Pond #2
FME ID: 023000006
Project Sponsor: TexAmericas Center
Date: 07/05/23

Input Into BCA Toolkit		
Project Useful Life	30	
Event Damages	Baseline	Project
10 - year storm	\$2,420,566	\$0
100 - year storm	\$7,647,881	\$132,860
Total Benefits from BCA Toolkit	\$6,381,203	
Other Benefits (Not Recreation)	\$806,923	
Recreation Benefits	\$0	
Total Costs	\$21,058,142	
Net Benefits	-\$13,870,015	
Final BCR	0.3	

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

Discharges downstream of the proposed pond were analyzed at two different locations. Decreases for all frequency storms analyzed decreased between revised existing and proposed conditions. These results are summarized in **Table 2: Pre- and Post- Project Discharges**

Table 2: Pre- and Post- Project Discharges (cfs)

Downstream of Proposed Pond		
	Revised Existing	Proposed
10 Year	802	172
100 Year	1495	292
Upstream of I-30		
10 Year	1054	470
100 Year	1960	789

Amended 2023 TWDB Region 2 Flood Plan - Project Narrative

Project Name: TexAmericas Detention Pond #2
FME ID: 023000006
Project Sponsor: TexAmericas Center
Date: 07/05/23

The result of this proposed project is 67 structures removed from the 100-year floodplain and an estimated 1.2 miles of city streets removed from 100-year flood risk. The pre-project level of service of this stream is less than 2-year, and the post project level of service of this stream is 25-year.

PROJECT RISKS

ROW/Real Estate Acquisition:

No, as TexAmericas Center already owns the land and will be the project sponsor.

Utilities Coordination:

No, currently there are no evident utility conflicts. During the design phase, utility conflicts should be further evaluated.

Permitting/Environmental:

Permits will be required as wetlands and other Waters of the U.S. will likely be impacted.

Stakeholder coordination:

No, as the sponsor is the primary stakeholder involved.

MITIGATION OF RISKS

Utility Coordination:

If utility conflicts are found, the utility coordinator will need to closely work with the affected utility companies to ensure timely completion of the proposed project.

Permitting/Environmental:

Coordination and permitting process should be started early on to avoid schedule delays.

Stakeholder Coordination:

Public meetings and flyers will help communicate impacts to affected businesses of any service interruption or inconvenience. The businesses near the project limits should be notified several weeks before the construction start date.

NATURE BASED SOLUTION (NBS) CONSIDERATION

Not considered.

INTERRELATED PROJECTS

FME ID 023000005 TexAmericas Detention Pond #1.

Amended 2023 TWDB Region 2 Flood Plan - Project Narrative

Project Name: City of Texarkana Gauges
FMP ID: 023000011
Project Sponsor: The City of Texarkana
Date: 6/28/2023

BACKGROUND INFORMATION:

Based on the Texas Water Development Board (TWDB) Region 2 Flood Plan, Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. The city of Texarkana has multiple streams flowing through it and currently has many areas with high flood risk in lower event storms. This causes multiple road closures and flooded structures. The project, City of Texarkana Gauges, was proposed in order to allow the City to better understand its flooding and potential mitigation strategies. The project is being sponsored by the City of Texarkana.

The Task 12 work that was completed for the City of Texarkana Gauges project was a location map and a cost estimate.

PROPOSED PROJECT SCOPE

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on drainage analysis to determine a feasible solution.

The City of Texarkana Gauges project proposes to add ten flood and rain gauges and two rain gauges throughout the city of Texarkana. The flood gauges would be located near the confluences along the major streams within the city limits. This would alert the city that a major storm event is occurring and help them mitigate flood hazards through better understanding of flooding within the City. The rain gauges would be located in the northern area of the city so that rain data could be evenly captured throughout the city.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on project costs.

The estimated project cost for the City of Texarkana Gauges is \$374,000, this was, calculated using 2022 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, installation, equipment, calibration, computer software, etc. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase depending upon any additional adjustments required.

PROPOSED PROJECT BENEFITS

This project will allow the City to better understand flooding and improve flood hazard mitigation. In the short term, this project will not affect flooding.

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

Amended 2023 TWDB Region 2 Flood Plan - Project Narrative

Project Name: City of Texarkana Gauges
FMP ID: 023000011
Project Sponsor: The City of Texarkana
Date: 6/28/2023

Due to the nature of the project, the flood gauges should have no impact on the existing floodplain. Based on engineering judgment, there is no impact analysis required for this project.

PROJECT RISKS

ROW/Real Estate Acquisition:

No, the proposed gauge location will be located along government owned land.

Utilities Coordination:

Due to the self-contained nature of the gauges, there should be no utility conflicts. During the design phase, utility conflicts should be further evaluated.

Permitting/Environmental:

No permits will be required.

Stakeholder coordination:

The sponsor is the primary stakeholder, so no additional coordination is expected.

MITIGATION OF RISKS

Permitting/Environmental:

If permits do arise during the design, coordination and permitting process should be started early on to avoid schedule delays.

NATURE BASED SOLUTION (NBS) CONSIDERATION

There are no proposed nature-based solutions.

INTERRELATED PROJECTS

There are no interrelated projects.