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# Overview

The purpose of this document is to provide an example of the information Texas Water Development Board (TWDB) staff are looking for when reviewing the Flood Management Evaluation (FME) full applications. This document is **not** intended to be used as a template for providing responses to the associated FME full application sections.

If there are questions about the information provided in this document or questions that arise as you complete your full application, please email FIF@twdb.texas.gov before the full application deadline. Include the phrase “FME Full Application Question” in the subject line.

# Application Sections

Each of the sections below corresponds to a question or text input box located in the Full Application document. The sections are listed in the order that they appear in the application.

## Project/Study Need

* **Provide details on the need for the proposed project**

“This flood study will address the needs of [Entity] through: [...]”

* **Please identify any relevant recent flooding information and the number of properties that are potentially at risk of flooding. This should include any flood risk evaluation and alternatives considered.**

**[if data is unavailable, please respond with “Data not available”. Do not leave blank]**

“[Entity] has experienced the following flood events in recent years: “

* + [Date and location]

 “[Entity] estimates that [###] of properties are potentially at risk of flooding in the study area. [Entity] has considered the following flood risk evaluations and alternatives:”

Project/Study Description

* **a detailed description of the proposed project**

“The proposed project focuses on a study of […]. We plan to accomplish this through performing the following actions: [...]”

* **a full scope of work that aligns with each task**

[Refer to the “Attachment 8: FME Minimum Scope of Work Tasks” section for Scope of Work details]

* **how the costs were derived, including a bulleted list of project elements/components**

“Task 4 was estimated to cost $50,000 based on the assumption of an average of 1,000 staff hours at $50/hr”

## 16. In-Kind Services

* **such services are directly in support of the planning effort, are fully explained and documented in the complete application, and approved as part of the TWDB commitment**

“[Entity] is planning to utilize in-kind efforts to supplement the project costs for the project in the following ways:”

* + Task 1: [in-kind effort explanation]. We anticipate this will cover $[###] of the project cost
	+ Task 2: [in-kind effort explanation]. We anticipate this will cover $[###] of the project cost
	+ Task 3: [in-kind effort explanation]. We anticipate this will cover $[###] of the project cost

## 22. Description of Project Area

**a. Identification of HUC-8 numbers and names to be studied for this project, including identification of partial or full HUC-8 study area.**

Table 1: FME Study Area

|  |  |  |
| --- | --- | --- |
| HUC-8 | Watershed Name | Full/Partial |
| 12090109 | San Saba | Full |
| 12090204 | Llano | Partial  |

**b. Identification of hydrologic project area watershed(s), including HUC-8s, to be studied for this project. Total square miles to be studied must be included.**

Table 2: Hydrologic Study Area

|  |  |  |
| --- | --- | --- |
| HUC-8 | Watershed Name | Study Area (sq.mi) |
| 12090109 | San Saba | 100 |
| 12090204 | Llano | 50  |
|   |   |   |
| Total: |   | 150 |

**c. Identification of hydraulic project area, including HUC-8s and stream centerlines. Total stream miles to be studied must be included.**

Table 3: Hydraulic Study Area

|  |  |  |  |
| --- | --- | --- | --- |
| HUC-8 | Watershed Name | Stream Name | Stream Miles |
| 12090109 | San Saba | San Saba River | 35 |
| 12090204 | Llano | Llano River | 25 |
|   |   |   |   |
| Total: |   |   | 60 |

**d. A map of identified watershed(s) showing major hydrologic features, including applicable HUC-8 numbers, Regional Flood Planning Groups, and political subdivision boundaries as applicable. The map must be GIS generated, and all shapefiles and associated files must be submitted with the application.**

 

**e. Identification of historical flooding and flood damages.**

**[if data is unavailable, please respond with “Data not available”. Do not leave blank]**

Table 4: Historical Flooding

|  |  |  |
| --- | --- | --- |
| Year | Event | Damages |
| 2005 | Hurricane Katrina | $95 million in declared damages, 200 properties destroyed, loss of life |
| 2017 | Hurricane Harvey | $180 million in declared damages, 3,000 properties destroyed, loss of life |

**f. Identification of existing or potential flood hazards this project intends to address, including how the proposed planning will address** those hazards.

**[if data is unavailable, please respond with “Data not available”. Do not leave blank]**

“There are a number of known and potential flood hazards within the study area, including […]

This FME study will address these hazards by […]”

**g. Identification of which eligible entities do or do not participate in the National Flood Insurance Program.**

|  |  |
| --- | --- |
| Entity | NFIP Participant? |
| City of Austin | Yes |
| Henderson County | No |

## 23. Description of areas identified for flood risk evaluation

* **a description of areas identified for flood risk evaluation**

“The FME study will focus on evaluating the flood risk in [...] areas. Below is a description of the known flood risks to those areas: […]“

## 24. Description of method for benefits and costs to solutions

* **proposed method for estimating the benefits and costs of potential solutions to identified flooding problems**

**[if data is unavailable, please respond with “Data not available”. Do not leave blank]**

“Potential solutions to address identified flooding problems will have their benefits and costs estimated through the use of [...]. This will result in a prioritization of solutions for future funding considerations”

## 25. Scope of Work, Budget, and Schedule

**a. Project organization**



**b. A description of how flood protection needs of the entire watershed will be considered,**

“The following tasks will address the needs of [...] watershed: “

**c. Identification of tasks, +**

**· Must align with each task listed in the Task Budget**

Task Budget: Task 1 = Project Management

Scope of Work Task 1 = Project Management

\*\*\*First 11 Tasks must align with the tasks outlined in Attachment 8: FME Minimum Scope of Work Tasks

**· At a minimum, the Scope of Work must include the Tasks listed in Attachment**  **8**

*This needs to be written as a standard scope of work document detailing what tasks will be performed and include details on how each task will be accomplished. A list of task deliverables will also be required. Attachment 8 is only to be used as a checklist to ensure that the submitted Scope of Work includes, at a minimum, all of the items listed. Resubmission of Attachment 8 will not qualify as an acceptable Scope of Work.*

**d. A task budget, \***

|  |  |  |
| --- | --- | --- |
| **TASK** | **DESCRIPTION** | **AMOUNT** |
| 1 | Project Management and Meetings | $10,000 |
| 2 | Data Collection and Review | $2,000 |
| 3 | Survey/Field Work | $7,000 |
| 4 | Coordination with applicable Regional Flood Planning Groups and overlapping projects | $4,000 |
| 5 | Hydrologic Analysis | $45,000 |
| .... | ENTER TASK DESCRIPTION | ENTER TASK AMOUNT |
| TOTAL |  | $200,000 |

**· Must show how the costs were derived, including a bulleted list of project elements/components.**

“Task 1 was estimated to cost $10,000 based on the assumption of an average of 200 staff hours at $50/hr”

* Task 1 – Project Management = $10,000
	+ 1.1 – Monthly meetings and progress updates = $3,000
	+ 1.2 – Public meetings = $2,000
	+ 1.3 – Milestone reporting = $5,000

**· List costs per square mile and/or cost per stream mile, as applicable.**

Table 6: Hydrologic Study Area Cost

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HUC-8 | Watershed Name | Study Area (sq.mi) | Estimated Cost | Cost per sq.mi |
| 12090109 | San Saba | 100 | $25,000 | $250 |
| 12090204 | Llano | 50  | $20,000 | $400 |
|   |   |   |  |  |
| Total: |   | 150 | $45,000 |  |

Table 7: Hydraulic Study Area

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| HUC-8 | Watershed Name | Stream Name | Stream Miles | Estimated Cost | Cost per stream mile |
| 12090109 | San Saba | San Saba River | 35 | $20,000 | $571.42 |
| 12090204 | Llano | Llano River | 25 | $15,000 | $600 |
|   |   |   |   |  |  |
| Total: |   |   | 60 | $35,000 |  |

**e. A time schedule for completing tasks,**

|  |  |
| --- | --- |
| Task | Schedule (months) |
| Project Management | 0-30 |
| Data collection | 0-4 |
| Modeling | 4-24 |
| Alternative Analysis | 22-26 |
| Reporting | 26-30 |

**f. An expense budget by category, \***

|  |  |
| --- | --- |
| **CATEGORY** | **AMOUNT** |
| Salaries & Wages1 | ENTER EXPENSE AMOUNT |
| Fringe2 | ENTER EXPENSE AMOUNT |
| Travel3 | ENTER EXPENSE AMOUNT |
| Subcontract Services | ENTER EXPENSE AMOUNT |
| Other Expenses4 | ENTER EXPENSE AMOUNT |
| Overhead5 | ENTER EXPENSE AMOUNT |
| Profit | ENTER EXPENSE AMOUNT |
| TOTAL | ENTER TOTAL EXPENSE AMOUNT |

**g. Potential benefits of the project.**

“Through the results of this study, we expect to gain the following benefits: [...]”

## Attachment 8: FME Minimum Scope of Work Tasks

Below is an example of a Scope of Work template that incorporates all of the items listed in Attachment 8: FME Minimum Scope of Work Tasks. All highlighted sections will need to be filled in with information specific to the FME study being performed. Additional information and deliverable items may be added as necessary.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**[Project Name]**

**Scope of Work**

**Project Description**

[insert project description]

**Task 1 – Project Management**

[insert summary of project management tasks]

**Task 1.1 TWDB Project Management**

[Entity] will provide an Outlay request to reimbursement per TWDB requirements.

[Entity] will submit Monthly detailed progress reports per TWDB requirements. These reports will include a high-level schedule and budget tracking overview, and meeting minutes. These reports will be submitted within two weeks of each month’s end.

**Task 1.2 Project Meetings**

[Entity] will conduct Monthly Progress meetings with at least one member of [Entity]’s staff and TWDB staff [and subcontractors]. An agenda will be provided at least one day prior to each monthly meeting.

[Entity] will attend a project kick-off meeting and a project closeout meeting with TWDB staff.

**[For Projects under $750,000]** [Entity] will conduct, at a minimum, two public meetings to present the study to the public. The public meetings are subject to the Texas Open Public Meetings Act (in accordance with Section II, Article X, Paragraph 2H). Details are provided in Task 9.

**[For Projects $750,000 or higher]** [Entity] will conduct, at a minimum, three public meetings to present the study to the public. The public meetings are subject to the Texas Open Public Meetings Act (in accordance with Section II, Article X, Paragraph 2H). Details are provided in Task 9.

**Task 1.3 Milestone Reporting**

**[For Entities that do not have engineering staff available to review project progress]** [Entity] will submit requested deliverables to TWDB at each of the following progress milestones: 10%, 30%, 50%, 75%, 90%.

*Task 1 Deliverables*:

1. Task 1.1: Outlay Requests and Monthly Detailed Progress Reports
2. Task 1.2: Monthly Progress meeting agendas and Public Meeting notices
3. Task 1.3: Deliverables at progress milestones per TWDB request

**Task 2 – Data Collection and Review**

[insert summary of data collection tasks]

**Task 2.1 - Previous Studies**

[Entity] will collect data from previous studies performed within the project area. Collection outreach efforts will include communication with [insert all entities that may have a study within the project area]

**Task 2.2 - Best Available Data**

[Entity] will collect best available data from public sources for use in modeling efforts.

Data collected will be utilized for calibration and modeling efforts. All information from this task will be referenced, cited, and included in the Report deliverable package.

*Task 2 Deliverables*:

1. Data Collection correspondence, reports and studies, memo summarizing data collected

**Task 3 – Survey/Field Work**

[insert summary of survey/field work tasks]

[Entity] will perform survey/field work in the following areas: [...] [include a map]

[Entity] will collect the following data from the survey sites: [...]

*Task 3 Deliverables:*

1. Survey reports and files

**Task 4 – Coordination with applicable Regional Flood Planning Groups and overlapping projects**

[insert summary of coordination tasks]

**Task 4.1 - Project Coordination**

[Entity] will engage in communication with TWDB, GLO, [insert applicable RFPGs], FEMA, and other organizations who may be conducting similar studies within the project area.

Should there be any duplicate study efforts identified, [Entity] will immediately contact TWDB to resolve the issue.

**Task 4.2 - Data Collaboration**

[Entity] will coordinate and provide data to any FIF projects within the study area. Data requests from organizations outside of TWDB will be coordinated with TWDB staff.

[Entity] will coordinate with [insert applicable RFPGs] to provide updates and data related to this FME Study.

*Task 4 Deliverables:*

1. Outreach effort documentation

**Task 5: Hydrologic Analysis**

[insert summary of Hydrologic Analysis tasks]

**Task 5.1 Model Analysis**

[Entity] will perform a hydrologic analysis of the following watersheds utilizing HEC-HMS version 4.8 or newer:

|  |  |  |
| --- | --- | --- |
| HUC-8 | Watershed Name | Study Area (sq.mi) |
| 12090109 | San Saba | 100 |
| 12090204 | Llano | 50  |
|   |   |   |
| Total: |   | 150 |

Hydrologic analysis will utilize data collected from Task 2 and NOAA Atlas 14 or newer rainfall data.

The following rainfall events will be analyzed: 10%, 1%, 0.2%, [additional storm events if needed] annual chance flood events.

**Task 5.2 Calibration**

[Entity] will calibrate the models produced in Task 5.1 using historical data gathered in Task 2. Identified storms to be used for calibration include [....]

*Task 5 Deliverables:*

1. HEC-HMS models, Calibration data, detailed section describing hydrologic analysis results in Report deliverable

**Task 6: Hydraulic Analysis**

[insert summary of Hydraulic Analysis tasks]

**Task 6.1 - Model Analysis**

[Entity] will perform a hydraulic analysis of the following watersheds utilizing HEC-RAS version 6.1 or newer:

|  |  |  |  |
| --- | --- | --- | --- |
| HUC-8 | Watershed Name | Stream Name | Stream Miles |
| 12090109 | San Saba | San Saba River | 35 |
| 12090204 | Llano | Llano River | 25 |
|   |   |   |   |
| Total: |   |   | 60 |

Hydraulic analysis will utilize data collected from Task 2.

The following storm events will be analyzed: 10%, 1%, 0.2%, [additional storm events if needed] annual chance flood events.

**Task 6.2 Calibration**

[Entity] will calibrate the models produced in Task 6.1 using historical data gathered in Task 2. Identified storms to be used for calibration include [....]

*Task 6 Deliverables:*

1. HEC-RAS models, Calibration data, detailed section describing hydrologic analysis results in Report deliverable

**Task 7: Identification of Flood Problem Areas**

[insert summary of identification tasks]

[Entity] will generate GIS maps detailing the 1% and 0.2% annual chance flood events. The generated maps will identify areas of high flood risk to life and properties.

The following criteria will be used to identify flood problem areas: [...]

*Task 7 Deliverables:*

1. GIS files and PDF map of the 1% and 0.2% annual chance flood events.
2. Flood Problem Areas description memo identifying problem, location and why or why not additional analysis implemented.

**Task 8: Alternatives Analysis**

[insert summary of alternative analysis tasks]

**Task 8.1 - Alternative Solution Identification**

[Entity] will generate a list/table of alternative solutions to address flooding in the problem areas identified in Task 7. The solution list/table will include all solutions analyzed, including those that were deemed impractical.

[Entity] will describe the results of implementing each of the alternative solutions. The results will include maps detailing structures affected, roadway miles impacted, and existing and proposed inundation extents. Any local- and watershed-wide impacts will be highlighted on these maps.

**Task 8.2 - Alternative Solution Details**

For each of the alternatives solutions, [Entity] will produce:

* One-page fact sheet describing the solution and all assumptions and constraints
* GIS map describing all aspects of the alternative solution
* Benefit-Costs explanation
* Identification of water supply benefit, if any
* An Exhibit C Spreadsheet entry consistent with the latest “Technical Guidelines for Regional Flood Planning,” Exhibit C to Regional Flood Planning Grant Contracts
* An Exhibit D Geodatabase entry consistent with the latest “Data Submittal Guidelines for Regional Flood Planning,” Exhibit D to Regional Flood Planning Grant Contracts

**Task 8.3 - Regional Flood Planning Data Evaluation**

Each feasible flood mitigation alternative evaluated must identify and compare cost and benefits of projects. Quantification of cost will include engineering, permitting, easement and/or property acquisition, capital cost, operation and maintenance, and other costs as applicable. Quantification of benefit of the project will include the following items:

 ☐ Number of structures with reduced 100-year (1% annual chance) flood risk.

 ☐ Number of structures removed from 100-year (1% annual chance) flood risk.

 ☐ Number of structures removed from 500-year (0.2% annual chance) flood risk.

 ☐ Residential structures removed from 100-year (1% annual chance) flood risk.

 ☐ Estimated population removed from 100-year (1% annual chance) flood risk.

 ☐ Critical facilities removed from 100-year (1% annual chance) flood risk (#).

 ☐ Emergency facilities removed 1% annual flood risk (#)

 ☐ Number of low water crossings removed from 100-year (1% annual chance) flood risk (#).

 ☐ Estimated length of roads removed from 1% annual flood risk (miles)

 ☐ Estimated reduction in road closure occurrences.

 ☐ Estimated length of roads removed from 100-year flood risk (miles).

 ☐ Estimated farm and ranch land removed from 100-year flood risk (acres).

* + - Estimated farm and ranch land at 100-year flood risk (acres) should only include farm and ranch land that are negatively impacted by flooding events and should not include land that benefits from floodplains (e.g., rice fields).

 ☐ Estimated reduction in fatalities (if available).

 ☐ Estimated reduction in injuries (if available).

 ☐ Pre-project level-of-service

 ☐ Post-project level-of-service

 ☐ Cost/structure removed

 ☐ Percent nature-based solution (by cost)

 ☐ Negative impact (Y/N)

 ☐ Negative impact mitigation (Y/N)

 ☐ Texas F-SVI

 ☐ Water supply benefit (Y/N)

 ☐ Benefit-cost ratio

The recommended flood risk reduction solutions must have no negative effect on neighboring areas in accordance with statutory requirements for regional flood plans ([Texas Water Code § 16.062(i) and (j)(2)](https://statutes.capitol.texas.gov/Docs/WA/htm/WA.16.htm)). Recommended flood risk reduction solutions, including flood mitigation projects, must meet the definition and requirements regarding no negative effect identified in [Exhibit C to the Regional Flood Planning Contracts, Technical Guidelines for Regional Flood Planning](https://www.twdb.texas.gov/flood/planning/planningdocu/2028/index.asp).

The flood mitigation projects identified from this FME study must comply with ‘no negative effect’ in order to be included in the regional flood plans. [Entity] will perform a Benefit-Cost Analysis for all feasible Flood Mitigation Project (FMP) alternatives.

*Task 8 Deliverables:*

1. List/Table of Alternative Solutions
2. Maps of Alternatives Solutions Results
3. One-page Fact Sheet for each alternative analyzed
4. Exhibit C Spreadsheet for each RFPG within the study area
5. Exhibit D Geodatabase for each RFPG within the study area
6. No Negative Impact Table for each RFPG within the study area
7. Benefit-Cost Analysis Calculations

**Task 9: Community Outreach**

[insert summary of Community Outreach tasks]

[Entity] will conduct [2 or 3] public meetings to engage with the community during the study.

* 1. Public Meeting 1: Will occur toward the beginning of the project during data collection phase, to inform people of the project, how the study outcome will benefit the community, and gather any additional project related information that people have to share including location of flood risk. Hard copy maps will be provided for communities to engage and comment on.
	2. Public Meeting 2: Will occur toward the end of the project to present the Draft Report and key findings of the study, how the study outcome will benefit the community, communicate any identified flood risks in the study area, and receive feedback.
	3. **[Required for FMEs with total cost of $750,000 or more. For FMEs with total cost less than $750,000, this information needs to be added to Public Meeting 2.]** Public Meeting 3: Will occur prior to completing the Final Report and present project updates on alternative solution identification and receive feedback.

*Task 9 Deliverables:*

1. Public Meeting Notices
2. Public Meeting Sign-In Sheets
3. Presentation Materials
4. Community Feedback

**Task 10: QC/Model Validation**

[insert summary of QC tasks]

[Entity] will perform Quality Assurance/Quality Control efforts to validate the results of the study’s modeling efforts. This task will include calibrating applicable models with data collected from Task 2. All QA/QC efforts will be documented.

*Task 10 Deliverables:*

1. Hydrologic QA/QC Reports
2. Hydraulic QA/QC Reports

**Task 11: Reporting**

[Entity] will summarize all study efforts and tasks into a Draft Report and a Final Report for TWDB review. The Draft Report and Final Report will be submitted via physical hard drive. [Entity] will review comments provided by TWDB and update the Draft Report accordingly.

**Task 11.1 - Draft Report**

[Entity] will prepare the Draft Report using the most recent version of the TWDB report template as posted on the agency website. The Draft Report will meet all review checklist requirements, including Accessibility requirements, as posted on the agency website.

**Task 11.2 - Final Report**

[Entity] will submit the Final Report via mail after gaining approval from TWDB that the Draft Report has been sufficiently updated to satisfy all review requirements.

*Task 11 Deliverables:*

1. Draft Report
2. Final Report

**Task 12: [Add as necessary]**

[Add any additional tasks that are being performed in this study that do not fall into the 11 tasks listed above]

*Task 12 Deliverables:*

1. [List all deliverables for each task]