



City of League City, TX

300 West Walker
League City TX 77673

Text File

File Number: 11-0202

13A.

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Matter Type: Agenda Item

Title

Consider and take action on an ordinance amending Ordinance No. 2003-53 approving the Third Amendment to the Utility Agreement by and between Galveston County Municipal Utility District No. 45, League City Investors, Ltd. and the City of League City, Texas (Assistant City Manager, Public Works)

Staff recommends approval.

Background:

In an effort to resolve pending litigation by and between Ernest Randall, Hidden Lakes Investments, Sam Boyd, Galveston County MUD No. 45 and others involving that certain lake known as the "Gun Range Lake," the parties recently entered into a Settlement Agreement whereby, among other things, the MUD will modify its outfall structure east of the lake in order to restore lake levels to 12 feet and Hidden Lakes will convey its interest in the lake to Mr. Randall. Although the City is not a party to the lawsuit, there are certain components in the Settlement Agreement that are contingent on the City's approval of the MUD's Master Drainage Plan and control of developed flows from adjacent properties into the lake. The MUD has requested that these additional conditions be incorporated into an amendment to the existing Utility Agreement for MUD No. 45.

FUNDING

☒ NOT APPLICABLE

☐ Funds are available from Account # _____

☐ Requires Budget Amendment to transfer from Account # _____ to Account # _____

Ordinance No. 2011-22



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Linda F. Sotirake
Legal Assistant

August 26, 2011

Ms. Dale Pearson
City of League City
Public Works Adm.
300 W. Walker Street
League City, TX 77573

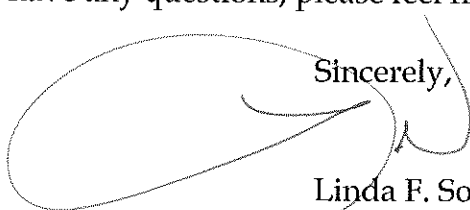
Re: Galveston County Municipal Utility District No. 45 (the "District")

Dear Ms. Pearson:

Enclosed please find three (3) originals of the executed Third Amendment to Utility Agreement. Following execution, please forward one (1) original Amendment to me for the District's files.

Should you have any questions, please feel free to call me at (713) 860-6424.

Sincerely,

A handwritten signature in black ink, appearing to read 'Linda F. Sotirake', with a large, loopy initial 'L'.

Linda F. Sotirake
Legal Assistant

Enclosures

**Ordinance No. 2011-22
Exhibit "A"**

**THIRD AMENDMENT TO
UTILITY AGREEMENT
BY AND BETWEEN
GALVESTON COUNTY MUNICIPAL UTILITY DISTRICT NO. 45,
AND
THE CITY OF LEAGUE CITY, TEXAS**

STATE OF TEXAS §
 §
COUNTY OF GALVESTON §

THIS THIRD AMENDMENT ("Amendment") to the Utility Agreement By and Between Galveston County Municipal Utility District No. 45, League City Investors, Ltd., and the City of League City, Texas (the "Agreement") made and entered into as of the 10th day of May, 2011 by and between GALVESTON COUNTY MUNICIPAL UTILITY DISTRICT NO. 45, a body politic and corporate and governmental agency created and operating under the provisions of Chapters 49 and 54, Texas Water Code, and pursuant to Article XVI, Section 59, Texas Constitution (the "District"), and the CITY OF LEAGUE CITY, TEXAS, a municipal corporation (the "City").

WITNESSETH

WHEREAS, the District and the City have previously entered into the Agreement, as amended; and

WHEREAS, the District has accepted the terms and conditions of the Agreement in accordance with Section 1.03(a) of the Agreement; and

WHEREAS, the City and the District are willing to amend the Agreement to establish certain Drainage requirements for the District and all landowners whose land might drain into the District's drainage system.

WHEREAS, the District, a third-party defendant in a lawsuit entitled *Ernest Randall v. BG Group, LLC, et al.*, Cause No. 2008-08CV0354 in the 122nd Judicial District Court of Galveston County (the "Suit");

WHEREAS, the Suit seeks, among other things, to require modifications to the District's drainage facilities;

WHEREAS, the parties to the Suit have reached a settlement agreement conditioned upon the District's modification of its Drainage facilities and upon the District having certain agreements with the City and the landowners of property that drain or potentially could drain into the District's drainage system;

WHEREAS, these agreements regarding future drainage are critical to the District's development of a Master Drainage Plan to provide for the orderly development within the District, planning of future improvements and to protect the lives and property of residents of the City and the District;

A G R E E M E N T

For and in consideration of the mutual promises, obligations, covenants, and benefits set forth, the District and the City contract and agree as follows:

Section 1. The City hereby approves the District's Master Drainage Plan as attached hereto as **Exhibit A**, including the identification of the future drainage and detention improvements necessary for the full build-out of the land in the District contained therein. The District's Master Drainage Plan shall be deemed to include that certain "Sequence of Construction" dated April 11, 2011 as an addendum thereto, which shall serve to define the sequence of drainage improvements to be implemented by the District by reference to phase completion.

Section 2. The City Council hereby orders and directs the City's Engineer and all other officers and employees of the City to take all action necessary to evidence approval of the plans and specifications for South Shore Boulevard, Phase 3; Improvements to Existing Lake at Hidden Lakes, and sections 3, 4 and 5 of Hidden Lakes in the District.

Section 3. The City will not impose on the District any drainage or detention requirements not contained in the Master Drainage Plan unless there is a major change to the land plan assumptions in the Master Drainage Plan. "Major Change" would be limited to change in land use (not density) of more than 10% of the total acreage in the District.

Section 4. The City will not permit any developed flows from any adjacent land owner into the Shared Lake, which Shared Lake is shown on **Exhibit B**, except the developed flows currently resulting from the present condition of the 88-acre Randall tract shown in the Master Drainage Plan. All future developed flows from any properties into the Shared Lake will be detained "off-lake" and discharged into the lake at undeveloped rates. The City will require all appropriate storm water quality

management facilities be installed at a point in the system upstream of the discharge point into the Shared Lake.

Section 5. As part of any site development plan for any property that could potentially discharge into the Shared Lake, the City will provide the District's engineer 60 days notice to review and comment upon both the Drainage Master Plan and the site development plans. Such review will be limited to the confirmation of i) the extent of the drainage area, ii) the adequacy of the off-lake detention ponds to detain 100% of the developed flows, and iii) the storm water management and storm water quality facilities are appropriate and consistent with the City's standards and practice for similar facilities. If the District's Engineer believes these requirements are not being met, the plans will be submitted to a third party engineer mutually agreed upon by the landowners' engineer and the District's engineer, from the following list: Pate Engineers, Jacobs, LJA Engineering and Surveying, or RG Miller, Inc.

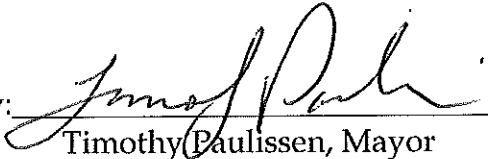
Section 6. The City will take all appropriate measures to ensure that no hazardous substance is discharged into the Shared Lake.

Section 7. Except as provided in this Amendment, the Agreement remains in full force and effect and the terms and conditions of the Agreement have not be modified or amended.

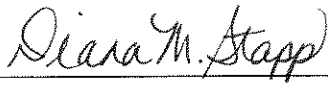
Section 8. By execution hereof, League City Investors, Ltd. acknowledges this amendment to the Utility Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Amendment in multiple copies, each of which shall be deemed to be an original, this the 2nd day of September 2011.

THE CITY OF LEAGUE CITY, TEXAS

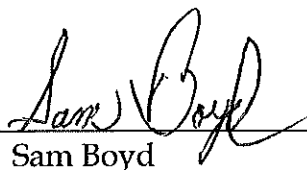
By: 
Timothy Paulissen, Mayor

ATTEST:

By: 
Diana Stapp, City Secretary

IN WITNESS WHEREOF, the parties hereto have executed this Amendment in multiple copies, each of which shall be deemed to be an original, this the 18th day of August 2011.

LEAGUE CITY INVESTORS, LTD.

By: 
Sam Boyd
President

IN WITNESS WHEREOF, the parties hereto have executed this Amendment in multiple copies, each of which shall be deemed to be an original, this the 18th day of August 2011.

GALVESTON COUNTY MUNICIPAL
UTILITY DISTRICT NO. 45

By: Jedd Olkowski
Name: JEDD OLKOWSKI
Title: PRESIDENT

ATTEST:

By: Joe T. Choate
Name: JOE T. CHOATE
Title: Secretary

Exhibit A
Hidden Lakes Subdivision Master Drainage Plan

EXHIBIT A

DISTRICT'S MASTER DRAINAGE PLAN

Hidden Lakes Master Drainage Plan

Sequence of Construction

April 11, 2011

Approved
[Signature]
4-12-11

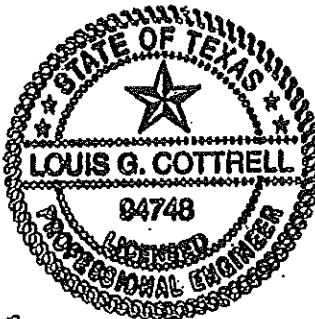
Phase	Project Description
1.1	Randall Lake Overflow Wall - Features 6 foot wide weir at FL=12.00'
1.2	Detention Pond Interconnect Channel (MT-P2P3 to MT-P4) - 20 foot BW, 6:1 SS, FL=8.00'
1.3	Hidden Lakes, Sections 3, 4, and 5, Phases 1 and 2
2.1	MT-P6_2, a portion of MT-P6_1, and outfall to MT-P5
2.2	Hidden Lakes, Sections 6 and 7 (SF-9 and SF-10) east of SSB
3.1	MT-P6_1 - Construct the remainder.
3.2	Gum Bayou Diversion Structure - weir, 60 foot BW, 6:1 SS, FL=10.20'
3.3	Gum Bayou Improvements # 1 - Move Drop Structure upstream to Bay Ridge Box Culvert - add one 42" RCP to existing 8' x 7' RCB - from School Road crossing to diversion excavate 20 foot BW, 5:1 SS on west bank at 0.05% - School Road to Bay Ridge Culvert excavate 12 foot BW, 5:1 SS on east bank at 0.05%
3.4	Gum Bayou Improvements #2 - from d/s of Riley Wood Bridge #1 to d/s of Riley Wood Bridge #2 excavate 12 foot BW, 3:1 SS, at 0.10% in bottom one foot of existing channel
3.5	Hidden Lakes, Sections 8 and 9 (SF-7 and SF-8) east of SSB
4.1	East Fork Detention Pond #1 - Provide 111 ac-ft storage volume - diversion structure with 70 foot BW, 6:1 SS, FL=8.20' - 24" RCP Outfall pipe
4.2	East Fork Detention Pond #2 - Provide 37 ac-ft storage volume - diversion structure with 60 foot BW, 6:1 SS, FL=8.90' - 24" RCP Outfall pipe
4.3	Hidden Lakes Detention System Outlet - Add Weir with 5 foot BW, 6:1 SS, FL=9.00'
4.4	Hidden Lakes, Sections 10 and 11 (SF-5 and SF-6) east of SSB and Commercial Tracts along FM 646

HIDDEN LAKES SUBDIVISION MASTER DRAINAGE PLAN

CITY OF DICKINSON, TEXAS
CITY OF LEAGUE CITY, TEXAS
CITY OF TEXAS CITY, TEXAS

Prepared for:

Galveston County Municipal Utility District No. 45



Louis G. Cottrell
8-27-10

Prepared by:

DANNENBAUM
ENGINEERING CORPORATION
T.B.P.E. FIRM REGISTRATION #302
3100 WEST ALABAMA HOUSTON, TX 77099 (713) 520-9570

*Approved
with control wear
lowest elev. 12.00
and constructed
per AECFD criteria.*

John M. [Signature]
2-18-2011

August 2010

Contents

Section 1 Introduction	1
1.1 Background	1
1.2 Scope of Work	1
1.3 Data Collection	1
Section 2 Methodology	3
2.1 Hydrologic Methodology	3
2.2 Hydraulic Methodology	3
Section 3 Existing Conditions	4
3.1 Description	4
3.2 Existing Conditions Flow Calculations	4
3.3 Existing Conditions Water Surface Elevations Calculations	4
3.4 Existing Conditions in Dickinson Bayou	5
Section 4 Proposed Conditions	6
4.1 Background	6
4.2 Proposed Conditions Flow Calculations	6
4.3 Proposed Conditions Water Surface Elevations Calculations	7
4.4 Comparison with Existing Conditions	7
Section 5 Mitigated Conditions	8
5.1 Background	8
5.2 Proposed Mitigation Plan	8
5.2.1 Gum Bayou Diversion	8
5.2.2 East Fork Detention	8
5.2.3 Channel Rectification/Improvements	9
5.2.4 Bay Ridge Culvert Addition	9
5.2.5 Raising of Shared Lake Static Water Surface Elevation	10
5.3 Mitigated Conditions Flow and Water Surface Elevation Calculations	10
5.4 Comparison with Existing Conditions	10
5.4.1 Elevation 10 Scenario	10
5.4.2 Elevation 12 Scenario	10
Section 6 Conclusions	12
6.1 General Summary	12
6.2 Proposed Mitigation Plan	12

Tables

Table 1.1	Gum Bayou Peak Flow Comparison – Existing vs. Proposed
Table 1.2	Gum Bayou Main Channel Water Surface Elevation Comparison – Existing vs. Proposed
Table 1.3	Gum Bayou East Fork Water Surface Elevation Comparison – Existing vs. Proposed
Table 2.1	Gum Bayou Peak Flow Comparison – Existing vs. Mitigated, Elevation 10 Scenario
Table 2.2	Gum Bayou Main Channel Water Surface Elevation Comparison – Existing vs. Mitigated, Elevation 10 Scenario
Table 2.3	Gum Bayou East Fork Water Surface Elevation Comparison – Existing vs. Mitigated, Elevation 10 Scenario
Table 3.1	Gum Bayou Peak Flow Comparison – Existing vs. Mitigated, Elevation 12 Scenario
Table 3.2	Gum Bayou Main Channel Water Surface Elevation Comparison – Existing vs. Mitigated, Elevation 12 Scenario
Table 3.3	Gum Bayou East Fork Water Surface Elevation Comparison – Existing vs. Mitigated, Elevation 12 Scenario

Exhibits

Exhibit 1	Vicinity Map
Exhibit 2	Existing Conditions Drainage Areas
Exhibit 3	Proposed Conditions Drainage Areas
Exhibit 4	Gum Bayou & East Fork Cross Sections
Exhibit 5	2-foot Contour Map
Exhibit 6	Proposed Land Plan
Exhibit 7	Drainage Mitigation Details, Elevation 10 Scenario
Exhibit 8	Drainage Mitigation Details, Elevation 12 Scenario

Appendices

Appendix A	Existing Conditions TC & R Calculations Existing Conditions HEC-HMS Models
Appendix B	Existing Conditions HEC-RAS Models Proposed Conditions TC & R Calculations Proposed Conditions HEC-HMS Models Proposed Conditions HEC-RAS Models
Appendix C	Mitigated Conditions HEC-HMS Models, Elevation 10 Scenario Mitigated Conditions HEC-RAS Models, Elevation 10 Scenario Channel Improvement Profiles & Cross Sections, Elevation 10 Scenario
Appendix D	Mitigated Conditions HEC-HMS Models, Elevation 12 Scenario Mitigated Conditions HEC-RAS Models, Elevation 12 Scenario Channel Improvement Profiles & Cross Sections, Elevation 12 Scenario

Section 1

Introduction

1.1 Background

Hidden Lakes is a 480 acre multi-use development in north central Galveston County, which lies within the city limits of League City and the boundaries of Galveston County Municipal Utility District No. 45. It is located on the south side of League City Parkway (State Highway 96) extending south to F.M. 646, and bisected by South Shore Boulevard. The study area includes two non-contiguous commercial tracts located south of F.M. 646. The properties drain to Gum Bayou, which bounds the eastern portion of the property. It is adjacent to and south of the Bay Ridge subdivision. Exhibit 1 is a vicinity map.

Gum Bayou is a tributary to lower Dickinson Bayou. The Gum Bayou watershed covers approximately 7,760 acres (12.12 sq mi) and includes portions of the cities of League City, Texas City, and Dickinson. Within the upper reaches of the Gum Bayou Watershed, several large tracts of land have been developed or are under consideration for development, such as Hidden Lakes. Gum Bayou serves as the drainage outfall for these developments.

1.2 Scope of Work

The scope of DEC's work on this project is as follows:

- Establish target peak flows and water surface elevations on Gum Bayou and its East Fork tributary based on existing conditions and current criteria
- Quantify impacts on flows and water surface elevations as a result of the proposed Hidden Lakes development
- Design a mitigation plan to offset the impacts of Hidden Lakes

1.3 Data Collection

Numerous studies have been done on the Gum Bayou and Dickinson Bayou watersheds. These include the following:

- *Dickinson Bayou Watershed Regional Drainage Plan Phase 1 – Hydraulic Baseline Report*, Walsh Engineering/Dodson & Associates, August 1992
- *Gum Bayou Watershed Update*, Dannenbaum Engineering Corporation (DEC), February 2004
- *Gum Bayou Watershed Update and Proposed Channel Improvements*, DEC, rev. May 2004
- *Gum Bayou Watershed Update and Proposed Channel Improvements*, DEC, rev. November 2004
- *Moody Tract Master Drainage Plan*, 4Site Engineering, January 2005
- *Gum Bayou Watershed Update and Proposed Channel Improvements*, DEC, rev. August 2006
- *Dickinson Bayou Watershed Floodplain Delineation*, JKC & Associates, December 2008

Some of the data from these previous studies were included here.

In 2006, aerial survey of Galveston County was taken to create new LiDAR data, which became available from the Texas Natural Resources Information System (TNRIS) in 2010. Topographic data from this was used as part of the modeling effort of this study.

Section 2 Methodology

2.1 Hydrologic Methodology

Of the reports mentioned in section 1.3, all those from 2006 and before used the U.S. Army Corps of Engineers' (USACE) HEC-1 program to calculate flows. Beginning with Dodson's Dickinson Bayou report, the rainfall data used was the distribution dictated in the manual *Hydrology for Harris County* (USACE, 1988), with the 24-hour total rainfall amount being augmented by two percent as per League City standards. For a 100-year event, the total 24-hour rainfall used in these models was 13.18 inches.

On June 18, 2007, the hydrologic data and models used for the Tropical Storm Allison Recovery Project (TSARP) in Harris County became effective. It was requested by the City of League City that, in conjunction with ongoing work on the City's master drainage plan, that the TSARP data be used for this study. In addition, flow calculations were done using HEC-HMS version 3.4, the newest version of the USACE's program that has superseded HEC-1. 100-year, 24-hour rainfall under TSARP criteria is 13.77 inches.

2.2 Hydraulic Methodology

The Dodson Dickinson Bayou study used the USACE's HEC-2 program to calculate water surface elevations on the main channel and each tributary, including Gum Bayou. In the subsequent reports beginning in 2004, new hydraulic models for Gum Bayou were created using information from 2001 League City LiDAR data and channel section ground survey data, which were input into GIS, and from which was created geometric data for use in HEC-RAS, which has superseded HEC-2. Flows from HEC-1 were input into HEC-RAS, from which the water surface elevations were calculated. This was done in a steady flow analysis.

For this study, in addition to use of the new 2006 LiDAR data, it was decided that peak flows and water surface elevations would be calculated using the unsteady flow analysis capabilities of HEC-RAS. The reason behind this is that using an unsteady flow analysis would both allow for more efficient calculation of all conditions, and make re-calculation of various options less time-consuming.

Version 3.1.3 of HEC-RAS was used in this study.

Section 3 Existing Conditions

3.1 Description

As mentioned in section 1.1, Hidden Lakes is a proposed development to be located within the Gum Bayou watershed. Exhibit 2 is the existing conditions drainage area map as used for this study. There are two primary tributaries of the main channel: areas 38D1, 38D2, and 38E represent the East Fork tributary of Gum Bayou, while area 39 represents the West Fork tributary. The East Fork tributary is studied in more detail here.

Above F.M. 646 is where much of the proposed development will be. For this study, existing developments within the watershed include Bay Ridge subdivision (area 38A2), Mar Bella subdivision (formerly called Reflection Bay—area REFBAY), a K through 12 school complex (area 38A3), and Whispering Lakes subdivision (area 38B). The portions of the areas (MOODY1 and MOODY2) containing the proposed Hidden Lakes subdivision are considered totally undeveloped, with the exception of the 47.17-acre lake to the west.

3.2 Existing Conditions Flow Calculations

Because of the decision to analyze Gum Bayou using an unsteady flow analysis, flow hydrographs needed to be developed for input into the hydraulic model. Using TSARP methods, various parameters were determined in order to calculate the time of concentration (TC) and storage coefficient (R) needed in the Clark unit hydrograph method (see Appendix A). Once known, the TC and R and percent impervious values were input into a HEC-HMS model set up specifically to generate hydrographs for each subarea of Gum Bayou. The Green and Ampt loss method, used in the previous HEC-1 models, was also used in this study, with the same parameter values. The hydrograph peak flows from HEC-HMS can be found in Appendix A.

The rainfall data used in the HEC-HMS model also comes from TSARP. Harris County is divided into three regions, and League City is closest to region 3 (see Appendix D). Hence, the updated rainfall data for region 3, again augmented by two percent for League City, was used.

The generated hydrographs were then input into the HEC-RAS model. Because an unsteady analysis was performed, peak flows at the respective nodes would be calculated in the HEC-RAS environment (see Exhibit 2 for node locations). The hydrographs were input into the respective cross sections on the Gum Bayou main channel and East Fork tributary into which they flow (see Exhibit 4 for cross section locations). Models were created for the 10-year and 100-year events. The calculated existing conditions node flows can be seen in Table 1.1.

3.3 Existing Conditions Water Surface Elevations Calculations

As part of the same run, HEC-RAS also calculated the existing conditions water surface elevations on Gum Bayou and the East Fork. These can be seen in Tables 1.2 and 1.3 for the 10-year and 100-year events; these are the target elevations which can not be exceeded. HEC-RAS results can be found in Appendix A.

3.4 Existing Conditions in Dickinson Bayou

In addition to target conditions on Gum Bayou and the East Fork, it was also decided to show that there will be no flow increase on Dickinson Bayou downstream of the mouth of Gum Bayou as a result of the proposed development. To establish the existing conditions on Dickinson Bayou, the latest hydrologic model of the bayou from the JKC & Associates report was used. This model encompasses many of the tributaries to the bayou, including Gum Bayou. However, some aspects of it are not consistent with that of TSARP. In particular, these three aspects are different: 1) Rainfall data used does not consistently match that for Harris County region 3 with the two-percent augmentation; 2) The rainfall distribution peaks at 12 hours for a 24-hour event, instead of a 16-hour peak; 3) The initial-constant loss method was used as opposed to Green and Ampt.

In order to be consistent with the Gum Bayou modeling, these three aspects were revised in the Dickinson Bayou model to be consistent with TSARP. After these changes were made, the subareas and reaches of Gum Bayou were removed from the Dickinson Bayou model and replaced with a source node, which allows for a user-input hydrograph at that location. The input there is the resultant hydrograph at the mouth of Gum Bayou as calculated in the HEC-RAS model. The Dickinson Bayou HEC-HMS model was run, and the calculated peak flows can be seen in Table 1.1.

Section 4 Proposed Conditions

4.1 Background

The land plan for the proposed Hidden Lakes development can be seen on Exhibit 6. It will consist of two commercial tracts adjacent to the southwest side of State Highway 96; single-family residential lots less than ¼ acre; a series of internal detention lakes and channels (labeled with an MT prefix on Exhibit 6, plus the 47.17-acre Shared Lake), and commercial tracts south of F.M. 646, adjacent to both the Gum Bayou main channel and East Fork tributary. The outfall of the internal detention system has a 5'x6' RCB pipe set at flow line -0.1 foot and an overflow weir with a 5-foot-wide bottom, 6-to-1 side slopes, and flow line at elevation 9 feet.

It is expected that these tracts will be filled to an elevation above that of natural ground. Impacts, therefore, are expected to be as a result of both the fill and increased impervious area.

4.2 Proposed Conditions Flow Calculations

To better represent the drainage patterns of the proposed development, subareas MOODY1 and MOODY2 were divided as shown in Exhibit 3. The resulting subareas will drain into the proposed detention system in the following manner:

- MOODY1A, MOODY1B, MOODY2B, MOODY2C drain to MT-P2P3
- MOODY2D drains to MT-P4
- MOODY2E drains to MT-P6_1
- MOODY2F drains to MT-P6_2
- MOODY2G drains to MT-P5
- MOODY2A drains to the Shared Lake

The Shared Lake is connected to the internal system at MT-P2P3 by two 4'x2' RCB pipes.

As was done in the 2005 report by 4Site Engineering, the peak flows for these subareas (except MOODY2A) were calculated using the runoff curve method from the Harris County Flood Control District's *Policy Criteria and Procedure Manual*. The peak flow for MOODY2A, the subarea draining to the Shared Lake, was calculated using the rational method, as was done in the report *Drainage Analysis for Hidden Lakes/Randall Family Shared Lake* (DEC, June 2008).

With the peak flows known, hydrographs for input into HEC-RAS needed to be generated. In order to use the Clark unit hydrograph method in HEC-HMS, TC and R parameters still needed to be determined for these smaller development areas. Times of concentration (TC) were calculated using the upland method as described in the Texas Department of Transportation's *Hydraulic Design Manual*. The R value was determined iteratively, i.e. it was adjusted by trial-and-error until the calculated peak flow in HEC-HMS matched that determined from the runoff curves or rational method (see Appendix B).

Of the other subareas in the Gum Bayou watershed, only 38C changed from the existing conditions, and only very slightly in acreage. All other subareas remained unchanged.

The proposed conditions HEC-RAS model includes the following items different from existing:

- Obstructions have been added on Gum Bayou from cross section 18769.26 to cross section 12671.33 (set to elevation 15 ft), and on the East Fork from 4553.24 to 3563.86 (set to elevation 14 ft), to represent the proposed fill for the development
- The proposed internal detention system has been added with a series of storage areas, connections, and a lateral outfall structure to Gum Bayou
- A culvert with three 8'x8' RCB pipes has been added between cross sections 18769.26 and 18668.74 for a future road crossing (Lawrence Road)

The proposed conditions development hydrographs generated in HEC-HMS were input into their respective storage area locations in HEC-RAS, as well as the proposed 38C hydrograph replacing that from the existing condition in the same location. The model was run for the 10-year and 100-year events. Calculated peak flows can be seen on Table 1.1. Flow calculations can be found in Appendix B.

4.3 Proposed Conditions Water Surface Elevations Calculations

As with the existing conditions model, HEC-RAS also calculated the proposed conditions water surface elevations on Gum Bayou and the East Fork. These can be seen in Tables 1.2 and 1.3 for the 10-year and 100-year events. HEC-RAS results can be found in Appendix B.

4.4 Comparison with Existing Conditions

The existing and proposed conditions peak flows and water surface elevations are compared on Tables 1.1, 1.2, and 1.3. As can be seen, the 10-year event shows no flow impacts to either the Gum Bayou main channel or downstream in Dickinson Bayou; small 1-cfs impacts are shown on the East Fork tributary. However, from the Lawrence Road culvert all the way upstream on the main channel, there are water surface impacts as high as 0.13 foot; this is an effect of the proposed fill. On the East Fork tributary, however, no impacts occur, both as a result of a lower tailwater from the main channel, and that there are no effects to the East Fork from the development fill.

In the 100-year event, flow impacts as high as 94 cfs are seen on the main channel from just downstream of the confluence with the East Fork tributary all the way to the mouth (though there are no impacts downstream into Dickinson Bayou). Likewise, water surface elevations in that reach are impacted between 0.04 foot and 0.08 foot. Between roughly the detention system outfall and the existing Bay Ridge box culvert, there are impacts due to the proposed fill between 0.02 foot and 0.70 foot. On the East Fork tributary, a small 2-cfs impact is seen at F.M. 646, which is totally dissipated at the main channel confluence. At the confluence, though, the tailwater elevation rises 0.07 foot, simply as a result of the higher tailwater in the main channel, the effects of which propagate to approximately 1,000 feet upstream of the F.M. 646 bridge; some of the impact may also be a result of the proposed fill. From that point on upstream, no impacts are seen.

Because of the impacts described above, primarily on the main channel, a mitigation plan to alleviate these impacts must be devised.

Section 5

Mitigated Conditions

5.1 Background

As can be seen in Tables 1.1, 1.2, and 1.3, the impacts to the Gum Bayou main channel caused by the proposed Hidden Lakes development are focused in two locations: roughly from the East Fork confluence downstream to the mouth, and from the internal detention system outfall upstream to State Highway 96. Ordinances do not allow any increase in water surface elevation in critical locations as a result of development. A mitigation plan needed to be designed to offset these impacts.

5.2 Proposed Mitigation Plan

Two mitigation plans needed to be designed. Currently, the 47.17-acre Shared Lake, located to the west of the large Detention Lake (storage area MT-P2P3), is connected to the Detention Lake by two 4'x2' RCB pipes, and its static water surface elevation is 10 feet. One mitigation plan was designed based on these current conditions (the elevation 10 scenario).

In a pre-developed condition (i.e. assuming no connection), flow from subarea MOODY2A would drain from west to east, to the Shared Lake, which would outfall in the same direction directly to the Gum Bayou main channel. This is considered to be the natural drainage pattern of this area. As requested by the City of League City, this general pattern should not be altered without permission from all involved parties. Under current conditions, there would be flow from the Detention Lake to the Shared Lake. Because of this, a second mitigation plan had to be designed that would not cause any backflow between the lakes. The primary underlying premise of this plan is the raising of the static water surface elevation of the Shared Lake to 12 feet (the elevation 12 scenario).

Of numerous mitigation plans examined for each condition, the ones chosen each involve four parts: a diversion from the main channel of Gum Bayou through the internal detention system; offline detention on the East Fork tributary; rectification of the main channel; and addition of a pipe at the Bay Ridge culvert. All are described in the following sections.

5.2.1 *Gum Bayou Diversion*

In an effort to lower water surface elevations in the portions of Gum Bayou near Hidden Lakes, a diversion structure was designed such that a sufficient amount of flow could be removed from the main channel that would result in elevations that do not exceed those calculated in existing conditions. This structure will be located just downstream of the outfall channel for Mar Bella subdivision; will have a 60-foot bottom width, 6-to-1 side slopes; and have its flow line set at elevation 10.2 feet. It is the same in both mitigation plans. See Exhibits 7 and 8 for diversion details.

5.2.2 *East Fork Detention*

In an effort to mitigate the water surface elevation impacts on the East Fork and downstream of the confluence to the main channel, two offline detention basins were designed to lower flows

from the East Fork into the main channel to remove these impacts. Detention basin number one will be located on a tract of land immediately north of a tributary to the East Fork, and will provide approximately 111 acre-ft of storage. Its structure will have a diversion weir 70 feet wide with 6-to-1 side slopes, and its flow line will be set at elevation 8.2 feet. A 24-inch RCP with flap gate is provided for outflow (see Exhibits 7 and 8).

Detention basin number two will be located on a tract of land on the west bank of the East Fork, approximately 2,000 feet upstream of the main channel confluence. In the elevation 10 scenario, this basin will provide approximately 17 acre-ft of storage; in the elevation 12 scenario, it will provide approximately 37 acre-ft storage. In both scenarios, its structure will have a diversion weir 60 feet wide with 6-to-1 side slopes, and its flow line will be set at elevation 8.9 feet. A 24-inch RCP with flap gate is provided for outflow (see Exhibits 7 and 8).

5.2.3 Channel Rectification/Improvements

An additional aspect considered to lower water surface elevations in Gum Bayou to existing levels was to rectify a portion of the main channel to its previous state and/or improve a section.

In the plans titled *Channel Improvement to Gum Bayou* (LJA, July 1992), the main channel was to have a 12-foot bottom width, with 5-to-1 side slopes, a shelf section just above the bottom, and a grade of 0.05%. Over time, these conditions have changed due to erosion and sediment buildup. The following is proposed: between cross sections 19385.99 (downstream of Bay Ridge culvert) and 18769.45 (Lawrence Road crossing), the main channel be re-graded to a 0.05% slope, having a channel section with a 12-foot bottom, and 5-to-1 side slopes on the east bank (see Exhibit 7); between sections 18769.45 and 17549.89 (diversion location), the main channel be re-graded to a 0.05% slope, having a channel section with a 15-foot bottom, and 5-to-1 side slopes on the west bank (see Exhibit 7). This 15-foot-bottom section is wider than that in the original plans, but was necessary to fully mitigate elevations in the main channel. It is also recommended that the drop structure, currently located in the channel bend, be moved upstream approximately 400 feet (see Exhibit 7 and Appendix C). This is for the elevation 10 scenario.

In the elevation 12 scenario, the 12-foot-bottom portion is the same, but the other portion has a 20-foot bottom, again to lower elevations in the main channel to existing conditions. A second stretch of improvements is also needed for this scenario. In between the two Riley Wood Bridges, the flow line at the downstream end will match that of the low water crossing, and will grade upstream until the flow line at Wood Bridge #1 is matched, giving an overall grade of 0.10%. A small one-foot-deep section will be shaped in the channel bottom, with a 12-foot bottom width and 3-to-1 side slopes (see Exhibit 8 and Appendix D).

5.2.4 Bay Ridge Culvert Addition

During design of the mitigation plans, it was noticed that in the cross sections upstream of the Bay Ridge culvert, small impacts no larger than 0.02 foot were seen. While they are not located in a critical location, it was desired to eliminate these. It was decided that adding a pipe to the existing crossing would be the remedy. However, doing this in the unsteady model caused it to fail. In a different approach, the size of the existing culvert was increased, which did not cause a model failure. An additional eight square feet proved sufficient to mitigate. The next largest standard pipe size with at least that flow area is a 42-inch RCP (9.6 square feet). This size of pipe is recommended to be added to the crossing.

5.2.5 *Raising of Shared Lake Static Water Surface Elevation*

As part of the design of a mitigation plan with no backflow from the Detention Lake to the Shared Lake, the idea of raising the static water surface elevation of the Shared Lake was decided on. This will be accomplished by constructing a wall around the connecting 4'x2' RCB pipes to a height of 14.5 feet. A small opening in the wall will be cut out, to act as an outflow weir for the Shared Lake. This opening will have vertical sides and a bottom width of six (6) feet, with the flow line set at elevation 12 feet.

5.3 *Mitigated Conditions Flow and Water Surface Elevation Calculations*

The proposed mitigation plans as described in the previous sections were implemented into the proposed HEC-RAS model. Flow hydrograph inputs remained the same as from the proposed conditions. The model was run, calculating mitigated conditions flows and elevations. Elevation 10 scenario results can be found in Appendix C, and elevation 12 scenario results can be found in Appendix D.

5.4 *Comparison with Existing Conditions*

5.4.1 *Elevation 10 Scenario*

The existing and mitigated conditions elevation 10 scenario peak flows and water surface elevations are compared on Tables 2.1, 2.2, and 2.3. In the 10-year event, as can be seen, there are no flow or water surface elevation impacts in critical locations on the Gum Bayou main channel or downstream in Dickinson Bayou (the 0.01 and 0.02 upstream of the Bay Ridge culvert are negligible and not in a critical location). There is a 4-cfs impact shown at F.M. 646 on the East Fork, which is considered negligible and dissipates in the lower reach toward the main channel confluence. No water surface elevation impacts are seen on the East Fork.

In the 100-year event, there is an impact between 1 cfs and 3 cfs (considered negligible) from downstream of the East Fork confluence to upstream of the West Fork confluence, which is dissipated beyond the West Fork confluence to the mouth, with no impacts into Dickinson Bayou. There are no impacts to water surface elevations anywhere within the Gum Bayou main channel. No flow or water surface elevation impacts are seen on the East Fork.

With this mitigation plan, development of the Hidden Lakes subdivision will not cause any impact to the Gum Bayou main channel, East Fork tributary, and Dickinson Bayou. Despite this, there will be some flow from the Detention Lake to the Shared Lake, which the City of League City has requested be prevented.

5.4.2 *Elevation 12 Scenario*

The existing and mitigated conditions elevation 12 scenario peak flows and water surface elevations are compared on Tables 3.1, 3.2, and 3.3. In the 10-year event, there are no flow or water surface elevation impacts in critical locations on the Gum Bayou main channel or downstream in Dickinson Bayou (the 0.01 upstream of the Bay Ridge culvert is negligible and not in a critical location). There is a 4-cfs impact shown at F.M. 646 on the East Fork, which is considered negligible and dissipates in the lower reach toward the main channel confluence. No water surface elevation impacts are seen on the East Fork.

In the 100-year event, there is an impact of 57 cfs upstream of the East Fork confluence, which reduces to 16 cfs downstream of it. At the West Fork confluence, all impacts are dissipated to the mouth, with no impacts into Dickinson Bayou. There are no impacts to water surface elevations anywhere within the Gum Bayou main channel. No flow or water surface elevation impacts are seen on the East Fork.

This mitigation plan will also not cause any impact to the Gum Bayou main channel, East Fork tributary, and Dickinson Bayou, and satisfies the City's no backflow request.

Section 6

Conclusions

6.1 General Summary

Hidden Lakes is a proposed multi-use development located within the Cities of League City, Texas City, and Dickinson, and the boundaries of Galveston County Municipal Utility District No. 45. It will be located on the south side of State Highway 96, extending south to F.M. 646, bisected by South Shore Boulevard, and will include two non-contiguous commercial tracts located south of F.M. 646. All proposed properties in this report are within the Gum Bayou watershed, and will drain either to the main channel or the East Fork tributary. Development impacts are expected, and mitigation will be needed.

6.2 Proposed Mitigation Plan

While two mitigation plans were designed, the elevation 12 scenario plan is recommended as per the City of League City's mandate for no backflow from the Detention Lake in Hidden Lakes to the Shared Lake. The plan, as designed in accordance with the Harris County Flood Control District's criteria on 10-year- and 100-year-event release rates, is as follows:

- Construct a diversion structure to divert water from the Gum Bayou main channel into the internal Hidden Lakes detention system. The structure will be a weir with a 60-foot bottom width, 6-to-1 side slopes, and set at a flow line of elevation 10.2 feet
- Rectify/improve the Gum Bayou main channel in three parts
 - from the Bay Ridge culvert to the proposed Lawrence Road culvert, using a section with a 12-foot bottom, a 5-to-1 slope on the east bank, and a grade of 0.05%
 - from the Lawrence Road culvert to the proposed diversion location, using a section with a 20-foot bottom, a 5-to-1 slope on the west bank, and a grade of 0.05%
 - from Riley Wood Bridge #1 to Riley Wood Bridge #2, using a section with the bottom one foot excavated, with a 12-foot bottom, 3-to-1 side slopes, and a grade of 0.10%
- Construct two detention basins on the East Fork tributary.
 - Basin #1 will provide approximately 111 acre-ft of storage, and will have a weir diversion structure with a 70-foot bottom width, 6-to-1 side slopes, set at a flow line of elevation 8.2 feet, with a 24-inch RCP with flap gate for an outlet
 - Basin #2 will provide approximately 37 acre-ft of storage, and will have a weir diversion structure with a 60-foot bottom width, 6-to-1 side slopes, set at a flow line of elevation 8.9 feet, with a 24-inch RCP with flap gate for an outlet
- Add a 42-inch RCP to the existing Bay Ridge culvert
- Move the existing drop structure upstream approximately 400 feet to the Bay Ridge culvert outlet
- Construct a wall around the 4'x2' RCBs connecting the Shared Lake and Detention Lake up to an elevation of 14.5 feet, with a small opening in the wall to act as an outflow weir for the Shared Lake. The opening will be set at a lowest elevation of 12 feet, 6 feet wide with vertical sides.

TABLES

Table 1.1
Gum Bayou Peak Flow Comparison - Existing vs. Proposed Conditions

Main Channel									
Node	Location	HEC-RAS Station	Cumulative Area (sq mi)	10-Year			100-Year		
				Existing (cfs) (1)	Proposed (cfs) (2)	Difference (2)-(1)	Existing (cfs) (3)	Proposed (cfs) (4)	Difference (4)-(3)
Outlet	Mouth of Dickinson Bayou		94.98	9550	9456	-93	16376	16235	-141
J100a			94.13	9518	9420	-98	16267	16125	-142
J100c	Confluence w/Dickinson Bayou		86.39	8900	8797	-104	15213	15070	-143
GBN#6	Mouth of Gum Bayou	504.8711	12.12	3048	2930	-118	4933	5015	83
GBN#5d	D/S Confluence of West Fork	6445.483	11.39	2799	2682	-118	4487	4581	94
GBN#5u	U/S Confluence of West Fork	6912.951	8.15	1920	1794	-127	2924	2987	63
GBN#4d	D/S Confluence of East Fork	9558.148	7.75	1803	1675	-128	2734	2775	41
GBN#4u	U/S Confluence of East Fork	10608.35	5.17	1224	1087	-137	1882	1860	-21
GBN#2	FM 646	13282.82	4.55 (ex)/4.54 (pr)	1082	947	-136	1692	1648	-44
GBN#1		17549.9	2.96 (ex)/2.89 (pr)	914	824	-90	1543	1384	-159
38A2	Lawrence Road	18769.26	1.54	443	435	-8	715	781	66
38A	SH 96	21412.44	1.31	362	362	0	656	656	0

East Fork										
				10-Year		100-Year				
Node		Location	HEC-RAS Station	Cumulative Area (sq mi)	Existing (cfs) (1)	Proposed (cfs) (2)	Difference (2)-(1)	Existing (cfs) (3)	Proposed (cfs) (4)	Difference (4)-(3)
GBN#4		Mouth of East Fork	540.46	2.58	642	643	1	999	999	0
38D		FM 646	4718.69	1.23	250	251	1	335	337	2
38D 1		SH 146	11811.49	0.44	240	240	0	404	404	0

Table 1.2
Gum Bayou Main Channel Water Surface Elevation Comparison - Existing vs. Proposed Conditions

Sec. No.	10-Year			100-Year		
	Existing (1)	Proposed (2)	Difference (2)-(1)	Existing (3)	Proposed (4)	Difference (4)-(3)
504.8711	2.89	2.78	-0.11	4.18	4.23	0.05
2161.939	3.82	3.72	-0.10	5.09	5.13	0.04
2372.1	3.71	3.61	-0.10	4.90	4.94	0.04
2434.526						
FM 517 Bridge						
2452.965	3.71	3.60	-0.11	4.94	4.98	0.04
2995.046	4.64	4.53	-0.11	6.07	6.12	0.05
4057.931	4.97	4.86	-0.11	6.41	6.46	0.05
5412.954	5.32	5.21	-0.11	6.78	6.83	0.05
6445.483	5.69	5.58	-0.11	7.16	7.22	0.06
6912.951	6.16	6.04	-0.12	7.76	7.82	0.06
7407.249	6.24	6.11	-0.13	7.83	7.90	0.07
7790.17	6.47	6.34	-0.13	8.05	8.12	0.07
8218.802	6.44	6.31	-0.13	8.02	8.09	0.07
8648.945	7.11	6.90	-0.21	8.60	8.68	0.08
8655.526						
High Wood Bridge #1						
8661.26	7.47	7.23	-0.24	8.70	8.77	0.07
9189.58	8.03	7.82	-0.21	9.16	9.24	0.08
9518.148	8.23	8.01	-0.22	9.40	9.47	0.07
9528.148	8.23	8.01	-0.22	9.40	9.47	0.07
9542.525						
High Low Water Crossing						
9558.148	8.22	8.02	-0.20	9.39	9.46	0.07
9568.148	8.22	8.02	-0.20	9.40	9.47	0.07
10598.35	8.22	8.02	-0.20	9.40	9.47	0.07
10608.35	8.25	8.04	-0.21	9.43	9.50	0.07
10617.53						
Riley Wood Bridge #2						
10626.34	8.77	8.47	-0.30	9.91	9.90	-0.01
11889.33	10.04	9.68	-0.36	11.34	11.31	-0.03
11909.2						
Riley Wood Bridge #1						
11930.16	10.21	9.91	-0.30	11.41	11.37	-0.04
12111.49	10.38	10.07	-0.31	11.52	11.48	-0.04
12671.33	10.61	10.30	-0.31	11.69	11.65	-0.04
13089.39	10.74	10.42	-0.32	11.84	11.81	-0.03
13139.39	10.76	10.45	-0.31	11.88	11.85	-0.03
13229.52						
FM 646 Bridge						
13282.81	10.87	10.54	-0.33	12.04	12.00	-0.04
13315.93	10.86	10.54	-0.32	12.03	11.99	-0.04
13436.74	10.94	10.60	-0.34	12.14	12.10	-0.04
13508.5						
Hidden Lakes Detention Outlet						
13580.25	10.99	10.66	-0.33	12.21	12.19	-0.02
14565.57	11.26	10.89	-0.37	12.44	12.41	-0.03
14600.39	11.28	10.90	-0.38	12.45	12.43	-0.02
15073.13	11.46	11.08	-0.38	12.59	12.61	0.02
15216.53	11.53	11.16	-0.37	12.64	12.72	0.08
15845.97	11.65	11.27	-0.38	12.72	12.84	0.12
16699.7	11.84	11.46	-0.38	12.80	13.05	0.25
17549.89	12.10	11.84	-0.26	12.90	13.39	0.49
17805.33	12.17	12.07	-0.10	12.92	13.50	0.58
18222.95	12.18	12.13	-0.05	12.92	13.51	0.59
18668.74	12.21	12.20	-0.01	12.93	13.55	0.62
18719.05						
Lawrence Road Crossing						
18769.25	12.22	12.25	0.03	12.94	13.44	0.50
19152.51	12.32	12.45	0.13	13.02	13.71	0.69
19162.52	12.32	12.45	0.13	13.03	13.72	0.69
19385.99	12.38	12.51	0.13	13.12	13.77	0.65
19441.26	12.35	12.48	0.13	13.07	13.77	0.70
19477.05						
Bay Ridge Box Culvert						
19516.24	13.12	13.21	0.09	14.45	14.37	-0.08
19567.14	13.21	13.29	0.08	14.54	14.46	-0.08
20567.15	13.31	13.38	0.07	14.62	14.55	-0.07
21412.43	13.41	13.46	0.05	14.66	14.59	-0.07

Table 1.3
Gum Bayou East Fork Water Surface Elevation Comparison - Existing vs. Proposed Conditions

Sec. No.	10-Year			100-Year		
	Existing (1)	Proposed (2)	Difference (2)-(1)	Existing (3)	Proposed (4)	Difference (4)-(3)
535.4552	8.22	8.02	-0.20	9.40	9.47	0.07
540.4552	8.23	8.02	-0.21	9.40	9.47	0.07
774.9974	8.25	8.05	-0.20	9.43	9.50	0.07
1129.264	8.35	8.16	-0.19	9.54	9.62	0.08
1380.568	8.41	8.23	-0.18	9.61	9.68	0.07
1710.556	8.53	8.36	-0.17	9.74	9.81	0.07
1907.972	8.63	8.48	-0.15	9.86	9.92	0.06
2219.039	8.72	8.58	-0.14	9.95	10.01	0.06
2461.718	8.87	8.75	-0.12	10.11	10.17	0.06
2678.052	8.98	8.86	-0.12	10.23	10.28	0.05
2935.586	9.12	9.02	-0.10	10.41	10.46	0.05
3131.442	9.28	9.19	-0.09	10.58	10.62	0.04
3413.596	9.44	9.37	-0.07	10.74	10.77	0.03
3563.86	9.55	9.48	-0.07	10.83	10.87	0.04
3796.66	9.68	9.62	-0.06	10.93	10.96	0.03
4172.662	9.86	9.80	-0.06	11.09	11.11	0.02
4553.236	9.98	9.93	-0.05	11.18	11.20	0.02
4609.199	10.01	9.96	-0.05	11.20	11.23	0.03
4663.943	FM 646 Bridge					
4718.687	10.03	9.98	-0.05	11.23	11.25	0.02
4830.163	10.06	10.01	-0.05	11.25	11.27	0.02
5612.32	10.32	10.29	-0.03	11.41	11.43	0.02
6569.71	10.68	10.65	-0.03	11.61	11.61	0.00
6733.53	10.76	10.74	-0.02	11.67	11.67	0.00
7010.956	10.88	10.86	-0.02	11.73	11.73	0.00
7186.773	10.94	10.93	-0.01	11.78	11.77	-0.01
7575.182	11.08	11.07	-0.01	11.86	11.86	0.00
7815.951	11.14	11.13	-0.01	11.89	11.89	0.00
8045.906	11.17	11.16	-0.01	11.90	11.90	0.00
8154.852	11.18	11.17	-0.01	11.91	11.91	0.00
8365.465	11.21	11.21	0.00	11.92	11.92	0.00
8573.797	11.23	11.22	-0.01	11.92	11.92	0.00
8761.822	11.25	11.24	-0.01	11.92	11.93	0.01
8964.394	11.26	11.26	0.00	11.93	11.93	0.00
9164.902	11.27	11.27	0.00	11.93	11.93	0.00
9368.154	11.28	11.28	0.00	11.93	11.93	0.00
9560.854	11.29	11.28	-0.01	11.93	11.93	0.00
9758.052	11.29	11.29	0.00	11.93	11.93	0.00
9960.175	11.30	11.30	0.00	11.93	11.93	0.00
10160.33	11.31	11.31	0.00	11.93	11.93	0.00
10365.36	11.32	11.32	0.00	11.93	11.93	0.00
10560.64	11.33	11.32	-0.01	11.93	11.93	0.00
10759.64	11.33	11.33	0.00	11.93	11.93	0.00
10964.15	11.33	11.33	0.00	11.93	11.93	0.00
11128.81	11.33	11.33	0.00	11.93	11.93	0.00
11377.68	11.33	11.33	0.00	11.93	11.93	0.00
11643.13	11.34	11.33	-0.01	11.93	11.93	0.00
11811.49	11.34	11.34	0.00	11.93	11.93	0.00

Table 2.1
Gum Bayou Peak Flow Comparison - Existing vs. Mitigated Conditions
Elevation 10 Scenario

Main Channel									
Node	Location	HEC-RAS Station	Cumulative Area (sq mi)	10-Year			100-Year		
				Existing (cfs) (1)	Mitigated (cfs) (2)	Difference (2)-(1)	Existing (cfs) (3)	Mitigated (cfs) (4)	Difference (4)-(3)
Outlet	Mouth of Dickinson Bayou		94.98	9550	9433	-117	16375	16229	-147
J100a			94.13	9518	9395	-124	16267	16119	-148
J100c	Confluence w/Dickinson Bayou		86.39	8900	8764	-136	15212	15065	-148
GBN#6	Mouth of Gum Bayou	504.8711	12.12	3048	2870	-178	4933	4718	-215
GBN#5d	D/S Confluence of West Fork	6445.483	11.39	2799	2616	-184	4487	4374	-113
GBN#5u	U/S Confluence of West Fork	6912.951	8.15	1920	1722	-199	2924	2925	1
GBN#4d	D/S Confluence of East Fork	9558.148	7.75	1803	1602	-200	2734	2737	3
GBN#4u	U/S Confluence of East Fork	10608.35	5.17	1224	1077	-147	1882	1855	-27
GBN#2	FM 646	13282.82	4.55 (ex)/4.54 (pr)	1082	930	-153	1692	1606	-86
GBN#1		17549.9	2.96 (ex)/2.89 (pr)	914	823	-91	1543	1416	-127
38A2	Lawrence Road	18769.26	1.54	443	429	-14	715	723	8
38A	SH 96	21412.44	1.31	362	362	0	656	656	0

East Fork									
				10-Year		100-Year			
Node	Location	HEC-RAS Station	Cumulative Area (sq mi)	Existing (cfs) (1)	Mitigated (cfs) (2)	Difference (2)-(1)	Existing (cfs) (3)	Mitigated (cfs) (4)	Difference (4)-(3)
GBN#4	Mouth of East Fork	540.46	2.58	642	581	-61	999	885	-114
38D	FM 646	4718.69	1.23	250	253	4	335	329	-6
38D 1	SH 146	11811.49	0.44	240	240	0	404	404	0

Table 2.2
Gum Bayou Main Channel Water Surface Elevation Comparison - Existing vs. Mitigated Conditions
Elevation 10 Scenario

Sec. No.	10-Year			100-Year		
	Existing (1)	Mitigated (2)	Difference (2)-(1)	Existing (3)	Mitigated (4)	Difference (4)-(3)
504.8711	2.89	2.73	-0.16	4.18	4.07	-0.11
2161.939	3.82	3.66	-0.16	5.09	4.97	-0.12
2372.1	3.71	3.55	-0.16	4.90	4.80	-0.10
2434.526	FM 517 Bridge					
2452.965	3.71	3.55	-0.16	4.94	4.83	-0.11
2995.046	4.64	4.47	-0.17	6.07	5.93	-0.14
4057.931	4.97	4.80	-0.17	6.41	6.27	-0.14
5412.954	5.32	5.15	-0.17	6.78	6.64	-0.14
6445.483	5.69	5.52	-0.17	7.16	7.03	-0.13
6912.951	6.16	5.98	-0.18	7.76	7.61	-0.15
7407.249	6.24	6.05	-0.19	7.83	7.70	-0.13
7790.17	6.47	6.26	-0.21	8.05	7.94	-0.11
8218.802	6.44	6.24	-0.20	8.02	7.90	-0.12
8648.945	7.11	6.81	-0.30	8.60	8.55	-0.05
8655.526	High Wood Bridge #1					
8661.26	7.47	7.10	-0.37	8.70	8.67	-0.03
9189.58	8.03	7.69	-0.34	9.16	9.16	0.00
9518.148	8.23	7.88	-0.35	9.40	9.39	-0.01
9528.148	8.23	7.88	-0.35	9.40	9.40	0.00
9542.525	High Low Water Crossing					
9558.148	8.22	7.89	-0.33	9.39	9.39	0.00
9568.148	8.22	7.90	-0.32	9.40	9.39	-0.01
10598.35	8.22	7.90	-0.32	9.40	9.39	-0.01
10608.35	8.25	7.92	-0.33	9.43	9.43	0.00
10617.53	Riley Wood Bridge #2					
10626.34	8.77	8.36	-0.41	9.91	9.89	-0.02
11889.33	10.04	9.62	-0.42	11.34	11.30	-0.04
11909.2	Riley Wood Bridge #1					
11930.16	10.21	9.86	-0.35	11.41	11.36	-0.05
12111.49	10.38	10.02	-0.36	11.52	11.47	-0.05
12671.33	10.61	10.26	-0.35	11.69	11.64	-0.05
13089.39	10.74	10.38	-0.36	11.84	11.80	-0.04
13139.39	10.76	10.40	-0.36	11.88	11.84	-0.04
13229.52	FM 646 Bridge					
13282.81	10.87	10.49	-0.38	12.04	11.99	-0.05
13315.93	10.86	10.49	-0.37	12.03	11.97	-0.06
13436.74	10.94	10.56	-0.38	12.14	12.08	-0.06
13508.5	Hidden Lakes Detention Outlet					
13580.25	10.99	10.62	-0.37	12.21	12.18	-0.03
14565.57	11.26	10.78	-0.48	12.44	12.30	-0.14
14600.39	11.28	10.79	-0.49	12.45	12.32	-0.13
15073.13	11.46	10.91	-0.55	12.59	12.42	-0.17
15216.53	11.53	10.97	-0.56	12.64	12.49	-0.15
15845.97	11.65	11.04	-0.61	12.72	12.55	-0.17
16699.7	11.84	11.16	-0.68	12.80	12.65	-0.15
17124.8	Hidden Lakes Diversion					
17549.89	12.10	11.28	-0.82	12.90	12.75	-0.15
17805.33	12.17	11.34	-0.83	12.92	12.80	-0.12
18222.95	12.18	11.36	-0.82	12.92	12.82	-0.10
18668.74	12.21	11.39	-0.82	12.93	12.84	-0.09
18719.05	Lawrence Road Crossing					
18769.25	12.22	11.44	-0.78	12.94	12.75	-0.19
19152.51	12.32	11.57	-0.75	13.02	12.97	-0.05
19162.52	12.32	11.57	-0.75	13.03	12.97	-0.06
19385.99	12.38	11.58	-0.80	13.12	12.99	-0.13
19441.26	12.35	11.40	-0.95	13.07	12.92	-0.15
19477.05	Bay Ridge Box Culvert					
19516.24	13.12	13.14	0.02	14.45	14.42	-0.03
19567.14	13.21	13.22	0.01	14.54	14.52	-0.02
20567.15	13.31	13.31	0.00	14.62	14.60	-0.02
21412.43	13.41	13.40	-0.01	14.66	14.63	-0.03

Table 2.3
Gum Bayou East Fork Water Surface Elevation Comparison - Existing vs. Mitigated Conditions
Elevation 10 Scenario

Sec. No.	10-Year			100-Year		
	Existing (1)	Mitigated (2)	Difference (2)-(1)	Existing (3)	Mitigated (4)	Difference (4)-(3)
535.4552	8.22	7.90	-0.32	9.40	9.39	-0.01
540.4552	8.23	7.90	-0.33	9.40	9.39	-0.01
774.9974	8.25	7.92	-0.33	9.43	9.42	-0.01
1129.264	8.35	8.02	-0.33	9.54	9.53	-0.01
1380.568	8.41	8.08	-0.33	9.61	9.58	-0.03
1710.556	8.53	8.19	-0.34	9.74	9.70	-0.04
1809.264	East Fork Detention #2					
1907.972	8.63	8.28	-0.35	9.86	9.80	-0.06
2219.039	8.72	8.37	-0.35	9.95	9.88	-0.07
2461.718	8.87	8.51	-0.36	10.11	10.02	-0.09
2678.052	8.98	8.60	-0.38	10.23	10.13	-0.10
2935.586	9.12	8.73	-0.39	10.41	10.29	-0.12
3033.514	East Fork Detention #1					
3131.442	9.28	8.82	-0.46	10.58	10.46	-0.12
3413.596	9.44	9.05	-0.39	10.74	10.61	-0.13
3563.86	9.55	9.19	-0.36	10.83	10.70	-0.13
3796.66	9.68	9.36	-0.32	10.93	10.81	-0.12
4172.662	9.86	9.58	-0.28	11.09	10.97	-0.12
4553.236	9.98	9.74	-0.24	11.18	11.08	-0.10
4609.199	10.01	9.78	-0.23	11.20	11.11	-0.09
4663.943	FM 646 Bridge					
4718.687	10.03	9.80	-0.23	11.23	11.13	-0.10
4830.163	10.06	9.83	-0.23	11.25	11.15	-0.10
5612.32	10.32	10.16	-0.16	11.41	11.35	-0.06
6569.71	10.68	10.59	-0.09	11.61	11.57	-0.04
6733.53	10.76	10.69	-0.07	11.67	11.63	-0.04
7010.956	10.88	10.82	-0.06	11.73	11.69	-0.04
7186.773	10.94	10.89	-0.05	11.78	11.74	-0.04
7575.182	11.08	11.04	-0.04	11.86	11.83	-0.03
7815.951	11.14	11.11	-0.03	11.89	11.86	-0.03
8045.906	11.17	11.14	-0.03	11.90	11.87	-0.03
8154.852	11.18	11.15	-0.03	11.91	11.87	-0.04
8365.465	11.21	11.19	-0.02	11.92	11.88	-0.04
8573.797	11.23	11.21	-0.02	11.92	11.89	-0.03
8761.822	11.25	11.23	-0.02	11.92	11.89	-0.03
8964.394	11.26	11.25	-0.01	11.93	11.89	-0.04
9164.902	11.27	11.25	-0.02	11.93	11.89	-0.04
9368.154	11.28	11.26	-0.02	11.93	11.89	-0.04
9560.854	11.29	11.27	-0.02	11.93	11.89	-0.04
9758.052	11.29	11.28	-0.01	11.93	11.89	-0.04
9960.175	11.30	11.29	-0.01	11.93	11.90	-0.03
10160.33	11.31	11.30	-0.01	11.93	11.90	-0.03
10365.36	11.32	11.31	-0.01	11.93	11.90	-0.03
10560.64	11.33	11.32	-0.01	11.93	11.90	-0.03
10759.64	11.33	11.32	-0.01	11.93	11.90	-0.03
10964.15	11.33	11.32	-0.01	11.93	11.90	-0.03
11128.81	11.33	11.32	-0.01	11.93	11.90	-0.03
11377.68	11.33	11.32	-0.01	11.93	11.90	-0.03
11643.13	11.34	11.33	-0.01	11.93	11.90	-0.03
11811.49	11.34	11.33	-0.01	11.93	11.90	-0.03

HEC-RAS Plan: GBmi10100 Profile: Max WS

Storage Area	Profile	W.S. Elev (ft)	SA Min El (ft)	Net Flux (cfs)	SA Area (acres)	SA Volume (acre-ft)
MT-P2P3	Max WS	12.67	3.53	-335.43	24.72	177.44
MT-P4	Max WS	12.70	1.76	329.21	5.25	30.22
MT-P5	Max WS	12.68	-0.10	817.58	5.20	33.73
MT-P6_1	Max WS	12.72	2.12	29.41	15.18	160.82
MT-P6_2	Max WS	12.71	1.93	-1196.00	4.79	51.64
SharedLake	Max WS	12.70	10.00	-11.56	47.17	127.50
EF detention	Max WS	10.38	2.40	6.85	12.91	102.96
EF detention 2	Max WS	9.75	-0.40	0.36	1.63	16.59

Detention Lake elevations - el 10 scen.

Table 3.1
Gum Bayou Peak Flow Comparison - Existing vs. Mitigated Conditions
Elevation 12 Scenario

Main Channel									
Node	Location	HEC-RAS Station	Cumulative Area (sq mi)	10-Year			100-Year		
				Existing (cfs) (1)	Mitigated (cfs) (2)	Difference (2)-(1)	Existing (cfs) (3)	Mitigated (cfs) (4)	Difference (4)-(3)
Outlet	Mouth of Dickinson Bayou		94.98	9550	9418	-132	16375	16239	-136
J100a			94.13	9518	9379	-140	16267	16128	-139
J100c	Confluence w/Dickinson Bayou		86.39	8900	8753	-147	15212	15072	-140
GBN#6	Mouth of Gum Bayou	504.8711	12.12	3048	2889	-158	4933	4784	-149
GBN#5d	D/S Confluence of West Fork	6445.483	11.39	2799	2634	-165	4487	4414	-73
GBN#5u	U/S Confluence of West Fork	6912.951	8.15	1920	1737	-184	2924	2920	-4
GBN#4d	D/S Confluence of East Fork	9558.148	7.75	1803	1616	-187	2734	2750	16
GBN#4u	U/S Confluence of East Fork	10608.35	5.17	1224	1090	-134	1882	1939	57
GBN#2	FM 846	13282.82	4.55 (ex)/4.54 (pr)	1082	941	-142	1692	1682	-10
GBN#1		17549.9	2.96 (ex)/2.89 (pr)	914	824	-89	1543	1416	-127
38A2	Lawrence Road	18769.26	1.54	443	430	-12	715	723	8
38A	SH 96	21412.44	1.31	362	362	0	656	656	0

East Fork									
Node	Location	HEC-RAS Station	Cumulative Area (sq mi)	10-Year			100-Year		
				Existing (cfs) (1)	Mitigated (cfs) (2)	Difference (2)-(1)	Existing (cfs) (3)	Mitigated (cfs) (4)	Difference (4)-(3)
GBN#4	Mouth of East Fork	540.46	2.58	642	580	-62	999	828	-170
38D	FM 846	4718.69	1.23	250	253	4	335	328	-7
38D 1	SH 146	11811.49	0.44	240	240	0	404	404	0

Table 3.2
Gum Bayou Main Channel Water Surface Elevation Comparison - Existing vs. Mitigated Conditions
Elevation 12 Scenario

Sec. No.	10-Year			100-Year		
	Existing (1)	Mitigated (2)	Difference (2)-(1)	Existing (3)	Mitigated (4)	Difference (4)-(3)
504.8711	2.89	2.75	-0.14	4.18	4.11	-0.07
2161.939	3.82	3.68	-0.14	5.09	5.01	-0.08
2372.1	3.71	3.57	-0.14	4.90	4.83	-0.07
2434.526	FM 517 Bridge					
2452.965	3.71	3.58	-0.15	4.94	4.86	-0.08
2995.046	4.64	4.49	-0.15	6.07	5.97	-0.10
4057.931	4.97	4.82	-0.15	6.41	6.31	-0.10
5412.954	5.32	5.17	-0.15	6.78	6.68	-0.10
6445.483	5.69	5.54	-0.15	7.16	7.07	-0.09
6912.951	6.16	6.00	-0.16	7.76	7.66	-0.10
7407.249	6.24	6.07	-0.17	7.83	7.74	-0.09
7790.17	6.47	6.28	-0.19	8.05	7.98	-0.07
8218.802	6.44	6.26	-0.18	8.02	7.94	-0.08
8648.945	7.11	6.83	-0.28	8.60	8.57	-0.03
8655.526	High Wood Bridge #1					
8661.26	7.47	7.13	-0.34	8.70	8.68	-0.02
9189.58	8.03	7.72	-0.31	9.16	9.16	0.00
9518.148	8.23	7.91	-0.32	9.40	9.39	-0.01
9528.148	8.23	7.91	-0.32	9.40	9.40	0.00
9542.525	High Low Water Crossing					
9558.148	8.22	7.92	-0.30	9.39	9.39	0.00
9568.148	8.22	7.92	-0.30	9.40	9.39	-0.01
10598.35	8.22	7.92	-0.30	9.40	9.39	-0.01
10608.35	8.25	7.94	-0.31	9.43	9.42	-0.01
10617.53	Riley Wood Bridge #2					
10626.34	8.77	8.22	-0.55	9.91	9.80	-0.11
11889.33	10.04	9.39	-0.65	11.34	11.16	-0.18
11909.2	Riley Wood Bridge #1					
11930.16	10.21	9.71	-0.50	11.41	11.21	-0.20
12111.49	10.38	9.89	-0.49	11.52	11.36	-0.16
12671.33	10.61	10.16	-0.45	11.69	11.57	-0.12
13089.39	10.74	10.29	-0.45	11.84	11.75	-0.09
13139.39	10.76	10.32	-0.44	11.88	11.79	-0.09
13229.52	FM 646 Bridge					
13282.81	10.87	10.41	-0.46	12.04	11.96	-0.08
13315.93	10.86	10.41	-0.45	12.03	11.94	-0.09
13436.74	10.94	10.48	-0.46	12.14	12.06	-0.08
13508.5	Hidden Lakes Detention Outlet					
13580.25	10.99	10.55	-0.44	12.21	12.18	-0.03
14565.57	11.26	10.72	-0.54	12.44	12.31	-0.13
14600.39	11.28	10.73	-0.55	12.45	12.32	-0.13
15073.13	11.46	10.86	-0.60	12.59	12.44	-0.15
15216.53	11.53	10.92	-0.61	12.64	12.52	-0.12
15845.97	11.65	11.00	-0.65	12.72	12.58	-0.14
16699.7	11.84	11.13	-0.71	12.80	12.70	-0.10
17124.8	Hidden Lakes Diversion					
17549.89	12.10	11.26	-0.84	12.90	12.80	-0.10
17805.33	12.17	11.31	-0.86	12.92	12.85	-0.07
18222.95	12.18	11.32	-0.86	12.92	12.86	-0.06
18668.74	12.21	11.35	-0.86	12.93	12.88	-0.05
18719.05	Lawrence Road Crossing					
18769.25	12.22	11.40	-0.82	12.94	12.79	-0.15
19152.51	12.32	11.53	-0.79	13.02	13.00	-0.02
19162.52	12.32	11.53	-0.79	13.03	13.00	-0.03
19385.99	12.38	11.54	-0.84	13.12	13.02	-0.10
19441.26	12.35	11.36	-0.99	13.07	12.96	-0.11
19477.05	Bay Ridge Box Culvert					
19516.24	13.12	13.13	0.01	14.45	14.43	-0.02
19567.14	13.21	13.21	0.00	14.54	14.52	-0.02
20567.15	13.31	13.30	-0.01	14.62	14.60	-0.02
21412.43	13.41	13.39	-0.02	14.66	14.63	-0.03

Table 3.3
Gum Bayou East Fork Water Surface Elevation Comparison - Existing vs. Mitigated Conditions
Elevation 12 Scenario

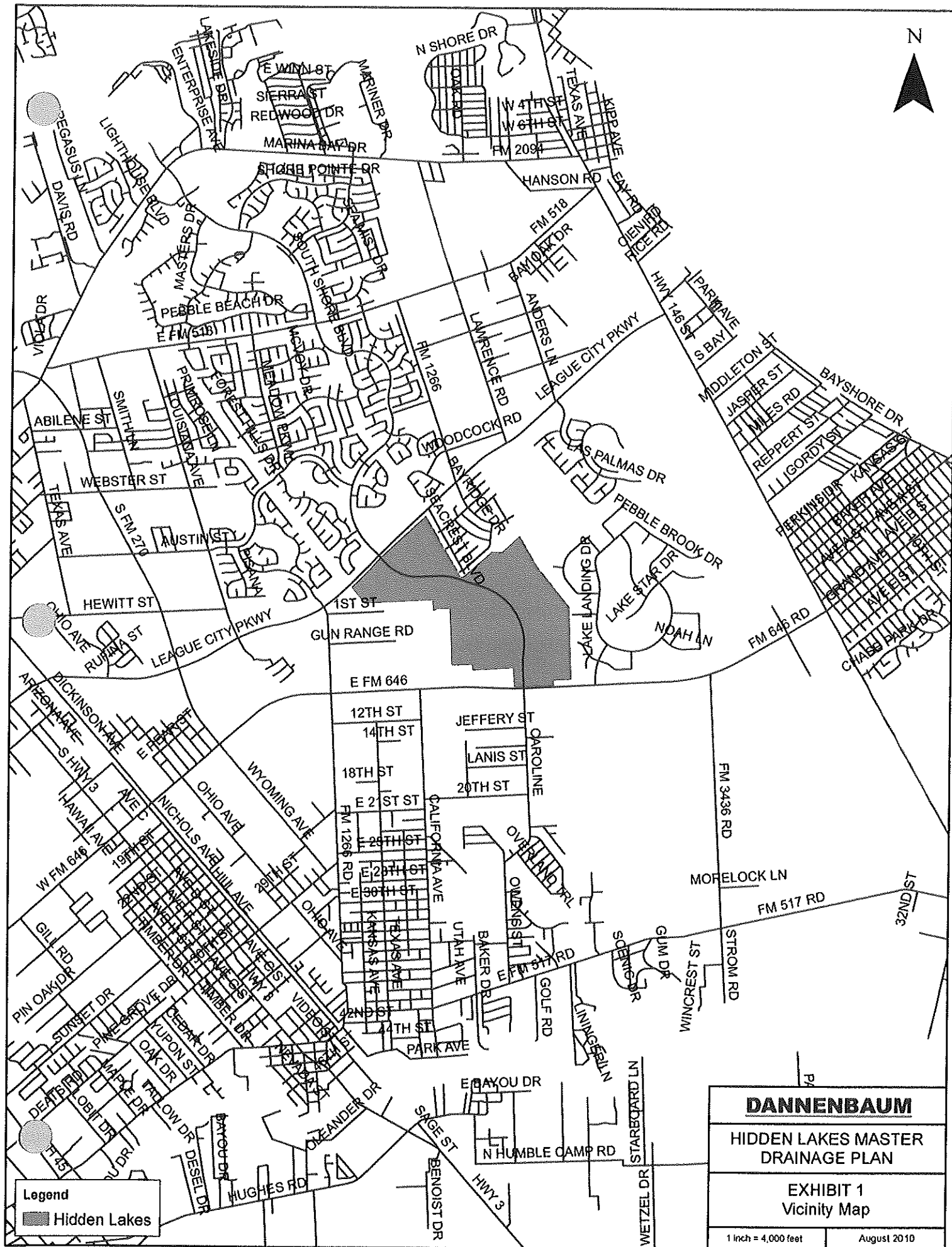
Sec. No.	10-Year			100-Year		
	Existing (1)	Mitigated (2)	Difference (2)-(1)	Existing (3)	Mitigated (4)	Difference (4)-(3)
535.4552	8.22	7.92	-0.30	9.40	9.39	-0.01
540.4552	8.23	7.92	-0.31	9.40	9.39	-0.01
774.9974	8.25	7.95	-0.30	9.43	9.42	-0.01
1129.264	8.35	8.04	-0.31	9.54	9.50	-0.04
1380.568	8.41	8.10	-0.31	9.61	9.55	-0.06
1710.556	8.53	8.21	-0.32	9.74	9.64	-0.10
1809.264	East Fork Detention #2					
1907.972	8.63	8.30	-0.33	9.86	9.74	-0.12
2219.039	8.72	8.38	-0.34	9.95	9.81	-0.14
2461.718	8.87	8.52	-0.35	10.11	9.95	-0.16
2678.052	8.98	8.62	-0.36	10.23	10.06	-0.17
2935.586	9.12	8.74	-0.38	10.41	10.24	-0.17
3033.514	East Fork Detention #1					
3131.442	9.28	8.83	-0.45	10.58	10.42	-0.16
3413.596	9.44	9.06	-0.38	10.74	10.58	-0.16
3563.86	9.55	9.19	-0.36	10.83	10.68	-0.15
3796.66	9.68	9.37	-0.31	10.93	10.79	-0.14
4172.662	9.86	9.59	-0.27	11.09	10.96	-0.13
4553.236	9.98	9.74	-0.24	11.18	11.07	-0.11
4609.199	10.01	9.78	-0.23	11.20	11.10	-0.10
4663.943	FM 646 Bridge					
4718.687	10.03	9.80	-0.23	11.23	11.12	-0.11
4830.163	10.06	9.84	-0.22	11.25	11.14	-0.11
5612.32	10.32	10.16	-0.16	11.41	11.34	-0.07
6569.71	10.68	10.59	-0.09	11.61	11.56	-0.05
6733.53	10.76	10.69	-0.07	11.67	11.62	-0.05
7010.956	10.88	10.82	-0.06	11.73	11.69	-0.04
7186.773	10.94	10.89	-0.05	11.78	11.74	-0.04
7575.182	11.08	11.04	-0.04	11.86	11.83	-0.03
7815.951	11.14	11.11	-0.03	11.89	11.86	-0.03
8045.906	11.17	11.14	-0.03	11.90	11.87	-0.03
8154.852	11.18	11.15	-0.03	11.91	11.87	-0.04
8365.465	11.21	11.19	-0.02	11.92	11.88	-0.04
8573.797	11.23	11.21	-0.02	11.92	11.89	-0.03
8761.822	11.25	11.23	-0.02	11.92	11.89	-0.03
8964.394	11.26	11.25	-0.01	11.93	11.89	-0.04
9164.902	11.27	11.26	-0.01	11.93	11.89	-0.04
9368.154	11.28	11.26	-0.02	11.93	11.89	-0.04
9560.854	11.29	11.27	-0.02	11.93	11.89	-0.04
9758.052	11.29	11.28	-0.01	11.93	11.89	-0.04
9960.175	11.30	11.29	-0.01	11.93	11.90	-0.03
10160.33	11.31	11.30	-0.01	11.93	11.90	-0.03
10365.36	11.32	11.31	-0.01	11.93	11.90	-0.03
10560.64	11.33	11.32	-0.01	11.93	11.90	-0.03
10759.64	11.33	11.32	-0.01	11.93	11.90	-0.03
10964.15	11.33	11.32	-0.01	11.93	11.90	-0.03
11128.81	11.33	11.32	-0.01	11.93	11.90	-0.03
11377.68	11.33	11.32	-0.01	11.93	11.90	-0.03
11643.13	11.34	11.33	-0.01	11.93	11.90	-0.03
11811.49	11.34	11.33	-0.01	11.93	11.90	-0.03

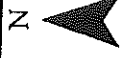
HEC-RAS Plan: GBm112100 Profile: Max WS

Storage Area	Profile	W.S. Elev (ft)	SA Min El (ft)	Net Flux (cfs)	SA Area (acres)	SA Volume (acre-ft)
MT-P2P3	Max WS	12.75	3.53	-336.08	24.72	179.32
MT-P4	Max WS	12.78	1.76	361.81	5.25	30.66
MT-P5	Max WS	12.76	-0.10	817.42	5.20	34.12
MT-P6_1	Max WS	12.78	2.12	-140.52	15.18	161.72
MT-P6_2	Max WS	12.78	1.93	-1214.26	4.79	52.00
SharedLake	Max WS	13.77	12.00	-47.05	47.17	83.37
EF detention	Max WS	10.33	2.40	6.98	12.91	102.37
Dummy	Max WS	13.19	10.00	-0.42	0.01	0.03
EF detention 2	Max WS	9.69	-0.40	19.24	3.55	35.82

Detention Lake elevations - el 12 scen.

EXHIBITS





DANNENBAUM

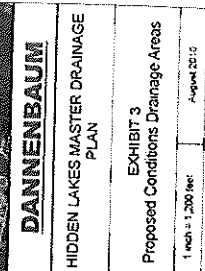
HIDDEN LAKES MASTER DRAINAGE
PLAN

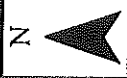
EXHIBIT 2
Existing Conditions Drainage Areas

1" = 1,200' feet August 2010



Legend
Water Bodies
Wetlands
Easements
Other Features
Boundary Lines





DANNENBAUM
HIDDEN LAKES MASTER DRAINAGE PLAN
EXHIBIT 4 Gum Bayou & East Fork Cross Sections
1 inch = 1,000 feet August 2019

Legend
● Public Facilities
— Drainage Lines
— East Fork

Note: Shape of lakes MT-P6_1 and MT-P6_2 are initial estimates. Ultimate shape will be determined when land plan is finalized.

Lake Provisions
MT-P2P3: 27.2 ac, 222.33 ac-ft
MT-P4: 5.62 ac, 37.06 ac-ft
MT-P5: 5.59 ac, 40.59 ac-ft
MT-P6_1: 18.6 ac, 180.29 ac-ft
MT-P6_2: 6.8 ac, 57.82 ac-ft

1 42" RCP (existing)
Weir: 20' width
6-to-1 sides
Elevation 8'

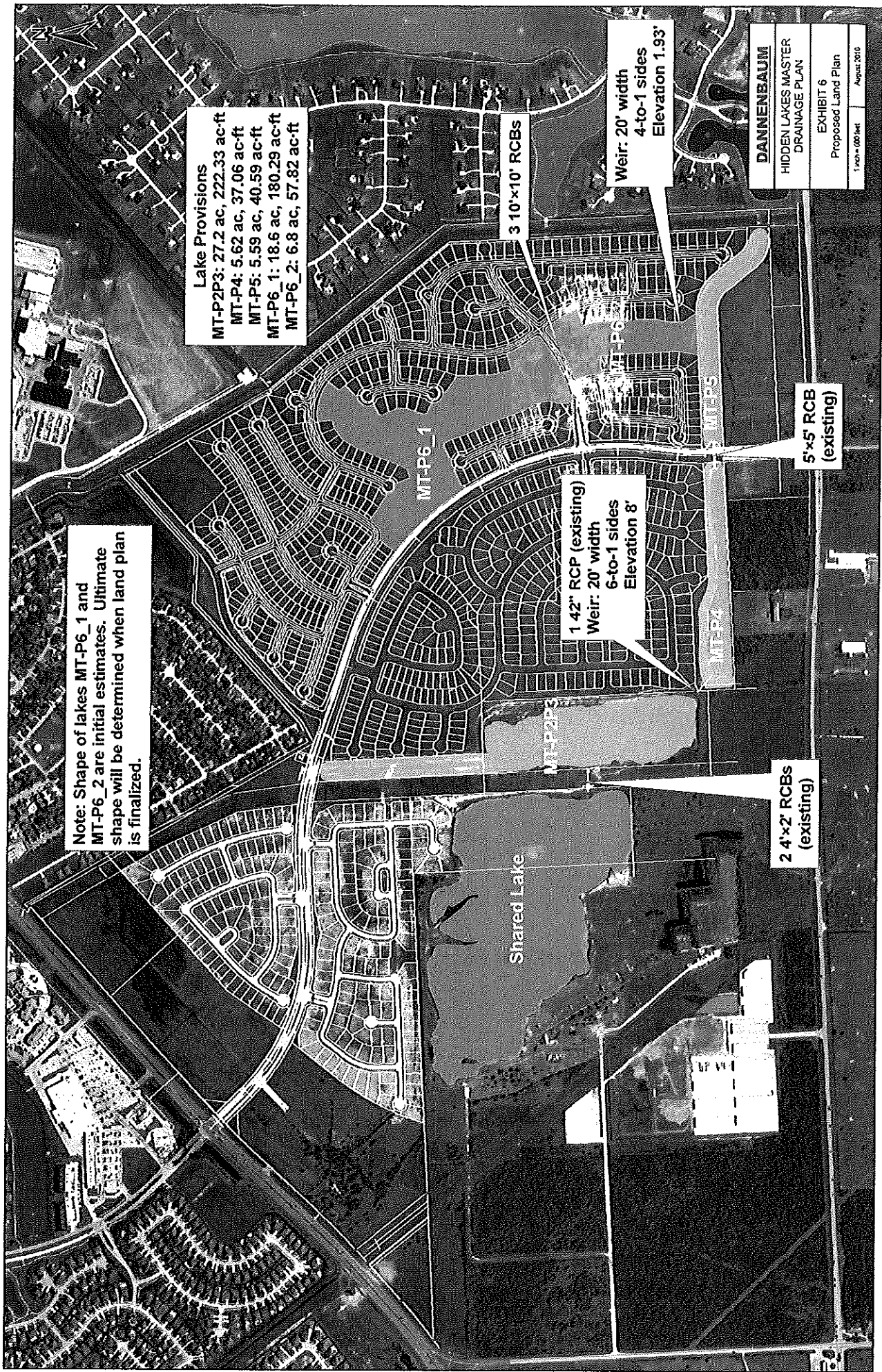
Weir: 20' width
4-to-1 sides
Elevation 1.93'

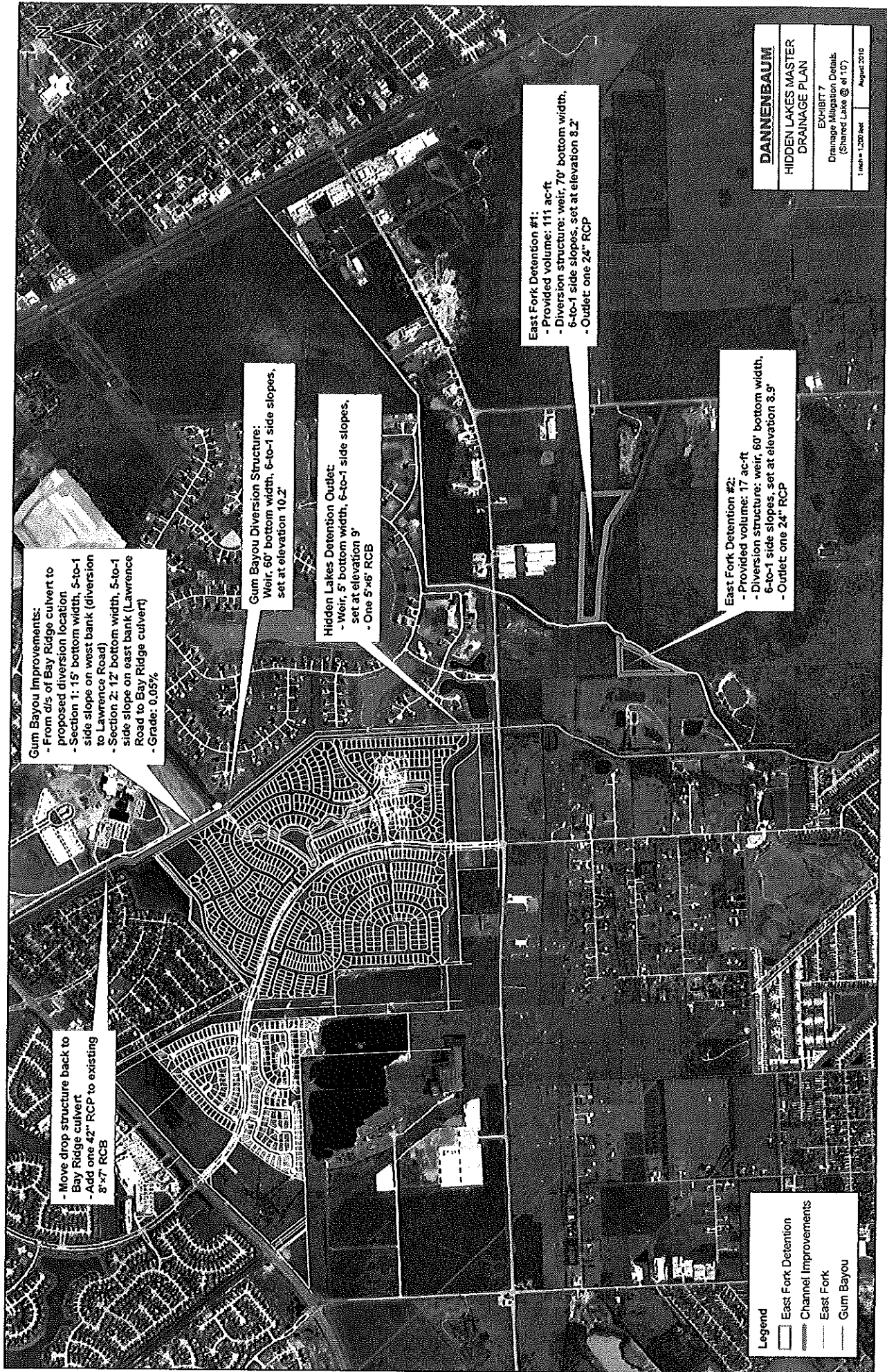
3 10"x10" RCBS

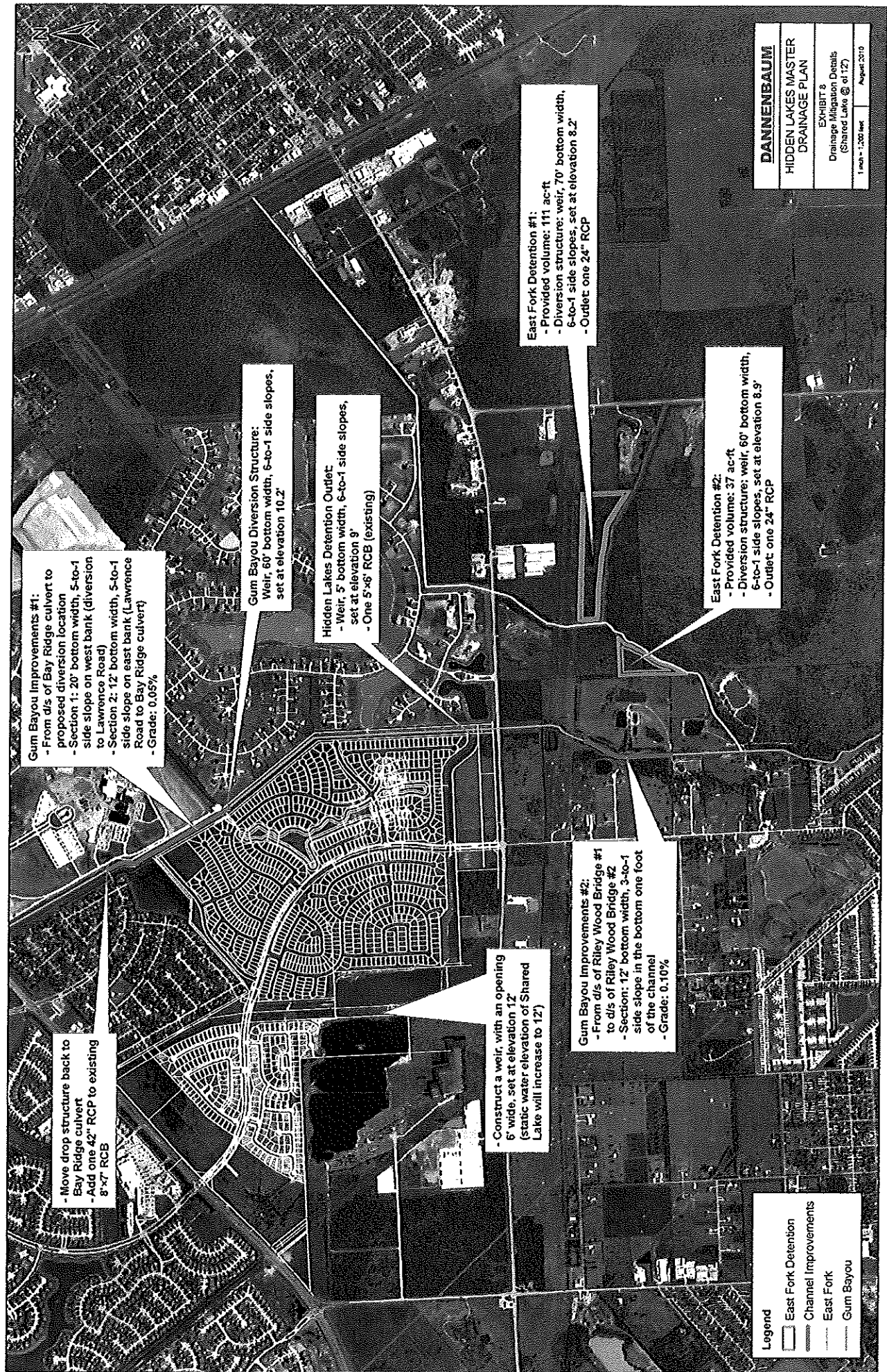
5'x5' RCB
(existing)

2 4'x2' RCBS
(existing)

DANNENBAUM
HIDDEN LAKES MASTER
DRAINAGE PLAN
EXHIBIT 6
Proposed Land Plan
1 inch = 500 feet August 2016







APPENDICE A



DANNENBAUM
HIDDEN LAKES MASTER
DRAINAGE PLAN
APPENDIX A.1
L, Lc3, Centroids
1 inch = 2,500 feet
July 2010



Legend
Centroids
Lc3
L
Basins



DANNENBAUM	
HIDDEN LAKES MASTER DRAINAGE PLAN	
APPENDIX A.2	
10-85 Lengths	
1 mile = 2,227 feet	July 2010

Legend	
—	10-85 Lengths
—	L
□	Basins



DANNENBAUM
HIDDEN LAKES MASTER
DRAINAGE PLAN
APPENDIX A.3
Defined, Improved Channels
1 inch = 2,500 feet
July 2010

Legend
— Imp Ch Length
— Def Ch Length
□ Basins



DANNENBAUM
HIDDEN LAKES MASTER
DRAINAGE PLAN
APPENDIX A.4
Existing Land Use
1 inch = 2500 feet
July 2010

Legend
Existing Land Use
Basins

APPENDIX A

$$E_{\text{eff}} = \frac{1}{2} \sum_{\mathbf{k}} \left(\frac{1}{m} \hbar^2 \mathbf{k}^2 + \frac{1}{2} \hbar \omega_{\text{ph}} \right) = \frac{1}{2} \sum_{\mathbf{k}} \left(\frac{1}{m} \hbar^2 \mathbf{k}^2 + \frac{1}{2} \hbar \omega_{\text{ph}} \right) = \frac{1}{2} \sum_{\mathbf{k}} \left(\frac{1}{m} \hbar^2 \mathbf{k}^2 + \frac{1}{2} \hbar \omega_{\text{ph}} \right)$$

APPENDIX A
Development Summary
 Gum Bayou - Galveston County

Subbasin	Area (mi ²)	Area (acres)	Development Area per Basin (acres)										Percent Impervious (%)	Percent Developed (%)		
			HD	U	GA	RS	RL	RR	T	WL	IC	Unknown			SCH	AIR
DA38A	1.310	838.60	0.00	290.00	0.00	479.00	0.00	29.10	40.50	0.00	0.00	0.00	0.00	0.00	27.4	61.9
DA38A 2	0.234	150.06	0.00	13.86	0.00	136.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.3	90.8
DA38A 3	0.276	176.35	19.04	13.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	143.34	0.00	41.7	51.4
MOODY1	0.359	230.07	0.00	230.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0
REFBAY	0.830	531.24	0.00	0.04	0.00	531.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.0	100.0
DA38B	0.829	530.96	0.00	17.98	0.00	512.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.6	96.6
MOODY2	0.553	354.14	0.00	289.14	0.00	0.00	0.00	0.00	0.00	65.00	0.00	0.00	0.00	0.00	18.4	0.0
DA38C	0.632	404.55	4.60	244.05	0.00	0.00	0.00	153.60	2.30	0.00	0.00	0.00	0.00	0.00	3.4	1.7
DA38D 1	0.442	283.05	0.00	40.53	0.00	242.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.3	85.7
DA38D 2	0.790	505.55	19.74	470.49	0.00	0.00	0.00	0.00	8.89	5.7	6.43	0.00	0.00	0.00	5.7	6.9
DA38E	1.347	862.20	35.04	805.94	0.00	0.00	0.00	0.00	14.55	0.00	6.67	0.00	0.00	0.00	5.4	6.5
DA38F	0.401	256.89	0.00	246.89	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.6	3.9
DA39	3.381	2163.67	47.31	1191.96	55.00	718.90	68.70	65.70	16.10	0.00	0.00	0.00	0.00	0.00	17.0	39.0
DA40	0.735	470.28	0.00	371.09	0.00	0.00	0.00	88.20	11.00	0.00	0.00	0.00	0.00	0.00	3.0	2.3

Appendix A
Gum Bayou HEC-HMS Output - 10-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DA38A	1.31	362.3	01Mar2010, 17:35	6.18
38A	1.31	362.3	01Mar2010, 17:35	6.18
R_38A	1.31	362.3	01Mar2010, 17:35	6.18
DA38A2	0.234	170.1	01Mar2010, 16:35	6.39
38A2	1.544	517.7	01Mar2010, 17:05	6.21
R_38A2	1.544	517.7	01Mar2010, 17:05	6.21
REFBAY	0.83	273.8	01Mar2010, 17:35	6.47
REFROU	0.83	273.8	01Mar2010, 18:50	6.47
DA38A3	0.276	169.1	01Mar2010, 16:40	6.51
GBN#1 US	2.65	889	01Mar2010, 18:10	6.32
MOODY1	0.359	154	01Mar2010, 17:15	5.54
GBN#1 DS	3.009	1035.2	01Mar2010, 18:10	6.23
R_GBN#1	3.009	1035.2	01Mar2010, 18:10	6.23
DA38B	0.829	280.8	01Mar2010, 17:35	6.44
MOODY2	0.553	257.3	01Mar2010, 17:10	5.97
GBN#2	4.391	1555.7	01Mar2010, 18:05	6.24
R_GBN#2	4.391	1555.7	01Mar2010, 18:05	6.24
DA38C	0.632	313.7	01Mar2010, 17:05	5.62
GBN#4 US	5.023	1846.3	01Mar2010, 18:00	6.16
DA38E	1.347	445.4	01Mar2010, 17:40	5.66
DA38D_2	0.79	247.3	01Mar2010, 17:40	5.67
DA38D_1	0.442	239.5	01Mar2010, 17:00	6.34
38D_1	0.442	239.5	01Mar2010, 17:00	6.34
R_38D_1	0.442	239.5	01Mar2010, 17:00	6.34
38D	1.232	481.8	01Mar2010, 17:20	5.91
R_38D	1.232	481.8	01Mar2010, 17:20	5.91
EASTFORK	2.579	924.5	01Mar2010, 17:30	5.78
GBN#4 DS	7.602	2756.8	01Mar2010, 17:55	6.03
R_GBN#4	7.602	2756.8	01Mar2010, 17:55	6.03
DA38F	0.401	148.6	01Mar2010, 17:25	5.57
GBN#5 US	8.003	2903.1	01Mar2010, 17:55	6.01
DA39	3.381	946.7	01Mar2010, 18:20	5.93
GBN#5 DS	11.384	3843	01Mar2010, 18:00	5.99
R_GBN#5	11.384	3843	01Mar2010, 18:00	5.99
DA40	0.735	326.9	01Mar2010, 17:05	5.61
GBN#6	12.119	4151.9	01Mar2010, 17:55	5.96

Appendix A
Gum Bayou HEC-HMS Output - 100-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DA38A	1.31	655.6	01Mar2010, 18:15	11.91
38A	1.31	655.6	01Mar2010, 18:15	11.91
R_38A	1.31	655.6	01Mar2010, 18:15	11.91
DA38A2	0.234	279.4	01Mar2010, 16:35	12.14
38A2	1.544	899.7	01Mar2010, 17:20	11.95
R_38A2	1.544	899.7	01Mar2010, 17:20	11.95
REFBAY	0.83	482.8	01Mar2010, 18:05	12.23
REFROU	0.83	482.8	01Mar2010, 19:20	12.23
DA38A3	0.276	281.2	01Mar2010, 16:40	12.28
GBN#1 US	2.65	1580.6	01Mar2010, 18:15	12.07
MOODY1	0.359	270.6	01Mar2010, 17:30	11.21
GBN#1 DS	3.009	1845.2	01Mar2010, 18:10	11.97
R_GBN#1	3.009	1845.2	01Mar2010, 18:10	11.97
DA38B	0.829	494.4	01Mar2010, 18:05	12.2
MOODY2	0.553	443.9	01Mar2010, 17:20	11.68
GBN#2	4.391	2770.4	01Mar2010, 18:10	11.97
R_GBN#2	4.391	2770.4	01Mar2010, 18:10	11.97
DA38C	0.632	541.9	01Mar2010, 17:10	11.3
GBN#4 US	5.023	3290.1	01Mar2010, 18:05	11.89
DA38E	1.347	804.2	01Mar2010, 18:05	11.35
DA38D_2	0.79	448.9	01Mar2010, 18:10	11.36
DA38D_1	0.442	404.2	01Mar2010, 17:05	12.09
38D_1	0.442	404.2	01Mar2010, 17:05	12.09
R_38D_1	0.442	404.2	01Mar2010, 17:05	12.09
38D	1.232	841.9	01Mar2010, 17:30	11.62
R_38D	1.232	841.9	01Mar2010, 17:30	11.62
EASTFORK	2.579	1641.3	01Mar2010, 17:50	11.48
GBN#4 DS	7.602	4926.6	01Mar2010, 18:05	11.75
R_GBN#4	7.602	4926.6	01Mar2010, 18:05	11.75
DA38F	0.401	265.3	01Mar2010, 17:45	11.25
GBN#5 US	8.003	5190.8	01Mar2010, 18:05	11.72
DA39	3.381	1726.2	01Mar2010, 18:50	11.64
GBN#5 DS	11.384	6889.1	01Mar2010, 18:10	11.7
R_GBN#5	11.384	6889.1	01Mar2010, 18:10	11.7
DA40	0.735	570.7	01Mar2010, 17:15	11.29
GBN#6	12.119	7444.2	01Mar2010, 18:05	11.68

HEC-RAS Profile: Max WS

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crt W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Cnt	Vel Total (ft/s)
East Fork	trib	535.4552	Max WS	GBex10	610.35	-1.25	8.22	8.22	8.25	0.000123	1.21	522.05	123.67	0.09	1.17
East Fork	trib	535.4552	Max WS	GBex100	926.87	-1.25	9.40	9.40	9.43	0.000139	1.47	684.47	180.76	0.10	1.35
East Fork	trib	540.4552	Max WS	GBex10	610.35	-1.25	8.23	8.23	8.25	0.000123	1.21	522.12	123.67	0.09	1.17
East Fork	trib	540.4552	Max WS	GBex100	926.98	-1.25	9.40	9.40	9.43	0.000139	1.47	684.59	180.76	0.10	1.35
East Fork	trib	774.9974	Max WS	GBex10	611.38	-1.79	8.25	8.25	8.30	0.000304	1.84	372.47	96.57	0.14	1.64
East Fork	trib	774.9974	Max WS	GBex100	930.18	-1.79	9.43	9.43	9.49	0.000353	2.18	529.06	225.81	0.16	1.76
East Fork	trib	1129.264	Max WS	GBex10	583.54	-1.57	8.35	8.35	8.40	0.000205	1.82	409.28	128.95	0.12	1.43
East Fork	trib	1129.264	Max WS	GBex100	890.41	-1.57	9.54	9.54	9.60	0.000232	2.15	584.20	175.53	0.13	1.52
East Fork	trib	1380.568	Max WS	GBex10	558.15	-1.94	8.41	8.41	8.46	0.000287	1.82	312.36	66.73	0.14	1.79
East Fork	trib	1380.568	Max WS	GBex100	849.06	-1.94	9.61	9.61	9.68	0.000350	2.22	417.83	152.91	0.15	2.03
East Fork	trib	1710.556	Max WS	GBex10	529.17	-1.04	8.53	8.53	8.60	0.000495	2.15	247.04	57.92	0.18	2.14
East Fork	trib	1710.556	Max WS	GBex100	801.34	-1.04	9.74	9.74	9.84	0.000531	2.52	329.85	82.51	0.19	2.43
East Fork	trib	1907.972	Max WS	GBex10	511.00	-1.51	8.63	8.63	8.67	0.000196	1.76	381.34	100.69	0.12	1.34
East Fork	trib	1907.972	Max WS	GBex100	759.51	-1.51	9.86	9.86	9.91	0.000217	2.07	540.21	240.69	0.13	1.42
East Fork	trib	2219.039	Max WS	GBex10	481.96	-0.96	8.72	8.72	8.80	0.000619	2.39	204.96	50.03	0.19	2.35
East Fork	trib	2219.039	Max WS	GBex100	716.81	-0.96	9.95	9.95	10.06	0.000647	2.71	299.71	122.06	0.20	2.39
East Fork	trib	2461.718	Max WS	GBex10	456.26	-0.82	8.87	8.87	8.94	0.000458	2.18	210.22	45.19	0.17	2.17
East Fork	trib	2461.718	Max WS	GBex100	568.81	-0.82	10.11	10.11	10.21	0.000471	2.51	285.59	305.22	0.18	2.34
East Fork	trib	2678.052	Max WS	GBex10	437.98	-0.71	8.98	8.98	9.05	0.000493	2.23	196.63	41.45	0.18	2.23
East Fork	trib	2678.052	Max WS	GBex100	635.15	-0.71	10.23	10.23	10.33	0.000532	2.55	256.01	276.16	0.19	2.48
East Fork	trib	2935.586	Max WS	GBex10	413.92	-0.21	9.12	9.12	9.22	0.000718	2.53	163.54	35.72	0.21	2.53
East Fork	trib	2935.586	Max WS	GBex100	591.80	-0.21	10.41	10.41	10.52	0.000866	2.70	229.49	284.94	0.23	2.58
East Fork	trib	3131.442	Max WS	GBex10	393.33	0.11	9.28	9.28	9.35	0.000545	2.19	179.61	41.26	0.18	2.19
East Fork	trib	3131.442	Max WS	GBex100	554.99	0.11	10.58	10.58	10.67	0.000490	2.34	245.82	444.71	0.18	2.26
East Fork	trib	3413.596	Max WS	GBex10	363.78	1.45	9.44	9.44	9.53	0.000606	2.28	159.21	36.71	0.19	2.28
East Fork	trib	3413.596	Max WS	GBex100	502.72	1.45	10.74	10.74	10.82	0.000489	2.35	235.95	315.25	0.18	2.13
East Fork	trib	3563.860	Max WS	GBex10	346.93	1.61	9.55	9.55	9.62	0.000514	2.10	165.20	38.74	0.18	2.10
East Fork	trib	3563.860	Max WS	GBex100	473.29	1.61	10.63	10.63	10.89	0.000391	2.03	294.29	487.61	0.16	1.61
East Fork	trib	3796.660	Max WS	GBex10	319.47	2.04	9.68	9.68	9.74	0.000459	1.96	162.93	39.16	0.17	1.96
East Fork	trib	3796.660	Max WS	GBex100	425.51	2.04	10.93	10.93	10.99	0.000393	1.97	220.39	941.57	0.16	1.93
East Fork	trib	4172.662	Max WS	GBex10	279.24	2.57	9.86	9.86	9.99	0.000287	1.55	180.09	44.08	0.14	1.55
East Fork	trib	4172.662	Max WS	GBex100	356.04	2.57	11.09	11.09	11.12	0.000212	1.49	245.11	666.16	0.12	1.45

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Crl	Vel Total (ft/s)
East Fork	trib	4553.236	Max WS	GBex10	240.51	2.81	9.98		10.02	0.000308	1.62	148.88	61.70	0.14	1.62
East Fork	trib	4553.236	Max WS	GBex100	289.39	2.81	11.18		11.21	0.000197	1.50	195.82	292.91	0.12	1.48
East Fork	trib	4609.199	Max WS	GBex10	235.59	3.02	10.01		10.03	0.000148	1.19	197.79	100.11	0.10	1.19
East Fork	trib	4609.199	Max WS	GBex100	281.35	3.02	11.20		11.22	0.000108	1.12	252.16	279.19	0.09	1.12
East Fork	trib	4663.943		Bridge											
East Fork	trib	4718.687	Max WS	GBex10	235.84	2.01	10.03	5.64	10.06	0.000274	1.43	164.73	56.44	0.13	1.43
East Fork	trib	4718.687	Max WS	GBex100	281.96	2.01	11.23	5.91	11.26	0.000174	1.28	220.90	202.50	0.11	1.28
East Fork	trib	4830.163	Max WS	GBex10	232.26	2.74	10.06		10.10	0.000361	1.65	140.75	36.53	0.15	1.65
East Fork	trib	4830.163	Max WS	GBex100	275.76	2.74	11.25		11.28	0.000218	1.47	197.30	106.96	0.12	1.40
East Fork	trib	5612.320	Max WS	GBex10	210.72	4.79	10.32		10.35	0.000260	1.34	157.50	48.52	0.13	1.34
East Fork	trib	5612.320	Max WS	GBex100	245.83	4.79	11.41		11.43	0.000150	1.14	237.26	109.54	0.10	1.04
East Fork	trib	6569.710	Max WS	GBex10	195.74	5.79	10.68		10.72	0.000506	1.76	117.75	49.42	0.17	1.66
East Fork	trib	6569.710	Max WS	GBex100	229.56	5.79	11.61		11.65	0.000292	1.51	175.28	82.57	0.13	1.31
East Fork	trib	6730.530	Max WS	GBex10	193.49	5.78	10.76		10.80	0.000405	1.59	139.34	64.48	0.15	1.39
East Fork	trib	6730.530	Max WS	GBex100	231.08	5.78	11.67		11.69	0.000229	1.35	239.70	280.03	0.12	0.96
East Fork	trib	7010.956	Max WS	GBex10	188.65	5.77	10.88		10.91	0.000371	1.55	134.40	55.33	0.15	1.40
East Fork	trib	7010.956	Max WS	GBex100	227.32	5.77	11.73		11.76	0.000241	1.39	206.57	146.75	0.12	1.10
East Fork	trib	7186.773	Max WS	GBex10	185.41	5.76	10.94		10.98	0.000356	1.53	130.91	55.05	0.15	1.42
East Fork	trib	7186.773	Max WS	GBex100	225.25	5.76	11.78		11.80	0.000235	1.38	202.85	147.32	0.12	1.11
East Fork	trib	7575.182	Max WS	GBex10	179.36	5.75	11.08		11.11	0.000287	1.36	145.49	77.98	0.13	1.23
East Fork	trib	7575.182	Max WS	GBex100	221.40	5.75	11.86		11.88	0.000150	1.14	321.63	358.53	0.10	0.69
East Fork	trib	7815.951	Max WS	GBex10	175.24	5.74	11.14		11.15	0.000096	0.80	441.98	500.31	0.08	0.40
East Fork	trib	7815.951	Max WS	GBex100	217.06	5.74	11.89		11.89	0.000029	0.50	868.56	614.75	0.04	0.25
East Fork	trib	8045.906	Max WS	GBex10	170.20	5.73	11.17		11.18	0.000137	0.96	295.50	382.91	0.09	0.57
East Fork	trib	8045.906	Max WS	GBex100	209.88	5.73	11.90		11.91	0.000051	0.67	637.74	573.51	0.06	0.33
East Fork	trib	8154.852	Max WS	GBex10	167.97	6.06	11.18		11.20	0.000196	1.15	247.02	414.84	0.11	0.68
East Fork	trib	8154.852	Max WS	GBex100	209.01	6.06	11.91		11.91	0.000060	0.72	622.66	562.89	0.06	0.34
East Fork	trib	8365.465	Max WS	GBex10	163.58	5.51	11.21		11.22	0.000060	0.64	546.65	810.34	0.06	0.30
East Fork	trib	8365.465	Max WS	GBex100	203.19	5.51	11.92		11.92	0.000016	0.38	1390.26	1665.43	0.03	0.15
East Fork	trib	8573.797	Max WS	GBex10	159.08	5.42	11.23		11.24	0.000108	0.84	432.35	868.23	0.06	0.37
East Fork	trib	8573.797	Max WS	GBex100	197.52	5.42	11.92		11.92	0.000020	0.39	1338.81	1824.46	0.04	0.15
East Fork	trib	8761.822	Max WS	GBex10	155.23	5.53	11.25		11.26	0.000094	0.79	598.23	1989.73	0.08	0.28

HEC-RAS Profile: Max WS (Continued)

River	Reach	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Cntl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Crl	Vel Total (ft/s)
East Fork	trib	Max WS	GBex100	191.99	5.53	11.92		11.92	0.000008	0.26	2159.85	2480.07	0.02	0.09
East Fork	trib	Max WS	GBex10	150.82	5.68	11.26		11.27	0.000039	0.50	931.68	2896.24	0.05	0.16
East Fork	trib	Max WS	GBex100	185.34	5.68	11.93		11.93	0.000004	0.17	3380.43	4014.30	0.02	0.05
East Fork	trib	Max WS	GBex10	146.27	5.87	11.27		11.27	0.000041	0.51	929.43	2749.81	0.05	0.16
East Fork	trib	Max WS	GBex100	178.53	5.87	11.93		11.93	0.000003	0.16	3394.78	4238.11	0.01	0.05
East Fork	trib	Max WS	GBex10	141.60	5.76	11.28		11.28	0.000035	0.49	1024.81	3210.05	0.05	0.14
East Fork	trib	Max WS	GBex100	171.74	5.76	11.93		11.93	0.000003	0.15	3956.16	5297.39	0.01	0.04
East Fork	trib	Max WS	GBex10	137.15	6.24	11.29		11.29	0.000030	0.45	1032.03	2794.15	0.04	0.13
East Fork	trib	Max WS	GBex100	165.20	6.24	11.93		11.93	0.000003	0.15	3655.18	5114.21	0.01	0.05
East Fork	trib	Max WS	GBex10	132.60	6.07	11.29		11.29	0.000037	0.50	866.80	1351.89	0.05	0.20
East Fork	trib	Max WS	GBex100	158.52	6.07	11.93		11.93	0.000005	0.21	2737.44	4872.54	0.02	0.06
East Fork	trib	Max WS	GBex10	127.99	6.10	11.30		11.30	0.000054	0.60	593.25	1511.19	0.06	0.22
East Fork	trib	Max WS	GBex100	151.71	6.10	11.93		11.93	0.000006	0.22	2514.41	4904.50	0.02	0.06
East Fork	trib	Max WS	GBex10	123.46	6.60	11.31		11.32	0.000075	0.63	542.98	1603.86	0.07	0.23
East Fork	trib	Max WS	GBex100	144.94	6.60	11.93		11.93	0.000005	0.19	2676.74	5195.79	0.02	0.05
East Fork	trib	Max WS	GBex10	118.83	6.53	11.32		11.32	0.000026	0.38	951.50	2554.93	0.04	0.12
East Fork	trib	Max WS	GBex100	137.97	6.53	11.93		11.93	0.000002	0.13	3807.90	6045.09	0.01	0.04
East Fork	trib	Max WS	GBex10	114.30	6.36	11.33		11.33	0.000014	0.29	1343.87	3434.36	0.03	0.09
East Fork	trib	Max WS	GBex100	131.36	6.36	11.93		11.93	0.000001	0.10	4406.65	6667.46	0.01	0.03
East Fork	trib	Max WS	GBex10	109.74	6.50	11.33		11.33	0.000006	0.18	2139.61	4743.37	0.02	0.05
East Fork	trib	Max WS	GBex100	124.63	6.50	11.93		11.93	0.000001	0.06	5940.26	7213.26	0.01	0.02
East Fork	trib	Max WS	GBex10	104.99	6.60	11.33		11.33	0.000004	0.15	2327.72	4611.42	0.01	0.05
East Fork	trib	Max WS	GBex100	117.76	6.60	11.93		11.93	0.000000	0.06	6108.65	7928.10	0.01	0.02
East Fork	trib	Max WS	GBex10	101.39	6.71	11.33		11.33	0.000005	0.16	2033.15	4107.44	0.02	0.05
East Fork	trib	Max WS	GBex100	112.23	6.71	11.93		11.93	0.000001	0.06	4987.76	5820.86	0.01	0.02
East Fork	trib	Max WS	GBex10	95.88	6.83	11.33		11.33	0.000007	0.19	1554.32	2987.12	0.02	0.06
East Fork	trib	Max WS	GBex100	103.81	6.83	11.93		11.93	0.000001	0.07	3771.15	4094.53	0.01	0.03
East Fork	trib	Max WS	GBex10	90.41	6.89	11.34		11.34	0.000014	0.27	1172.79	3227.55	0.03	0.08
East Fork	trib	Max WS	GBex100	94.80	6.89	11.93		11.93	0.000001	0.08	3524.43	4423.20	0.01	0.03
East Fork	trib	Max WS	GBex10	92.17	7.12	11.34		11.34	0.000022	0.33	1008.91	2811.71	0.04	0.09
East Fork	trib	Max WS	GBex100	94.90	7.12	11.93		11.93	0.000001	0.09	3134.30	4320.78	0.01	0.03
Gum Bayou	Lower	Max WS	GBex10	3047.53	-7.92	2.89	-1.62	3.33	0.000600	5.61	742.46	363.56	0.34	4.10

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev. (ft)	Crit W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
Gum Bayou	Lower	504.8711	Max WS	GBex100	4932.87	-7.92	4.18	0.44	4.62	0.000601	6.18	1322.33	512.20	0.35	3.73
Gum Bayou	Lower	2161.939	Max WS	GBex10	3047.61	-7.92	3.82		3.95	0.000232	2.90	1121.85	275.25	0.24	2.72
Gum Bayou	Lower	2161.939	Max WS	GBex100	4932.98	-7.92	5.09		5.27	0.000290	3.55	1473.62	281.86	0.26	3.35
Gum Bayou	Lower	2372.100	Max WS	GBex10	3036.96	-5.82	3.71		4.09	0.000915	4.91	618.07	267.59	0.46	4.91
Gum Bayou	Lower	2372.100	Max WS	GBex100	4913.86	-5.82	4.90		5.46	0.001224	5.96	824.11	277.27	0.48	5.96
Gum Bayou	Lower	2434.526		Bridge											
Gum Bayou	Lower	2452.965	Max WS	GBex10	3037.05	-8.10	3.71	2.79	4.27	0.001805	6.00	506.18	242.67	0.60	6.00
Gum Bayou	Lower	2452.965	Max WS	GBex100	4913.95	-8.10	4.94	3.62	5.68	0.002124	6.92	709.99	255.38	0.59	6.92
Gum Bayou	Lower	2995.046	Max WS	GBex10	3004.91	-2.60	4.64		4.78	0.000331	3.11	1178.95	355.79	0.25	2.55
Gum Bayou	Lower	2995.046	Max WS	GBex100	4855.14	-2.60	6.07		6.25	0.000328	3.68	1735.34	418.57	0.26	2.80
Gum Bayou	Lower	4057.931	Max WS	GBex10	2942.60	-5.70	4.97		5.07	0.000229	2.84	1405.16	404.95	0.21	2.09
Gum Bayou	Lower	4057.931	Max WS	GBex100	4742.82	-5.70	6.41		6.55	0.000244	3.41	2031.68	501.26	0.23	2.33
Gum Bayou	Lower	5412.954	Max WS	GBex10	2859.33	-6.10	5.32		5.51	0.000369	3.87	985.37	264.04	0.27	2.90
Gum Bayou	Lower	5412.954	Max WS	GBex100	4593.13	-6.10	6.78		7.02	0.000368	4.54	1412.57	325.71	0.29	3.25
Gum Bayou	Lower	6445.483	Max WS	GBex10	2798.94	-6.20	5.69		5.03	0.000574	5.05	797.35	210.10	0.35	3.51
Gum Bayou	Lower	6445.483	Max WS	GBex100	4485.07	-6.20	7.16		7.64	0.000671	6.16	1130.66	244.77	0.38	3.97
Gum Bayou	Lower	6912.951	Max WS	GBex10	1887.41	-6.20	6.16		6.29	0.000227	3.04	873.13	235.25	0.22	2.16
Gum Bayou	Lower	6912.951	Max WS	GBex100	2811.10	-6.20	7.76		7.90	0.000213	3.35	1379.73	366.99	0.22	2.04
Gum Bayou	Lower	7407.249	Max WS	GBex10	1866.66	-6.20	5.24		6.50	0.000458	4.34	626.92	217.13	0.31	2.98
Gum Bayou	Lower	7407.249	Max WS	GBex100	2775.06	-6.20	7.83		8.11	0.000414	4.67	1048.25	318.57	0.30	2.65
Gum Bayou	Lower	7790.170	Max WS	GBex10	1854.79	-3.80	6.47		6.60	0.000221	3.24	739.01	214.81	0.21	2.51
Gum Bayou	Lower	7790.170	Max WS	GBex100	2758.61	-3.80	8.05		8.19	0.000202	3.53	1173.25	337.59	0.21	2.35
Gum Bayou	Lower	8218.802	Max WS	GBex10	1833.73	-3.60	6.44		6.89	0.000668	5.56	528.92	177.62	0.37	3.47
Gum Bayou	Lower	8218.802	Max WS	GBex100	2719.66	-3.60	8.02		8.52	0.000650	6.17	893.21	343.87	0.37	3.04
Gum Bayou	Lower	8648.945	Max WS	GBex10	1829.07	-3.40	7.11		7.27	0.001646	3.21	570.07	180.67	0.32	3.21
Gum Bayou	Lower	8648.945	Max WS	GBex100	2723.68	-3.40	8.60		8.73	0.001002	3.00	1017.24	433.46	0.26	2.68
Gum Bayou	Lower	8655.526		Bridge											
Gum Bayou	Lower	8661.260	Max WS	GBex10	1832.17	-3.40	7.47	3.89	7.61	0.001358	2.96	632.66	239.90	0.29	2.90
Gum Bayou	Lower	8661.260	Max WS	GBex100	2737.84	-3.40	8.70	5.24	8.83	0.000918	3.03	1043.88	414.87	0.25	2.62
Gum Bayou	Lower	9189.580	Max WS	GBex10	1812.30	-4.40	8.03		8.13	0.000621	2.95	827.76	201.76	0.23	2.19
Gum Bayou	Lower	9189.580	Max WS	GBex100	2737.27	-4.40	9.16		9.30	0.000772	3.45	1133.05	466.02	0.26	2.42

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Mfn Ch El (ft)	W.S. Elev (ft)	Crt W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Cntl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Ctl	Vel Total (ft/s)
Gum Bayou	Lower	9518.148	Max WS	GBext10	1798.76	-1.93	8.23		8.25	0.000233	1.67	1629.81	671.96	0.13	1.10
Gum Bayou	Lower	9518.148	Max WS	GBext100	2720.67	-1.93	9.40		9.42	0.000223	1.81	2937.52	1448.07	0.13	0.93
Gum Bayou	Lower	9528.148	Max WS	GBext10	1798.32	-1.93	8.23		8.26	0.000233	1.66	1631.42	672.76	0.13	1.10
Gum Bayou	Lower	9528.148	Max WS	GBext100	2715.95	-1.93	9.40		9.43	0.000223	1.81	2940.82	1449.04	0.13	0.92
Gum Bayou	Lower	9542.525		Culvert											
Gum Bayou	Lower	9558.148	Max WS	GBext10	1798.27	-1.93	8.22		8.26	0.000306	1.91	1409.48	590.72	0.15	1.28
Gum Bayou	Lower	9558.148	Max WS	GBext100	2719.86	-1.93	9.39		9.43	0.000318	2.16	2507.73	1559.88	0.16	1.08
Gum Bayou	Lower	9568.148	Max WS	GBext10	1798.27	-1.93	8.22		8.26	0.000299	1.89	1411.57	592.37	0.15	1.27
Gum Bayou	Lower	9568.148	Max WS	GBext100	2715.95	-1.93	9.40		9.43	0.000281	2.03	2516.01	1567.87	0.15	1.08
Gum Bayou	Upper	10598.35	Max WS	GBext10	1187.92	-1.36	8.22		8.62	0.001967	5.08	243.94	63.00	0.34	4.87
Gum Bayou	Upper	10598.35	Max WS	GBext100	1793.08	-1.36	9.40		9.93	0.002487	6.06	398.75	203.62	0.39	4.50
Gum Bayou	Upper	10608.35	Max WS	GBext10	1188.42	-1.36	8.25		8.64	0.001953	5.07	245.39	65.48	0.34	4.85
Gum Bayou	Upper	10608.35	Max WS	GBext100	1798.17	-1.36	9.43		9.95	0.002464	6.02	403.78	207.59	0.39	4.43
Gum Bayou	Upper	10617.53		Bridge											
Gum Bayou	Upper	10626.34	Max WS	GBext10	1211.57	-1.35	8.77	4.42	8.98	0.001031	3.74	325.19	393.52	0.27	3.73
Gum Bayou	Upper	10626.34	Max WS	GBext100	1881.47	-1.35	9.81	5.51	10.27	0.001428	4.84	390.87	855.04	0.32	4.81
Gum Bayou	Upper	11889.33	Max WS	GBext10	1147.30	-0.55	10.04		10.20	0.000851	3.22	395.06	158.66	0.25	2.90
Gum Bayou	Upper	11889.33	Max WS	GBext100	1792.07	-0.55	11.34		11.46	0.000629	3.20	1111.58	1762.14	0.22	1.61
Gum Bayou	Upper	11909.2		Bridge											
Gum Bayou	Upper	11930.16	Max WS	GBext10	1148.90	-0.55	10.21	6.27	10.36	0.000763	3.11	429.87	236.49	0.23	2.68
Gum Bayou	Upper	11930.16	Max WS	GBext100	1792.13	-0.55	11.41	7.31	11.51	0.000554	3.05	1236.90	1889.35	0.21	1.45
Gum Bayou	Upper	12111.49	Max WS	GBext10	1139.81	-0.55	10.38		10.46	0.000467	2.48	692.91	412.01	0.18	1.64
Gum Bayou	Upper	12111.49	Max WS	GBext100	1777.86	-0.55	11.52		11.57	0.000320	2.32	1509.01	1915.94	0.16	1.10
Gum Bayou	Upper	12671.33	Max WS	GBext10	1102.51	-0.19	10.61		10.68	0.000267	2.12	604.04	473.21	0.14	1.83
Gum Bayou	Upper	12671.33	Max WS	GBext100	1727.85	-0.19	11.69		11.78	0.000331	2.60	922.29	2384.74	0.16	1.87
Gum Bayou	Upper	13089.39	Max WS	GBext10	1078.37	-0.11	10.74		10.82	0.000429	2.38	452.60	526.11	0.18	2.38
Gum Bayou	Upper	13089.39	Max WS	GBext100	1695.42	-0.11	11.84		11.99	0.000614	3.09	563.56	2135.84	0.22	3.01
Gum Bayou	Upper	13139.39	Max WS	GBext10	1075.64	0.03	10.76		10.84	0.000385	2.29	468.80	380.77	0.17	2.29
Gum Bayou	Upper	13139.39	Max WS	GBext100	1691.55	0.03	11.88		12.02	0.000520	2.99	587.59	2200.75	0.20	2.88
Gum Bayou	Upper	13229.52		Bridge											
Gum Bayou	Upper	13282.81	Max WS	GBext10	1076.63	-0.65	10.87	4.51	10.94	0.000401	2.17	500.52	2200.00	0.17	2.15

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
Gum Bayou	Upper	13282.81	Max WS	GBex100	1691.55	-0.65	12.04	5.67	12.16	0.000526	2.74	638.38	3901.27	0.20	2.65
Gum Bayou	Upper	13315.93	Max WS	GBex10	1075.62	-0.29	10.86		10.95	0.000457	2.45	442.35	334.71	0.18	2.43
Gum Bayou	Upper	13315.93	Max WS	GBex100	1690.18	-0.29	12.03		12.18	0.000587	3.06	583.52	1753.85	0.21	2.90
Gum Bayou	Upper	13456.74	Max WS	GBex10	1072.77	-0.88	10.94		11.00	0.000252	1.96	574.17	1749.05	0.14	1.87
Gum Bayou	Upper	13456.74	Max WS	GBex100	1685.32	-0.88	12.14		12.22	0.000292	2.37	668.16	3431.09	0.15	1.94
Gum Bayou	Upper	13580.25	Max WS	GBex10	1068.95	-0.77	10.99		11.03	0.000208	1.73	828.89	2072.06	0.12	1.29
Gum Bayou	Upper	13580.25	Max WS	GBex100	1679.60	-0.77	12.21		12.25	0.000194	1.90	1295.09	3614.43	0.12	1.30
Gum Bayou	Upper	14565.57	Max WS	GBex10	1040.15	0.16	11.26		11.35	0.000412	2.51	546.51	1716.71	0.17	1.90
Gum Bayou	Upper	14565.57	Max WS	GBex100	1643.17	0.16	12.44		12.48	0.000231	2.11	1966.83	5939.41	0.13	0.84
Gum Bayou	Upper	14600.39	Max WS	GBex10	1039.19	0.20	11.28		11.36	0.000401	2.39	587.94	1682.92	0.17	1.77
Gum Bayou	Upper	14600.39	Max WS	GBex100	1641.95	0.20	12.45		12.51	0.000305	2.34	1694.46	5808.38	0.15	0.97
Gum Bayou	Upper	15073.13	Max WS	GBex10	1026.23	0.64	11.46		11.52	0.000291	2.01	674.89	3445.77	0.15	1.52
Gum Bayou	Upper	15073.13	Max WS	GBex100	1638.35	0.64	12.59		12.64	0.000263	2.14	1765.49	6145.23	0.14	0.93
Gum Bayou	Upper	15216.53	Max WS	GBex10	825.57	0.92	11.53		11.56	0.000172	1.56	710.61	3377.62	0.11	1.16
Gum Bayou	Upper	15216.53	Max WS	GBex100	1322.37	0.92	12.64		12.67	0.000141	1.58	2152.07	6441.50	0.11	0.61
Gum Bayou	Upper	15845.97	Max WS	GBex10	808.35	1.01	11.65		11.68	0.000200	1.55	843.08	3746.17	0.12	0.96
Gum Bayou	Upper	15845.97	Max WS	GBex100	1300.11	1.01	12.72		12.73	0.000081	1.08	3245.83	5742.75	0.08	0.40
Gum Bayou	Upper	16699.70	Max WS	GBex10	802.12	1.42	11.84		11.88	0.000248	1.77	782.87	1459.99	0.13	1.02
Gum Bayou	Upper	16699.70	Max WS	GBex100	1274.37	1.42	12.80		12.81	0.000110	1.30	2853.73	3162.56	0.09	0.45
Gum Bayou	Upper	17549.89	Max WS	GBex10	825.09	1.83	12.10		12.13	0.000337	1.85	1148.37	1980.94	0.15	0.72
Gum Bayou	Upper	17549.89	Max WS	GBex100	1259.01	1.83	12.90		12.90	0.000109	1.17	3075.95	2682.79	0.09	0.41
Gum Bayou	Upper	17805.33	Max WS	GBex10	399.12	1.95	12.17		12.17	0.000058	0.78	1383.76	2319.77	0.06	0.29
Gum Bayou	Upper	17805.33	Max WS	GBex100	633.77	1.95	12.92		12.92	0.000020	0.50	3961.63	4503.27	0.04	0.16
Gum Bayou	Upper	18222.95	Max WS	GBex10	399.99	2.15	12.18		12.19	0.000063	0.84	1211.91	1982.11	0.07	0.33
Gum Bayou	Upper	18222.95	Max WS	GBex100	633.86	2.15	12.92		12.92	0.000028	0.55	3539.33	3742.98	0.04	0.19
Gum Bayou	Upper	18658.74	Max WS	GBex10	402.56	2.37	12.21		12.21	0.000095	0.90	1131.59	1886.45	0.08	0.36
Gum Bayou	Upper	18658.74	Max WS	GBex100	634.00	2.37	12.93		12.93	0.000036	0.62	2823.95	2589.53	0.05	0.22
Gum Bayou	Upper	18658.74	Max WS	GBex10	402.70	2.37	12.21		12.21	0.000095	0.90	1133.36	1887.85	0.08	0.36
Gum Bayou	Upper	18658.74	Max WS	GBex100	634.05	2.37	12.93		12.93	0.000036	0.62	2824.86	2589.69	0.05	0.22
Gum Bayou	Upper	18769.25	Max WS	GBex10	403.66	2.42	12.22		12.25	0.000270	1.45	360.14	570.66	0.16	1.12
Gum Bayou	Upper	18769.25	Max WS	GBex100	634.31	2.42	12.94		12.96	0.000189	1.28	893.38	894.93	0.13	0.71
Gum Bayou	Upper	19152.51	Max WS	GBex10	338.22	2.60	12.32		12.35	0.000200	1.32	260.60	84.54	0.11	1.30

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta.	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Cnl	Vel Total (ft/s)
Gum Bayou	Upper	19152.51	Max WS	GBex100	562.72	2.60	13.02		13.07	0.000318	1.85	332.26	122.09	0.15	1.69
Gum Bayou	Upper	19162.52	Max WS	GBex10	338.22	4.96	12.32		12.35	0.000293	1.48	253.99	131.29	0.14	1.33
Gum Bayou	Upper	19162.52	Max WS	GBex100	562.72	4.96	13.03		13.08	0.000378	1.89	360.23	165.88	0.16	1.56
Gum Bayou	Upper	19385.99	Max WS	GBex10	338.73	6.28	12.38		12.41	0.000148	1.17	312.84	129.69	0.10	1.08
Gum Bayou	Upper	19385.99	Max WS	GBex100	562.73	6.28	13.12		13.15	0.000210	1.55	429.63	164.28	0.12	1.31
Gum Bayou	Upper	19441.26	Max WS	GBex10	338.53	5.24	12.35		12.44	0.000736	2.37	147.44	99.19	0.22	2.30
Gum Bayou	Upper	19441.26	Max WS	GBex100	562.72	5.24	13.07		13.22	0.001064	3.14	212.12	149.49	0.27	2.55
Gum Bayou	Upper	19477.05		Culvert											
Gum Bayou	Upper	19516.24	Max WS	GBex10	339.62	5.32	13.12		13.23	0.000847	2.81	150.07	117.28	0.23	2.26
Gum Bayou	Upper	19516.24	Max WS	GBex100	563.32	5.32	14.45		14.55	0.000639	2.91	300.92	149.19	0.21	1.87
Gum Bayou	Upper	19567.14	Max WS	GBex10	339.67	4.61	13.21		13.22	0.000102	0.97	388.91	160.47	0.08	0.87
Gum Bayou	Upper	19567.14	Max WS	GBex100	563.32	4.61	14.54		14.56	0.000093	1.11	605.96	165.94	0.08	0.93
Gum Bayou	Upper	20567.15	Max WS	GBex10	339.78	7.26	13.31		13.32	0.000092	0.95	470.66	239.77	0.08	0.72
Gum Bayou	Upper	20567.15	Max WS	GBex100	563.43	7.26	14.62		14.63	0.000050	0.83	1616.42	2255.71	0.06	0.35
Gum Bayou	Upper	21412.43	Max WS	GBex10	340.58	7.22	13.41		13.41	0.000123	0.87	880.84	1359.90	0.09	0.39
Gum Bayou	Upper	21412.43	Max WS	GBex100	564.96	7.22	14.66		14.66	0.000018	0.39	2937.27	1782.33	0.03	0.19

Appendix A
Dickinson Bayou HEC-HMS Output - 10-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB100d	0.4255	93.4	01Jan2008, 18:20	6.08
DB117a	0.4019	65.7	01Jan2008, 19:10	5.36
DB100e	0.3817	54.3	01Jan2008, 19:10	5.5
DB116a	1.0145	146.9	01Jan2008, 19:30	5.25
DB115a	0.7371	95.2	01Jan2008, 19:40	5.15
DB100f	0.4351	64.9	01Jan2008, 19:10	5.56
DB100g	0.4314	99.1	01Jan2008, 18:30	5.96
BG100a	0.2239	249.4	01Jan2008, 16:40	6.36
DB100h2	0.7813	69.1	01Jan2008, 20:30	4.59
DB110a	0.7918	110.4	01Jan2008, 19:40	5.54
DB100h1	1.046	135.2	01Jan2008, 20:00	5.51
DB100i	1.1485	53.1	02Jan2008, 00:00	3.08
DB100j	0.8411	109.4	01Jan2008, 19:30	5.19
DB101a	0.26	46.1	01Jan2008, 18:40	5.53
DB100k	0.8664	44.2	02Jan2008, 00:10	3.36
DB107a	0.3073	58.8	01Jan2008, 18:30	5.46
DB100l	0.2722	45.6	01Jan2008, 19:10	5.38
DB100m	0.4097	42.3	01Jan2008, 20:10	5.13
DB106a	0.5802	93.4	01Jan2008, 19:00	5.35
DB100n	0.4055	58.4	01Jan2008, 19:20	5.24
DB100o	1.0802	133.3	01Jan2008, 19:30	5.05
DB100p	1.1671	150.3	01Jan2008, 19:50	5.1
DB100v	0.3414	71	01Jan2008, 18:30	5.5
DB100q	1.5445	201.4	01Jan2008, 19:50	5.16
DB100r	1.0674	147.4	01Jan2008, 19:20	5.37
DB100s	0.5783	79.6	01Jan2008, 19:20	5.19
J100z	0.5783	79.6	01Jan2008, 19:20	5.19
R100z	0.5783	74.9	02Jan2008, 06:20	5.12
DB100t	0.2557	57.5	01Jan2008, 18:00	5.52
J100ab	0.2557	57.5	01Jan2008, 18:00	5.52
R100ab	0.2557	49.1	02Jan2008, 03:20	5.47
J100y	1.9014	231.7	02Jan2008, 03:00	5.31
R100y	1.9014	231.5	02Jan2008, 04:10	5.3
DB100x	0.1482	37.6	01Jan2008, 17:40	5.54
J100aa	0.1482	37.6	01Jan2008, 17:40	5.54
R100aa	0.1482	27.4	02Jan2008, 05:30	5.54
J100x	2.0496	258.7	02Jan2008, 04:20	5.31
R100x	2.0496	258.1	02Jan2008, 05:40	5.27
DB100y	0.3291	81.7	01Jan2008, 18:00	6.19
J100ac	0.3291	81.7	01Jan2008, 18:00	6.19
R100ac	0.3291	80.5	01Jan2008, 21:00	6.17
J100w	3.9232	483.6	01Jan2008, 23:00	5.3
R100w	3.9232	483.6	01Jan2008, 23:00	5.3
DB100w	1.1203	92.5	01Jan2008, 20:30	4.42

Appendix A
Dickinson Bayou HEC-HMS Output - 10-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
J100ad	1.1203	92.5	01Jan2008, 20:30	4.42
R100ad	1.1203	91.5	02Jan2008, 01:00	4.21
J100v	5.3849	630.2	01Jan2008, 23:20	5.08
R100v	5.3849	618.7	02Jan2008, 03:40	5.04
DB101g	1.3033	173	01Jan2008, 19:20	5.15
DB101h	0.5994	86.7	01Jan2008, 19:10	5.25
DB101i	0.3999	75.7	01Jan2008, 18:30	5.46
DB101k	0.7138	108.5	01Jan2008, 19:00	5.52
DB101l	0.6079	99.4	01Jan2008, 19:00	5.69
DB101m	0.4682	103.8	01Jan2008, 18:10	5.93
DB101n	0.5905	65.6	01Jan2008, 19:30	5.04
DB101p	0.8115	99.4	01Jan2008, 19:50	5.23
DB101q	0.9593	102.5	01Jan2008, 19:30	4.94
DB101r	1.9095	85.1	02Jan2008, 00:20	2.98
Chigger	1.9095	28.4	02Jan2008, 00:20	0.99
R101o	1.9095	28.3	02Jan2008, 03:00	0.94
J101n	2.8688	125.6	01Jan2008, 22:40	2.28
R101n	2.8688	122.2	02Jan2008, 05:20	2.21
DB101o	0.4823	86.5	01Jan2008, 18:50	5.88
J101p	0.4823	86.5	01Jan2008, 18:50	5.88
R101p	0.4823	65.8	02Jan2008, 09:20	5.85
J101m	4.7531	314.6	02Jan2008, 03:30	3.45
R101m	4.7531	313.6	02Jan2008, 05:10	3.44
J101l	5.8292	464.8	01Jan2008, 22:00	3.87
R101l	5.8292	464.5	01Jan2008, 23:30	3.86
J101k	6.543	562.8	01Jan2008, 22:40	4.04
R101k	6.543	560.8	02Jan2008, 00:20	4.04
DB101j	0.3461	138.7	01Jan2008, 17:10	6.08
J101j	6.8891	643.7	01Jan2008, 21:50	4.14
R101j	6.8891	635.8	02Jan2008, 00:40	4.12
J101i	7.289	694.8	02Jan2008, 00:10	4.2
R101i	7.289	688.7	02Jan2008, 03:30	4.18
J101h	7.8884	753.6	02Jan2008, 02:50	4.26
R101h	7.8884	748.8	02Jan2008, 05:10	4.24
DB101s	0.4214	151.4	01Jan2008, 17:20	6.03
DB101t	0.6201	190.8	01Jan2008, 17:20	6.12
DB101u	0.7635	162.1	01Jan2008, 18:30	5.91
J101s	0.7635	162.1	01Jan2008, 18:30	5.91
R101s	0.7635	146.3	02Jan2008, 04:40	5.9
J101r	1.3836	277.2	01Jan2008, 18:20	6
R101r	1.3836	261.9	01Jan2008, 20:50	6
J101q	1.805	382.8	01Jan2008, 20:10	6
R101q	1.805	317.3	02Jan2008, 04:50	6
J101g	10.9967	1191.8	02Jan2008, 04:20	4.64

Appendix A
Dickinson Bayou HEC-HMS Output - 10-year Existing Conditions

Hydrologic Element	Drainage Area (mi ²)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R101g	10.9967	1184.3	02Jan2008, 05:40	4.63
J100u	17.5487	1909.9	02Jan2008, 04:20	4.79
R100u	17.5487	1888.2	02Jan2008, 06:20	4.77
Weir-Split	17.5487	1354.4	02Jan2008, 06:20	3.63
R100t	17.5487	1351.3	02Jan2008, 07:50	3.62
J100s2	18.6289	1440.1	02Jan2008, 07:10	3.7
R100s2	18.6289	1437.5	02Jan2008, 08:40	3.69
DB104a	0.8529	131	01Jan2008, 19:10	5.31
DB104b	1.8897	256	01Jan2008, 19:40	5.17
DB104c	1.5214	128.5	01Jan2008, 20:50	4.49
DB104d	0.7771	123	01Jan2008, 19:10	5.44
J104d	0.7771	123	01Jan2008, 19:10	5.44
R104d	0.7771	119.6	01Jan2008, 21:10	5.43
J104c	2.2985	248	01Jan2008, 21:10	4.8
R104c	2.2985	246.6	01Jan2008, 23:40	4.75
J104b	4.1882	485.8	01Jan2008, 22:30	4.94
R104b	4.1882	434.2	02Jan2008, 05:10	4.47
J104a	5.0411	521	02Jan2008, 04:50	4.61
R104a	5.0411	520.6	02Jan2008, 05:00	4.6
J100s1	24.0755	1966.2	02Jan2008, 06:40	3.91
R100s1	24.0755	1955.3	02Jan2008, 08:00	3.9
DB106b	0.9051	148.4	01Jan2008, 19:00	5.61
DB105a	1.0654	92.2	01Jan2008, 20:30	4.52
DB106c	0.638	132.9	01Jan2008, 18:30	5.59
DB106d	0.3265	55.5	01Jan2008, 19:00	5.39
J106b	0.9645	188.3	01Jan2008, 18:40	5.52
R106b	0.9645	186.9	01Jan2008, 20:20	5.51
DB105b	0.3873	64.8	01Jan2008, 19:00	5.63
DB105c	0.8905	147.6	01Jan2008, 19:00	5.37
J105b	0.8905	147.6	01Jan2008, 19:00	5.37
R105b	0.8905	143.9	01Jan2008, 22:40	5.35
J105a	1.2778	202.7	01Jan2008, 22:20	5.44
R105a	1.2778	199	02Jan2008, 01:00	5.41
J106a	4.2128	581.8	01Jan2008, 23:00	5.25
R106a	4.2128	581.2	02Jan2008, 00:00	5.24
J100r	29.2782	2481.7	02Jan2008, 05:40	4.14
R100r	29.2782	2480.6	02Jan2008, 06:10	4.13
DB107b	1.4378	188.1	01Jan2008, 19:40	5.2
DB107c	0.32	46.4	01Jan2008, 19:10	5.43
J107b	0.32	46.4	01Jan2008, 19:10	5.43
R107b	0.32	46.2	01Jan2008, 20:20	5.4
J107a	1.7578	234.1	01Jan2008, 19:50	5.24
R107a	1.7578	232.4	01Jan2008, 21:40	5.19
J100q	31.6155	2722.2	02Jan2008, 04:40	4.22

Appendix A
Dickinson Bayou HEC-HMS Output - 10-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100q	31.6155	2718.6	02Jan2008, 06:50	4.17
DB101b	0.4813	73.4	01Jan2008, 19:00	5.3
DB101c	0.4599	77	01Jan2008, 18:50	5.38
DB101d	2.4142	253.7	01Jan2008, 20:20	4.79
DB101e	1.1825	158.4	01Jan2008, 19:20	5.16
DB101f	0.8417	146.6	01Jan2008, 18:50	5.41
J101f	0.8417	146.6	01Jan2008, 18:50	5.41
R101f	0.8417	146.5	01Jan2008, 19:10	5.38
J101e	2.0242	304.9	01Jan2008, 19:20	5.25
R101e	2.0242	242	02Jan2008, 15:50	4.94
J101d	2.0242	707.1	02Jan2008, 08:30	14.86
R101d	2.0242	700.2	02Jan2008, 10:50	14.76
J101c	4.4384	867.9	02Jan2008, 10:10	9.34
R101c	4.4384	858.6	02Jan2008, 13:30	9.27
J101b	4.8983	887	02Jan2008, 13:20	8.91
R101b	4.8983	886.9	02Jan2008, 13:30	8.89
J101a	5.3796	917.1	02Jan2008, 13:20	8.57
R101a	5.3796	916.7	02Jan2008, 14:20	8.51
DB101v	0.5653	93.2	01Jan2008, 19:00	5.37
J100p	38.6868	3615.8	02Jan2008, 09:00	4.78
R100p	38.6868	3614.8	02Jan2008, 09:20	4.77
DB108b	0.5279	106.7	01Jan2008, 18:40	5.84
DB108a	1.2268	135.6	01Jan2008, 19:50	4.99
DB108c	0.6193	123.9	01Jan2008, 19:00	5.9
J108c	0.6193	123.9	01Jan2008, 19:00	5.9
R108c	0.6193	123.5	01Jan2008, 20:00	5.89
J108b	1.8461	259.1	01Jan2008, 19:50	5.29
R108b	1.8461	257.3	01Jan2008, 21:20	5.29
J108a	2.374	359.6	01Jan2008, 19:30	5.41
R108a	2.374	353.4	02Jan2008, 01:00	5.38
J100o	41.0608	3847.1	02Jan2008, 08:20	4.81
R100o	41.0608	3846.2	02Jan2008, 08:50	4.8
J100n	41.9019	3913.9	02Jan2008, 08:30	4.81
R100n	41.9019	3911	02Jan2008, 09:40	4.78
DB109a	0.6757	569	01Jan2008, 17:20	6.31
DB109b	0.182	39.2	01Jan2008, 18:20	5.6
DB109d	0.3999	89.1	01Jan2008, 18:20	5.88
DB109g	0.8689	119.2	01Jan2008, 19:50	5.48
DB109f	0.2845	94	01Jan2008, 17:10	6.15
DB109e	0.6993	114.8	01Jan2008, 19:20	5.69
J109f	0.9838	204.6	01Jan2008, 18:10	5.82
R109f	0.9838	203.7	01Jan2008, 19:20	5.81
J109c	1.8527	322.5	01Jan2008, 19:30	5.66
R109c	1.8527	320.4	01Jan2008, 20:50	5.65

Appendix A
Dickinson Bayou HEC-HMS Output - 10-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB109c	0.5646	114.3	01Jan2008, 18:40	5.84
DB109h	0.4721	151.9	01Jan2008, 17:30	6.31
J109e	0.4721	151.9	01Jan2008, 17:30	6.31
R109e	0.4721	137	02Jan2008, 02:00	6.31
J109d	1.0367	220.4	02Jan2008, 01:10	6.05
R109d	1.0367	218.5	02Jan2008, 02:40	6.05
J109b	3.4713	631.5	01Jan2008, 20:20	5.79
R109b	3.4713	628.8	01Jan2008, 21:00	5.79
J109a	4.147	906.5	01Jan2008, 18:00	5.87
R109a	4.147	897.2	01Jan2008, 18:50	5.87
J100m	47.1974	4346.6	02Jan2008, 07:20	4.83
R100m	47.1974	4343.3	02Jan2008, 08:00	4.8
DB112a	0.4975	85.4	01Jan2008, 19:10	5.4
DB112d	0.3564	57.2	01Jan2008, 19:10	5.63
J112b	0.3564	57.2	01Jan2008, 19:10	5.63
R112b	0.3564	56	02Jan2008, 00:20	5.59
DB112b	0.3748	127.3	01Jan2008, 17:30	6.29
DB112c	0.7429	103.6	01Jan2008, 19:30	5.47
DB112f	0.3175	42.7	01Jan2008, 19:20	5.37
DB112e	0.7645	119.8	01Jan2008, 19:20	5.43
J112f	1.082	162.5	01Jan2008, 19:20	5.41
R112f	1.082	162.2	01Jan2008, 20:10	5.4
J112e	1.8249	265.3	01Jan2008, 20:00	5.43
R112e	1.8249	265.3	01Jan2008, 20:10	5.42
J112d	1.8249	265.3	01Jan2008, 20:10	5.42
R112d	1.8249	264.1	01Jan2008, 21:30	5.4
J112c	2.1997	365.5	01Jan2008, 20:40	5.55
R112c	2.1997	365.1	01Jan2008, 21:10	5.54
J112a	3.0536	489.8	01Jan2008, 21:40	5.53
R112a	3.0536	475.8	02Jan2008, 02:00	5.49
J100l	52.0888	4891.8	02Jan2008, 06:30	4.87
R100l	52.0888	4890.1	02Jan2008, 07:00	4.85
J100k	52.8701	4945.6	02Jan2008, 07:00	4.85
R100k	52.8701	4943.3	02Jan2008, 07:30	4.83
BG100b	0.9681	286.6	01Jan2008, 17:40	6.24
BG100c	0.8305	353.7	01Jan2008, 17:00	6.31
BG100d	0.7905	107	01Jan2008, 19:20	5.39
JBGc	0.7905	107	01Jan2008, 19:20	5.39
RBGc	0.7905	66.3	02Jan2008, 18:10	4.51
JBGb	1.621	354.4	01Jan2008, 17:00	5.43
RBGb	1.621	243.1	02Jan2008, 05:40	5.28
JBGa	2.5891	408	01Jan2008, 21:40	5.64
RBGa	2.5891	402.9	02Jan2008, 00:20	5.58
J100j	55.6831	5294.4	02Jan2008, 07:10	4.88

Appendix A
Dickinson Bayou HEC-HMS Output - 10-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100j	55.6831	5293.2	02Jan2008, 07:20	4.87
DB111a	0.2553	45.9	01Jan2008, 18:40	5.43
DB111b	1.2071	134.1	01Jan2008, 20:10	4.88
J111b	1.2071	134.1	01Jan2008, 20:10	4.88
R111b	1.2071	120.6	02Jan2008, 09:20	4.81
J111a	1.4624	141.7	02Jan2008, 08:00	4.92
R111a	1.4624	140.6	02Jan2008, 12:00	4.79
MB100a	0.4305	469.2	01Jan2008, 16:50	6.36
MB100b	0.6341	258.2	01Jan2008, 17:10	6.15
MB100h	0.5156	106.1	01Jan2008, 18:30	5.85
MB100c1	0.1197	80.5	01Jan2008, 16:40	6.19
MB100c2	0.3741	132.3	01Jan2008, 17:10	5.91
MB100d	1.2082	180.7	01Jan2008, 19:20	5.36
MB100e	0.5889	95.9	01Jan2008, 19:00	5.36
MB100f	1.3315	164.8	01Jan2008, 19:40	5.05
MB100g	0.4893	92.1	01Jan2008, 18:40	5.46
JMBi	0.4893	92.1	01Jan2008, 18:40	5.46
RMBi	0.4893	81.2	02Jan2008, 01:40	5.4
JMBg	2.4097	312.1	01Jan2008, 23:20	5.2
RMBg	2.4097	304.5	02Jan2008, 04:20	5.16
JMBe	3.6179	437.4	02Jan2008, 02:40	5.23
RMBe	3.6179	437.2	02Jan2008, 03:30	5.19
JMBd	3.992	487.1	02Jan2008, 01:30	5.26
RMBd	3.992	486.8	02Jan2008, 02:10	5.24
JMBc	4.6273	578.2	01Jan2008, 20:30	5.33
RMBc	4.6273	574.3	02Jan2008, 01:30	5.31
JMBb	5.2614	741.6	01Jan2008, 21:00	5.41
RMBb	5.2614	726.6	02Jan2008, 00:10	5.39
JMBa	5.6919	758.8	01Jan2008, 23:50	5.46
RMBa	5.6919	756.1	02Jan2008, 00:40	5.46
J100h	63.2688	6057.2	02Jan2008, 06:20	4.93
R100h	63.2688	6054.9	02Jan2008, 06:50	4.91
DB114a	0.6772	87.2	01Jan2008, 19:30	5.11
DB114b	0.4096	93.2	01Jan2008, 18:00	5.52
J114b	0.4096	93.2	01Jan2008, 18:00	5.52
R114b	0.4096	82.1	02Jan2008, 05:00	5.47
J114a	1.0868	147	02Jan2008, 04:10	5.25
R114a	1.0868	132.5	02Jan2008, 12:20	5.13
BB100a	0.8055	630.9	01Jan2008, 16:50	6.36
BB100b	0.873	273.8	01Jan2008, 17:30	6.12
BB100c	0.2175	188.2	01Jan2008, 16:50	6.12
BB100d	1.2851	298.6	01Jan2008, 18:20	6.1
BB100e	1.2538	326.1	01Jan2008, 18:00	6.12
JBBd	2.5389	624.4	01Jan2008, 18:10	6.11

Appendix A
Dickinson Bayou HEC-HMS Output - 10-year Existing Conditions

Hydrologic Element	Drainage Area (mi ²)	Peak Discharge (cfs)	Time of Peak	Volume (in)
RBBd	2.5389	601.9	01Jan2008, 19:50	6.11
JBBc	2.7564	694.7	01Jan2008, 18:50	6.11
RBBc	2.7564	681.3	01Jan2008, 21:00	6.11
JBBb	3.6294	910.9	01Jan2008, 20:30	6.11
RBBb	3.6294	842.5	02Jan2008, 02:20	6.11
JBBa	4.4349	977.8	01Jan2008, 18:30	6.15
RBBa	4.4349	957.8	02Jan2008, 00:30	6.15
J100g	69.2256	7021.8	02Jan2008, 04:20	5
R100g	69.2256	7020	02Jan2008, 04:30	4.99
J100f	71.3589	7236.2	02Jan2008, 04:30	5
R100f	71.3589	7233.6	02Jan2008, 04:40	4.99
J100e	71.7608	7276.4	02Jan2008, 04:40	4.99
R100e	71.7608	7273.7	02Jan2008, 05:00	4.98
J100d	72.1863	7323.8	02Jan2008, 04:50	4.99
R100d	72.1863	7236.7	02Jan2008, 08:40	4.89
Gum Bayou	12.12	3047.3	01Jan2008, 19:50	6.42
DB100c	2.0856	178.7	01Jan2008, 21:50	4.55
J100c	86.3919	8900.4	02Jan2008, 06:30	5.1
R100c	86.3919	8824.3	02Jan2008, 08:50	5.02
DB100b1	2.4787	222.6	01Jan2008, 20:50	4.52
DB100b2	0.9668	134.1	01Jan2008, 19:20	5.2
J100b	89.8374	9071.5	02Jan2008, 08:50	5.01
R100b	89.8374	9064.4	02Jan2008, 10:00	4.98
DB118a	1.2724	164	01Jan2008, 19:40	5.11
DB118b	2.4501	261.6	01Jan2008, 20:00	4.82
DB118c	0.5656	102.6	01Jan2008, 18:50	5.52
J118c	0.5656	102.6	01Jan2008, 18:50	5.52
R118c	0.5656	85.4	02Jan2008, 08:00	5.49
J118b	3.0157	319.9	01Jan2008, 20:40	4.95
R118b	3.0157	317.3	01Jan2008, 23:20	4.93
J118a	4.2881	471.7	01Jan2008, 22:40	4.98
R118a	4.2881	453.9	02Jan2008, 10:20	4.76
J100a	94.1255	9518.1	02Jan2008, 10:00	4.97
R100a	94.1255	9490.3	02Jan2008, 11:20	4.91
DB100a	0.8551	95.3	01Jan2008, 20:00	4.96
Outlet	94.9806	9549.6	02Jan2008, 11:20	4.91

Appendix A
Dickinson Bayou HEC-HMS Output - 100-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB100d	0.4255	215.6	01Jan2008, 18:10	11.85
DB117a	0.4019	166.3	01Jan2008, 19:00	11.16
DB100e	0.3817	135.9	01Jan2008, 19:10	11.37
DB116a	1.0145	375.9	01Jan2008, 19:30	11.07
DB115a	0.7371	245.6	01Jan2008, 19:30	10.99
DB100f	0.4351	161.9	01Jan2008, 19:10	11.42
DB100g	0.4314	231.5	01Jan2008, 18:20	11.7
BG100a	0.2239	394.7	01Jan2008, 16:40	12.11
DB100h2	0.7813	176.4	01Jan2008, 20:00	10.21
DB110a	0.7918	275.4	01Jan2008, 19:30	11.42
DB100h1	1.046	334.2	01Jan2008, 20:00	11.4
DB100i	1.1485	143.3	01Jan2008, 23:10	7.63
DB100j	0.8411	281.4	01Jan2008, 19:20	11.05
DB101a	0.26	114.1	01Jan2008, 18:40	11.32
DB100k	0.8664	117	01Jan2008, 23:20	8.1
DB107a	0.3073	146.2	01Jan2008, 18:30	11.21
DB100l	0.2722	115	01Jan2008, 19:10	11.18
DB100m	0.4097	104.9	01Jan2008, 19:50	10.9
DB106a	0.5802	236.8	01Jan2008, 18:50	11.16
DB100n	0.4055	149.7	01Jan2008, 19:10	11.07
DB100o	1.0802	346.3	01Jan2008, 19:20	10.89
DB100p	1.1671	388.5	01Jan2008, 19:40	10.94
DB100v	0.3414	175.1	01Jan2008, 18:30	11.21
DB100q	1.5445	519.1	01Jan2008, 19:40	11
DB100r	1.0674	373.6	01Jan2008, 19:20	11.23
DB100s	0.5783	204.9	01Jan2008, 19:10	11.03
J100z	0.5783	204.9	01Jan2008, 19:10	11.03
R100z	0.5783	178.8	02Jan2008, 04:30	10.96
DB100t	0.2557	140.5	01Jan2008, 17:50	11.21
J100ab	0.2557	140.5	01Jan2008, 17:50	11.21
R100ab	0.2557	67.6	02Jan2008, 20:30	11.21
J100y	1.9014	485.7	02Jan2008, 04:20	11.14
R100y	1.9014	470.3	02Jan2008, 06:40	11.13
DB100x	0.1482	90.5	01Jan2008, 17:40	11.21
J100aa	0.1482	90.5	01Jan2008, 17:40	11.21
R100aa	0.1482	43	02Jan2008, 14:30	11.21
J100x	2.0496	510.9	02Jan2008, 06:40	11.14
R100x	2.0496	505.1	02Jan2008, 08:20	11.09
DB100y	0.3291	191.8	01Jan2008, 17:50	11.93
J100ac	0.3291	191.8	01Jan2008, 17:50	11.93
R100ac	0.3291	166	02Jan2008, 03:10	11.93
J100w	3.9232	1075.1	01Jan2008, 22:30	11.13
R100w	3.9232	1074.6	01Jan2008, 22:50	11.12
DB100w	1.1203	243.9	01Jan2008, 20:00	10.05

Appendix A
Dickinson Bayou HEC-HMS Output - 100-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
J100ad	1.1203	243.9	01Jan2008, 20:00	10.05
R100ad	1.1203	226.1	02Jan2008, 07:20	9.71
J100v	5.3849	1379.3	01Jan2008, 22:50	10.84
R100v	5.3849	1329	02Jan2008, 06:30	10.78
DB101g	1.3033	443.6	01Jan2008, 19:10	10.98
DB101h	0.5994	222	01Jan2008, 19:10	11.08
DB101i	0.3999	188.6	01Jan2008, 18:20	11.21
DB101k	0.7138	271.1	01Jan2008, 19:00	11.37
DB101l	0.6079	243.3	01Jan2008, 19:00	11.54
DB101m	0.4682	245.6	01Jan2008, 18:00	11.67
DB101n	0.5905	168.7	01Jan2008, 19:20	10.87
DB101p	0.8115	252.6	01Jan2008, 19:40	11.08
DB101q	0.9593	264.7	01Jan2008, 19:20	10.75
DB101r	1.9095	230.2	02Jan2008, 00:00	7.43
Chigger	1.9095	76.7	02Jan2008, 00:00	2.48
R101o	1.9095	74.7	02Jan2008, 09:40	2.38
J101n	2.8688	297.8	01Jan2008, 20:20	5.18
R101n	2.8688	269.8	02Jan2008, 15:10	5.06
DB101o	0.4823	208.6	01Jan2008, 18:50	11.71
J101p	0.4823	208.6	01Jan2008, 18:50	11.71
R101p	0.4823	115.8	02Jan2008, 17:10	11.7
J101m	4.7531	590.7	01Jan2008, 23:10	7.49
R101m	4.7531	589.3	02Jan2008, 00:20	7.48
J101l	5.8292	997.1	01Jan2008, 20:30	8.24
R101l	5.8292	945.7	02Jan2008, 03:20	8.22
J101k	6.543	1127.3	02Jan2008, 02:20	8.56
R101k	6.543	1113.2	02Jan2008, 04:30	8.56
DB101j	0.3461	298	01Jan2008, 17:00	11.8
J101j	6.8891	1159.4	02Jan2008, 03:50	8.72
R101j	6.8891	1134.9	02Jan2008, 08:40	8.7
J101i	7.289	1193.8	02Jan2008, 08:10	8.83
R101i	7.289	1183.2	02Jan2008, 11:50	8.81
J101h	7.8884	1262.5	02Jan2008, 11:10	8.98
R101h	7.8884	1259.8	02Jan2008, 12:40	8.96
DB101s	0.4214	333.2	01Jan2008, 17:10	11.75
DB101t	0.6201	427.6	01Jan2008, 17:30	11.85
DB101u	0.7635	385.6	01Jan2008, 18:20	11.67
J101s	0.7635	385.6	01Jan2008, 18:20	11.67
R101s	0.7635	371.3	01Jan2008, 23:20	11.67
J101r	1.3836	642.1	01Jan2008, 22:20	11.75
R101r	1.3836	605.9	02Jan2008, 00:40	11.75
J101q	1.805	749	02Jan2008, 00:10	11.75
R101q	1.805	502.5	02Jan2008, 13:40	11.75
J101g	10.9967	1933.9	02Jan2008, 11:10	9.66

Appendix A
Dickinson Bayou HEC-HMS Output - 100-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R101g	10.9967	1931.3	02Jan2008, 12:10	9.65
J100u	17.5487	3459.4	02Jan2008, 06:00	10.08
R100u	17.5487	3438.5	02Jan2008, 07:50	10.06
Weir-Split	17.5487	2189.6	02Jan2008, 07:50	6.85
R100t	17.5487	2175.2	02Jan2008, 10:50	6.84
J100s2	18.6289	2335.8	02Jan2008, 10:10	7.07
R100s2	18.6289	2331	02Jan2008, 11:30	7.06
DB104a	0.8529	328.6	01Jan2008, 19:10	11.11
DB104b	1.8897	659.3	01Jan2008, 19:30	11.01
DB104c	1.5214	334.9	01Jan2008, 20:20	10.11
DB104d	0.7771	310.4	01Jan2008, 19:10	11.26
J104d	0.7771	310.4	01Jan2008, 19:10	11.26
R104d	0.7771	276.9	01Jan2008, 23:30	11.26
J104c	2.2985	603.8	01Jan2008, 22:40	10.5
R104c	2.2985	578	02Jan2008, 06:30	10.43
J104b	4.1882	1067.2	01Jan2008, 23:50	10.69
R104b	4.1882	1043	02Jan2008, 03:10	10.05
J104a	5.0411	1267.6	02Jan2008, 01:50	10.23
R104a	5.0411	1264.6	02Jan2008, 02:30	10.22
J100s1	24.0755	3444.7	02Jan2008, 09:50	7.79
R100s1	24.0755	3437.7	02Jan2008, 10:30	7.78
DB106b	0.9051	364.9	01Jan2008, 19:00	11.44
DB105a	1.0654	240.9	01Jan2008, 20:00	10.17
DB106c	0.638	326	01Jan2008, 18:20	11.31
DB106d	0.3265	139.7	01Jan2008, 19:00	11.18
J106b	0.9645	465.3	01Jan2008, 18:30	11.27
R106b	0.9645	439.9	01Jan2008, 22:40	11.27
DB105b	0.3873	159.7	01Jan2008, 19:00	11.46
DB105c	0.8905	373	01Jan2008, 19:00	11.17
J105b	0.8905	373	01Jan2008, 19:00	11.17
R105b	0.8905	346	02Jan2008, 01:00	11.16
J105a	1.2778	468	02Jan2008, 00:20	11.25
R105a	1.2778	418.4	02Jan2008, 08:10	11.23
J106a	4.2128	1270.6	01Jan2008, 23:00	11.02
R106a	4.2128	1260.7	02Jan2008, 01:30	11
J100r	29.2782	4713.9	02Jan2008, 03:50	8.35
R100r	29.2782	4697.1	02Jan2008, 05:00	8.35
DB107b	1.4378	483.3	01Jan2008, 19:40	11.05
DB107c	0.32	114.7	01Jan2008, 19:10	11.26
J107b	0.32	114.7	01Jan2008, 19:10	11.26
R107b	0.32	114	01Jan2008, 20:10	11.23
J107a	1.7578	596.6	01Jan2008, 19:40	11.08
R107a	1.7578	546.8	02Jan2008, 02:50	11.04
J100q	31.6155	5361.1	02Jan2008, 04:10	8.55

Appendix A
Dickinson Bayou HEC-HMS Output - 100-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100q	31.6155	5325.5	02Jan2008, 07:30	8.49
DB101b	0.4813	187.1	01Jan2008, 19:00	11.12
DB101c	0.4599	194.3	01Jan2008, 18:40	11.18
DB101d	2.4142	665.9	01Jan2008, 20:10	10.59
DB101e	1.1825	408.6	01Jan2008, 19:10	11
DB101f	0.8417	368.4	01Jan2008, 18:50	11.19
J101f	0.8417	368.4	01Jan2008, 18:50	11.19
R101f	0.8417	368.9	01Jan2008, 18:40	11.18
J101e	2.0242	776.7	01Jan2008, 19:00	11.07
R101e	2.0242	663.4	02Jan2008, 08:10	10.75
J101d	2.0242	1912.2	02Jan2008, 08:10	38.59
R101d	2.0242	1898.3	02Jan2008, 09:30	38.47
J101c	4.4384	2290.4	02Jan2008, 08:50	23.3
R101c	4.4384	2234.8	02Jan2008, 12:30	23.22
J101b	4.8983	2286.1	02Jan2008, 12:20	22.09
R101b	4.8983	2261	02Jan2008, 14:00	22.07
J101a	5.3796	2312.3	02Jan2008, 13:50	21.09
R101a	5.3796	2287	02Jan2008, 17:40	21.01
DB101v	0.5653	235.6	01Jan2008, 19:00	11.17
J100p	38.6868	7278.2	02Jan2008, 07:40	10.28
R100p	38.6868	7265.2	02Jan2008, 09:10	10.27
DB108b	0.5279	257.5	01Jan2008, 18:30	11.62
DB108a	1.2268	349.2	01Jan2008, 19:40	10.81
DB108c	0.6193	298.3	01Jan2008, 18:50	11.69
J108c	0.6193	298.3	01Jan2008, 18:50	11.69
R108c	0.6193	218.1	02Jan2008, 08:00	11.69
J108b	1.8461	556.6	01Jan2008, 20:10	11.11
R108b	1.8461	531.7	02Jan2008, 01:30	11.1
J108a	2.374	713	02Jan2008, 00:00	11.22
R108a	2.374	684.2	02Jan2008, 07:30	11.18
J100o	41.0608	7937.1	02Jan2008, 08:40	10.33
R100o	41.0608	7905.1	02Jan2008, 11:20	10.31
J100n	41.9019	8026.4	02Jan2008, 11:00	10.33
R100n	41.9019	7929.8	02Jan2008, 16:50	10.29
DB109a	0.6757	1082.5	01Jan2008, 17:20	12.05
DB109b	0.182	95.8	01Jan2008, 18:10	11.31
DB109d	0.3999	213	01Jan2008, 18:10	11.62
DB109g	0.8689	293	01Jan2008, 19:40	11.33
DB109f	0.2845	208.4	01Jan2008, 17:20	11.88
DB109e	0.6993	278.3	01Jan2008, 19:10	11.53
J109f	0.9838	475.6	01Jan2008, 18:10	11.63
R109f	0.9838	465.2	01Jan2008, 20:00	11.62
J109c	1.8527	757.8	01Jan2008, 20:00	11.49
R109c	1.8527	679.8	02Jan2008, 01:50	11.48

Appendix A
Dickinson Bayou HEC-HMS Output - 100-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB109c	0.5646	273.7	01Jan2008, 18:40	11.62
DB109h	0.4721	328.6	01Jan2008, 17:40	12.05
J109e	0.4721	328.6	01Jan2008, 17:40	12.05
R109e	0.4721	284.7	02Jan2008, 03:20	12.05
J109d	1.0367	439.7	02Jan2008, 02:10	11.82
R109d	1.0367	423.6	02Jan2008, 06:00	11.82
J109b	3.4713	1229.6	02Jan2008, 01:40	11.59
R109b	3.4713	1220	02Jan2008, 03:30	11.58
J109a	4.147	1775	01Jan2008, 17:30	11.66
R109a	4.147	1593	01Jan2008, 19:30	11.65
J100m	47.1974	8685.7	02Jan2008, 09:50	10.35
R100m	47.1974	8562.8	02Jan2008, 12:20	10.31
DB112a	0.4975	211.8	01Jan2008, 19:00	11.18
DB112d	0.3564	141.8	01Jan2008, 19:10	11.48
J112b	0.3564	141.8	01Jan2008, 19:10	11.48
R112b	0.3564	124.3	02Jan2008, 09:10	11.44
DB112b	0.3748	274	01Jan2008, 17:30	12.03
DB112c	0.7429	255.2	01Jan2008, 19:30	11.32
DB112f	0.3175	107.9	01Jan2008, 19:20	11.23
DB112e	0.7645	300.6	01Jan2008, 19:10	11.25
J112f	1.082	408.4	01Jan2008, 19:10	11.25
R112f	1.082	382.9	02Jan2008, 00:50	11.24
J112e	1.8249	601.5	02Jan2008, 00:00	11.27
R112e	1.8249	597.2	02Jan2008, 01:00	11.27
J112d	1.8249	597.2	02Jan2008, 01:00	11.27
R112d	1.8249	585.5	02Jan2008, 04:10	11.25
J112c	2.1997	658.8	02Jan2008, 03:30	11.38
R112c	2.1997	651.3	02Jan2008, 05:40	11.37
J112a	3.0536	869.4	02Jan2008, 05:20	11.35
R112a	3.0536	855	02Jan2008, 10:40	11.31
J100l	52.0888	9669.5	02Jan2008, 12:00	10.41
R100l	52.0888	9591.2	02Jan2008, 14:00	10.39
J100k	52.8701	9689.3	02Jan2008, 14:00	10.38
R100k	52.8701	9666	02Jan2008, 14:50	10.36
BG100b	0.9681	650.8	01Jan2008, 17:40	11.98
BG100c	0.8305	773.7	01Jan2008, 16:50	12.05
BG100d	0.7905	268.9	01Jan2008, 19:20	11.26
JBGc	0.7905	268.9	01Jan2008, 19:20	11.26
RBGc	0.7905	204	02Jan2008, 06:10	10.11
JBGb	1.621	776.1	01Jan2008, 16:50	11.1
RBGb	1.621	479.5	01Jan2008, 22:40	10.89
JBGa	2.5891	909.4	01Jan2008, 22:40	11.3
RBGa	2.5891	838.6	02Jan2008, 01:20	11.21
J100j	55.6831	10043.6	02Jan2008, 14:30	10.41

Appendix A
Dickinson Bayou HEC-HMS Output - 100-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100j	55.6831	10041	02Jan2008, 14:50	10.4
DB111a	0.2553	114.8	01Jan2008, 18:30	11.2
DB111b	1.2071	350.9	01Jan2008, 20:00	10.7
J111b	1.2071	350.9	01Jan2008, 20:00	10.7
R111b	1.2071	324.1	02Jan2008, 05:20	10.61
J111a	1.4624	380.5	02Jan2008, 03:50	10.71
R111a	1.4624	301.2	02Jan2008, 21:50	10.56
MB100a	0.4305	744.7	01Jan2008, 16:50	12.11
MB100b	0.6341	556	01Jan2008, 17:10	11.88
MB100h	0.5156	253.7	01Jan2008, 18:20	11.62
MB100c1	0.1197	166.4	01Jan2008, 16:30	11.93
MB100c2	0.3741	299.9	01Jan2008, 17:10	11.62
MB100d	1.2082	459.2	01Jan2008, 19:10	11.2
MB100e	0.5889	242.8	01Jan2008, 19:00	11.16
MB100f	1.3315	427.9	01Jan2008, 19:30	10.89
MB100g	0.4893	229.5	01Jan2008, 18:30	11.21
JMBi	0.4893	229.5	01Jan2008, 18:30	11.21
RMBi	0.4893	202	02Jan2008, 00:30	11.19
JMBg	2.4097	792.8	01Jan2008, 22:10	11.02
RMBg	2.4097	774	02Jan2008, 03:00	10.98
JMBe	3.6179	1100.5	02Jan2008, 01:30	11.05
RMBe	3.6179	1063.6	02Jan2008, 06:10	11.02
JMBd	3.992	1102.3	02Jan2008, 05:40	11.07
RMBd	3.992	1077.5	02Jan2008, 08:40	11.06
JMBc	4.6273	1156.2	01Jan2008, 20:10	11.14
RMBc	4.6273	1128.4	02Jan2008, 12:40	11.12
JMBb	5.2614	1379.9	01Jan2008, 21:30	11.21
RMBb	5.2614	1308.5	02Jan2008, 06:40	11.19
JMBa	5.6919	1308.9	02Jan2008, 06:40	11.26
RMBa	5.6919	1307.6	02Jan2008, 07:40	11.26
J100h	63.2688	11562.5	02Jan2008, 14:20	10.49
R100h	63.2688	11553.8	02Jan2008, 15:00	10.47
DB114a	0.6772	225.7	01Jan2008, 19:20	10.95
DB114b	0.4096	227.5	01Jan2008, 18:00	11.21
J114b	0.4096	227.5	01Jan2008, 18:00	11.21
R114b	0.4096	192	02Jan2008, 06:30	11.21
J114a	1.0868	329	02Jan2008, 04:50	11.05
R114a	1.0868	253	02Jan2008, 22:30	10.94
BB100a	0.8055	1031	01Jan2008, 16:50	12.11
BB100b	0.873	609.3	01Jan2008, 17:30	11.85
BB100c	0.2175	305.9	01Jan2008, 16:50	11.85
BB100d	1.2851	692.4	01Jan2008, 18:20	11.85
BB100e	1.2538	762.8	01Jan2008, 18:00	11.85
JBBd	2.5389	1454.3	01Jan2008, 18:10	11.85

Appendix A
Dickinson Bayou HEC-HMS Output - 100-year Existing Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
RBBd	2.5389	1382.6	01Jan2008, 19:40	11.85
JBBc	2.7564	1547.3	01Jan2008, 19:10	11.85
RBBc	2.7564	1408.5	02Jan2008, 00:40	11.85
JBBb	3.6294	1768.5	01Jan2008, 22:30	11.85
RBBb	3.6294	1462.2	02Jan2008, 10:30	11.85
JBBa	4.4349	1579.9	01Jan2008, 17:00	11.9
RBBa	4.4349	1446.1	02Jan2008, 13:40	11.9
J100g	69.2256	13267	02Jan2008, 14:20	10.57
R100g	69.2256	13262.7	02Jan2008, 14:40	10.57
J100f	71.3589	13501.4	02Jan2008, 14:30	10.58
R100f	71.3589	13491.7	02Jan2008, 15:00	10.57
J100e	71.7608	13529.1	02Jan2008, 15:00	10.57
R100e	71.7608	13527.1	02Jan2008, 15:10	10.56
J100d	72.1863	13557.5	02Jan2008, 15:10	10.56
R100d	72.1863	13480.5	02Jan2008, 18:20	10.42
Gum Bayou	12.12	4932.6	01Jan2008, 20:10	12.04
DB100c	2.0856	464.9	01Jan2008, 21:30	10.21
J100c	86.3919	15213	02Jan2008, 06:50	10.64
R100c	86.3919	15197	02Jan2008, 10:20	10.52
DB100b1	2.4787	588.3	01Jan2008, 20:40	10.22
DB100b2	0.9668	344.8	01Jan2008, 19:20	11.04
J100b	89.8374	15721.6	02Jan2008, 09:30	10.51
R100b	89.8374	15719.6	02Jan2008, 11:00	10.47
DB118a	1.2724	424.2	01Jan2008, 19:40	10.95
DB118b	2.4501	686.6	01Jan2008, 19:50	10.63
DB118c	0.5656	255.6	01Jan2008, 18:40	11.31
J118c	0.5656	255.6	01Jan2008, 18:40	11.31
R118c	0.5656	223.1	02Jan2008, 02:30	11.29
J118b	3.0157	815	02Jan2008, 00:40	10.75
R118b	3.0157	730.5	02Jan2008, 10:40	10.73
J118a	4.2881	981	01Jan2008, 21:10	10.8
R118a	4.2881	877.5	03Jan2008, 11:40	10.53
J100a	94.1255	16267.4	02Jan2008, 11:30	10.47
R100a	94.1255	16261.8	02Jan2008, 13:10	10.38
DB100a	0.8551	248	01Jan2008, 19:50	10.79
Outlet	94.9806	16375.7	02Jan2008, 13:00	10.38

APPENDICE B

APPENDIX B
Clark Unit Hydrograph Parameters - Proposed
 Gum Bayou - Galveston County

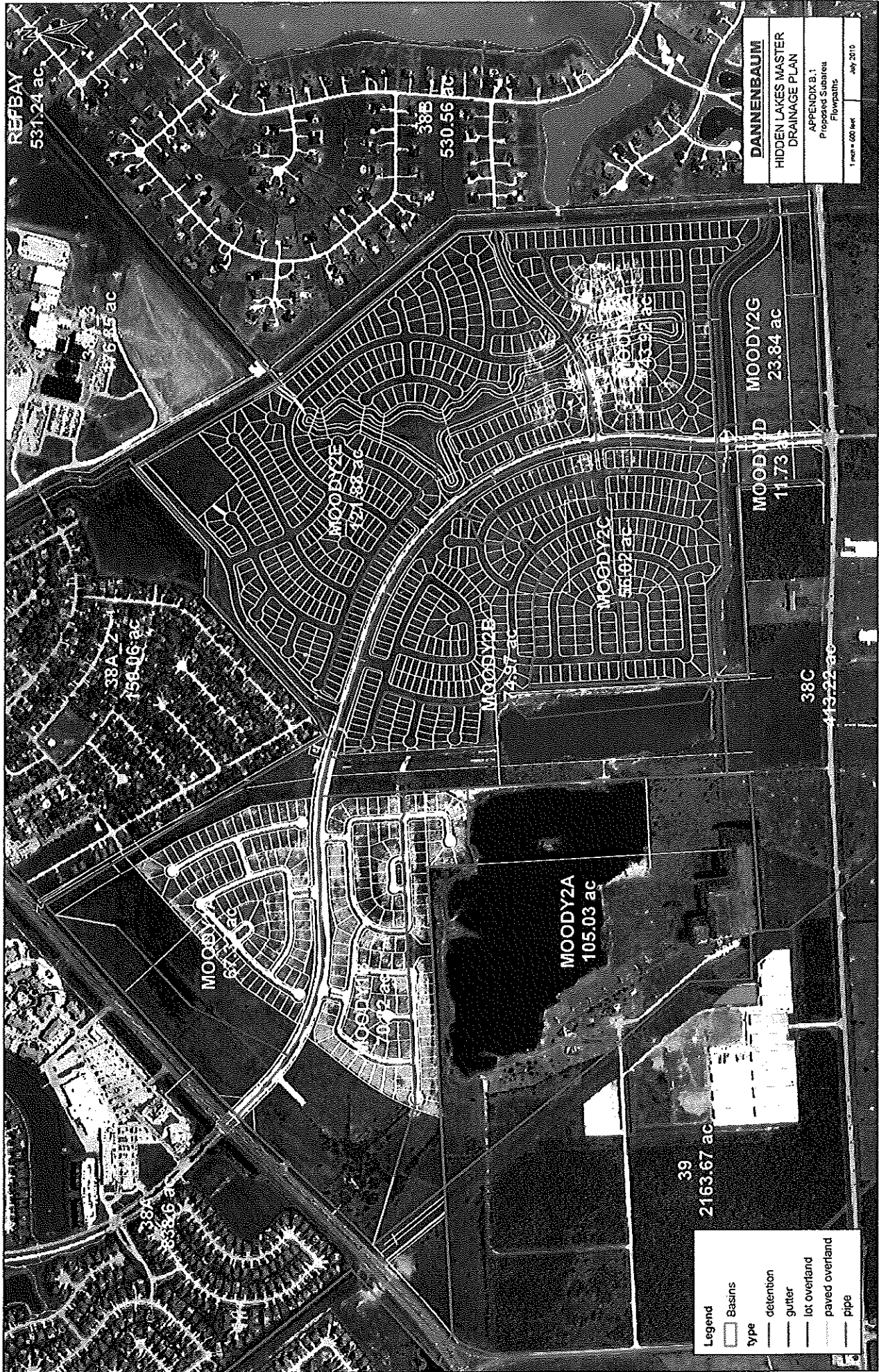
Subbasin	Drainage Area (acres)	Drainage Area (mi ²)	Watershed Length (mi)	Length to Centroid (mi)	Channel Slope (ft/mi)	Watershed Slope (ft/mi)	D Value	Development (Unadjusted) %	Development (Minimum) %	Development (Adjusted) %	Channel Improvement %	Channel Conveyance %	Ponding %	Percentage Serviced by Detention %	Subbasin %	Impervious %	Time of Concentration (HR)	Storage Coefficient 10% (100-YR)	Storage Coefficient 2% (50-YR)	Storage Coefficient 1% (100-YR)	Storage Coefficient 0.2% (500-YR)
DA38A	838.6	1.010	1.882	0.462	3.1	5.0	2.40	81.9	17.6	17.6	100.0	100	0	0	57	27.4	0.49	9.45	9.45	9.45	9.45
DA38A.2	150.06	0.224	0.255	0.385	3.1	5.0	2.46	90.8	95.4	95.4	100.0	100	0	0	90.8	36.3	0.12	2.66	2.66	2.66	2.66
DA38A.3	176.35	0.276	0.379	0.375	2.5	5.0	2.46	51.4	95.4	51.4	100.0	30	0	0	92.1	41.7	0.14	3.41	3.41	3.41	3.41
MOODY1								Area separated in proposed conditions - flows calculated using HEC2 runoff curves or rational method													
REFBAY	531.24	0.630	1.696	0.652	1.7	5.0	2.40	100.0	17.6	17.6	100.0	100	0	0	100.0	40.0	0.84	7.78	7.78	7.78	7.78
DA38B	530.56	0.629	1.678	0.638	1.8	5.0	2.46	96.5	17.6	17.6	100.0	100	0	0	96.5	38.6	0.90	7.49	7.49	7.49	7.49
MOODY2								Area separated in proposed conditions - flows calculated using HEC2 runoff curves or rational method													
DA38C	413.22	0.646	1.724	0.694	8.7	5.0	2.46	85.7	17.6	17.6	100.0	100	0	0	100.0	40.0	0.84	7.78	7.78	7.78	7.78
DA38D.1	283.05	0.442	0.937	0.608	3.1	5.0	2.46	85.7	446.5	85.7	0.0	10	0	0	0.0	34.3	0.72	4.24	4.24	4.24	4.24
DA38D.2	505.55	0.750	2.322	1.077	3.3	5.0	2.46	6.9	446.5	85.7	0.0	10	0	0	0.0	34.3	0.67	3.97	3.97	3.97	3.97
DA38E	862.20	1.347	2.501	1.354	4.4	5.0	2.46	6.5	446.5	85.7	0.0	10	0	0	0.0	5.7	0.96	7.66	7.66	7.66	7.66
DA38F	256.89	0.401	1.096	0.390	1.2	5.0	2.48	3.9	17.6	3.9	0.0	100	0	0	0.0	5.4	1.07	7.14	7.14	7.14	7.14
DA38G	210.67	0.381	3.521	1.707	4.1	5.0	2.48	39.0	46.5	39.0	25.7	50	0	0	1.4	18.0	0.82	6.15	6.15	6.15	6.15
DA40	470.23	0.733	1.727	0.789	6.7	5.0	2.46	2.3	24.1	2.3	42.1	80	0	0	0.0	17.0	1.71	9.01	9.01	9.01	9.01
																3.0	0.55	4.90	4.90	4.90	4.90

Areae different from existing

APPENDIX B
Development Summary - Proposed
Gum Bayou - Galveston County

Subbasin	Area (mi ²)	Area (acres)	Development Area per Basin (acres)												Percent Impervious (%)	Percent Developed (%)
			HD	U	GA	RS	RL	RR	T	WL	IC	Unknown	SCH	AIR		
DA38A	1.310	838.60	0.00	290.00	0.00	479.00	0.00	29.10	40.50	0.00	0.00	0.00	0.00	0.00	27.4	61.9
DA38A 2	0.234	150.06	0.00	13.86	0.00	136.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.3	90.8
DA38A 3	0.276	176.35	19.04	13.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	143.34	0.00	0.00	41.7	51.4
MOODY1	0.359	230.07	0.00	230.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0
REFBAY	0.830	531.24	0.00	0.04	0.00	531.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.0	100.0
DA38B	0.829	530.56	0.00	17.98	0.00	512.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.6	96.6
MOODY2	0.553	354.14	0.00	289.14	0.00	0.00	0.00	0.00	0.00	65.00	0.00	0.00	0.00	0.00	18.4	0.0
DA38C	0.646	413.22	4.60	252.72	0.00	0.00	0.00	153.60	2.30	0.00	0.00	0.00	0.00	0.00	3.3	1.7
DA38D 1	0.442	283.05	0.00	40.53	0.00	242.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.3	85.7
DA38D 2	0.790	505.55	19.74	470.49	0.00	0.00	0.00	0.00	8.89	0.00	6.43	0.00	0.00	0.00	5.7	6.9
DA38E	1.347	862.20	35.04	805.94	0.00	0.00	0.00	0.00	14.55	0.00	6.67	0.00	0.00	0.00	5.4	6.5
DA38F	0.401	256.89	0.00	246.89	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.6	3.9
DA39	3.381	2163.67	47.31	1191.96	55.00	718.90	68.70	65.70	16.10	0.00	0.00	0.00	0.00	0.00	17.0	39.0
DA40	0.735	470.29	0.00	371.09	0.00	0.00	0.00	88.20	11.00	0.00	0.00	0.00	0.00	0.00	3.0	2.3

Acresage different from existing



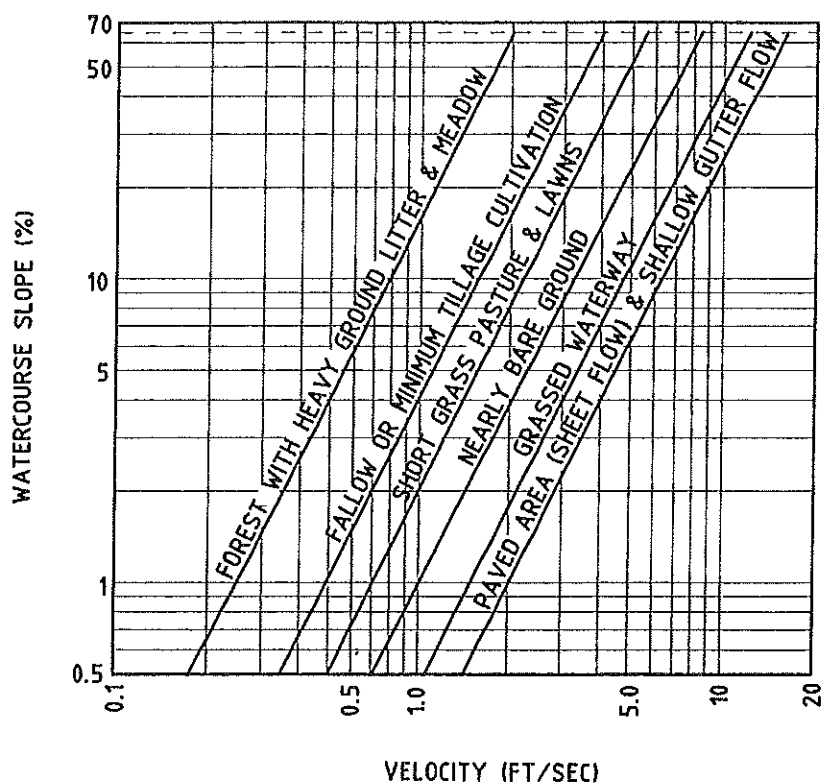


Figure 5-4. Velocities for Upland Method of Estimating Time of Concentration--English
(Adapted from the National Engineering Handbook Volume 4)

Appendix B
Hidden Lakes Drainage Areas - Proposed Conditions Peak Flows

Basin	Area (ac)	Area (sq mi)	Cover				Developed (ac)	Percent Impervious	m	b10	b100	10-year Peak Flow (cfs)	100-year Peak Flow (cfs)	TC	R10	R100
			Residential Small Lot (ac)	Commercial (ac)	Water (ac)	Isolated Road (ac)										
MOODY1A	67.33	0.105	40%	85%	100%	90%	37.90	56.3%	0.823	5.07	7.81	162	250	0.43	0.81	0.79
MOODY1B	70.82	0.111	41.53	26.25	0	2.83	41.47	58.6%	0.823	5.14	7.88	171	262	0.35	0.82	0.82
MOODY2A								Flow calculated using rational method								
MOODY2B	74.97	0.117	37.97	0	18.79	2.56	36.28	48.4%	0.823	4.84	7.56	169	264	0.72	0.82	0.8
MOODY2C	56.02	0.088	54.52	0	0	1.5	23.16	41.3%	0.823	4.64	7.34	127	202	0.34	0.92	0.85
MOODY2D	11.73	0.018	0	4.24	6.76	0.73	11.02	94.0%	1	3.50	5.10	41	60	0.17	0.43	0.43
MOODY2E	121.88	0.190	93.62	0	16.98	3.33	57.43	47.1%	0.823	4.81	7.52	250	392	0.68	1	0.99
MOODY2F	43.92	0.069	37.11	0	5.84	0.97	21.56	49.1%	0.823	4.86	7.58	109	171	0.46	0.76	0.72
MOODY2G	23.84	0.037	0	18.06	5.07	0.71	21.06	88.3%	0.823	5.90	8.70	80	118	0.54	0.37	0.37

Q = bAⁿ

b table

%imp	10yr			100yr		
	<=20 ac	>20 ac	>20 ac	<=20 ac	>20 ac	>20 ac
0%	1.2	2.1		2	3.4	
10%	1.5	2.6		2.5	4.3	
20%	1.8	3.1		3.1	5.3	
30%	2.3	3.9		3.8	6.4	
40%	2.7	4.6		4.3	7.3	
85%	3.5	5.9		5.1	8.7	
100%	3.5	5.9		5.1	8.7	

Appendix B
Hidden Lakes Drainage Areas - Proposed Conditions Times of Concentration

Basin	Area (ac)	Flow Paths					Travel Times					Time of Concentration (min)	TC (hr)			
		Sheet (ft)	Paved Sheet (ft)	Channel (ft)	Gutter (ft)	Pipe (ft)	Water (ft)	Sheet (min)	Paved Sheet (min)	Channel (min)	Gutter (min)			Pipe (min)	Water (min)	
MOODY1A	67.33	0	453.37	0	0	3723.4	0	0	5.0	0	0	20.7	0	25.7	0.43	
MOODY1B	70.82	0	513.73	0	0	2791	0	0	5.7	0	0	15.5	0	21.2	0.35	
MOODY2A								Flow calculated using rational method								
MOODY2B	74.97	193.45	0	0	110.92	1324.47	1699.77	6.4	0	0	0.9	7.4	28.3	43.1	0.72	
MOODY2C	56.02	197.64	0	0	86.31	2361.2	0	6.6	0	0	0.7	13.1	0	20.4	0.34	
MOODY2D	11.73	0	69.12	0	0	556.64	311.9	0	0.8	0	0	3.1	5.2	10.0	0.17	
MOODY2E	121.88	155.02	0	0	193.24	1593.04	1509.62	5.2	0	0	1.6	8.9	25.2	40.8	0.68	
MOODY2F	43.92	187.23	0	0	188.23	821.34	928.63	6.2	0	0	1.6	4.6	15.5	27.8	0.46	
MOODY2G	23.84	0	134.79	0	0	592.13	1653.99	0.0	1.5	0	0	3.3	27.6	32.4	0.54	

Velocity Assumptions

Sheet	0.5 ft/s
Channel	1.5 ft/s
Gutter	2 ft/s
Pipe	3 ft/s
Water	1 ft/s
Paved Sheet	1.5 ft/s



Appendix B

Hidden Lakes Shared Lake Area Flow Calculations

	Area (acres)	C	tc (min)	i (in/hr)	Q	
MOODY2A	105.03	0.559	72.0	3.03	178	10-year
				4.14	243	100-year

Galveston County

	10yr	100yr
e	0.742	0.69
b	78	85
d	7.6	7.8

lake	47.17 ac	100%	47.17
high density	0 ac	85%	0
assumed undev	57.86 ac	0%	0

total %imp 44.9%

TC (hr)	area (sq mi)	R10	R100
1.20	0.164	1.27	1.73

Appendix B

Hidden Lakes Shared Lake Area Time of Concentration Calculations

short grass pasture

L	741.52 ft	
ΔE	1 ft	
S	0.001349 ft/ft	
V	0.5 ft/s	from TxDOT figure 5-4
tc	24.7 min	

shallow channel

L	837.04 ft	
ΔE	0.8 ft	
S	0.000956 ft/ft	
V	0.75 ft/s	from TxDOT figure 5-4
tc	18.6 min	(btwn bare ground & grassed waterway)

lake

L	1720.99 ft	
V	1 ft/s	assumed
tc	28.7 min	

total tc	72.0 min
	1.20 hr

Appendix B
Gum Bayou HEC-HMS Output - 10-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DA38A	1.31	362.3	01Mar2010, 17:35	6.18
38A	1.31	362.3	01Mar2010, 17:35	6.18
R_38A	1.31	362.3	01Mar2010, 17:35	6.18
DA38A2	0.234	170.1	01Mar2010, 16:35	6.39
38A2	1.544	517.7	01Mar2010, 17:05	6.21
R_38A2	1.544	517.7	01Mar2010, 17:05	6.21
REFBAY	0.83	273.8	01Mar2010, 17:35	6.47
REFROU	0.83	273.8	01Mar2010, 18:50	6.47
DA38A3	0.276	169.1	01Mar2010, 16:40	6.51
GBN#1 US	2.65	889	01Mar2010, 18:10	6.32
MOODY1B	0.111	171.7	01Mar2010, 16:25	6.91
MOODY1A	0.105	161.8	01Mar2010, 16:30	6.86
GBN#1 DS	2.866	1056.7	01Mar2010, 16:35	6.37
R_GBN#1	2.866	1056.7	01Mar2010, 16:35	6.37
DA38B	0.829	280.8	01Mar2010, 17:35	6.44
MOODY2E	0.19	250.7	01Mar2010, 16:40	6.64
MOODY2A	0.164	177.8	01Mar2010, 17:10	6.59
MOODY2B	0.117	169.5	01Mar2010, 16:45	6.67
MOODY2C	0.088	126.8	01Mar2010, 16:25	6.5
MOODY2F	0.069	109.1	01Mar2010, 16:30	6.69
MOODY2G	0.037	80.1	01Mar2010, 16:30	7.61
MOODY2D	0.018	40.9	01Mar2010, 16:15	7.74
GBN#2	4.378	2160.5	01Mar2010, 16:40	6.43
R_GBN#2	4.378	2160.5	01Mar2010, 16:40	6.43
DA38C	0.646	320.7	01Mar2010, 17:05	5.61
GBN#4 US	5.024	2466.6	01Mar2010, 16:45	6.33
DA38E	1.347	445.4	01Mar2010, 17:40	5.66
DA38D_2	0.79	247.3	01Mar2010, 17:40	5.67
DA38D_1	0.442	239.5	01Mar2010, 17:00	6.34
R_38D_1	0.442	239.5	01Mar2010, 17:00	6.34
38D	1.232	481.8	01Mar2010, 17:20	5.91
R_38D	1.232	481.8	01Mar2010, 17:20	5.91
EASTFORK	2.579	924.5	01Mar2010, 17:30	5.78
GBN#4 DS	7.603	3290.7	01Mar2010, 16:55	6.14
R_GBN#4	7.603	3290.7	01Mar2010, 16:55	6.14
DA38F	0.401	148.6	01Mar2010, 17:25	5.57
GBN#5 US	8.004	3434.1	01Mar2010, 16:55	6.11
DA39	3.381	946.7	01Mar2010, 18:20	5.93
GBN#5 DS	11.385	4122.6	01Mar2010, 17:15	6.06
R_GBN#5	11.385	4122.6	01Mar2010, 17:15	6.06
DA40	0.735	326.9	01Mar2010, 17:05	5.61
GBN#6	12.12	4449.3	01Mar2010, 17:10	6.03

Appendix B
Gum Bayou HEC-HMS Output - 100-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DA38A	1.31	655.6	01Mar2010, 18:15	11.91
38A	1.31	655.6	01Mar2010, 18:15	11.91
R_38A	1.31	655.6	01Mar2010, 18:15	11.91
DA38A2	0.234	279.4	01Mar2010, 16:35	12.14
38A2	1.544	899.7	01Mar2010, 17:20	11.95
R_38A2	1.544	899.7	01Mar2010, 17:20	11.95
REFBAY	0.83	482.8	01Mar2010, 18:05	12.23
REFROU	0.83	482.8	01Mar2010, 19:20	12.23
DA38A3	0.276	281.2	01Mar2010, 16:40	12.28
GBN#1 US	2.65	1580.6	01Mar2010, 18:15	12.07
MOODY1B	0.111	262.4	01Mar2010, 16:25	12.71
MOODY1A	0.105	250.6	01Mar2010, 16:30	12.65
GBN#1 DS	2.866	1798.7	01Mar2010, 16:35	12.12
R_GBN#1	2.866	1798.7	01Mar2010, 16:35	12.12
DA38B	0.829	494.4	01Mar2010, 18:05	12.2
MOODY2E	0.19	391.6	01Mar2010, 16:40	12.42
MOODY2A	0.164	243.3	01Mar2010, 17:10	12.36
MOODY2B	0.117	264.1	01Mar2010, 16:40	12.45
MOODY2C	0.088	202.6	01Mar2010, 16:25	12.27
MOODY2F	0.069	171.1	01Mar2010, 16:30	12.47
MOODY2G	0.037	118.8	01Mar2010, 16:30	13.47
MOODY2D	0.018	60.2	01Mar2010, 16:15	13.62
GBN#2	4.378	3548.8	01Mar2010, 16:40	12.19
R_GBN#2	4.378	3548.8	01Mar2010, 16:40	12.19
DA38C	0.646	553.9	01Mar2010, 17:10	11.29
GBN#4 US	5.024	4078	01Mar2010, 16:45	12.07
DA38E	1.347	804.2	01Mar2010, 18:05	11.35
DA38D_2	0.79	448.9	01Mar2010, 18:10	11.36
DA38D_1	0.442	404.2	01Mar2010, 17:05	12.09
R_38D_1	0.442	404.2	01Mar2010, 17:05	12.09
38D	1.232	841.9	01Mar2010, 17:30	11.62
R_38D	1.232	841.9	01Mar2010, 17:30	11.62
EASTFORK	2.579	1641.3	01Mar2010, 17:50	11.48
GBN#4 DS	7.603	5552.1	01Mar2010, 16:55	11.87
R_GBN#4	7.603	5552.1	01Mar2010, 16:55	11.87
DA38F	0.401	265.3	01Mar2010, 17:45	11.25
GBN#5 US	8.004	5805.8	01Mar2010, 16:55	11.84
DA39	3.381	1726.2	01Mar2010, 18:50	11.64
GBN#5 DS	11.385	7197.6	01Mar2010, 17:40	11.78
R_GBN#5	11.385	7197.6	01Mar2010, 17:40	11.78
DA40	0.735	570.7	01Mar2010, 17:15	11.29
GBN#6	12.12	7764.4	01Mar2010, 17:40	11.75

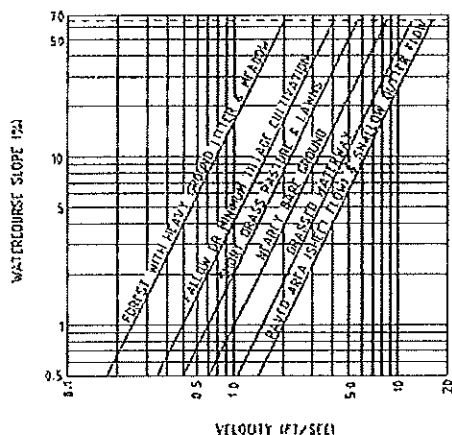


Figure 5-4. Velocities for Upland Method of Estimating Time of Concentration--English (Adapted from the National Engineering Handbook Volume 4)

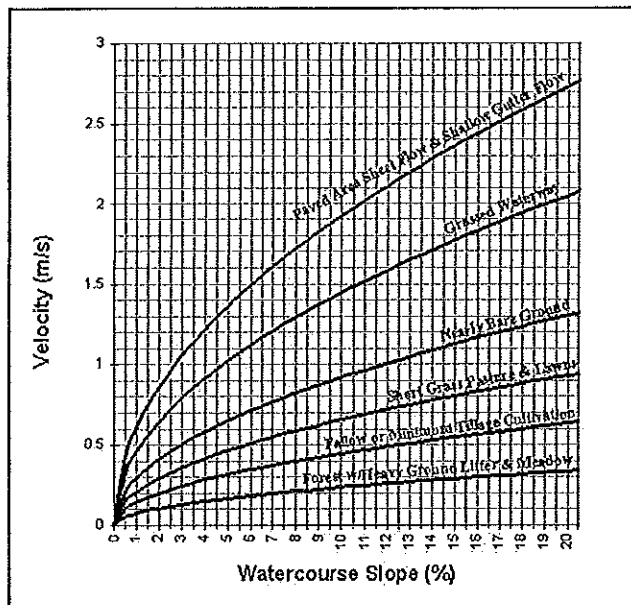


Figure 5-5. Velocities for Upland Method of Estimating Time of Concentration--Metric (Adapted from the National Engineering Handbook Volume 4)

For simplicity, you might employ Figure 5-4 and Figure 5-5 for shallow flow in gutters and swales. Alternatively, you might employ the method outlined in the following paragraphs.

HEC-RAS Profile: Max WS

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crtt W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Ch	Vel Total (ft/s)
East Fork	trib	535.4552	Max WS	GBpr10	616.74	-1.25	8.02		8.04	0.000144	1.27	496.77	121.63	0.10	1.24
East Fork	trib	535.4552	Max WS	GBpr100	957.07	-1.25	9.47		9.50	0.000142	1.50	695.80	161.19	0.10	1.38
East Fork	trib	540.4552	Max WS	GBpr10	616.81	-1.25	8.02		8.04	0.000144	1.27	496.86	121.63	0.10	1.24
East Fork	trib	540.4552	Max WS	GBpr100	957.07	-1.25	9.47		9.50	0.000142	1.50	695.91	161.20	0.10	1.38
East Fork	trib	774.9974	Max WS	GBpr10	616.13	-1.79	8.05		8.11	0.000350	1.95	353.11	53.68	0.15	1.75
East Fork	trib	774.9974	Max WS	GBpr100	957.02	-1.79	9.50		9.57	0.000354	2.20	545.37	234.23	0.16	1.75
East Fork	trib	1129.264	Max WS	GBpr10	589.42	-1.57	8.16		8.21	0.000237	1.92	385.71	123.85	0.13	1.53
East Fork	trib	1129.264	Max WS	GBpr100	903.84	-1.57	9.62		9.68	0.000229	2.15	597.77	204.87	0.13	1.51
East Fork	trib	1380.568	Max WS	GBpr10	563.69	-1.94	8.23		8.29	0.000323	1.91	300.70	65.19	0.15	1.87
East Fork	trib	1380.568	Max WS	GBpr100	856.28	-1.94	9.68		9.75	0.000321	2.21	429.40	171.50	0.15	1.99
East Fork	trib	1710.556	Max WS	GBpr10	533.98	-1.04	8.36		8.44	0.000555	2.25	237.85	55.49	0.19	2.25
East Fork	trib	1710.556	Max WS	GBpr100	801.70	-1.04	9.81		9.90	0.000511	2.49	335.64	91.58	0.19	2.39
East Fork	trib	1907.972	Max WS	GBpr10	514.93	-1.51	8.48		8.52	0.000219	1.84	366.32	98.85	0.13	1.41
East Fork	trib	1907.972	Max WS	GBpr100	767.27	-1.51	9.92		9.97	0.000208	2.04	553.91	260.24	0.13	1.39
East Fork	trib	2219.039	Max WS	GBpr10	485.25	-0.96	8.58		8.67	0.000688	2.48	198.18	48.15	0.20	2.45
East Fork	trib	2219.039	Max WS	GBpr100	714.38	-0.96	10.01		10.12	0.000630	2.65	307.26	134.44	0.20	2.32
East Fork	trib	2461.718	Max WS	GBpr10	458.83	-0.82	8.75		8.83	0.000499	2.25	204.63	45.13	0.18	2.24
East Fork	trib	2461.718	Max WS	GBpr100	666.77	-0.82	10.17		10.26	0.000453	2.47	289.87	385.68	0.18	2.30
East Fork	trib	2678.052	Max WS	GBpr10	440.17	-0.71	8.86		8.94	0.000534	2.29	192.00	40.53	0.18	2.29
East Fork	trib	2678.052	Max WS	GBpr100	633.49	-0.71	10.28		10.37	0.000519	2.52	259.39	333.51	0.19	2.44
East Fork	trib	2935.586	Max WS	GBpr10	415.90	-0.21	9.02		9.12	0.000769	2.60	159.93	35.31	0.22	2.60
East Fork	trib	2935.586	Max WS	GBpr100	590.31	-0.21	10.46		10.57	0.000862	2.66	234.06	318.87	0.23	2.52
East Fork	trib	3131.442	Max WS	GBpr10	395.15	0.11	9.19		9.26	0.000585	2.25	175.91	40.58	0.19	2.25
East Fork	trib	3131.442	Max WS	GBpr100	553.40	0.11	10.62		10.71	0.000466	2.31	248.05	469.43	0.18	2.23
East Fork	trib	3413.596	Max WS	GBpr10	365.42	1.45	9.37		9.45	0.000642	2.34	156.31	36.39	0.20	2.34
East Fork	trib	3413.596	Max WS	GBpr100	500.73	1.45	10.77		10.85	0.000472	2.32	240.13	338.50	0.18	2.09
East Fork	trib	3563.860	Max WS	GBpr10	348.48	1.51	9.48		9.55	0.000543	2.15	162.36	38.42	0.18	2.15
East Fork	trib	3563.860	Max WS	GBpr100	470.82	1.61	10.87		10.92	0.000375	1.99	304.52	535.56	0.16	1.55
East Fork	trib	3796.660	Max WS	GBpr10	320.88	2.04	9.62		9.69	0.000484	2.00	160.35	38.86	0.17	2.00
East Fork	trib	3796.660	Max WS	GBpr100	421.96	2.04	10.96		11.02	0.000372	1.95	216.68	423.18	0.16	1.95
East Fork	trib	4172.662	Max WS	GBpr10	280.51	2.57	9.80		9.84	0.000301	1.58	177.57	43.79	0.14	1.58
East Fork	trib	4172.662	Max WS	GBpr100	350.75	2.57	11.11		11.15	0.000204	1.47	239.89	187.68	0.12	1.46

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crt W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Crt	Vel Total (ft/s)
East Fork	trib	4553.236	Max WS	GBpr10	241.66	2.81	9.93		9.97	0.000323	1.64	147.05	37.80	0.14	1.64
East Fork	trib	4553.236	Max WS	GBpr100	282.85	2.81	11.20		11.23	0.000185	1.46	196.79	117.25	0.11	1.44
East Fork	trib	4609.199	Max WS	GBpr10	236.66	3.02	9.96		9.98	0.000154	1.21	195.62	81.51	0.10	1.21
East Fork	trib	4609.199	Max WS	GBpr100	274.67	3.02	11.23		11.24	0.000102	1.08	253.16	280.02	0.08	1.08
East Fork	trib	4653.943		Bridge											
East Fork	trib	4718.687	Max WS	GBpr10	236.94	2.01	9.98	5.65	10.01	0.000286	1.46	162.60	65.93	0.13	1.46
East Fork	trib	4718.687	Max WS	GBpr100	275.16	2.01	11.25	5.87	11.28	0.000164	1.24	221.96	211.41	0.10	1.24
East Fork	trib	4830.163	Max WS	GBpr10	233.40	2.74	10.01		10.05	0.000377	1.88	139.00	36.30	0.15	1.68
East Fork	trib	4830.163	Max WS	GBpr100	269.16	2.74	11.27		11.30	0.000205	1.42	198.93	112.25	0.12	1.35
East Fork	trib	5612.320	Max WS	GBpr10	212.14	4.79	10.29		10.32	0.000271	1.36	155.78	47.15	0.13	1.36
East Fork	trib	5612.320	Max WS	GBpr100	238.02	4.79	11.43		11.44	0.000140	1.10	238.52	110.64	0.10	1.00
East Fork	trib	5659.710	Max WS	GBpr10	197.38	5.79	10.65		10.70	0.000526	1.79	116.61	49.03	0.18	1.69
East Fork	trib	5659.710	Max WS	GBpr100	224.44	5.79	11.61		11.65	0.000279	1.47	175.30	82.59	0.13	1.28
East Fork	trib	6733.530	Max WS	GBpr10	194.78	5.78	10.74		10.78	0.000419	1.62	138.05	64.03	0.16	1.41
East Fork	trib	6733.530	Max WS	GBpr100	227.51	5.78	11.67		11.69	0.000223	1.33	239.24	278.68	0.12	0.95
East Fork	trib	7010.956	Max WS	GBpr10	190.05	5.77	10.86		10.90	0.000382	1.57	133.50	55.06	0.15	1.42
East Fork	trib	7010.956	Max WS	GBpr100	227.43	5.77	11.73		11.76	0.000241	1.59	206.33	148.23	0.12	1.10
East Fork	trib	7186.773	Max WS	GBpr10	186.85	5.76	10.93		10.96	0.000366	1.54	130.12	54.76	0.15	1.44
East Fork	trib	7186.773	Max WS	GBpr100	225.51	5.76	11.77		11.80	0.000236	1.39	202.66	146.52	0.12	1.11
East Fork	trib	7575.182	Max WS	GBpr10	180.46	5.75	11.07		11.10	0.000294	1.38	144.66	77.42	0.13	1.25
East Fork	trib	7575.182	Max WS	GBpr100	223.24	5.75	11.86		11.88	0.000153	1.15	321.52	358.44	0.10	0.69
East Fork	trib	7815.951	Max WS	GBpr10	176.28	5.74	11.13		11.14	0.000100	0.81	437.35	499.13	0.08	0.40
East Fork	trib	7815.951	Max WS	GBpr100	220.14	5.74	11.89		11.90	0.000030	0.51	866.75	614.78	0.04	0.25
East Fork	trib	8045.906	Max WS	GBpr10	171.37	5.73	11.16		11.17	0.000141	0.97	296.43	360.22	0.09	0.58
East Fork	trib	8045.906	Max WS	GBpr100	213.55	5.73	11.90		11.91	0.000053	0.68	638.07	573.71	0.06	0.33
East Fork	trib	8154.852	Max WS	GBpr10	169.09	6.06	11.17		11.19	0.000202	1.16	243.69	410.84	0.11	0.69
East Fork	trib	8154.852	Max WS	GBpr100	211.07	6.06	11.91		11.91	0.000061	0.73	623.07	562.95	0.06	0.34
East Fork	trib	8365.465	Max WS	GBpr10	164.69	5.51	11.21		11.21	0.000062	0.65	541.00	804.15	0.06	0.30
East Fork	trib	8365.465	Max WS	GBpr100	205.89	5.51	11.92		11.92	0.000016	0.38	1391.88	1566.40	0.03	0.15
East Fork	trib	8573.797	Max WS	GBpr10	160.24	5.42	11.22		11.23	0.000111	0.85	426.75	861.09	0.08	0.38
East Fork	trib	8573.797	Max WS	GBpr100	199.54	5.42	11.92		11.92	0.000020	0.40	1340.67	1826.25	0.04	0.15
East Fork	trib	8761.822	Max WS	GBpr10	156.28	5.53	11.24		11.25	0.000098	0.81	546.78	1966.77	0.08	0.29

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Cntl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Ctl	Vel Total (ft/s)
East Fork	trib	8761.822	Max WS	GBpr100	193.65	5.53	11.93		11.93	0.000008	0.27	2162.50	2490.20	0.02	0.09
East Fork	trib	8964.394	Max WS	GBpr10	151.75	5.68	11.26		11.26	0.000040	0.51	915.52	2856.27	0.05	0.17
East Fork	trib	8964.394	Max WS	GBpr100	166.81	5.68	11.93		11.93	0.000004	0.17	3394.77	4015.01	0.02	0.06
East Fork	trib	9164.902	Max WS	GBpr10	147.17	5.87	11.27		11.27	0.000043	0.52	915.73	2720.68	0.05	0.16
East Fork	trib	9164.902	Max WS	GBpr100	180.05	5.87	11.93		11.93	0.000003	0.16	3399.40	4238.45	0.01	0.05
East Fork	trib	9368.154	Max WS	GBpr10	142.47	5.76	11.28		11.28	0.000037	0.50	1009.69	3184.70	0.05	0.14
East Fork	trib	9368.154	Max WS	GBpr100	173.16	5.76	11.93		11.93	0.000003	0.15	3961.99	5298.30	0.01	0.04
East Fork	trib	9560.854	Max WS	GBpr10	138.01	6.24	11.28		11.28	0.000031	0.45	1019.47	2775.46	0.04	0.14
East Fork	trib	9560.854	Max WS	GBpr100	166.61	6.24	11.93		11.93	0.000003	0.15	3661.86	5116.08	0.01	0.05
East Fork	trib	9759.052	Max WS	GBpr10	133.43	6.07	11.29		11.29	0.000038	0.51	661.01	1337.61	0.05	0.20
East Fork	trib	9759.052	Max WS	GBpr100	159.93	6.07	11.93		11.93	0.000005	0.21	2742.90	4875.31	0.02	0.06
East Fork	trib	9960.175	Max WS	GBpr10	128.74	6.10	11.30		11.30	0.000056	0.81	587.13	1498.55	0.06	0.22
East Fork	trib	9960.175	Max WS	GBpr100	153.03	6.10	11.93		11.93	0.000006	0.22	2519.90	4908.32	0.02	0.06
East Fork	trib	10160.33	Max WS	GBpr10	124.23	6.60	11.31		11.31	0.000077	0.64	537.04	1589.47	0.07	0.23
East Fork	trib	10160.33	Max WS	GBpr100	146.19	6.60	11.93		11.93	0.000005	0.20	2682.67	5201.59	0.02	0.05
East Fork	trib	10365.36	Max WS	GBpr10	119.56	6.53	11.32		11.32	0.000026	0.39	952.76	2528.88	0.04	0.13
East Fork	trib	10365.36	Max WS	GBpr100	139.17	6.53	11.93		11.93	0.000002	0.13	3808.85	6048.34	0.01	0.04
East Fork	trib	10560.64	Max WS	GBpr10	115.00	6.36	11.32		11.33	0.000015	0.29	1332.47	3412.86	0.03	0.09
East Fork	trib	10560.64	Max WS	GBpr100	132.48	6.36	11.93		11.93	0.000001	0.10	4414.31	6670.44	0.01	0.03
East Fork	trib	10759.64	Max WS	GBpr10	110.39	6.50	11.33		11.33	0.000006	0.18	2124.09	4722.80	0.02	0.05
East Fork	trib	10759.64	Max WS	GBpr100	125.77	6.50	11.93		11.93	0.000001	0.05	5849.56	7215.60	0.01	0.02
East Fork	trib	10964.15	Max WS	GBpr10	105.73	6.60	11.33		11.33	0.000004	0.15	2312.76	4593.10	0.01	0.05
East Fork	trib	10964.15	Max WS	GBpr100	118.63	6.60	11.93		11.93	0.000000	0.06	6117.86	7935.06	0.01	0.02
East Fork	trib	11128.81	Max WS	GBpr10	102.05	6.71	11.33		11.33	0.000005	0.17	2019.94	4098.69	0.02	0.05
East Fork	trib	11128.81	Max WS	GBpr100	113.12	6.71	11.93		11.93	0.000001	0.05	4994.51	5824.12	0.01	0.02
East Fork	trib	11377.68	Max WS	GBpr10	96.52	6.83	11.33		11.33	0.000007	0.20	1544.81	2974.17	0.02	0.08
East Fork	trib	11377.68	Max WS	GBpr100	104.65	6.83	11.93		11.93	0.000001	0.07	3775.90	4096.34	0.01	0.03
East Fork	trib	11643.13	Max WS	GBpr10	91.08	6.89	11.33		11.33	0.000015	0.28	1162.80	3216.21	0.03	0.08
East Fork	trib	11643.13	Max WS	GBpr100	95.81	6.89	11.93		11.93	0.000001	0.08	3529.51	4424.78	0.01	0.03
East Fork	trib	11811.49	Max WS	GBpr10	92.92	7.12	11.34		11.34	0.000023	0.33	1000.58	2800.69	0.04	0.09
East Fork	trib	11811.49	Max WS	GBpr100	95.97	7.12	11.93		11.93	0.000001	0.09	3139.32	4322.30	0.01	0.03
Gum Bayou	Lower	504.8711	Max WS	GBpr10	2929.96	-7.92	2.78	-1.76	3.22	0.000501	5.57	703.02	355.19	0.34	4.17

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
Gum Bayou	Lower	504.8711	Max WS	GBpr100	5015.40	-7.92	4.23	0.52	4.66	0.000601	6.19	1344.87	513.74	0.35	3.73
Gum Bayou	Lower	2161.939	Max WS	GBpr10	2930.04	-7.92	3.72		3.84	0.000230	2.86	1092.42	274.72	0.24	2.68
Gum Bayou	Lower	2161.939	Max WS	GBpr100	5015.54	-7.92	5.13		5.32	0.000293	3.38	1485.77	282.09	0.26	3.38
Gum Bayou	Lower	2372.100	Max WS	GBpr10	2919.39	-5.82	3.61		3.98	0.000901	4.87	600.05	266.55	0.46	4.87
Gum Bayou	Lower	2372.100	Max WS	GBpr100	4996.78	-5.82	4.94		5.51	0.001240	6.01	830.81	277.58	0.48	6.01
Gum Bayou	Lower	2434.526			Bridge										
Gum Bayou	Lower	2452.965	Max WS	GBpr10	2919.56	-8.10	3.60	2.72	4.15	0.001799	5.37	488.80	241.82	0.61	5.97
Gum Bayou	Lower	2452.965	Max WS	GBpr100	4997.13	-8.10	4.98	3.85	5.74	0.002143	6.97	716.88	255.71	0.59	6.97
Gum Bayou	Lower	2995.046	Max WS	GBpr10	2887.55	-2.60	4.53		4.66	0.000333	3.08	1140.06	352.40	0.25	2.53
Gum Bayou	Lower	2995.046	Max WS	GBpr100	4940.17	-2.60	6.12		6.30	0.000329	3.70	1755.55	422.50	0.26	2.81
Gum Bayou	Lower	4057.931	Max WS	GBpr10	2825.23	-5.70	4.86		4.96	0.000227	2.79	1361.66	393.34	0.21	2.07
Gum Bayou	Lower	4057.931	Max WS	GBpr100	4831.20	-5.70	6.46		6.61	0.000246	3.44	2058.92	507.18	0.23	2.35
Gum Bayou	Lower	5412.954	Max WS	GBpr10	2741.94	-6.10	5.21		5.39	0.000367	3.81	956.28	262.77	0.27	2.87
Gum Bayou	Lower	5412.954	Max WS	GBpr100	4685.70	-6.10	6.83		7.08	0.000391	4.58	1430.88	327.33	0.29	3.27
Gum Bayou	Lower	6445.483	Max WS	GBpr10	2681.49	-6.20	5.58		5.91	0.000563	4.95	773.94	207.26	0.34	3.46
Gum Bayou	Lower	6445.483	Max WS	GBpr100	4580.50	-6.20	7.22		7.71	0.000579	6.23	1145.08	245.73	0.35	4.00
Gum Bayou	Lower	6912.951	Max WS	GBpr10	1769.68	-6.20	6.04		6.16	0.000214	2.92	846.06	227.16	0.22	2.09
Gum Bayou	Lower	6912.951	Max WS	GBpr100	2920.85	-6.20	7.82		7.97	0.000222	3.44	1402.41	388.34	0.22	2.08
Gum Bayou	Lower	7407.249	Max WS	GBpr10	1748.54	-6.20	6.11		6.36	0.000433	4.18	600.71	211.80	0.30	2.91
Gum Bayou	Lower	7407.249	Max WS	GBpr100	2885.94	-6.20	7.90		8.19	0.000434	4.81	1069.03	326.47	0.31	2.70
Gum Bayou	Lower	7790.170	Max WS	GBpr10	1735.39	-3.80	6.34		6.46	0.000210	3.11	711.34	195.60	0.21	2.44
Gum Bayou	Lower	7790.170	Max WS	GBpr100	2887.01	-3.80	8.12		8.27	0.000210	3.53	1188.82	350.24	0.22	2.39
Gum Bayou	Lower	8218.802	Max WS	GBpr10	1714.55	-3.60	6.31		6.73	0.000630	5.33	505.84	173.24	0.36	3.39
Gum Bayou	Lower	8218.802	Max WS	GBpr100	2828.67	-3.60	8.09		8.62	0.000653	6.31	919.16	350.50	0.38	3.08
Gum Bayou	Lower	8648.945	Max WS	GBpr10	1703.09	-3.40	6.90		7.08	0.001267	3.35	508.81	167.64	0.29	3.35
Gum Bayou	Lower	8648.945	Max WS	GBpr100	2819.72	-3.40	8.68		8.82	0.000992	3.02	1054.32	441.90	0.26	2.67
Gum Bayou	Lower	8655.526			Bridge										
Gum Bayou	Lower	8661.260	Max WS	GBpr10	1707.17	-3.40	7.23	3.69	7.37	0.001439	2.98	577.94	214.42	0.30	2.95
Gum Bayou	Lower	8661.260	Max WS	GBpr100	2824.87	-3.40	8.77	5.31	8.91	0.000920	3.07	1076.13	440.14	0.25	2.63
Gum Bayou	Lower	9188.580	Max WS	GBpr10	1686.21	-4.40	7.82		7.92	0.000604	2.88	785.81	194.50	0.22	2.15
Gum Bayou	Lower	9188.580	Max WS	GBpr100	2732.43	-4.40	9.24		9.37	0.000769	3.45	1167.33	504.92	0.26	2.39

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
Gum Bayou	Lower	9518.148	Max WS	GBpr10	1672.05	-1.93	8.01		8.04	0.000237	1.55	1489.23	631.39	0.13	1.12
Gum Bayou	Lower	9518.148	Max WS	GBpr100	2768.20	-1.93	9.47		9.49	0.000217	1.79	3039.52	1471.43	0.13	0.91
Gum Bayou	Lower	9528.148	Max WS	GBpr10	1671.60	-1.93	8.01		8.04	0.000236	1.55	1490.76	631.80	0.13	1.12
Gum Bayou	Lower	9528.148	Max WS	GBpr100	2767.41	-1.93	9.47		9.49	0.000216	1.79	3042.78	1472.11	0.13	0.91
Gum Bayou	Lower	9542.525			Culvert										
Gum Bayou	Lower	9558.148	Max WS	GBpr10	1671.57	-1.93	8.02		8.05	0.000296	1.85	1297.12	516.85	0.15	1.29
Gum Bayou	Lower	9558.148	Max WS	GBpr100	2767.41	-1.93	9.46		9.50	0.000306	2.13	2616.83	1658.74	0.15	1.06
Gum Bayou	Lower	9568.148	Max WS	GBpr10	1671.57	-1.93	8.02		8.05	0.000293	1.84	1298.72	517.28	0.14	1.29
Gum Bayou	Lower	9568.148	Max WS	GBpr100	2767.43	-1.93	9.47		9.50	0.000271	2.01	2625.18	1665.20	0.14	1.05
Gum Bayou	Upper	10598.35	Max WS	GBpr10	1054.83	-1.36	8.02		8.36	0.001701	4.66	232.57	50.06	0.32	4.54
Gum Bayou	Upper	10598.35	Max WS	GBpr100	1810.36	-1.36	9.47		9.98	0.002457	6.00	413.36	211.81	0.39	4.38
Gum Bayou	Upper	10608.35	Max WS	GBpr10	1056.13	-1.36	8.04		8.37	0.001691	4.65	233.53	50.89	0.32	4.52
Gum Bayou	Upper	10608.35	Max WS	GBpr100	1813.93	-1.36	9.50		10.00	0.002428	5.95	420.68	215.82	0.38	4.31
Gum Bayou	Upper	10617.53			Bridge										
Gum Bayou	Upper	10626.34	Max WS	GBpr10	1074.29	-1.35	8.47	4.15	8.66	0.000953	3.49	308.12	242.14	0.26	3.49
Gum Bayou	Upper	10626.34	Max WS	GBpr100	1856.09	-1.35	9.90	5.56	10.25	0.001994	4.78	390.44	852.56	0.32	4.75
Gum Bayou	Upper	11889.33	Max WS	GBpr10	1008.52	-0.55	9.68		9.83	0.000853	3.08	352.04	115.37	0.24	2.86
Gum Bayou	Upper	11889.33	Max WS	GBpr100	1750.39	-0.55	11.31		11.43	0.000627	3.18	1077.03	1733.89	0.22	1.63
Gum Bayou	Upper	11909.2			Bridge										
Gum Bayou	Upper	11930.16	Max WS	GBpr10	1010.04	-0.55	9.91	5.99	10.04	0.000727	2.92	380.10	162.07	0.23	2.66
Gum Bayou	Upper	11930.16	Max WS	GBpr100	1750.39	-0.55	11.37	7.25	11.48	0.000572	3.06	1190.57	1854.76	0.21	1.47
Gum Bayou	Upper	12111.49	Max WS	GBpr10	1000.70	-0.55	10.07		10.15	0.000479	2.42	578.60	319.51	0.18	1.73
Gum Bayou	Upper	12111.49	Max WS	GBpr100	1738.79	-0.55	11.48		11.53	0.000323	2.32	1569.85	1904.82	0.16	1.11
Gum Bayou	Upper	12671.33	Max WS	GBpr10	963.09	-0.19	10.30		10.36	0.000256	2.01	522.68	253.44	0.14	1.84
Gum Bayou	Upper	12671.33	Max WS	GBpr100	1685.41	-0.19	11.65		11.75	0.000362	2.71	736.60	1104.82	0.17	2.28
Gum Bayou	Upper	13089.39	Max WS	GBpr10	939.00	-0.11	10.42		10.50	0.000381	2.19	427.84	244.98	0.17	2.19
Gum Bayou	Upper	13089.39	Max WS	GBpr100	1634.55	-0.11	11.81		11.95	0.000581	3.00	559.77	853.14	0.21	2.92
Gum Bayou	Upper	13139.39	Max WS	GBpr10	936.44	0.03	10.45		10.52	0.000342	2.11	443.41	120.33	0.16	2.11
Gum Bayou	Upper	13139.39	Max WS	GBpr100	1632.84	0.03	11.85		11.98	0.000492	2.90	583.89	851.12	0.20	2.80
Gum Bayou	Upper	13229.52			Bridge										
Gum Bayou	Upper	13282.81	Max WS	GBpr10	937.90	-0.65	10.54	4.23	10.60	0.000352	2.02	468.14	1670.09	0.16	2.00

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Cntl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Cnl	Vel Total (ft/s)
Gum Bayou	Upper	13282.81	Max WS	GBpr100	1642.64	-0.65	12.00	5.59	12.11	0.000507	2.57	633.42	2053.84	0.19	2.59
	Upper	13315.93	Max WS	GBpr10	937.95	-0.29	10.54		10.61	0.000406	2.26	414.15	75.59	0.17	2.26
	Upper	13315.93	Max WS	GBpr100	1648.74	-0.29	11.99		12.13	0.000596	3.09	545.93	389.37	0.21	3.02
Gum Bayou	Upper	13436.74	Max WS	GBpr10	938.94	-0.88	10.60		10.65	0.000234	1.82	525.05	1060.99	0.13	1.79
	Upper	13436.74	Max WS	GBpr100	1654.41	-0.88	12.10		12.18	0.000312	2.44	749.99	1907.74	0.16	2.21
Gum Bayou	Upper	13508.5			Lat Strud										
Gum Bayou	Upper	13590.25	Max WS	GBpr10	859.16	-0.77	10.66		10.69	0.000176	1.55	711.58	1518.35	0.11	1.21
	Upper	13590.25	Max WS	GBpr100	1397.60	-0.77	12.19		12.22	0.000139	1.60	1270.28	2156.34	0.10	1.10
Gum Bayou	Upper	14565.57	Max WS	GBpr10	859.14	0.16	10.89		10.97	0.000375	2.30	403.90	1180.84	0.16	2.13
	Upper	14565.57	Max WS	GBpr100	1413.86	0.16	12.41		12.51	0.000384	2.70	642.61	3832.22	0.17	2.20
Gum Bayou	Upper	14600.39	Max WS	GBpr10	859.38	0.20	10.90		10.98	0.000381	2.23	408.41	1250.90	0.16	2.10
	Upper	14600.39	Max WS	GBpr100	1424.26	0.20	12.43		12.52	0.000383	2.62	674.08	3952.26	0.17	2.11
Gum Bayou	Upper	15073.13	Max WS	GBpr10	861.66	0.64	11.08		11.13	0.000277	1.92	466.14	2610.10	0.14	1.85
	Upper	15073.13	Max WS	GBpr100	1438.58	0.64	12.61		12.70	0.000322	2.37	691.50	4236.15	0.16	2.08
Gum Bayou	Upper	15216.53	Max WS	GBpr10	662.05	0.92	11.16		11.19	0.000155	1.42	498.28	2234.45	0.11	1.33
	Upper	15216.53	Max WS	GBpr100	1087.55	0.92	12.72		12.76	0.000156	1.68	759.84	4073.69	0.11	1.43
Gum Bayou	Upper	15845.97	Max WS	GBpr10	663.74	1.01	11.27		11.30	0.000210	1.52	466.63	2465.33	0.12	1.42
	Upper	15845.97	Max WS	GBpr100	1101.26	1.01	12.84		12.88	0.000197	1.71	747.68	3216.72	0.12	1.47
Gum Bayou	Upper	16699.70	Max WS	GBpr10	682.55	1.42	11.46		11.51	0.000276	1.80	393.81	258.98	0.14	1.73
	Upper	16699.70	Max WS	GBpr100	1118.18	1.42	13.05		13.11	0.000258	2.05	700.38	850.12	0.14	1.60
Gum Bayou	Upper	17549.89	Max WS	GBpr10	738.75	1.83	11.84		11.95	0.000744	2.65	292.05	100.61	0.22	2.53
	Upper	17549.89	Max WS	GBpr100	1075.52	1.83	13.39		13.48	0.000454	2.62	529.39	168.14	0.18	2.03
Gum Bayou	Upper	17805.33	Max WS	GBpr10	412.33	1.95	12.07		12.10	0.000170	1.31	389.51	472.56	0.11	1.06
	Upper	17805.33	Max WS	GBpr100	596.28	1.95	13.50		13.50	0.000025	0.60	2774.04	2585.16	0.04	0.21
Gum Bayou	Upper	18222.95	Max WS	GBpr10	414.16	2.15	12.13		12.16	0.000236	1.42	361.43	262.59	0.12	1.15
	Upper	18222.95	Max WS	GBpr100	651.02	2.15	13.51		13.51	0.000056	0.83	2000.06	2303.17	0.06	0.33
Gum Bayou	Upper	18658.74	Max WS	GBpr10	418.41	2.37	12.20		12.29	0.000384	2.50	166.84	149.86	0.17	2.50
	Upper	18658.74	Max WS	GBpr100	649.11	2.37	13.54		13.57	0.000188	1.53	542.93	195.98	0.11	1.20
Gum Bayou	Upper	18668.74	Max WS	GBpr10	416.74	2.37	12.20		12.30	0.000384	2.50	166.94	149.99	0.17	2.50
	Upper	18668.74	Max WS	GBpr100	649.44	2.37	13.55		13.58	0.000188	1.53	543.29	196.12	0.11	1.20
Gum Bayou	Upper	18719.05			Culvert										

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Ctl	Vel Total (ft/s)
Gum Bayou	Upper	18769.25	Max WS	GBpr10	418.02	2.42	12.25		12.35	0.000380	2.49	167.65	121.62	0.17	2.49
Gum Bayou	Upper	18769.25	Max WS	GBpr100	649.44	2.42	13.44		13.61	0.000544	3.31	196.08	201.08	0.20	3.31
Gum Bayou	Upper	19152.51	Max WS	GBpr10	334.73	2.60	12.45		12.48	0.000176	1.27	272.01	91.27	0.11	1.23
Gum Bayou	Upper	19152.51	Max WS	GBpr100	559.54	2.60	13.71		13.75	0.000183	1.53	429.61	150.32	0.11	1.30
Gum Bayou	Upper	19162.52	Max WS	GBpr10	334.70	4.96	12.45		12.48	0.000248	1.39	271.56	136.53	0.13	1.23
Gum Bayou	Upper	19162.52	Max WS	GBpr100	559.59	4.96	13.72		13.75	0.000186	1.47	476.99	169.40	0.11	1.17
Gum Bayou	Upper	19385.99	Max WS	GBpr10	335.09	6.28	12.51		12.53	0.000130	1.12	330.43	155.27	0.09	1.01
Gum Bayou	Upper	19385.99	Max WS	GBpr100	561.89	6.28	13.77		13.80	0.000121	1.28	538.00	167.36	0.10	1.04
Gum Bayou	Upper	19441.26	Max WS	GBpr10	334.89	5.24	12.48		12.56	0.000652	2.25	156.21	105.13	0.20	2.14
Gum Bayou	Upper	19441.26	Max WS	GBpr100	562.06	5.24	13.77		13.80	0.000178	1.45	457.85	152.18	0.11	1.23
Gum Bayou	Upper	19477.05			Culvert										
Gum Bayou	Upper	19516.24	Max WS	GBpr10	336.09	5.32	13.21		13.31	0.000760	2.70	159.86	121.06	0.22	2.12
Gum Bayou	Upper	19516.24	Max WS	GBpr100	552.10	5.32	14.37		14.48	0.000686	2.98	291.30	138.52	0.22	1.93
Gum Bayou	Upper	19557.14	Max WS	GBpr10	336.13	4.61	13.29		13.30	0.000094	0.94	401.45	160.83	0.08	0.84
Gum Bayou	Upper	19557.14	Max WS	GBpr100	562.10	4.61	14.46		14.48	0.000098	1.13	592.91	165.62	0.08	0.95
Gum Bayou	Upper	20557.15	Max WS	GBpr10	336.15	7.26	13.38		13.39	0.000063	0.91	487.47	246.50	0.08	0.69
Gum Bayou	Upper	20557.15	Max WS	GBpr100	562.19	7.26	14.55		14.56	0.000058	0.89	1453.58	2233.38	0.07	0.39
Gum Bayou	Upper	21412.43	Max WS	GBpr10	336.54	7.22	13.46		13.47	0.000101	0.79	988.91	1413.65	0.08	0.35
Gum Bayou	Upper	21412.43	Max WS	GBpr100	563.92	7.22	14.59		14.59	0.000020	0.42	2816.55	1778.70	0.04	0.20

Appendix B
Dickinson Bayou HEC-HMS Output - 10-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB100d	0.4255	93.4	01Jan2008, 18:20	6.08
DB117a	0.4019	65.7	01Jan2008, 19:10	5.36
DB100e	0.3817	54.3	01Jan2008, 19:10	5.5
DB116a	1.0145	146.9	01Jan2008, 19:30	5.25
DB115a	0.7371	95.2	01Jan2008, 19:40	5.15
DB100f	0.4351	64.9	01Jan2008, 19:10	5.56
DB100g	0.4314	99.1	01Jan2008, 18:30	5.96
BG100a	0.2239	249.4	01Jan2008, 16:40	6.36
DB100h2	0.7813	69.1	01Jan2008, 20:30	4.59
DB110a	0.7918	110.4	01Jan2008, 19:40	5.54
DB100h1	1.046	135.2	01Jan2008, 20:00	5.51
DB100i	1.1485	53.1	02Jan2008, 00:00	3.08
DB100j	0.8411	109.4	01Jan2008, 19:30	5.19
DB101a	0.26	46.1	01Jan2008, 18:40	5.53
DB100k	0.8664	44.2	02Jan2008, 00:10	3.36
DB107a	0.3073	58.8	01Jan2008, 18:30	5.46
DB100l	0.2722	45.6	01Jan2008, 19:10	5.38
DB100m	0.4097	42.3	01Jan2008, 20:10	5.13
DB106a	0.5802	93.4	01Jan2008, 19:00	5.35
DB100n	0.4055	58.4	01Jan2008, 19:20	5.24
DB100o	1.0802	133.3	01Jan2008, 19:30	5.05
DB100p	1.1671	150.3	01Jan2008, 19:50	5.1
DB100v	0.3414	71	01Jan2008, 18:30	5.5
DB100q	1.5445	201.4	01Jan2008, 19:50	5.16
DB100r	1.0674	147.4	01Jan2008, 19:20	5.37
DB100s	0.5783	79.6	01Jan2008, 19:20	5.19
J100z	0.5783	79.6	01Jan2008, 19:20	5.19
R100z	0.5783	74.9	02Jan2008, 06:20	5.12
DB100t	0.2557	57.5	01Jan2008, 18:00	5.52
J100ab	0.2557	57.5	01Jan2008, 18:00	5.52
R100ab	0.2557	49.1	02Jan2008, 03:20	5.47
J100y	1.9014	231.7	02Jan2008, 03:00	5.31
R100y	1.9014	231.5	02Jan2008, 04:10	5.3
DB100x	0.1482	37.6	01Jan2008, 17:40	5.54
J100aa	0.1482	37.6	01Jan2008, 17:40	5.54
R100aa	0.1482	27.4	02Jan2008, 05:30	5.54
J100x	2.0496	258.7	02Jan2008, 04:20	5.31
R100x	2.0496	258.1	02Jan2008, 05:40	5.27
DB100y	0.3291	81.7	01Jan2008, 18:00	6.19
J100ac	0.3291	81.7	01Jan2008, 18:00	6.19
R100ac	0.3291	80.5	01Jan2008, 21:00	6.17
J100w	3.9232	483.6	01Jan2008, 23:00	5.3
R100w	3.9232	483.6	01Jan2008, 23:00	5.3
DB100w	1.1203	92.5	01Jan2008, 20:30	4.42

Appendix B
Dickinson Bayou HEC-HMS Output - 10-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
J100ad	1.1203	92.5	01Jan2008, 20:30	4.42
R100ad	1.1203	91.5	02Jan2008, 01:00	4.21
J100v	5.3849	630.2	01Jan2008, 23:20	5.08
R100v	5.3849	618.7	02Jan2008, 03:40	5.04
DB101g	1.3033	173	01Jan2008, 19:20	5.15
DB101h	0.5994	86.7	01Jan2008, 19:10	5.25
DB101i	0.3999	75.7	01Jan2008, 18:30	5.46
DB101k	0.7138	108.5	01Jan2008, 19:00	5.52
DB101l	0.6079	99.4	01Jan2008, 19:00	5.69
DB101m	0.4682	103.8	01Jan2008, 18:10	5.93
DB101n	0.5905	65.6	01Jan2008, 19:30	5.04
DB101p	0.8115	99.4	01Jan2008, 19:50	5.23
DB101q	0.9593	102.5	01Jan2008, 19:30	4.94
DB101r	1.9095	85.1	02Jan2008, 00:20	2.98
Chigger	1.9095	28.4	02Jan2008, 00:20	0.99
R101o	1.9095	28.3	02Jan2008, 03:00	0.94
J101n	2.8688	125.6	01Jan2008, 22:40	2.28
R101n	2.8688	122.2	02Jan2008, 05:20	2.21
DB101o	0.4823	86.5	01Jan2008, 18:50	5.88
J101p	0.4823	86.5	01Jan2008, 18:50	5.88
R101p	0.4823	65.8	02Jan2008, 09:20	5.85
J101m	4.7531	314.6	02Jan2008, 03:30	3.45
R101m	4.7531	313.6	02Jan2008, 05:10	3.44
J101l	5.8292	464.8	01Jan2008, 22:00	3.87
R101l	5.8292	464.5	01Jan2008, 23:30	3.86
J101k	6.543	562.8	01Jan2008, 22:40	4.04
R101k	6.543	560.8	02Jan2008, 00:20	4.04
DB101j	0.3461	138.7	01Jan2008, 17:10	6.08
J101j	6.8891	643.7	01Jan2008, 21:50	4.14
R101j	6.8891	635.8	02Jan2008, 00:40	4.12
J101i	7.289	694.8	02Jan2008, 00:10	4.2
R101i	7.289	688.7	02Jan2008, 03:30	4.18
J101h	7.8884	753.6	02Jan2008, 02:50	4.26
R101h	7.8884	748.8	02Jan2008, 05:10	4.24
DB101s	0.4214	151.4	01Jan2008, 17:20	6.03
DB101t	0.6201	190.8	01Jan2008, 17:20	6.12
DB101u	0.7635	162.1	01Jan2008, 18:30	5.91
J101s	0.7635	162.1	01Jan2008, 18:30	5.91
R101s	0.7635	146.3	02Jan2008, 04:40	5.9
J101r	1.3836	277.2	01Jan2008, 18:20	6
R101r	1.3836	261.9	01Jan2008, 20:50	6
J101q	1.805	382.8	01Jan2008, 20:10	6
R101q	1.805	317.3	02Jan2008, 04:50	6
J101g	10.9967	1191.8	02Jan2008, 04:20	4.64

Appendix B
Dickinson Bayou HEC-HMS Output - 10-year Proposed Conditions

Hydrologic Element	Drainage Area (mi ²)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R101g	10.9967	1184.3	02Jan2008, 05:40	4.63
J100u	17.5487	1909.9	02Jan2008, 04:20	4.79
R100u	17.5487	1888.2	02Jan2008, 06:20	4.77
Weir-Split	17.5487	1354.4	02Jan2008, 06:20	3.63
R100t	17.5487	1351.3	02Jan2008, 07:50	3.62
J100s2	18.6289	1440.1	02Jan2008, 07:10	3.7
R100s2	18.6289	1437.5	02Jan2008, 08:40	3.69
DB104a	0.8529	131	01Jan2008, 19:10	5.31
DB104b	1.8897	256	01Jan2008, 19:40	5.17
DB104c	1.5214	128.5	01Jan2008, 20:50	4.49
DB104d	0.7771	123	01Jan2008, 19:10	5.44
J104d	0.7771	123	01Jan2008, 19:10	5.44
R104d	0.7771	119.6	01Jan2008, 21:10	5.43
J104c	2.2985	248	01Jan2008, 21:10	4.8
R104c	2.2985	246.6	01Jan2008, 23:40	4.75
J104b	4.1882	485.8	01Jan2008, 22:30	4.94
R104b	4.1882	434.2	02Jan2008, 05:10	4.47
J104a	5.0411	521	02Jan2008, 04:50	4.61
R104a	5.0411	520.6	02Jan2008, 05:00	4.6
J100s1	24.0755	1966.2	02Jan2008, 06:40	3.91
R100s1	24.0755	1955.3	02Jan2008, 08:00	3.9
DB106b	0.9051	148.4	01Jan2008, 19:00	5.61
DB105a	1.0654	92.2	01Jan2008, 20:30	4.52
DB106c	0.638	132.9	01Jan2008, 18:30	5.59
DB106d	0.3265	55.5	01Jan2008, 19:00	5.39
J106b	0.9645	188.3	01Jan2008, 18:40	5.52
R106b	0.9645	186.9	01Jan2008, 20:20	5.51
DB105b	0.3873	64.8	01Jan2008, 19:00	5.63
DB105c	0.8905	147.6	01Jan2008, 19:00	5.37
J105b	0.8905	147.6	01Jan2008, 19:00	5.37
R105b	0.8905	143.9	01Jan2008, 22:40	5.35
J105a	1.2778	202.7	01Jan2008, 22:20	5.44
R105a	1.2778	199	02Jan2008, 01:00	5.41
J106a	4.2128	581.8	01Jan2008, 23:00	5.25
R106a	4.2128	581.2	02Jan2008, 00:00	5.24
J100r	29.2782	2481.7	02Jan2008, 05:40	4.14
R100r	29.2782	2480.6	02Jan2008, 06:10	4.13
DB107b	1.4378	188.1	01Jan2008, 19:40	5.2
DB107c	0.32	46.4	01Jan2008, 19:10	5.43
J107b	0.32	46.4	01Jan2008, 19:10	5.43
R107b	0.32	46.2	01Jan2008, 20:20	5.4
J107a	1.7578	234.1	01Jan2008, 19:50	5.24
R107a	1.7578	232.4	01Jan2008, 21:40	5.19
J100q	31.6155	2722.2	02Jan2008, 04:40	4.22

Appendix B
Dickinson Bayou HEC-HMS Output - 10-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100q	31.6155	2718.6	02Jan2008, 06:50	4.17
DB101b	0.4813	73.4	01Jan2008, 19:00	5.3
DB101c	0.4599	77	01Jan2008, 18:50	5.38
DB101d	2.4142	253.7	01Jan2008, 20:20	4.79
DB101e	1.1825	158.4	01Jan2008, 19:20	5.16
DB101f	0.8417	146.6	01Jan2008, 18:50	5.41
J101f	0.8417	146.6	01Jan2008, 18:50	5.41
R101f	0.8417	146.5	01Jan2008, 19:10	5.38
J101e	2.0242	304.9	01Jan2008, 19:20	5.25
R101e	2.0242	242	02Jan2008, 15:50	4.94
J101d	2.0242	707.1	02Jan2008, 08:30	14.86
R101d	2.0242	700.2	02Jan2008, 10:50	14.76
J101c	4.4384	867.9	02Jan2008, 10:10	9.34
R101c	4.4384	858.6	02Jan2008, 13:30	9.27
J101b	4.8983	887	02Jan2008, 13:20	8.91
R101b	4.8983	886.9	02Jan2008, 13:30	8.89
J101a	5.3796	917.1	02Jan2008, 13:20	8.57
R101a	5.3796	916.7	02Jan2008, 14:20	8.51
DB101v	0.5653	93.2	01Jan2008, 19:00	5.37
J100p	38.6868	3615.8	02Jan2008, 09:00	4.78
R100p	38.6868	3614.8	02Jan2008, 09:20	4.77
DB108b	0.5279	106.7	01Jan2008, 18:40	5.84
DB108a	1.2268	135.6	01Jan2008, 19:50	4.99
DB108c	0.6193	123.9	01Jan2008, 19:00	5.9
J108c	0.6193	123.9	01Jan2008, 19:00	5.9
R108c	0.6193	123.5	01Jan2008, 20:00	5.89
J108b	1.8461	259.1	01Jan2008, 19:50	5.29
R108b	1.8461	257.3	01Jan2008, 21:20	5.29
J108a	2.374	359.6	01Jan2008, 19:30	5.41
R108a	2.374	353.4	02Jan2008, 01:00	5.38
J100o	41.0608	3847.1	02Jan2008, 08:20	4.81
R100o	41.0608	3846.2	02Jan2008, 08:50	4.8
J100n	41.9019	3913.9	02Jan2008, 08:30	4.81
R100n	41.9019	3911	02Jan2008, 09:40	4.78
DB109a	0.6757	569	01Jan2008, 17:20	6.31
DB109b	0.182	39.2	01Jan2008, 18:20	5.6
DB109d	0.3999	89.1	01Jan2008, 18:20	5.88
DB109g	0.8689	119.2	01Jan2008, 19:50	5.48
DB109f	0.2845	94	01Jan2008, 17:10	6.15
DB109e	0.6993	114.8	01Jan2008, 19:20	5.69
J109f	0.9838	204.6	01Jan2008, 18:10	5.82
R109f	0.9838	203.7	01Jan2008, 19:20	5.81
J109c	1.8527	322.5	01Jan2008, 19:30	5.66
R109c	1.8527	320.4	01Jan2008, 20:50	5.65

Appendix B
Dickinson Bayou HEC-HMS Output - 10-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB109c	0.5646	114.3	01Jan2008, 18:40	5.84
DB109h	0.4721	151.9	01Jan2008, 17:30	6.31
J109e	0.4721	151.9	01Jan2008, 17:30	6.31
R109e	0.4721	137	02Jan2008, 02:00	6.31
J109d	1.0367	220.4	02Jan2008, 01:10	6.05
R109d	1.0367	218.5	02Jan2008, 02:40	6.05
J109b	3.4713	631.5	01Jan2008, 20:20	5.79
R109b	3.4713	628.8	01Jan2008, 21:00	5.79
J109a	4.147	906.5	01Jan2008, 18:00	5.87
R109a	4.147	897.2	01Jan2008, 18:50	5.87
J100m	47.1974	4346.6	02Jan2008, 07:20	4.83
R100m	47.1974	4343.3	02Jan2008, 08:00	4.8
DB112a	0.4975	85.4	01Jan2008, 19:10	5.4
DB112d	0.3564	57.2	01Jan2008, 19:10	5.63
J112b	0.3564	57.2	01Jan2008, 19:10	5.63
R112b	0.3564	56	02Jan2008, 00:20	5.59
DB112b	0.3748	127.3	01Jan2008, 17:30	6.29
DB112c	0.7429	103.6	01Jan2008, 19:30	5.47
DB112f	0.3175	42.7	01Jan2008, 19:20	5.37
DB112e	0.7645	119.8	01Jan2008, 19:20	5.43
J112f	1.082	162.5	01Jan2008, 19:20	5.41
R112f	1.082	162.2	01Jan2008, 20:10	5.4
J112e	1.8249	265.3	01Jan2008, 20:00	5.43
R112e	1.8249	265.3	01Jan2008, 20:10	5.42
J112d	1.8249	265.3	01Jan2008, 20:10	5.42
R112d	1.8249	264.1	01Jan2008, 21:30	5.4
J112c	2.1997	365.5	01Jan2008, 20:40	5.55
R112c	2.1997	365.1	01Jan2008, 21:10	5.54
J112a	3.0536	489.8	01Jan2008, 21:40	5.53
R112a	3.0536	475.8	02Jan2008, 02:00	5.49
J100l	52.0888	4891.8	02Jan2008, 06:30	4.87
R100l	52.0888	4890.1	02Jan2008, 07:00	4.85
J100k	52.8701	4945.6	02Jan2008, 07:00	4.85
R100k	52.8701	4943.3	02Jan2008, 07:30	4.83
BG100b	0.9681	286.6	01Jan2008, 17:40	6.24
BG100c	0.8305	353.7	01Jan2008, 17:00	6.31
BG100d	0.7905	107	01Jan2008, 19:20	5.39
JBGc	0.7905	107	01Jan2008, 19:20	5.39
RBGc	0.7905	66.3	02Jan2008, 18:10	4.51
JBGb	1.621	354.4	01Jan2008, 17:00	5.43
RBGb	1.621	243.1	02Jan2008, 05:40	5.28
JBGa	2.5891	408	01Jan2008, 21:40	5.64
RBGa	2.5891	402.9	02Jan2008, 00:20	5.58
J100j	55.6831	5294.4	02Jan2008, 07:10	4.88

Appendix B
Dickinson Bayou HEC-HMS Output - 10-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100j	55.6831	5293.2	02Jan2008, 07:20	4.87
DB111a	0.2553	45.9	01Jan2008, 18:40	5.43
DB111b	1.2071	134.1	01Jan2008, 20:10	4.88
J111b	1.2071	134.1	01Jan2008, 20:10	4.88
R111b	1.2071	120.6	02Jan2008, 09:20	4.81
J111a	1.4624	141.7	02Jan2008, 08:00	4.92
R111a	1.4624	140.6	02Jan2008, 12:00	4.79
MB100a	0.4305	469.2	01Jan2008, 16:50	6.36
MB100b	0.6341	258.2	01Jan2008, 17:10	6.15
MB100h	0.5156	106.1	01Jan2008, 18:30	5.85
MB100c1	0.1197	80.5	01Jan2008, 16:40	6.19
MB100c2	0.3741	132.3	01Jan2008, 17:10	5.91
MB100d	1.2082	180.7	01Jan2008, 19:20	5.36
MB100e	0.5889	95.9	01Jan2008, 19:00	5.36
MB100f	1.3315	164.8	01Jan2008, 19:40	5.05
MB100g	0.4893	92.1	01Jan2008, 18:40	5.46
JMBi	0.4893	92.1	01Jan2008, 18:40	5.46
RMBi	0.4893	81.2	02Jan2008, 01:40	5.4
JMBg	2.4097	312.1	01Jan2008, 23:20	5.2
RMBg	2.4097	304.5	02Jan2008, 04:20	5.16
JMBe	3.6179	437.4	02Jan2008, 02:40	5.23
RMBe	3.6179	437.2	02Jan2008, 03:30	5.19
JMBd	3.992	487.1	02Jan2008, 01:30	5.26
RMBd	3.992	486.8	02Jan2008, 02:10	5.24
JMBc	4.6273	578.2	01Jan2008, 20:30	5.33
RMBc	4.6273	574.3	02Jan2008, 01:30	5.31
JMBb	5.2614	741.6	01Jan2008, 21:00	5.41
RMBb	5.2614	726.6	02Jan2008, 00:10	5.39
JMBa	5.6919	758.8	01Jan2008, 23:50	5.46
RMBa	5.6919	756.1	02Jan2008, 00:40	5.46
J100h	63.2688	6057.2	02Jan2008, 06:20	4.93
R100h	63.2688	6054.9	02Jan2008, 06:50	4.91
DB114a	0.6772	87.2	01Jan2008, 19:30	5.11
DB114b	0.4096	93.2	01Jan2008, 18:00	5.52
J114b	0.4096	93.2	01Jan2008, 18:00	5.52
R114b	0.4096	82.1	02Jan2008, 05:00	5.47
J114a	1.0868	147	02Jan2008, 04:10	5.25
R114a	1.0868	132.5	02Jan2008, 12:20	5.13
BB100a	0.8055	630.9	01Jan2008, 16:50	6.36
BB100b	0.873	273.8	01Jan2008, 17:30	6.12
BB100c	0.2175	188.2	01Jan2008, 16:50	6.12
BB100d	1.2851	298.6	01Jan2008, 18:20	6.1
BB100e	1.2538	326.1	01Jan2008, 18:00	6.12
JBBd	2.5389	624.4	01Jan2008, 18:10	6.11

Appendix B
Dickinson Bayou HEC-HMS Output - 10-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
RBBd	2.5389	601.9	01Jan2008, 19:50	6.11
JBBc	2.7564	694.7	01Jan2008, 18:50	6.11
RBBc	2.7564	681.3	01Jan2008, 21:00	6.11
JBBb	3.6294	910.9	01Jan2008, 20:30	6.11
RBBb	3.6294	842.5	02Jan2008, 02:20	6.11
JBBa	4.4349	977.8	01Jan2008, 18:30	6.15
RBBa	4.4349	957.8	02Jan2008, 00:30	6.15
J100g	69.2256	7021.8	02Jan2008, 04:20	5
R100g	69.2256	7020	02Jan2008, 04:30	4.99
J100f	71.3589	7236.2	02Jan2008, 04:30	5
R100f	71.3589	7233.6	02Jan2008, 04:40	4.99
J100e	71.7608	7276.4	02Jan2008, 04:40	4.99
R100e	71.7608	7273.7	02Jan2008, 05:00	4.98
J100d	72.1863	7323.8	02Jan2008, 04:50	4.99
R100d	72.1863	7236.7	02Jan2008, 08:40	4.89
Gum Bayou	12.12	2929.6	01Jan2008, 19:50	6.64
DB100c	2.0856	178.7	01Jan2008, 21:50	4.55
J100c	86.3919	8796.9	02Jan2008, 06:10	5.13
R100c	86.3919	8723.7	02Jan2008, 08:40	5.05
DB100b1	2.4787	222.6	01Jan2008, 20:50	4.52
DB100b2	0.9668	134.1	01Jan2008, 19:20	5.2
J100b	89.8374	8972.3	02Jan2008, 08:40	5.03
R100b	89.8374	8966.5	02Jan2008, 09:50	5
DB118a	1.2724	164	01Jan2008, 19:40	5.11
DB118b	2.4501	261.6	01Jan2008, 20:00	4.82
DB118c	0.5656	102.6	01Jan2008, 18:50	5.52
J118c	0.5656	102.6	01Jan2008, 18:50	5.52
R118c	0.5656	85.4	02Jan2008, 08:00	5.49
J118b	3.0157	319.9	01Jan2008, 20:40	4.95
R118b	3.0157	317.3	01Jan2008, 23:20	4.93
J118a	4.2881	471.7	01Jan2008, 22:40	4.98
R118a	4.2881	453.9	02Jan2008, 10:20	4.76
J100a	94.1255	9419.9	02Jan2008, 09:50	4.99
R100a	94.1255	9396.9	02Jan2008, 11:20	4.93
DB100a	0.8551	95.3	01Jan2008, 20:00	4.96
Outlet	94.9806	9456.2	02Jan2008, 11:20	4.93

Appendix B
Dickinson Bayou HEC-HMS Output - 100-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB100d	0.4255	215.6	01Jan2008, 18:10	11.85
DB117a	0.4019	166.3	01Jan2008, 19:00	11.16
DB100e	0.3817	135.9	01Jan2008, 19:10	11.37
DB116a	1.0145	375.9	01Jan2008, 19:30	11.07
DB115a	0.7371	245.6	01Jan2008, 19:30	10.99
DB100f	0.4351	161.9	01Jan2008, 19:10	11.42
DB100g	0.4314	231.5	01Jan2008, 18:20	11.7
BG100a	0.2239	394.7	01Jan2008, 16:40	12.11
DB100h2	0.7813	176.4	01Jan2008, 20:00	10.21
DB110a	0.7918	275.4	01Jan2008, 19:30	11.42
DB100h1	1.046	334.2	01Jan2008, 20:00	11.4
DB100i	1.1485	143.3	01Jan2008, 23:10	7.63
DB100j	0.8411	281.4	01Jan2008, 19:20	11.05
DB101a	0.26	114.1	01Jan2008, 18:40	11.32
DB100k	0.8664	117	01Jan2008, 23:20	8.1
DB107a	0.3073	146.2	01Jan2008, 18:30	11.21
DB100l	0.2722	115	01Jan2008, 19:10	11.18
DB100m	0.4097	104.9	01Jan2008, 19:50	10.9
DB106a	0.5802	236.8	01Jan2008, 18:50	11.16
DB100n	0.4055	149.7	01Jan2008, 19:10	11.07
DB100o	1.0802	346.3	01Jan2008, 19:20	10.89
DB100p	1.1671	388.5	01Jan2008, 19:40	10.94
DB100v	0.3414	175.1	01Jan2008, 18:30	11.21
DB100q	1.5445	519.1	01Jan2008, 19:40	11
DB100r	1.0674	373.6	01Jan2008, 19:20	11.23
DB100s	0.5783	204.9	01Jan2008, 19:10	11.03
J100z	0.5783	204.9	01Jan2008, 19:10	11.03
R100z	0.5783	178.8	02Jan2008, 04:30	10.96
DB100t	0.2557	140.5	01Jan2008, 17:50	11.21
J100ab	0.2557	140.5	01Jan2008, 17:50	11.21
R100ab	0.2557	67.6	02Jan2008, 20:30	11.21
J100y	1.9014	485.7	02Jan2008, 04:20	11.14
R100y	1.9014	470.3	02Jan2008, 06:40	11.13
DB100x	0.1482	90.5	01Jan2008, 17:40	11.21
J100aa	0.1482	90.5	01Jan2008, 17:40	11.21
R100aa	0.1482	43	02Jan2008, 14:30	11.21
J100x	2.0496	510.9	02Jan2008, 06:40	11.14
R100x	2.0496	505.1	02Jan2008, 08:20	11.09
DB100y	0.3291	191.8	01Jan2008, 17:50	11.93
J100ac	0.3291	191.8	01Jan2008, 17:50	11.93
R100ac	0.3291	166	02Jan2008, 03:10	11.93
J100w	3.9232	1075.1	01Jan2008, 22:30	11.13
R100w	3.9232	1074.6	01Jan2008, 22:50	11.12
DB100w	1.1203	243.9	01Jan2008, 20:00	10.05

Appendix B
Dickinson Bayou HEC-HMS Output - 100-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
J100ad	1.1203	243.9	01Jan2008, 20:00	10.05
R100ad	1.1203	226.1	02Jan2008, 07:20	9.71
J100v	5.3849	1379.3	01Jan2008, 22:50	10.84
R100v	5.3849	1329	02Jan2008, 06:30	10.78
DB101g	1.3033	443.6	01Jan2008, 19:10	10.98
DB101h	0.5994	222	01Jan2008, 19:10	11.08
DB101i	0.3999	188.6	01Jan2008, 18:20	11.21
DB101k	0.7138	271.1	01Jan2008, 19:00	11.37
DB101l	0.6079	243.3	01Jan2008, 19:00	11.54
DB101m	0.4682	245.6	01Jan2008, 18:00	11.67
DB101n	0.5905	168.7	01Jan2008, 19:20	10.87
DB101p	0.8115	252.6	01Jan2008, 19:40	11.08
DB101q	0.9593	264.7	01Jan2008, 19:20	10.75
DB101r	1.9095	230.2	02Jan2008, 00:00	7.43
Chigger	1.9095	76.7	02Jan2008, 00:00	2.48
R101o	1.9095	74.7	02Jan2008, 09:40	2.38
J101n	2.8688	297.8	01Jan2008, 20:20	5.18
R101n	2.8688	269.8	02Jan2008, 15:10	5.06
DB101o	0.4823	208.6	01Jan2008, 18:50	11.71
J101p	0.4823	208.6	01Jan2008, 18:50	11.71
R101p	0.4823	115.8	02Jan2008, 17:10	11.7
J101m	4.7531	590.7	01Jan2008, 23:10	7.49
R101m	4.7531	589.3	02Jan2008, 00:20	7.48
J101l	5.8292	997.1	01Jan2008, 20:30	8.24
R101l	5.8292	945.7	02Jan2008, 03:20	8.22
J101k	6.543	1127.3	02Jan2008, 02:20	8.56
R101k	6.543	1113.2	02Jan2008, 04:30	8.56
DB101j	0.3461	298	01Jan2008, 17:00	11.8
J101j	6.8891	1159.4	02Jan2008, 03:50	8.72
R101j	6.8891	1134.9	02Jan2008, 08:40	8.7
J101i	7.289	1193.8	02Jan2008, 08:10	8.83
R101i	7.289	1183.2	02Jan2008, 11:50	8.81
J101h	7.8884	1262.5	02Jan2008, 11:10	8.98
R101h	7.8884	1259.8	02Jan2008, 12:40	8.96
DB101s	0.4214	333.2	01Jan2008, 17:10	11.75
DB101t	0.6201	427.6	01Jan2008, 17:30	11.85
DB101u	0.7635	385.6	01Jan2008, 18:20	11.67
J101s	0.7635	385.6	01Jan2008, 18:20	11.67
R101s	0.7635	371.3	01Jan2008, 23:20	11.67
J101r	1.3836	642.1	01Jan2008, 22:20	11.75
R101r	1.3836	605.9	02Jan2008, 00:40	11.75
J101q	1.805	749	02Jan2008, 00:10	11.75
R101q	1.805	502.5	02Jan2008, 13:40	11.75
J101g	10.9967	1933.9	02Jan2008, 11:10	9.66

Appendix B
Dickinson Bayou HEC-HMS Output - 100-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R101g	10.9967	1931.3	02Jan2008, 12:10	9.65
J100u	17.5487	3459.4	02Jan2008, 06:00	10.08
R100u	17.5487	3438.5	02Jan2008, 07:50	10.06
Weir-Split	17.5487	2189.6	02Jan2008, 07:50	6.85
R100t	17.5487	2175.2	02Jan2008, 10:50	6.84
J100s2	18.6289	2335.8	02Jan2008, 10:10	7.07
R100s2	18.6289	2331	02Jan2008, 11:30	7.06
DB104a	0.8529	328.6	01Jan2008, 19:10	11.11
DB104b	1.8897	659.3	01Jan2008, 19:30	11.01
DB104c	1.5214	334.9	01Jan2008, 20:20	10.11
DB104d	0.7771	310.4	01Jan2008, 19:10	11.26
J104d	0.7771	310.4	01Jan2008, 19:10	11.26
R104d	0.7771	276.9	01Jan2008, 23:30	11.26
J104c	2.2985	603.8	01Jan2008, 22:40	10.5
R104c	2.2985	578	02Jan2008, 06:30	10.43
J104b	4.1882	1067.2	01Jan2008, 23:50	10.69
R104b	4.1882	1043	02Jan2008, 03:10	10.05
J104a	5.0411	1267.6	02Jan2008, 01:50	10.23
R104a	5.0411	1264.6	02Jan2008, 02:30	10.22
J100s1	24.0755	3444.7	02Jan2008, 09:50	7.79
R100s1	24.0755	3437.7	02Jan2008, 10:30	7.78
DB106b	0.9051	364.9	01Jan2008, 19:00	11.44
DB105a	1.0654	240.9	01Jan2008, 20:00	10.17
DB106c	0.638	326	01Jan2008, 18:20	11.31
DB106d	0.3265	139.7	01Jan2008, 19:00	11.18
J106b	0.9645	465.3	01Jan2008, 18:30	11.27
R106b	0.9645	439.9	01Jan2008, 22:40	11.27
DB105b	0.3873	159.7	01Jan2008, 19:00	11.46
DB105c	0.8905	373	01Jan2008, 19:00	11.17
J105b	0.8905	373	01Jan2008, 19:00	11.17
R105b	0.8905	346	02Jan2008, 01:00	11.16
J105a	1.2778	468	02Jan2008, 00:20	11.25
R105a	1.2778	418.4	02Jan2008, 08:10	11.23
J106a	4.2128	1270.6	01Jan2008, 23:00	11.02
R106a	4.2128	1260.7	02Jan2008, 01:30	11
J100r	29.2782	4713.9	02Jan2008, 03:50	8.35
R100r	29.2782	4697.1	02Jan2008, 05:00	8.35
DB107b	1.4378	483.3	01Jan2008, 19:40	11.05
DB107c	0.32	114.7	01Jan2008, 19:10	11.26
J107b	0.32	114.7	01Jan2008, 19:10	11.26
R107b	0.32	114	01Jan2008, 20:10	11.23
J107a	1.7578	596.6	01Jan2008, 19:40	11.08
R107a	1.7578	546.8	02Jan2008, 02:50	11.04
J100q	31.6155	5361.1	02Jan2008, 04:10	8.55

Appendix B
Dickinson Bayou HEC-HMS Output - 100-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100q	31.6155	5325.5	02Jan2008, 07:30	8.49
DB101b	0.4813	187.1	01Jan2008, 19:00	11.12
DB101c	0.4599	194.3	01Jan2008, 18:40	11.18
DB101d	2.4142	665.9	01Jan2008, 20:10	10.59
DB101e	1.1825	408.6	01Jan2008, 19:10	11
DB101f	0.8417	368.4	01Jan2008, 18:50	11.19
J101f	0.8417	368.4	01Jan2008, 18:50	11.19
R101f	0.8417	368.9	01Jan2008, 18:40	11.18
J101e	2.0242	776.7	01Jan2008, 19:00	11.07
R101e	2.0242	663.4	02Jan2008, 08:10	10.75
J101d	2.0242	1912.2	02Jan2008, 08:10	38.59
R101d	2.0242	1898.3	02Jan2008, 09:30	38.47
J101c	4.4384	2290.4	02Jan2008, 08:50	23.3
R101c	4.4384	2234.8	02Jan2008, 12:30	23.22
J101b	4.8983	2286.1	02Jan2008, 12:20	22.09
R101b	4.8983	2261	02Jan2008, 14:00	22.07
J101a	5.3796	2312.3	02Jan2008, 13:50	21.09
R101a	5.3796	2287	02Jan2008, 17:40	21.01
DB101v	0.5653	235.6	01Jan2008, 19:00	11.17
J100p	38.6868	7278.2	02Jan2008, 07:40	10.28
R100p	38.6868	7265.2	02Jan2008, 09:10	10.27
DB108b	0.5279	257.5	01Jan2008, 18:30	11.62
DB108a	1.2268	349.2	01Jan2008, 19:40	10.81
DB108c	0.6193	298.3	01Jan2008, 18:50	11.69
J108c	0.6193	298.3	01Jan2008, 18:50	11.69
R108c	0.6193	218.1	02Jan2008, 08:00	11.69
J108b	1.8461	556.6	01Jan2008, 20:10	11.11
R108b	1.8461	531.7	02Jan2008, 01:30	11.1
J108a	2.374	713	02Jan2008, 00:00	11.22
R108a	2.374	684.2	02Jan2008, 07:30	11.18
J100o	41.0608	7937.1	02Jan2008, 08:40	10.33
R100o	41.0608	7905.1	02Jan2008, 11:20	10.31
J100n	41.9019	8026.4	02Jan2008, 11:00	10.33
R100n	41.9019	7929.8	02Jan2008, 16:50	10.29
DB109a	0.6757	1082.5	01Jan2008, 17:20	12.05
DB109b	0.182	95.8	01Jan2008, 18:10	11.31
DB109d	0.3999	213	01Jan2008, 18:10	11.62
DB109g	0.8689	293	01Jan2008, 19:40	11.33
DB109f	0.2845	208.4	01Jan2008, 17:20	11.88
DB109e	0.6993	278.3	01Jan2008, 19:10	11.53
J109f	0.9838	475.6	01Jan2008, 18:10	11.63
R109f	0.9838	465.2	01Jan2008, 20:00	11.62
J109c	1.8527	757.8	01Jan2008, 20:00	11.49
R109c	1.8527	679.8	02Jan2008, 01:50	11.48

Appendix B
Dickinson Bayou HEC-HMS Output - 100-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB109c	0.5646	273.7	01Jan2008, 18:40	11.62
DB109h	0.4721	328.6	01Jan2008, 17:40	12.05
J109e	0.4721	328.6	01Jan2008, 17:40	12.05
R109e	0.4721	284.7	02Jan2008, 03:20	12.05
J109d	1.0367	439.7	02Jan2008, 02:10	11.82
R109d	1.0367	423.6	02Jan2008, 06:00	11.82
J109b	3.4713	1229.6	02Jan2008, 01:40	11.59
R109b	3.4713	1220	02Jan2008, 03:30	11.58
J109a	4.147	1775	01Jan2008, 17:30	11.66
R109a	4.147	1593	01Jan2008, 19:30	11.65
J100m	47.1974	8685.7	02Jan2008, 09:50	10.35
R100m	47.1974	8562.8	02Jan2008, 12:20	10.31
DB112a	0.4975	211.8	01Jan2008, 19:00	11.18
DB112d	0.3564	141.8	01Jan2008, 19:10	11.48
J112b	0.3564	141.8	01Jan2008, 19:10	11.48
R112b	0.3564	124.3	02Jan2008, 09:10	11.44
DB112b	0.3748	274	01Jan2008, 17:30	12.03
DB112c	0.7429	255.2	01Jan2008, 19:30	11.32
DB112f	0.3175	107.9	01Jan2008, 19:20	11.23
DB112e	0.7645	300.6	01Jan2008, 19:10	11.25
J112f	1.082	408.4	01Jan2008, 19:10	11.25
R112f	1.082	382.9	02Jan2008, 00:50	11.24
J112e	1.8249	601.5	02Jan2008, 00:00	11.27
R112e	1.8249	597.2	02Jan2008, 01:00	11.27
J112d	1.8249	597.2	02Jan2008, 01:00	11.27
R112d	1.8249	585.5	02Jan2008, 04:10	11.25
J112c	2.1997	658.8	02Jan2008, 03:30	11.38
R112c	2.1997	651.3	02Jan2008, 05:40	11.37
J112a	3.0536	869.4	02Jan2008, 05:20	11.35
R112a	3.0536	855	02Jan2008, 10:40	11.31
J100l	52.0888	9669.5	02Jan2008, 12:00	10.41
R100l	52.0888	9591.2	02Jan2008, 14:00	10.39
J100k	52.8701	9689.3	02Jan2008, 14:00	10.38
R100k	52.8701	9666	02Jan2008, 14:50	10.36
BG100b	0.9681	650.8	01Jan2008, 17:40	11.98
BG100c	0.8305	773.7	01Jan2008, 16:50	12.05
BG100d	0.7905	268.9	01Jan2008, 19:20	11.26
JBGc	0.7905	268.9	01Jan2008, 19:20	11.26
RBGc	0.7905	204	02Jan2008, 06:10	10.11
JBGb	1.621	776.1	01Jan2008, 16:50	11.1
RBGb	1.621	479.5	01Jan2008, 22:40	10.89
JBGa	2.5891	909.4	01Jan2008, 22:40	11.3
RBGa	2.5891	838.6	02Jan2008, 01:20	11.21
J100j	55.6831	10043.6	02Jan2008, 14:30	10.41

Appendix B
Dickinson Bayou HEC-HMS Output - 100-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100j	55.6831	10041	02Jan2008, 14:50	10.4
DB111a	0.2553	114.8	01Jan2008, 18:30	11.2
DB111b	1.2071	350.9	01Jan2008, 20:00	10.7
J111b	1.2071	350.9	01Jan2008, 20:00	10.7
R111b	1.2071	324.1	02Jan2008, 05:20	10.61
J111a	1.4624	380.5	02Jan2008, 03:50	10.71
R111a	1.4624	301.2	02Jan2008, 21:50	10.56
MB100a	0.4305	744.7	01Jan2008, 16:50	12.11
MB100b	0.6341	556	01Jan2008, 17:10	11.88
MB100h	0.5156	253.7	01Jan2008, 18:20	11.62
MB100c1	0.1197	166.4	01Jan2008, 16:30	11.93
MB100c2	0.3741	299.9	01Jan2008, 17:10	11.62
MB100d	1.2082	459.2	01Jan2008, 19:10	11.2
MB100e	0.5889	242.8	01Jan2008, 19:00	11.16
MB100f	1.3315	427.9	01Jan2008, 19:30	10.89
MB100g	0.4893	229.5	01Jan2008, 18:30	11.21
JMBi	0.4893	229.5	01Jan2008, 18:30	11.21
RMBi	0.4893	202	02Jan2008, 00:30	11.19
JMBg	2.4097	792.8	01Jan2008, 22:10	11.02
RMBg	2.4097	774	02Jan2008, 03:00	10.98
JMBe	3.6179	1100.5	02Jan2008, 01:30	11.05
RMBe	3.6179	1063.6	02Jan2008, 06:10	11.02
JMBd	3.992	1102.3	02Jan2008, 05:40	11.07
RMBd	3.992	1077.5	02Jan2008, 08:40	11.06
JMBc	4.6273	1156.2	01Jan2008, 20:10	11.14
RMBc	4.6273	1128.4	02Jan2008, 12:40	11.12
JMBb	5.2614	1379.9	01Jan2008, 21:30	11.21
RMBb	5.2614	1308.5	02Jan2008, 06:40	11.19
JMBa	5.6919	1308.9	02Jan2008, 06:40	11.26
RMBa	5.6919	1307.6	02Jan2008, 07:40	11.26
J100h	63.2688	11562.5	02Jan2008, 14:20	10.49
R100h	63.2688	11553.8	02Jan2008, 15:00	10.47
DB114a	0.6772	225.7	01Jan2008, 19:20	10.95
DB114b	0.4096	227.5	01Jan2008, 18:00	11.21
J114b	0.4096	227.5	01Jan2008, 18:00	11.21
R114b	0.4096	192	02Jan2008, 06:30	11.21
J114a	1.0868	329	02Jan2008, 04:50	11.05
R114a	1.0868	253	02Jan2008, 22:30	10.94
BB100a	0.8055	1031	01Jan2008, 16:50	12.11
BB100b	0.873	609.3	01Jan2008, 17:30	11.85
BB100c	0.2175	305.9	01Jan2008, 16:50	11.85
BB100d	1.2851	692.4	01Jan2008, 18:20	11.85
BB100e	1.2538	762.8	01Jan2008, 18:00	11.85
JBBd	2.5389	1454.3	01Jan2008, 18:10	11.85

Appendix B
Dickinson Bayou HEC-HMS Output - 100-year Proposed Conditions

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
RBBd	2.5389	1382.6	01Jan2008, 19:40	11.85
JBBc	2.7564	1547.3	01Jan2008, 19:10	11.85
RBBc	2.7564	1408.5	02Jan2008, 00:40	11.85
JBBb	3.6294	1768.5	01Jan2008, 22:30	11.85
RBBb	3.6294	1462.2	02Jan2008, 10:30	11.85
JBBa	4.4349	1579.9	01Jan2008, 17:00	11.9
RBBa	4.4349	1446.1	02Jan2008, 13:40	11.9
J100g	69.2256	13267	02Jan2008, 14:20	10.57
R100g	69.2256	13262.7	02Jan2008, 14:40	10.57
J100f	71.3589	13501.4	02Jan2008, 14:30	10.58
R100f	71.3589	13491.7	02Jan2008, 15:00	10.57
J100e	71.7608	13529.1	02Jan2008, 15:00	10.57
R100e	71.7608	13527.1	02Jan2008, 15:10	10.56
J100d	72.1863	13557.5	02Jan2008, 15:10	10.56
R100d	72.1863	13480.5	02Jan2008, 18:20	10.42
Gum Bayou	12.12	5015.2	01Jan2008, 20:30	12.21
DB100c	2.0856	464.9	01Jan2008, 21:30	10.21
J100c	86.3919	15069.6	02Jan2008, 07:10	10.67
R100c	86.3919	15051.1	02Jan2008, 09:50	10.54
DB100b1	2.4787	588.3	01Jan2008, 20:40	10.22
DB100b2	0.9668	344.8	01Jan2008, 19:20	11.04
J100b	89.8374	15587.9	02Jan2008, 09:10	10.53
R100b	89.8374	15585.5	02Jan2008, 10:30	10.48
DB118a	1.2724	424.2	01Jan2008, 19:40	10.95
DB118b	2.4501	686.6	01Jan2008, 19:50	10.63
DB118c	0.5656	255.6	01Jan2008, 18:40	11.31
J118c	0.5656	255.6	01Jan2008, 18:40	11.31
R118c	0.5656	223.1	02Jan2008, 02:30	11.29
J118b	3.0157	815	02Jan2008, 00:40	10.75
R118b	3.0157	730.5	02Jan2008, 10:40	10.73
J118a	4.2881	981	01Jan2008, 21:10	10.8
R118a	4.2881	877.5	03Jan2008, 11:40	10.53
J100a	94.1255	16125.3	02Jan2008, 11:00	10.48
R100a	94.1255	16117.1	02Jan2008, 12:40	10.39
DB100a	0.8551	248	01Jan2008, 19:50	10.79
Outlet	94.9806	16234.6	02Jan2008, 12:30	10.39

APPENDICE C

HEC-RAS Profile: Max WS

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
East Fork	trib	535.4552	Max WS	GBmi1010	544.95	-1.25	7.90		7.92	0.000122	1.16	481.80	120.27	0.09	1.13
East Fork	trib	535.4552	Max WS	GBmi10100	884.97	-1.25	9.39		9.42	0.000127	1.40	683.91	160.74	0.10	1.29
East Fork	trib	540.4552	Max WS	GBmi1010	544.95	-1.25	7.90		7.92	0.000122	1.16	481.88	120.27	0.09	1.13
East Fork	trib	540.4552	Max WS	GBmi10100	884.97	-1.25	9.39		9.42	0.000127	1.40	684.01	160.74	0.10	1.29
East Fork	trib	774.9974	Max WS	GBmi1010	545.78	-1.79	7.92		7.97	0.000296	1.77	341.24	90.99	0.14	1.60
East Fork	trib	774.9974	Max WS	GBmi10100	884.97	-1.79	9.42		9.48	0.000321	2.07	527.67	225.01	0.15	1.88
East Fork	trib	1129.264	Max WS	GBmi1010	516.16	-1.57	8.02		8.06	0.000200	1.74	367.99	119.53	0.12	1.40
East Fork	trib	1129.264	Max WS	GBmi10100	834.39	-1.57	9.53		9.58	0.000206	2.03	581.01	174.13	0.13	1.44
East Fork	trib	1380.568	Max WS	GBmi1010	489.88	-1.94	8.08		8.12	0.000266	1.71	290.67	63.83	0.13	1.69
East Fork	trib	1380.568	Max WS	GBmi10100	791.38	-1.94	9.58		9.65	0.000291	2.08	413.97	148.23	0.14	1.91
East Fork	trib	1710.556	Max WS	GBmi1010	459.45	-1.04	8.19		8.25	0.000457	2.01	228.26	52.85	0.17	2.01
East Fork	trib	1710.556	Max WS	GBmi10100	737.34	-1.04	9.70		9.78	0.000482	2.33	326.47	81.14	0.18	2.26
East Fork	trib	1809.264			Lat Struct										
East Fork	trib	1907.972	Max WS	GBmi1010	439.79	-1.51	8.28		8.32	0.000182	1.64	347.01	96.54	0.11	1.27
East Fork	trib	1907.972	Max WS	GBmi10100	711.31	-1.51	9.80		9.85	0.000191	1.94	527.95	219.63	0.12	1.35
East Fork	trib	2219.039	Max WS	GBmi1010	409.99	-0.96	8.37		8.44	0.000567	2.20	188.14	46.83	0.18	2.18
East Fork	trib	2219.039	Max WS	GBmi10100	665.58	-0.96	9.88		9.98	0.000570	2.56	291.03	115.66	0.19	2.29
East Fork	trib	2461.718	Max WS	GBmi1010	383.37	-0.82	8.51		8.57	0.000406	1.96	194.03	43.05	0.16	1.98
East Fork	trib	2461.718	Max WS	GBmi10100	625.00	-0.82	10.02		10.11	0.000435	2.39	278.60	227.18	0.17	2.24
East Fork	trib	2678.052	Max WS	GBmi1010	364.68	-0.71	8.60		8.66	0.000430	2.01	181.69	38.78	0.16	2.01
East Fork	trib	2678.052	Max WS	GBmi10100	597.20	-0.71	10.13		10.22	0.000490	2.44	250.03	162.52	0.18	2.39
East Fork	trib	2935.586	Max WS	GBmi1010	340.32	-0.21	8.73		8.81	0.000612	2.27	149.88	34.14	0.19	2.27
East Fork	trib	2935.586	Max WS	GBmi10100	561.85	-0.21	10.29		10.40	0.000844	2.65	218.61	208.96	0.23	2.57
East Fork	trib	3033.514			Lat Struct										
East Fork	trib	3131.442	Max WS	GBmi1010	401.54	0.11	8.82		8.91	0.000761	2.49	161.27	38.81	0.22	2.49
East Fork	trib	3131.442	Max WS	GBmi10100	532.00	0.11	10.46		10.54	0.000475	2.30	238.19	362.59	0.18	2.23
East Fork	trib	3413.596	Max WS	GBmi1010	371.47	1.45	9.05		9.15	0.000812	2.56	145.01	35.10	0.22	2.56
East Fork	trib	3413.596	Max WS	GBmi10100	489.64	1.45	10.61		10.69	0.000511	2.36	223.31	239.80	0.18	2.19
East Fork	trib	3563.860	Max WS	GBmi1010	354.32	1.61	9.19		9.27	0.000677	2.34	151.46	37.18	0.20	2.34
East Fork	trib	3563.860	Max WS	GBmi10100	465.32	1.61	10.70		10.77	0.000424	2.09	266.51	259.79	0.17	1.75
East Fork	trib	3796.660	Max WS	GBmi1010	326.45	2.04	9.36		9.43	0.000593	2.17	150.57	37.73	0.19	2.17
East Fork	trib	3796.660	Max WS	GBmi10100	425.59	2.04	10.81		10.88	0.000412	2.03	210.04	314.47	0.16	2.03

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
East Fork	trib	4172.662	Max WS	GBm1010	285.77	2.57	9.58		9.63	0.000362	1.70	168.21	42.69		1.70
East Fork	trib	4172.662	Max WS	GBm10100	366.62	2.57	10.97		11.01	0.000243	1.58	232.70	153.01		1.58
East Fork	trib	4553.236	Max WS	GBm1010	246.75	2.81	9.74		9.78	0.000387	1.76	140.30	36.91		1.76
East Fork	trib	4553.236	Max WS	GBm10100	309.02	2.81	11.08		11.12	0.000240	1.63	191.52	70.90		1.61
East Fork	trib	4609.199	Max WS	GBm1010	241.86	3.02	9.78		9.80	0.000181	1.29	187.68	62.35		1.29
East Fork	trib	4609.199	Max WS	GBm10100	301.30	3.02	11.11		11.13	0.000181	1.22	247.57	268.59		1.22
East Fork	trib	4663.943		Bridge											
East Fork	trib	4718.687	Max WS	GBm1010	242.12	2.01	9.80	5.69	9.84	0.000340	1.56	154.84	64.04		1.56
East Fork	trib	4718.687	Max WS	GBm10100	301.43	2.01	11.13	6.02	11.16	0.000213	1.40	216.06	187.55		1.40
East Fork	trib	4830.163	Max WS	GBm1010	238.62	2.74	9.83		9.88	0.000447	1.80	132.67	35.47		1.80
East Fork	trib	4830.163	Max WS	GBm10100	295.58	2.74	11.15		11.19	0.000267	1.61	190.80	93.36		1.55
East Fork	trib	5612.320	Max WS	GBm1010	218.76	4.79	10.16		10.19	0.000319	1.46	150.09	44.29		1.46
East Fork	trib	5612.320	Max WS	GBm10100	260.38	4.79	11.35		11.37	0.000178	1.23	230.36	107.05		1.13
East Fork	trib	6569.710	Max WS	GBm1010	203.55	5.79	10.89		10.64	0.000587	1.89	113.28	47.93		1.80
East Fork	trib	6569.710	Max WS	GBm10100	229.86	5.79	11.57		11.61	0.000304	1.53	171.93	79.50		1.34
East Fork	trib	6733.530	Max WS	GBm1010	200.52	5.78	10.69		10.73	0.000470	1.70	134.44	62.77		1.49
East Fork	trib	6733.530	Max WS	GBm10100	227.75	5.78	11.63		11.65	0.000234	1.35	229.69	231.05		0.99
East Fork	trib	7010.956	Max WS	GBm1010	194.93	5.77	10.82		10.86	0.000419	1.63	131.08	54.36		1.49
East Fork	trib	7010.956	Max WS	GBm10100	223.57	5.77	11.69		11.72	0.000241	1.38	201.23	136.92		1.11
East Fork	trib	7186.773	Max WS	GBm1010	191.49	5.76	10.89		10.93	0.000398	1.60	128.07	59.99		1.50
East Fork	trib	7186.773	Max WS	GBm10100	220.37	5.76	11.74		11.77	0.000234	1.37	197.64	133.78		1.12
East Fork	trib	7575.182	Max WS	GBm1010	183.97	5.75	11.04		11.07	0.000315	1.42	142.60	76.05		1.29
East Fork	trib	7575.182	Max WS	GBm10100	217.89	5.75	11.83		11.84	0.000154	1.15	308.53	352.59		0.71
East Fork	trib	7815.951	Max WS	GBm1010	179.22	5.74	11.11		11.12	0.000107	0.84	426.21	495.05		0.42
East Fork	trib	7815.951	Max WS	GBm10100	214.36	5.74	11.86		11.86	0.000031	0.51	846.52	612.82		0.25
East Fork	trib	8045.906	Max WS	GBm1010	174.11	5.73	11.14		11.15	0.000152	1.00	289.14	353.76		0.60
East Fork	trib	8045.906	Max WS	GBm10100	208.26	5.73	11.87		11.87	0.000053	0.68	617.59	558.94		0.34
East Fork	trib	8154.852	Max WS	GBm1010	171.74	6.06	11.15		11.17	0.000217	1.20	235.85	400.31		0.73
East Fork	trib	8154.852	Max WS	GBm10100	205.77	6.06	11.87		11.88	0.000062	0.73	602.80	559.97		0.34
East Fork	trib	8365.465	Max WS	GBm1010	166.98	5.51	11.19		11.20	0.000066	0.67	527.70	782.48		0.32
East Fork	trib	8365.465	Max WS	GBm10100	200.00	5.51	11.88		11.88	0.000017	0.38	1332.87	1627.74		0.15

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froutc # Cnl	Vel Total (ft/s)
East Fork	trib	8573.797	Max WS	GBmi1010	162.36	5.42	11.21		11.22	0.000120	0.86	413.44	843.16	0.09	0.39
East Fork	trib	8573.797	Max WS	GBmi10100	193.97	5.42	11.89		11.89	0.000021	0.40	1276.51	1771.10	0.04	0.15
East Fork	trib	8761.822	Max WS	GBmi1010	158.24	5.53	11.23		11.24	0.000107	0.84	519.42	1914.03	0.08	0.30
East Fork	trib	8761.822	Max WS	GBmi10100	188.00	5.53	11.89		11.89	0.000009	0.27	2074.51	2475.83	0.02	0.09
East Fork	trib	8964.394	Max WS	GBmi1010	153.88	5.68	11.25		11.25	0.000044	0.53	880.40	2762.40	0.05	0.17
East Fork	trib	8964.394	Max WS	GBmi10100	181.43	5.68	11.89		11.89	0.000004	0.17	3242.96	3990.70	0.02	0.06
East Fork	trib	9164.902	Max WS	GBmi1010	149.04	5.87	11.25		11.26	0.000046	0.54	882.87	2648.26	0.05	0.17
East Fork	trib	9164.902	Max WS	GBmi10100	174.84	5.87	11.89		11.89	0.000004	0.17	3249.64	4227.28	0.02	0.05
East Fork	trib	9368.154	Max WS	GBmi1010	144.30	5.76	11.26		11.27	0.000040	0.52	973.07	3123.61	0.05	0.15
East Fork	trib	9368.154	Max WS	GBmi10100	168.18	5.76	11.89		11.89	0.000003	0.15	3775.34	5286.13	0.01	0.04
East Fork	trib	9560.854	Max WS	GBmi1010	139.82	6.24	11.27		11.27	0.000033	0.47	989.06	2710.51	0.05	0.14
East Fork	trib	9560.854	Max WS	GBmi10100	161.73	6.24	11.89		11.89	0.000003	0.16	3482.37	5055.03	0.01	0.05
East Fork	trib	9758.052	Max WS	GBmi1010	135.28	6.07	11.28		11.28	0.000040	0.52	647.11	1276.98	0.05	0.21
East Fork	trib	9758.052	Max WS	GBmi10100	155.15	6.07	11.89		11.89	0.000005	0.21	2572.56	4796.30	0.02	0.06
East Fork	trib	9960.175	Max WS	GBmi1010	130.54	6.10	11.29		11.29	0.000059	0.83	572.28	1467.05	0.06	0.23
East Fork	trib	9960.175	Max WS	GBmi10100	148.42	6.10	11.90		11.90	0.000006	0.23	2349.65	4783.80	0.02	0.05
East Fork	trib	10160.33	Max WS	GBmi1010	126.15	6.60	11.30		11.30	0.000082	0.66	522.64	1556.16	0.07	0.24
East Fork	trib	10160.33	Max WS	GBmi10100	141.72	6.60	11.90		11.90	0.000006	0.20	2502.85	5070.28	0.02	0.06
East Fork	trib	10365.36	Max WS	GBmi1010	121.54	6.53	11.31		11.31	0.000028	0.40	931.82	2463.34	0.04	0.13
East Fork	trib	10365.36	Max WS	GBmi10100	134.83	6.53	11.90		11.90	0.000002	0.13	3598.91	5973.06	0.01	0.04
East Fork	trib	10560.64	Max WS	GBmi1010	117.07	6.36	11.32		11.32	0.000016	0.30	1304.93	3360.84	0.03	0.09
East Fork	trib	10560.64	Max WS	GBmi10100	128.30	6.36	11.90		11.90	0.000001	0.10	4182.66	6594.08	0.01	0.03
East Fork	trib	10759.64	Max WS	GBmi1010	112.41	6.50	11.32		11.32	0.000005	0.19	2086.69	4873.02	0.02	0.05
East Fork	trib	10759.64	Max WS	GBmi10100	121.66	6.50	11.90		11.90	0.000001	0.07	5598.25	7127.50	0.01	0.02
East Fork	trib	10964.15	Max WS	GBmi1010	107.65	6.80	11.32		11.32	0.000004	0.15	2276.74	4548.64	0.02	0.05
East Fork	trib	10964.15	Max WS	GBmi10100	114.85	6.80	11.90		11.90	0.000000	0.06	5844.69	7719.76	0.01	0.02
East Fork	trib	11128.81	Max WS	GBmi1010	104.01	6.71	11.32		11.32	0.000005	0.17	1987.89	4077.03	0.02	0.05
East Fork	trib	11128.81	Max WS	GBmi10100	109.26	6.71	11.90		11.90	0.000001	0.06	4792.94	5731.86	0.01	0.02
East Fork	trib	11377.68	Max WS	GBmi1010	98.48	6.83	11.32		11.32	0.000008	0.20	1521.99	2946.59	0.02	0.06
East Fork	trib	11377.68	Max WS	GBmi10100	100.96	6.83	11.90		11.90	0.000001	0.07	3633.70	4060.89	0.01	0.03
East Fork	trib	11643.13	Max WS	GBmi1010	93.25	6.89	11.33		11.33	0.000016	0.29	1138.91	3188.30	0.03	0.08
East Fork	trib	11643.13	Max WS	GBmi10100	92.36	6.89	11.90		11.90	0.000001	0.08	3376.06	4376.92	0.01	0.03

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
East Fork	trib	11811.49	Max WS	GBm1010	95.20	7.12	11.33		11.33	0.000025	0.35	580.82	2773.99	0.04	0.10
East Fork	trib	11811.49	Max WS	GBm10100	92.45	7.12	11.90		11.90	0.000001	0.09	2990.07	4236.47	0.01	0.03
Gum Bayou	Lower	504.8711	Max WS	GBm1010	2869.89	-7.92	2.73	-1.83	3.17	0.000601	5.54	682.97	351.03	0.34	4.20
Gum Bayou	Lower	504.8711	Max WS	GBm10100	4717.98	-7.92	4.07	0.23	4.50	0.000500	6.12	1263.48	508.16	0.35	3.73
Gum Bayou	Lower	2161.939	Max WS	GBm1010	2869.88	-7.92	3.66		3.78	0.000229	2.85	1077.23	274.46	0.24	2.66
Gum Bayou	Lower	2161.939	Max WS	GBm10100	4718.07	-7.92	4.97		5.15	0.000282	3.47	1441.65	281.26	0.26	3.27
Gum Bayou	Lower	2372.100	Max WS	GBm1010	2859.05	-5.82	3.55		3.92	0.000893	4.84	590.74	266.01	0.46	4.84
Gum Bayou	Lower	2372.100	Max WS	GBm10100	4698.73	-5.82	4.80		5.33	0.001181	5.83	806.28	276.44	0.48	5.83
Gum Bayou	Lower	2434.526		Bridge											
Gum Bayou	Lower	2452.965	Max WS	GBm1010	2859.25	-8.10	3.55	2.70	4.10	0.001793	5.95	480.14	241.39	0.61	5.95
Gum Bayou	Lower	2452.965	Max WS	GBm10100	4698.90	-8.10	4.83	3.53	5.55	0.002075	6.80	691.46	254.49	0.59	6.80
Gum Bayou	Lower	2395.046	Max WS	GBm1010	2826.44	-2.60	4.47		4.61	0.000334	3.05	1120.51	348.40	0.25	2.52
Gum Bayou	Lower	2395.046	Max WS	GBm10100	4639.78	-2.60	5.53		6.10	0.000327	3.61	1675.01	412.92	0.26	2.77
Gum Bayou	Lower	4057.931	Max WS	GBm1010	2752.81	-5.70	4.80		4.90	0.000226	2.77	1339.73	389.66	0.21	2.06
Gum Bayou	Lower	4057.931	Max WS	GBm10100	4526.26	-5.70	6.27		6.40	0.000241	3.34	1961.10	485.24	0.22	2.31
Gum Bayou	Lower	5412.954	Max WS	GBm1010	2677.29	-6.10	5.15		5.33	0.000364	3.78	941.23	282.11	0.27	2.84
Gum Bayou	Lower	5412.954	Max WS	GBm10100	4457.08	-6.10	6.64		6.88	0.000397	4.53	1366.82	321.61	0.29	3.26
Gum Bayou	Lower	6445.483	Max WS	GBm1010	2615.39	-6.20	5.52		5.84	0.000554	4.89	761.71	205.77	0.34	3.43
Gum Bayou	Lower	6445.483	Max WS	GBm10100	4374.41	-6.20	7.03		7.51	0.000683	6.15	1098.09	242.55	0.39	3.98
Gum Bayou	Lower	5912.951	Max WS	GBm1010	1697.00	-6.20	5.98		6.09	0.000204	2.84	831.78	225.03	0.21	2.04
Gum Bayou	Lower	5912.951	Max WS	GBm10100	2889.74	-6.20	7.61		7.78	0.000244	3.55	1327.17	363.84	0.23	2.18
Gum Bayou	Lower	7407.249	Max WS	GBm1010	1675.30	-6.20	6.05		6.28	0.000414	4.06	586.79	208.91	0.30	2.86
Gum Bayou	Lower	7407.249	Max WS	GBm10100	2859.72	-6.20	7.70		8.02	0.000471	4.94	1006.79	305.88	0.32	2.84
Gum Bayou	Lower	7790.170	Max WS	GBm1010	1661.16	-3.80	6.26		6.38	0.000201	3.03	686.91	185.95	0.20	2.38
Gum Bayou	Lower	7790.170	Max WS	GBm10100	2839.74	-3.80	7.94		8.10	0.000226	3.71	1138.53	323.97	0.22	2.49
Gum Bayou	Lower	8218.802	Max WS	GBm1010	1640.01	-3.60	6.24		6.63	0.000602	5.17	493.22	170.82	0.35	3.33
Gum Bayou	Lower	8218.802	Max WS	GBm10100	2809.63	-3.60	7.90		8.47	0.000717	6.52	854.63	332.18	0.39	3.29
Gum Bayou	Lower	8648.945	Max WS	GBm1010	1628.28	-3.40	6.81		6.98	0.001249	3.27	497.39	163.33	0.29	3.27
Gum Bayou	Lower	8648.945	Max WS	GBm10100	2789.78	-3.40	8.55		8.70	0.001097	3.11	998.26	429.45	0.27	2.79
Gum Bayou	Lower	8655.526		Bridge											
Gum Bayou	Lower	8661.260	Max WS	GBm1010	1632.70	-3.40	7.10	3.56	7.24	0.001446	2.98	550.75	156.24	0.30	2.96
Gum Bayou	Lower	8661.260	Max WS	GBm10100	2791.06	-3.40	8.67	5.23	8.81	0.000977	3.11	1032.75	411.64	0.26	2.70

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crt W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
Gum Bayou	Lower	9189.580	Max WS	GBml1010	1612.62	-4.40	7.69		7.78	0.000584	2.84	760.84	150.02	0.22	2.12
Gum Bayou	Lower	9189.580	Max WS	GBml10100	2759.08	-4.40	9.16		9.29	0.000787	3.48	1129.66	463.48	0.26	2.44
Gum Bayou	Lower	9518.148	Max WS	GBml1010	1598.64	-1.93	7.88		7.90	0.000239	1.54	1406.87	611.29	0.13	1.14
Gum Bayou	Lower	9518.148	Max WS	GBml10100	2736.29	-1.93	9.39		9.42	0.000227	1.82	2932.40	1446.56	0.13	0.93
Gum Bayou	Lower	9528.148	Max WS	GBml1010	1598.18	-1.93	7.88		7.91	0.000238	1.64	1408.37	611.56	0.13	1.13
Gum Bayou	Lower	9528.148	Max WS	GBml10100	2735.61	-1.93	9.40		9.42	0.000226	1.82	2935.75	1447.55	0.13	0.93
Gum Bayou	Lower	9542.525		Culvert											
Gum Bayou	Lower	9558.148	Max WS	GBml1010	1598.14	-1.93	7.89		7.93	0.000297	1.84	1234.03	505.06	0.15	1.30
Gum Bayou	Lower	9558.148	Max WS	GBml10100	2735.61	-1.93	9.39		9.43	0.000323	2.18	2502.29	1554.90	0.16	1.09
Gum Bayou	Lower	9568.148	Max WS	GBml1010	1598.14	-1.93	7.90		7.93	0.000295	1.83	1235.61	505.24	0.14	1.29
Gum Bayou	Lower	9568.148	Max WS	GBml10100	2735.61	-1.93	9.39		9.43	0.000286	2.05	2510.68	1562.73	0.15	1.09
Gum Bayou	Upper	10598.35	Max WS	GBml1010	1053.19	-1.36	7.90		8.24	0.001795	4.75	226.51	47.83	0.33	4.65
Gum Bayou	Upper	10598.35	Max WS	GBml10100	1850.64	-1.36	9.39		9.96	0.002853	6.26	398.03	203.25	0.40	4.65
Gum Bayou	Upper	10608.35	Max WS	GBml1010	1054.26	-1.36	7.92		8.26	0.001782	4.74	227.48	48.19	0.33	4.63
Gum Bayou	Upper	10608.35	Max WS	GBml10100	1850.85	-1.36	9.43		9.98	0.002611	6.20	405.68	207.53	0.40	4.56
Gum Bayou	Upper	10617.53		Bridge											
Gum Bayou	Upper	10628.34	Max WS	GBml1010	1066.99	-1.35	8.36	4.14	8.56	0.000997	3.53	302.23	216.76	0.26	3.53
Gum Bayou	Upper	10628.34	Max WS	GBml10100	1854.30	-1.35	9.89	5.56	10.25	0.001395	4.78	390.12	850.74	0.32	4.75
Gum Bayou	Upper	11889.33	Max WS	GBml1010	996.15	-0.55	9.62		9.76	0.000872	3.08	344.87	113.05	0.24	2.89
Gum Bayou	Upper	11889.33	Max WS	GBml10100	1734.66	-0.55	11.30		11.42	0.000619	3.16	1072.37	1729.10	0.22	1.62
Gum Bayou	Upper	11909.2		Bridge											
Gum Bayou	Upper	11930.16	Max WS	GBml1010	999.33	-0.55	9.86	5.97	9.99	0.000737	2.93	373.50	151.34	0.23	2.66
Gum Bayou	Upper	11930.16	Max WS	GBml10100	1735.45	-0.55	11.36	7.23	11.47	0.000567	3.04	1183.95	1852.67	0.21	1.47
Gum Bayou	Upper	12111.49	Max WS	GBml1010	988.14	-0.55	10.02		10.10	0.000489	2.43	563.85	309.67	0.19	1.75
Gum Bayou	Upper	12111.49	Max WS	GBml10100	1716.66	-0.55	11.47		11.52	0.000317	2.30	1563.80	1895.11	0.16	1.10
Gum Bayou	Upper	12671.33	Max WS	GBml1010	947.98	-0.19	10.26		10.32	0.000255	2.00	517.09	243.88	0.14	1.83
Gum Bayou	Upper	12671.33	Max WS	GBml10100	1649.63	-0.19	11.64		11.74	0.000348	2.66	737.14	1101.04	0.17	2.24
Gum Bayou	Upper	13089.39	Max WS	GBml1010	922.43	-0.11	10.38		10.45	0.000376	2.17	424.42	227.29	0.16	2.17
Gum Bayou	Upper	13089.39	Max WS	GBml10100	1605.69	-0.11	11.80		11.94	0.000564	2.95	558.55	850.43	0.21	2.87
Gum Bayou	Upper	13139.39	Max WS	GBml1010	919.63	0.03	10.40		10.47	0.000337	2.09	439.92	113.15	0.16	2.09
Gum Bayou	Upper	13139.39	Max WS	GBml10100	1600.92	0.03	11.84		11.96	0.000476	2.85	582.48	847.97	0.19	2.75

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Cntl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froutde # Chl	Vel Total (ft/s)
Gum Bayou	Upper	13228.52			Bridge										
Gum Bayou	Upper	13282.81	Max WS	GBmi1010	921.04	-0.65	10.49	4.19	10.56	0.000346	2.00	463.79	1651.69		1.99
Gum Bayou	Upper	13282.81	Max WS	GBmi10100	1600.92	-0.65	11.99	5.52	12.09	0.000486	2.61	631.02	2046.92		2.54
Gum Bayou	Upper	13315.93	Max WS	GBmi1010	921.04	-0.29	10.49		10.57	0.000400	2.24	410.74	75.28		2.24
Gum Bayou	Upper	13315.93	Max WS	GBmi10100	1600.06	-0.29	11.97		12.11	0.000565	3.01	544.32	390.40		2.94
Gum Bayou	Upper	13436.74	Max WS	GBmi1010	921.99	-0.88	10.36		10.61	0.000232	1.80	519.56	1052.04		1.77
Gum Bayou	Upper	13436.74	Max WS	GBmi10100	1604.62	-0.88	12.08		12.16	0.000296	2.37	747.05	1904.64		2.15
Gum Bayou	Upper	13508.5			Lat Struct										
Gum Bayou	Upper	13580.25	Max WS	GBmi1010	685.65	-0.77	10.82		10.65	0.000115	1.25	701.36	1466.16		0.98
Gum Bayou	Upper	13580.25	Max WS	GBmi10100	1059.26	-0.77	12.18		12.20	0.000080	1.21	1266.33	2155.24		0.84
Gum Bayou	Upper	14565.57	Max WS	GBmi1010	685.95	0.16	10.78		10.83	0.000256	1.88	387.81	1125.14		1.77
Gum Bayou	Upper	14565.57	Max WS	GBmi10100	1059.32	0.16	12.30		12.36	0.000230	2.07	625.89	3780.08		1.69
Gum Bayou	Upper	14600.39	Max WS	GBmi1010	686.11	0.20	10.79		10.84	0.000261	1.83	394.66	1236.30		1.74
Gum Bayou	Upper	14600.39	Max WS	GBmi10100	1069.58	0.20	12.32		12.37	0.000232	2.02	653.42	3915.83		1.64
Gum Bayou	Upper	15073.13	Max WS	GBmi1010	687.68	0.64	10.91		10.95	0.000192	1.58	445.45	2491.30		1.54
Gum Bayou	Upper	15073.13	Max WS	GBmi10100	1067.78	0.64	12.42		12.47	0.000199	1.82	659.57	4246.97		1.62
Gum Bayou	Upper	15216.53	Max WS	GBmi1010	483.88	0.92	10.97		10.99	0.000093	1.08	473.23	2103.12		1.02
Gum Bayou	Upper	15216.53	Max WS	GBmi10100	740.50	0.92	12.49		12.51	0.000083	1.20	719.31	3957.07		1.03
Gum Bayou	Upper	15845.97	Max WS	GBmi1010	485.16	1.01	11.04		11.06	0.000133	1.18	436.21	2301.14		1.11
Gum Bayou	Upper	15845.97	Max WS	GBmi10100	740.43	1.01	12.55		12.57	0.000108	1.23	691.27	3106.83		1.07
Gum Bayou	Upper	16699.70	Max WS	GBmi1010	500.53	1.42	11.16		11.19	0.000178	1.41	359.86	155.79		1.39
Gum Bayou	Upper	16699.70	Max WS	GBmi10100	764.63	1.42	12.65		12.69	0.000159	1.54	572.85	521.37		1.33
Gum Bayou	Upper	17124.8			Lat Struct										
Gum Bayou	Upper	17549.89	Max WS	GBmi1010	717.96	1.83	11.28		11.31	0.000132	1.31	553.06	111.85		1.30
Gum Bayou	Upper	17549.89	Max WS	GBmi10100	1143.00	1.83	12.75		12.79	0.000145	1.61	757.70	161.45		1.51
Gum Bayou	Upper	17605.33	Max WS	GBmi1010	391.82	1.96	11.34		11.35	0.000039	0.71	560.50	138.33		0.70
Gum Bayou	Upper	17605.33	Max WS	GBmi10100	658.33	1.96	12.80		12.81	0.000035	0.79	1493.25	1789.29		0.44
Gum Bayou	Upper	18222.95	Max WS	GBmi1010	391.82	2.17	11.36		11.37	0.000066	0.86	478.77	153.97		0.82
Gum Bayou	Upper	18222.95	Max WS	GBmi10100	662.06	2.17	12.82		12.83	0.000064	0.96	1065.16	1137.34		0.62
Gum Bayou	Upper	18658.74	Max WS	GBmi1010	391.78	2.38	11.38		11.46	0.000278	2.24	174.89	108.38		2.24
Gum Bayou	Upper	18658.74	Max WS	GBmi10100	661.87	2.38	12.84		12.86	0.000083	1.08	677.78	185.05		0.98

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
Gum Bayou	Upper	18668.74	Max WS	GBmi1010	391.78	2.39	11.39		11.46	0.000278	2.24	174.81	108.81	0.15	2.24
Gum Bayou	Upper	18668.74	Max WS	GBmi10100	662.34	2.39	12.84		12.86	0.000084	1.09	677.27	185.06	0.08	0.98
Gum Bayou	Upper	18719.05		Culvert											
Gum Bayou	Upper	18769.25	Max WS	GBmi1010	394.84	2.44	11.44		11.51	0.000280	2.25	175.27	94.98	0.15	2.25
Gum Bayou	Upper	18769.25	Max WS	GBmi10100	640.36	2.44	12.75		12.90	0.000425	3.10	203.71	176.72	0.19	3.10
Gum Bayou	Upper	19152.51	Max WS	GBmi1010	326.75	2.60	11.57		11.58	0.000052	0.79	415.02	80.77	0.06	0.79
Gum Bayou	Upper	19152.51	Max WS	GBmi10100	561.26	2.60	12.97		12.99	0.000089	1.05	559.52	123.61	0.07	1.00
Gum Bayou	Upper	19152.52	Max WS	GBmi1010	326.75	2.60	11.57		11.58	0.000052	0.79	415.06	80.78	0.06	0.79
Gum Bayou	Upper	19152.52	Max WS	GBmi10100	561.28	2.60	12.97		12.99	0.000066	1.02	598.82	185.60	0.07	0.94
Gum Bayou	Upper	19385.99	Max WS	GBmi1010	326.75	2.75	11.59		11.59	0.000064	0.89	371.46	74.55	0.07	0.88
Gum Bayou	Upper	19385.99	Max WS	GBmi10100	561.33	2.75	12.99		13.01	0.000080	1.15	549.68	163.65	0.08	1.02
Gum Bayou	Upper	19441.26	Max WS	GBmi1010	326.74	5.24	11.40		12.35	0.005869	7.85	41.60	52.09	0.61	7.85
Gum Bayou	Upper	19441.26	Max WS	GBmi10100	561.37	5.24	12.92		13.09	0.001217	3.28	195.90	140.92	0.28	2.87
Gum Bayou	Upper	19477.05		Culvert											
Gum Bayou	Upper	19516.24	Max WS	GBmi1010	326.77	5.32	13.14		13.24	0.000769	2.59	151.98	118.11	0.22	2.15
Gum Bayou	Upper	19516.24	Max WS	GBmi10100	561.68	5.32	14.42		14.53	0.000860	2.92	298.00	148.18	0.21	1.88
Gum Bayou	Upper	19567.14	Max WS	GBmi1010	326.77	4.61	13.22		13.23	0.000094	0.93	390.66	160.52	0.08	0.84
Gum Bayou	Upper	19567.14	Max WS	GBmi10100	561.75	4.61	14.52		14.53	0.000094	1.11	601.92	165.84	0.08	0.93
Gum Bayou	Upper	20567.15	Max WS	GBmi1010	326.81	7.26	13.31		13.32	0.000085	0.91	471.32	240.04	0.08	0.69
Gum Bayou	Upper	20567.15	Max WS	GBmi10100	561.81	7.26	14.60		14.61	0.000052	0.85	1564.96	2248.68	0.06	0.36
Gum Bayou	Upper	21412.43	Max WS	GBmi1010	327.46	7.22	13.40		13.41	0.000115	0.84	875.31	1356.53	0.08	0.37
Gum Bayou	Upper	21412.43	Max WS	GBmi10100	564.03	7.22	14.63		14.63	0.000018	0.40	2898.80	1781.76	0.04	0.19

HEC-RAS Plan: GBmi10100 Profile: Max WS

Storage Area	Profile	W.S. Elev (ft)	SA Min El (ft)	Net Flux (cfs)	SA Area (acres)	SA Volume (acre-ft)
MT-P2P3	Max WS	12.67	3.53	-335.43	24.72	177.44
MT-P4	Max WS	12.70	1.76	329.21	5.25	30.22
MT-P5	Max WS	12.68	-0.10	817.58	5.20	33.73
MT-P6_1	Max WS	12.72	2.12	29.41	15.18	160.82
MT-P6_2	Max WS	12.71	1.93	-1196.00	4.79	51.64
SharedLake	Max WS	12.70	10.00	-11.56	47.17	127.50
EF detention	Max WS	10.38	2.40	6.85	12.91	102.96
EF detention 2	Max WS	9.75	-0.40	0.36	1.63	16.59

Appendix C
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB100d	0.4255	93.4	01Jan2008, 18:20	6.08
DB117a	0.4019	65.7	01Jan2008, 19:10	5.36
DB100e	0.3817	54.3	01Jan2008, 19:10	5.5
DB116a	1.0145	146.9	01Jan2008, 19:30	5.25
DB115a	0.7371	95.2	01Jan2008, 19:40	5.15
DB100f	0.4351	64.9	01Jan2008, 19:10	5.56
DB100g	0.4314	99.1	01Jan2008, 18:30	5.96
BG100a	0.2239	249.4	01Jan2008, 16:40	6.36
DB100h2	0.7813	69.1	01Jan2008, 20:30	4.59
DB110a	0.7918	110.4	01Jan2008, 19:40	5.54
DB100h1	1.046	135.2	01Jan2008, 20:00	5.51
DB100i	1.1485	53.1	02Jan2008, 00:00	3.08
DB100j	0.8411	109.4	01Jan2008, 19:30	5.19
DB101a	0.26	46.1	01Jan2008, 18:40	5.53
DB100k	0.8664	44.2	02Jan2008, 00:10	3.36
DB107a	0.3073	58.8	01Jan2008, 18:30	5.46
DB100l	0.2722	45.6	01Jan2008, 19:10	5.38
DB100m	0.4097	42.3	01Jan2008, 20:10	5.13
DB106a	0.5802	93.4	01Jan2008, 19:00	5.35
DB100n	0.4055	58.4	01Jan2008, 19:20	5.24
DB100o	1.0802	133.3	01Jan2008, 19:30	5.05
DB100p	1.1671	150.3	01Jan2008, 19:50	5.1
DB100v	0.3414	71	01Jan2008, 18:30	5.5
DB100q	1.5445	201.4	01Jan2008, 19:50	5.16
DB100r	1.0674	147.4	01Jan2008, 19:20	5.37
DB100s	0.5783	79.6	01Jan2008, 19:20	5.19
J100z	0.5783	79.6	01Jan2008, 19:20	5.19
R100z	0.5783	74.9	02Jan2008, 06:20	5.12
DB100t	0.2557	57.5	01Jan2008, 18:00	5.52
J100ab	0.2557	57.5	01Jan2008, 18:00	5.52
R100ab	0.2557	49.1	02Jan2008, 03:20	5.47
J100y	1.9014	231.7	02Jan2008, 03:00	5.31
R100y	1.9014	231.5	02Jan2008, 04:10	5.3
DB100x	0.1482	37.6	01Jan2008, 17:40	5.54
J100aa	0.1482	37.6	01Jan2008, 17:40	5.54
R100aa	0.1482	27.4	02Jan2008, 05:30	5.54
J100x	2.0496	258.7	02Jan2008, 04:20	5.31
R100x	2.0496	258.1	02Jan2008, 05:40	5.27
DB100y	0.3291	81.7	01Jan2008, 18:00	6.19
J100ac	0.3291	81.7	01Jan2008, 18:00	6.19
R100ac	0.3291	80.5	01Jan2008, 21:00	6.17
J100w	3.9232	483.6	01Jan2008, 23:00	5.3
R100w	3.9232	483.6	01Jan2008, 23:00	5.3
DB100w	1.1203	92.5	01Jan2008, 20:30	4.42

Appendix C
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
J100ad	1.1203	92.5	01Jan2008, 20:30	4.42
R100ad	1.1203	91.5	02Jan2008, 01:00	4.21
J100v	5.3849	630.2	01Jan2008, 23:20	5.08
R100v	5.3849	618.7	02Jan2008, 03:40	5.04
DB101g	1.3033	173	01Jan2008, 19:20	5.15
DB101h	0.5994	86.7	01Jan2008, 19:10	5.25
DB101i	0.3999	75.7	01Jan2008, 18:30	5.46
DB101k	0.7138	108.5	01Jan2008, 19:00	5.52
DB101l	0.6079	99.4	01Jan2008, 19:00	5.69
DB101m	0.4682	103.8	01Jan2008, 18:10	5.93
DB101n	0.5905	65.6	01Jan2008, 19:30	5.04
DB101p	0.8115	99.4	01Jan2008, 19:50	5.23
DB101q	0.9593	102.5	01Jan2008, 19:30	4.94
DB101r	1.9095	85.1	02Jan2008, 00:20	2.98
Chigger	1.9095	28.4	02Jan2008, 00:20	0.99
R101o	1.9095	28.3	02Jan2008, 03:00	0.94
J101n	2.8688	125.6	01Jan2008, 22:40	2.28
R101n	2.8688	122.2	02Jan2008, 05:20	2.21
DB101o	0.4823	86.5	01Jan2008, 18:50	5.88
J101p	0.4823	86.5	01Jan2008, 18:50	5.88
R101p	0.4823	65.8	02Jan2008, 09:20	5.85
J101m	4.7531	314.6	02Jan2008, 03:30	3.45
R101m	4.7531	313.6	02Jan2008, 05:10	3.44
J101l	5.8292	464.8	01Jan2008, 22:00	3.87
R101l	5.8292	464.5	01Jan2008, 23:30	3.86
J101k	6.543	562.8	01Jan2008, 22:40	4.04
R101k	6.543	560.8	02Jan2008, 00:20	4.04
DB101j	0.3461	138.7	01Jan2008, 17:10	6.08
J101j	6.8891	643.7	01Jan2008, 21:50	4.14
R101j	6.8891	635.8	02Jan2008, 00:40	4.12
J101i	7.289	694.8	02Jan2008, 00:10	4.2
R101i	7.289	688.7	02Jan2008, 03:30	4.18
J101h	7.8884	753.6	02Jan2008, 02:50	4.26
R101h	7.8884	748.8	02Jan2008, 05:10	4.24
DB101s	0.4214	151.4	01Jan2008, 17:20	6.03
DB101t	0.6201	190.8	01Jan2008, 17:20	6.12
DB101u	0.7635	162.1	01Jan2008, 18:30	5.91
J101s	0.7635	162.1	01Jan2008, 18:30	5.91
R101s	0.7635	146.3	02Jan2008, 04:40	5.9
J101r	1.3836	277.2	01Jan2008, 18:20	6
R101r	1.3836	261.9	01Jan2008, 20:50	6
J101q	1.805	382.8	01Jan2008, 20:10	6
R101q	1.805	317.3	02Jan2008, 04:50	6
J101g	10.9967	1191.8	02Jan2008, 04:20	4.64

Appendix C
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R101g	10.9967	1184.3	02Jan2008, 05:40	4.63
J100u	17.5487	1909.9	02Jan2008, 04:20	4.79
R100u	17.5487	1888.2	02Jan2008, 06:20	4.77
Weir-Split	17.5487	1354.4	02Jan2008, 06:20	3.63
R100t	17.5487	1351.3	02Jan2008, 07:50	3.62
J100s2	18.6289	1440.1	02Jan2008, 07:10	3.7
R100s2	18.6289	1437.5	02Jan2008, 08:40	3.69
DB104a	0.8529	131	01Jan2008, 19:10	5.31
DB104b	1.8897	256	01Jan2008, 19:40	5.17
DB104c	1.5214	128.5	01Jan2008, 20:50	4.49
DB104d	0.7771	123	01Jan2008, 19:10	5.44
J104d	0.7771	123	01Jan2008, 19:10	5.44
R104d	0.7771	119.6	01Jan2008, 21:10	5.43
J104c	2.2985	248	01Jan2008, 21:10	4.8
R104c	2.2985	246.6	01Jan2008, 23:40	4.75
J104b	4.1882	485.8	01Jan2008, 22:30	4.94
R104b	4.1882	434.2	02Jan2008, 05:10	4.47
J104a	5.0411	521	02Jan2008, 04:50	4.61
R104a	5.0411	520.6	02Jan2008, 05:00	4.6
J100s1	24.0755	1966.2	02Jan2008, 06:40	3.91
R100s1	24.0755	1955.3	02Jan2008, 08:00	3.9
DB106b	0.9051	148.4	01Jan2008, 19:00	5.61
DB105a	1.0654	92.2	01Jan2008, 20:30	4.52
DB106c	0.638	132.9	01Jan2008, 18:30	5.59
DB106d	0.3265	55.5	01Jan2008, 19:00	5.39
J106b	0.9645	188.3	01Jan2008, 18:40	5.52
R106b	0.9645	186.9	01Jan2008, 20:20	5.51
DB105b	0.3873	64.8	01Jan2008, 19:00	5.63
DB105c	0.8905	147.6	01Jan2008, 19:00	5.37
J105b	0.8905	147.6	01Jan2008, 19:00	5.37
R105b	0.8905	143.9	01Jan2008, 22:40	5.35
J105a	1.2778	202.7	01Jan2008, 22:20	5.44
R105a	1.2778	199	02Jan2008, 01:00	5.41
J106a	4.2128	581.8	01Jan2008, 23:00	5.25
R106a	4.2128	581.2	02Jan2008, 00:00	5.24
J100r	29.2782	2481.7	02Jan2008, 05:40	4.14
R100r	29.2782	2480.6	02Jan2008, 06:10	4.13
DB107b	1.4378	188.1	01Jan2008, 19:40	5.2
DB107c	0.32	46.4	01Jan2008, 19:10	5.43
J107b	0.32	46.4	01Jan2008, 19:10	5.43
R107b	0.32	46.2	01Jan2008, 20:20	5.4
J107a	1.7578	234.1	01Jan2008, 19:50	5.24
R107a	1.7578	232.4	01Jan2008, 21:40	5.19
J100q	31.6155	2722.2	02Jan2008, 04:40	4.22

Appendix C
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100q	31.6155	2718.6	02Jan2008, 06:50	4.17
DB101b	0.4813	73.4	01Jan2008, 19:00	5.3
DB101c	0.4599	77	01Jan2008, 18:50	5.38
DB101d	2.4142	253.7	01Jan2008, 20:20	4.79
DB101e	1.1825	158.4	01Jan2008, 19:20	5.16
DB101f	0.8417	146.6	01Jan2008, 18:50	5.41
J101f	0.8417	146.6	01Jan2008, 18:50	5.41
R101f	0.8417	146.5	01Jan2008, 19:10	5.38
J101e	2.0242	304.9	01Jan2008, 19:20	5.25
R101e	2.0242	242	02Jan2008, 15:50	4.94
J101d	2.0242	707.1	02Jan2008, 08:30	14.86
R101d	2.0242	700.2	02Jan2008, 10:50	14.76
J101c	4.4384	867.9	02Jan2008, 10:10	9.34
R101c	4.4384	858.6	02Jan2008, 13:30	9.27
J101b	4.8983	887	02Jan2008, 13:20	8.91
R101b	4.8983	886.9	02Jan2008, 13:30	8.89
J101a	5.3796	917.1	02Jan2008, 13:20	8.57
R101a	5.3796	916.7	02Jan2008, 14:20	8.51
DB101v	0.5653	93.2	01Jan2008, 19:00	5.37
J100p	38.6868	3615.8	02Jan2008, 09:00	4.78
R100p	38.6868	3614.8	02Jan2008, 09:20	4.77
DB108b	0.5279	106.7	01Jan2008, 18:40	5.84
DB108a	1.2268	135.6	01Jan2008, 19:50	4.99
DB108c	0.6193	123.9	01Jan2008, 19:00	5.9
J108c	0.6193	123.9	01Jan2008, 19:00	5.9
R108c	0.6193	123.5	01Jan2008, 20:00	5.89
J108b	1.8461	259.1	01Jan2008, 19:50	5.29
R108b	1.8461	257.3	01Jan2008, 21:20	5.29
J108a	2.374	359.6	01Jan2008, 19:30	5.41
R108a	2.374	353.4	02Jan2008, 01:00	5.38
J100o	41.0608	3847.1	02Jan2008, 08:20	4.81
R100o	41.0608	3846.2	02Jan2008, 08:50	4.8
J100n	41.9019	3913.9	02Jan2008, 08:30	4.81
R100n	41.9019	3911	02Jan2008, 09:40	4.78
DB109a	0.6757	569	01Jan2008, 17:20	6.31
DB109b	0.182	39.2	01Jan2008, 18:20	5.6
DB109d	0.3999	89.1	01Jan2008, 18:20	5.88
DB109g	0.8689	119.2	01Jan2008, 19:50	5.48
DB109f	0.2845	94	01Jan2008, 17:10	6.15
DB109e	0.6993	114.8	01Jan2008, 19:20	5.69
J109f	0.9838	204.6	01Jan2008, 18:10	5.82
R109f	0.9838	203.7	01Jan2008, 19:20	5.81
J109c	1.8527	322.5	01Jan2008, 19:30	5.66
R109c	1.8527	320.4	01Jan2008, 20:50	5.65

Appendix C
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB109c	0.5646	114.3	01Jan2008, 18:40	5.84
DB109h	0.4721	151.9	01Jan2008, 17:30	6.31
J109e	0.4721	151.9	01Jan2008, 17:30	6.31
R109e	0.4721	137	02Jan2008, 02:00	6.31
J109d	1.0367	220.4	02Jan2008, 01:10	6.05
R109d	1.0367	218.5	02Jan2008, 02:40	6.05
J109b	3.4713	631.5	01Jan2008, 20:20	5.79
R109b	3.4713	628.8	01Jan2008, 21:00	5.79
J109a	4.147	906.5	01Jan2008, 18:00	5.87
R109a	4.147	897.2	01Jan2008, 18:50	5.87
J100m	47.1974	4346.6	02Jan2008, 07:20	4.83
R100m	47.1974	4343.3	02Jan2008, 08:00	4.8
DB112a	0.4975	85.4	01Jan2008, 19:10	5.4
DB112d	0.3564	57.2	01Jan2008, 19:10	5.63
J112b	0.3564	57.2	01Jan2008, 19:10	5.63
R112b	0.3564	56	02Jan2008, 00:20	5.59
DB112b	0.3748	127.3	01Jan2008, 17:30	6.29
DB112c	0.7429	103.6	01Jan2008, 19:30	5.47
DB112f	0.3175	42.7	01Jan2008, 19:20	5.37
DB112e	0.7645	119.8	01Jan2008, 19:20	5.43
J112f	1.082	162.5	01Jan2008, 19:20	5.41
R112f	1.082	162.2	01Jan2008, 20:10	5.4
J112e	1.8249	265.3	01Jan2008, 20:00	5.43
R112e	1.8249	265.3	01Jan2008, 20:10	5.42
J112d	1.8249	265.3	01Jan2008, 20:10	5.42
R112d	1.8249	264.1	01Jan2008, 21:30	5.4
J112c	2.1997	365.5	01Jan2008, 20:40	5.55
R112c	2.1997	365.1	01Jan2008, 21:10	5.54
J112a	3.0536	489.8	01Jan2008, 21:40	5.53
R112a	3.0536	475.8	02Jan2008, 02:00	5.49
J100l	52.0888	4891.8	02Jan2008, 06:30	4.87
R100l	52.0888	4890.1	02Jan2008, 07:00	4.85
J100k	52.8701	4945.6	02Jan2008, 07:00	4.85
R100k	52.8701	4943.3	02Jan2008, 07:30	4.83
BG100b	0.9681	286.6	01Jan2008, 17:40	6.24
BG100c	0.8305	353.7	01Jan2008, 17:00	6.31
BG100d	0.7905	107	01Jan2008, 19:20	5.39
JBGc	0.7905	107	01Jan2008, 19:20	5.39
RBGc	0.7905	66.3	02Jan2008, 18:10	4.51
JBGb	1.621	354.4	01Jan2008, 17:00	5.43
RBGb	1.621	243.1	02Jan2008, 05:40	5.28
JBGa	2.5891	408	01Jan2008, 21:40	5.64
RBGa	2.5891	402.9	02Jan2008, 00:20	5.58
J100j	55.6831	5294.4	02Jan2008, 07:10	4.88

Appendix C
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100j	55.6831	5293.2	02Jan2008, 07:20	4.87
DB111a	0.2553	45.9	01Jan2008, 18:40	5.43
DB111b	1.2071	134.1	01Jan2008, 20:10	4.88
J111b	1.2071	134.1	01Jan2008, 20:10	4.88
R111b	1.2071	120.6	02Jan2008, 09:20	4.81
J111a	1.4624	141.7	02Jan2008, 08:00	4.92
R111a	1.4624	140.6	02Jan2008, 12:00	4.79
MB100a	0.4305	469.2	01Jan2008, 16:50	6.36
MB100b	0.6341	258.2	01Jan2008, 17:10	6.15
MB100h	0.5156	106.1	01Jan2008, 18:30	5.85
MB100c1	0.1197	80.5	01Jan2008, 16:40	6.19
MB100c2	0.3741	132.3	01Jan2008, 17:10	5.91
MB100d	1.2082	180.7	01Jan2008, 19:20	5.36
MB100e	0.5889	95.9	01Jan2008, 19:00	5.36
MB100f	1.3315	164.8	01Jan2008, 19:40	5.05
MB100g	0.4893	92.1	01Jan2008, 18:40	5.46
JMBi	0.4893	92.1	01Jan2008, 18:40	5.46
RMBi	0.4893	81.2	02Jan2008, 01:40	5.4
JMBg	2.4097	312.1	01Jan2008, 23:20	5.2
RMBg	2.4097	304.5	02Jan2008, 04:20	5.16
JMBc	3.6179	437.4	02Jan2008, 02:40	5.23
RMBc	3.6179	437.2	02Jan2008, 03:30	5.19
JMBd	3.992	487.1	02Jan2008, 01:30	5.26
RMBd	3.992	486.8	02Jan2008, 02:10	5.24
JMBb	4.6273	578.2	01Jan2008, 20:30	5.33
RMBb	4.6273	574.3	02Jan2008, 01:30	5.31
JMBa	5.2614	741.6	01Jan2008, 21:00	5.41
RMBa	5.2614	726.6	02Jan2008, 00:10	5.39
JMBa	5.6919	758.8	01Jan2008, 23:50	5.46
RMBa	5.6919	756.1	02Jan2008, 00:40	5.46
J100h	63.2688	6057.2	02Jan2008, 06:20	4.93
R100h	63.2688	6054.9	02Jan2008, 06:50	4.91
DB114a	0.6772	87.2	01Jan2008, 19:30	5.11
DB114b	0.4096	93.2	01Jan2008, 18:00	5.52
J114b	0.4096	93.2	01Jan2008, 18:00	5.52
R114b	0.4096	82.1	02Jan2008, 05:00	5.47
J114a	1.0868	147	02Jan2008, 04:10	5.25
R114a	1.0868	132.5	02Jan2008, 12:20	5.13
BB100a	0.8055	630.9	01Jan2008, 16:50	6.36
BB100b	0.873	273.8	01Jan2008, 17:30	6.12
BB100c	0.2175	188.2	01Jan2008, 16:50	6.12
BB100d	1.2851	298.6	01Jan2008, 18:20	6.1
BB100e	1.2538	326.1	01Jan2008, 18:00	6.12
JBBd	2.5389	624.4	01Jan2008, 18:10	6.11

Appendix C
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
RBBd	2.5389	601.9	01Jan2008, 19:50	6.11
JBBc	2.7564	694.7	01Jan2008, 18:50	6.11
RBBc	2.7564	681.3	01Jan2008, 21:00	6.11
JBBb	3.6294	910.9	01Jan2008, 20:30	6.11
RBBb	3.6294	842.5	02Jan2008, 02:20	6.11
JBBa	4.4349	977.8	01Jan2008, 18:30	6.15
RBBa	4.4349	957.8	02Jan2008, 00:30	6.15
J100g	69.2256	7021.8	02Jan2008, 04:20	5
R100g	69.2256	7020	02Jan2008, 04:30	4.99
J100f	71.3589	7236.2	02Jan2008, 04:30	5
R100f	71.3589	7233.6	02Jan2008, 04:40	4.99
J100e	71.7608	7276.4	02Jan2008, 04:40	4.99
R100e	71.7608	7273.7	02Jan2008, 05:00	4.98
J100d	72.1863	7323.8	02Jan2008, 04:50	4.99
R100d	72.1863	7236.7	02Jan2008, 08:40	4.89
Gum Bayou	12.12	2869.6	01Jan2008, 19:50	6.62
DB100c	2.0856	178.7	01Jan2008, 21:50	4.55
J100c	86.3919	8764.4	02Jan2008, 06:00	5.12
R100c	86.3919	8697.5	02Jan2008, 08:40	5.04
DB100b1	2.4787	222.6	01Jan2008, 20:50	4.52
DB100b2	0.9668	134.1	01Jan2008, 19:20	5.2
J100b	89.8374	8946.1	02Jan2008, 08:40	5.03
R100b	89.8374	8941.1	02Jan2008, 09:50	5
DB118a	1.2724	164	01Jan2008, 19:40	5.11
DB118b	2.4501	261.6	01Jan2008, 20:00	4.82
DB118c	0.5656	102.6	01Jan2008, 18:50	5.52
J118c	0.5656	102.6	01Jan2008, 18:50	5.52
R118c	0.5656	85.4	02Jan2008, 08:00	5.49
J118b	3.0157	319.9	01Jan2008, 20:40	4.95
R118b	3.0157	317.3	01Jan2008, 23:20	4.93
J118a	4.2881	471.7	01Jan2008, 22:40	4.98
R118a	4.2881	453.9	02Jan2008, 10:20	4.76
J100a	94.1255	9394.5	02Jan2008, 09:50	4.99
R100a	94.1255	9373.7	02Jan2008, 11:20	4.93
DB100a	0.8551	95.3	01Jan2008, 20:00	4.96
Outlet	94.9806	9433	02Jan2008, 11:20	4.93

Appendix C
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB100d	0.4255	215.6	01Jan2008, 18:10	11.85
DB117a	0.4019	166.3	01Jan2008, 19:00	11.16
DB100e	0.3817	135.9	01Jan2008, 19:10	11.37
DB116a	1.0145	375.9	01Jan2008, 19:30	11.07
DB115a	0.7371	245.6	01Jan2008, 19:30	10.99
DB100f	0.4351	161.9	01Jan2008, 19:10	11.42
DB100g	0.4314	231.5	01Jan2008, 18:20	11.7
BG100a	0.2239	394.7	01Jan2008, 16:40	12.11
DB100h2	0.7813	176.4	01Jan2008, 20:00	10.21
DB110a	0.7918	275.4	01Jan2008, 19:30	11.42
DB100h1	1.046	334.2	01Jan2008, 20:00	11.4
DB100i	1.1485	143.3	01Jan2008, 23:10	7.63
DB100j	0.8411	281.4	01Jan2008, 19:20	11.05
DB101a	0.26	114.1	01Jan2008, 18:40	11.32
DB100k	0.8664	117	01Jan2008, 23:20	8.1
DB107a	0.3073	146.2	01Jan2008, 18:30	11.21
DB100l	0.2722	115	01Jan2008, 19:10	11.18
DB100m	0.4097	104.9	01Jan2008, 19:50	10.9
DB106a	0.5802	236.8	01Jan2008, 18:50	11.16
DB100n	0.4055	149.7	01Jan2008, 19:10	11.07
DB100o	1.0802	346.3	01Jan2008, 19:20	10.89
DB100p	1.1671	388.5	01Jan2008, 19:40	10.94
DB100v	0.3414	175.1	01Jan2008, 18:30	11.21
DB100q	1.5445	519.1	01Jan2008, 19:40	11
DB100r	1.0674	373.6	01Jan2008, 19:20	11.23
DB100s	0.5783	204.9	01Jan2008, 19:10	11.03
J100z	0.5783	204.9	01Jan2008, 19:10	11.03
R100z	0.5783	178.8	02Jan2008, 04:30	10.96
DB100t	0.2557	140.5	01Jan2008, 17:50	11.21
J100ab	0.2557	140.5	01Jan2008, 17:50	11.21
R100ab	0.2557	67.6	02Jan2008, 20:30	11.21
J100y	1.9014	485.7	02Jan2008, 04:20	11.14
R100y	1.9014	470.3	02Jan2008, 06:40	11.13
DB100x	0.1482	90.5	01Jan2008, 17:40	11.21
J100aa	0.1482	90.5	01Jan2008, 17:40	11.21
R100aa	0.1482	43	02Jan2008, 14:30	11.21
J100x	2.0496	510.9	02Jan2008, 06:40	11.14
R100x	2.0496	505.1	02Jan2008, 08:20	11.09
DB100y	0.3291	191.8	01Jan2008, 17:50	11.93
J100ac	0.3291	191.8	01Jan2008, 17:50	11.93
R100ac	0.3291	166	02Jan2008, 03:10	11.93
J100w	3.9232	1075.1	01Jan2008, 22:30	11.13
R100w	3.9232	1074.6	01Jan2008, 22:50	11.12
DB100w	1.1203	243.9	01Jan2008, 20:00	10.05

Appendix C
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
J100ad	1.1203	243.9	01Jan2008, 20:00	10.05
R100ad	1.1203	226.1	02Jan2008, 07:20	9.71
J100v	5.3849	1379.3	01Jan2008, 22:50	10.84
R100v	5.3849	1329	02Jan2008, 06:30	10.78
DB101g	1.3033	443.6	01Jan2008, 19:10	10.98
DB101h	0.5994	222	01Jan2008, 19:10	11.08
DB101i	0.3999	188.6	01Jan2008, 18:20	11.21
DB101k	0.7138	271.1	01Jan2008, 19:00	11.37
DB101l	0.6079	243.3	01Jan2008, 19:00	11.54
DB101m	0.4682	245.6	01Jan2008, 18:00	11.67
DB101n	0.5905	168.7	01Jan2008, 19:20	10.87
DB101p	0.8115	252.6	01Jan2008, 19:40	11.08
DB101q	0.9593	264.7	01Jan2008, 19:20	10.75
DB101r	1.9095	230.2	02Jan2008, 00:00	7.43
Chigger	1.9095	76.7	02Jan2008, 00:00	2.48
R101o	1.9095	74.7	02Jan2008, 09:40	2.38
J101n	2.8688	297.8	01Jan2008, 20:20	5.18
R101n	2.8688	269.8	02Jan2008, 15:10	5.06
DB101o	0.4823	208.6	01Jan2008, 18:50	11.71
J101p	0.4823	208.6	01Jan2008, 18:50	11.71
R101p	0.4823	115.8	02Jan2008, 17:10	11.7
J101m	4.7531	590.7	01Jan2008, 23:10	7.49
R101m	4.7531	589.3	02Jan2008, 00:20	7.48
J101l	5.8292	997.1	01Jan2008, 20:30	8.24
R101l	5.8292	945.7	02Jan2008, 03:20	8.22
J101k	6.543	1127.3	02Jan2008, 02:20	8.56
R101k	6.543	1113.2	02Jan2008, 04:30	8.56
DB101j	0.3461	298	01Jan2008, 17:00	11.8
J101j	6.8891	1159.4	02Jan2008, 03:50	8.72
R101j	6.8891	1134.9	02Jan2008, 08:40	8.7
J101i	7.289	1193.8	02Jan2008, 08:10	8.83
R101i	7.289	1183.2	02Jan2008, 11:50	8.81
J101h	7.8884	1262.5	02Jan2008, 11:10	8.98
R101h	7.8884	1259.8	02Jan2008, 12:40	8.96
DB101s	0.4214	333.2	01Jan2008, 17:10	11.75
DB101t	0.6201	427.6	01Jan2008, 17:30	11.85
DB101u	0.7635	385.6	01Jan2008, 18:20	11.67
J101s	0.7635	385.6	01Jan2008, 18:20	11.67
R101s	0.7635	371.3	01Jan2008, 23:20	11.67
J101r	1.3836	642.1	01Jan2008, 22:20	11.75
R101r	1.3836	605.9	02Jan2008, 00:40	11.75
J101q	1.805	749	02Jan2008, 00:10	11.75
R101q	1.805	502.5	02Jan2008, 13:40	11.75
J101g	10.9967	1933.9	02Jan2008, 11:10	9.66

Appendix C
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R101g	10.9967	1931.3	02Jan2008, 12:10	9.65
J100u	17.5487	3459.4	02Jan2008, 06:00	10.08
R100u	17.5487	3438.5	02Jan2008, 07:50	10.06
Weir-Split	17.5487	2189.6	02Jan2008, 07:50	6.85
R100t	17.5487	2175.2	02Jan2008, 10:50	6.84
J100s2	18.6289	2335.8	02Jan2008, 10:10	7.07
R100s2	18.6289	2331	02Jan2008, 11:30	7.06
DB104a	0.8529	328.6	01Jan2008, 19:10	11.11
DB104b	1.8897	659.3	01Jan2008, 19:30	11.01
DB104c	1.5214	334.9	01Jan2008, 20:20	10.11
DB104d	0.7771	310.4	01Jan2008, 19:10	11.26
J104d	0.7771	310.4	01Jan2008, 19:10	11.26
R104d	0.7771	276.9	01Jan2008, 23:30	11.26
J104c	2.2985	603.8	01Jan2008, 22:40	10.5
R104c	2.2985	578	02Jan2008, 06:30	10.43
J104b	4.1882	1067.2	01Jan2008, 23:50	10.69
R104b	4.1882	1043	02Jan2008, 03:10	10.05
J104a	5.0411	1267.6	02Jan2008, 01:50	10.23
R104a	5.0411	1264.6	02Jan2008, 02:30	10.22
J100s1	24.0755	3444.7	02Jan2008, 09:50	7.79
R100s1	24.0755	3437.7	02Jan2008, 10:30	7.78
DB106b	0.9051	364.9	01Jan2008, 19:00	11.44
DB105a	1.0654	240.9	01Jan2008, 20:00	10.17
DB106c	0.638	326	01Jan2008, 18:20	11.31
DB106d	0.3265	139.7	01Jan2008, 19:00	11.18
J106b	0.9645	465.3	01Jan2008, 18:30	11.27
R106b	0.9645	439.9	01Jan2008, 22:40	11.27
DB105b	0.3873	159.7	01Jan2008, 19:00	11.46
DB105c	0.8905	373	01Jan2008, 19:00	11.17
J105b	0.8905	373	01Jan2008, 19:00	11.17
R105b	0.8905	346	02Jan2008, 01:00	11.16
J105a	1.2778	468	02Jan2008, 00:20	11.25
R105a	1.2778	418.4	02Jan2008, 08:10	11.23
J106a	4.2128	1270.6	01Jan2008, 23:00	11.02
R106a	4.2128	1260.7	02Jan2008, 01:30	11
J100r	29.2782	4713.9	02Jan2008, 03:50	8.35
R100r	29.2782	4697.1	02Jan2008, 05:00	8.35
DB107b	1.4378	483.3	01Jan2008, 19:40	11.05
DB107c	0.32	114.7	01Jan2008, 19:10	11.26
J107b	0.32	114.7	01Jan2008, 19:10	11.26
R107b	0.32	114	01Jan2008, 20:10	11.23
J107a	1.7578	596.6	01Jan2008, 19:40	11.08
R107a	1.7578	546.8	02Jan2008, 02:50	11.04
J100q	31.6155	5361.1	02Jan2008, 04:10	8.55

Appendix C
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100q	31.6155	5325.5	02Jan2008, 07:30	8.49
DB101b	0.4813	187.1	01Jan2008, 19:00	11.12
DB101c	0.4599	194.3	01Jan2008, 18:40	11.18
DB101d	2.4142	665.9	01Jan2008, 20:10	10.59
DB101e	1.1825	408.6	01Jan2008, 19:10	11
DB101f	0.8417	368.4	01Jan2008, 18:50	11.19
J101f	0.8417	368.4	01Jan2008, 18:50	11.19
R101f	0.8417	368.9	01Jan2008, 18:40	11.18
J101e	2.0242	776.7	01Jan2008, 19:00	11.07
R101e	2.0242	663.4	02Jan2008, 08:10	10.75
J101d	2.0242	1912.2	02Jan2008, 08:10	38.59
R101d	2.0242	1898.3	02Jan2008, 09:30	38.47
J101c	4.4384	2290.4	02Jan2008, 08:50	23.3
R101c	4.4384	2234.8	02Jan2008, 12:30	23.22
J101b	4.8983	2286.1	02Jan2008, 12:20	22.09
R101b	4.8983	2261	02Jan2008, 14:00	22.07
J101a	5.3796	2312.3	02Jan2008, 13:50	21.09
R101a	5.3796	2287	02Jan2008, 17:40	21.01
DB101v	0.5653	235.6	01Jan2008, 19:00	11.17
J100p	38.6868	7278.2	02Jan2008, 07:40	10.28
R100p	38.6868	7265.2	02Jan2008, 09:10	10.27
DB108b	0.5279	257.5	01Jan2008, 18:30	11.62
DB108a	1.2268	349.2	01Jan2008, 19:40	10.81
DB108c	0.6193	298.3	01Jan2008, 18:50	11.69
J108c	0.6193	298.3	01Jan2008, 18:50	11.69
R108c	0.6193	218.1	02Jan2008, 08:00	11.69
J108b	1.8461	556.6	01Jan2008, 20:10	11.11
R108b	1.8461	531.7	02Jan2008, 01:30	11.1
J108a	2.374	713	02Jan2008, 00:00	11.22
R108a	2.374	684.2	02Jan2008, 07:30	11.18
J100o	41.0608	7937.1	02Jan2008, 08:40	10.33
R100o	41.0608	7905.1	02Jan2008, 11:20	10.31
J100n	41.9019	8026.4	02Jan2008, 11:00	10.33
R100n	41.9019	7929.8	02Jan2008, 16:50	10.29
DB109a	0.6757	1082.5	01Jan2008, 17:20	12.05
DB109b	0.182	95.8	01Jan2008, 18:10	11.31
DB109d	0.3999	213	01Jan2008, 18:10	11.62
DB109g	0.8689	293	01Jan2008, 19:40	11.33
DB109f	0.2845	208.4	01Jan2008, 17:20	11.88
DB109e	0.6993	278.3	01Jan2008, 19:10	11.53
J109f	0.9838	475.6	01Jan2008, 18:10	11.63
R109f	0.9838	465.2	01Jan2008, 20:00	11.62
J109c	1.8527	757.8	01Jan2008, 20:00	11.49
R109c	1.8527	679.8	02Jan2008, 01:50	11.48

Appendix C
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 10 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB109c	0.5646	273.7	01Jan2008, 18:40	11.62
DB109h	0.4721	328.6	01Jan2008, 17:40	12.05
J109e	0.4721	328.6	01Jan2008, 17:40	12.05
R109e	0.4721	284.7	02Jan2008, 03:20	12.05
J109d	1.0367	439.7	02Jan2008, 02:10	11.82
R109d	1.0367	423.6	02Jan2008, 06:00	11.82
J109b	3.4713	1229.6	02Jan2008, 01:40	11.59
R109b	3.4713	1220	02Jan2008, 03:30	11.58
J109a	4.147	1775	01Jan2008, 17:30	11.66
R109a	4.147	1593	01Jan2008, 19:30	11.65
J100m	47.1974	8685.7	02Jan2008, 09:50	10.35
R100m	47.1974	8562.8	02Jan2008, 12:20	10.31
DB112a	0.4975	211.8	01Jan2008, 19:00	11.18
DB112d	0.3564	141.8	01Jan2008, 19:10	11.48
J112b	0.3564	141.8	01Jan2008, 19:10	11.48
R112b	0.3564	124.3	02Jan2008, 09:10	11.44
DB112b	0.3748	274	01Jan2008, 17:30	12.03
DB112c	0.7429	255.2	01Jan2008, 19:30	11.32
DB112f	0.3175	107.9	01Jan2008, 19:20	11.23
DB112e	0.7645	300.6	01Jan2008, 19:10	11.25
J112f	1.082	408.4	01Jan2008, 19:10	11.25
R112f	1.082	382.9	02Jan2008, 00:50	11.24
J112e	1.8249	601.5	02Jan2008, 00:00	11.27
R112e	1.8249	597.2	02Jan2008, 01:00	11.27
J112d	1.8249	597.2	02Jan2008, 01:00	11.27
R112d	1.8249	585.5	02Jan2008, 04:10	11.25
J112c	2.1997	658.8	02Jan2008, 03:30	11.38
R112c	2.1997	651.3	02Jan2008, 05:40	11.37
J112a	3.0536	869.4	02Jan2008, 05:20	11.35
R112a	3.0536	855	02Jan2008, 10:40	11.31
J100l	52.0888	9669.5	02Jan2008, 12:00	10.41
R100l	52.0888	9591.2	02Jan2008, 14:00	10.39
J100k	52.8701	9689.3	02Jan2008, 14:00	10.38
R100k	52.8701	9666	02Jan2008, 14:50	10.36
BG100b	0.9681	650.8	01Jan2008, 17:40	11.98
BG100c	0.8305	773.7	01Jan2008, 16:50	12.05
BG100d	0.7905	268.9	01Jan2008, 19:20	11.26
JBGc	0.7905	268.9	01Jan2008, 19:20	11.26
RBGc	0.7905	204	02Jan2008, 06:10	10.11
JBGb	1.621	776.1	01Jan2008, 16:50	11.1
RBGb	1.621	479.5	01Jan2008, 22:40	10.89
JBGa	2.5891	909.4	01Jan2008, 22:40	11.3
RBGa	2.5891	838.6	02Jan2008, 01:20	11.21
J100j	55.6831	10043.6	02Jan2008, 14:30	10.41

Appendix C
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 10 Scenario

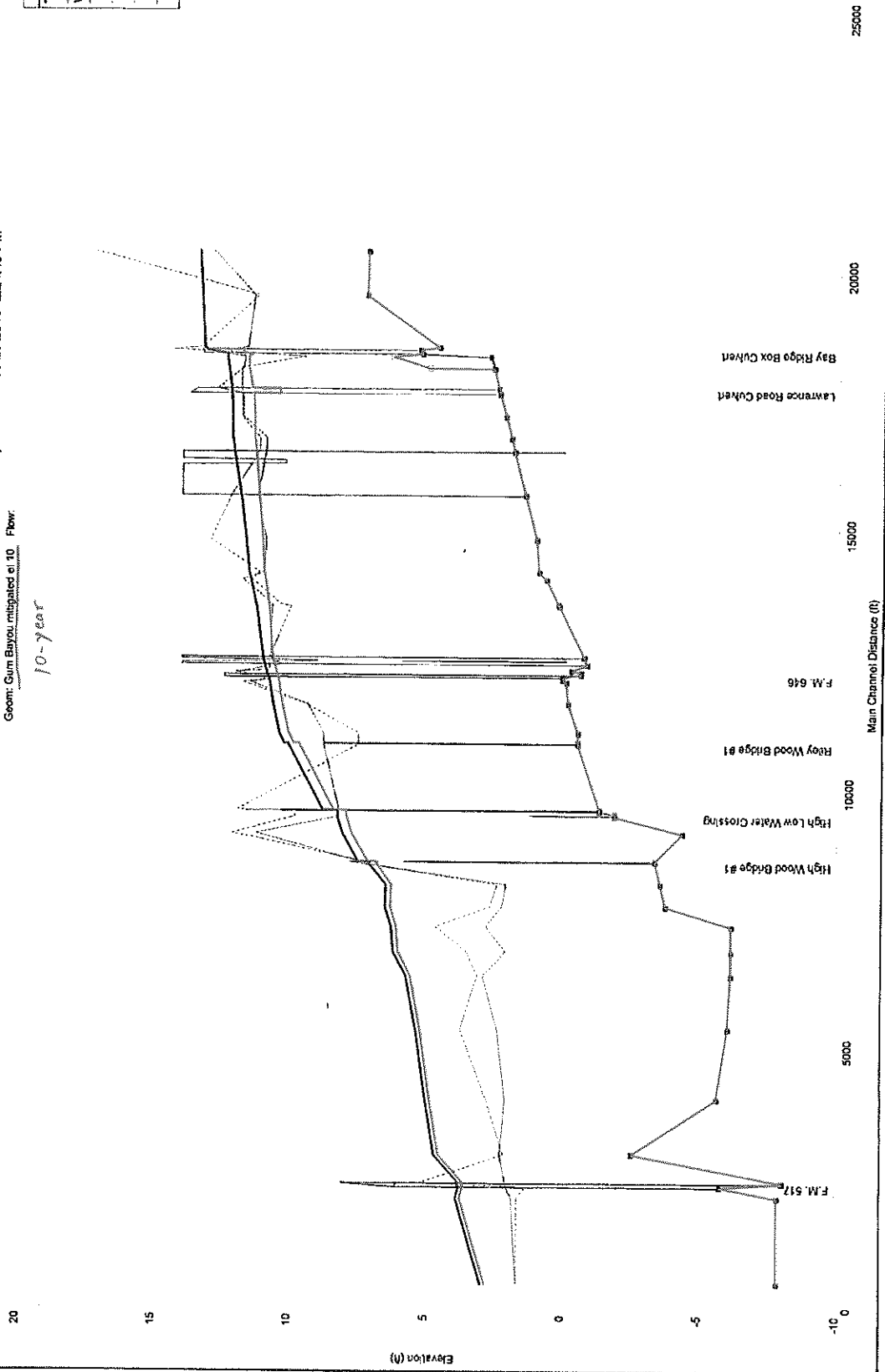
Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100j	55.6831	10041	02Jan2008, 14:50	10.4
DB111a	0.2553	114.8	01Jan2008, 18:30	11.2
DB111b	1.2071	350.9	01Jan2008, 20:00	10.7
J111b	1.2071	350.9	01Jan2008, 20:00	10.7
R111b	1.2071	324.1	02Jan2008, 05:20	10.61
J111a	1.4624	380.5	02Jan2008, 03:50	10.71
R111a	1.4624	301.2	02Jan2008, 21:50	10.56
MB100a	0.4305	744.7	01Jan2008, 16:50	12.11
MB100b	0.6341	556	01Jan2008, 17:10	11.88
MB100h	0.5156	253.7	01Jan2008, 18:20	11.62
MB100c1	0.1197	166.4	01Jan2008, 16:30	11.93
MB100c2	0.3741	299.9	01Jan2008, 17:10	11.62
MB100d	1.2082	459.2	01Jan2008, 19:10	11.2
MB100e	0.5889	242.8	01Jan2008, 19:00	11.16
MB100f	1.3315	427.9	01Jan2008, 19:30	10.89
MB100g	0.4893	229.5	01Jan2008, 18:30	11.21
JMBi	0.4893	229.5	01Jan2008, 18:30	11.21
RMBi	0.4893	202	02Jan2008, 00:30	11.19
JMBg	2.4097	792.8	01Jan2008, 22:10	11.02
RMBg	2.4097	774	02Jan2008, 03:00	10.98
JMBc	3.6179	1100.5	02Jan2008, 01:30	11.05
RMBc	3.6179	1063.6	02Jan2008, 06:10	11.02
JMBd	3.992	1102.3	02Jan2008, 05:40	11.07
RMBd	3.992	1077.5	02Jan2008, 08:40	11.06
JMBc	4.6273	1156.2	01Jan2008, 20:10	11.14
RMBc	4.6273	1128.4	02Jan2008, 12:40	11.12
JMBb	5.2614	1379.9	01Jan2008, 21:30	11.21
RMBb	5.2614	1308.5	02Jan2008, 06:40	11.19
JMBa	5.6919	1308.9	02Jan2008, 06:40	11.26
RMBa	5.6919	1307.6	02Jan2008, 07:40	11.26
J100h	63.2688	11562.5	02Jan2008, 14:20	10.49
R100h	63.2688	11553.8	02Jan2008, 15:00	10.47
DB114a	0.6772	225.7	01Jan2008, 19:20	10.95
DB114b	0.4096	227.5	01Jan2008, 18:00	11.21
J114b	0.4096	227.5	01Jan2008, 18:00	11.21
R114b	0.4096	192	02Jan2008, 06:30	11.21
J114a	1.0868	329	02Jan2008, 04:50	11.05
R114a	1.0868	253	02Jan2008, 22:30	10.94
BB100a	0.8055	1031	01Jan2008, 16:50	12.11
BB100b	0.873	609.3	01Jan2008, 17:30	11.85
BB100c	0.2175	305.9	01Jan2008, 16:50	11.85
BB100d	1.2851	692.4	01Jan2008, 18:20	11.85
BB100e	1.2538	762.8	01Jan2008, 18:00	11.85
JBBd	2.5389	1454.3	01Jan2008, 18:10	11.85

Appendix C
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 10 Scenario

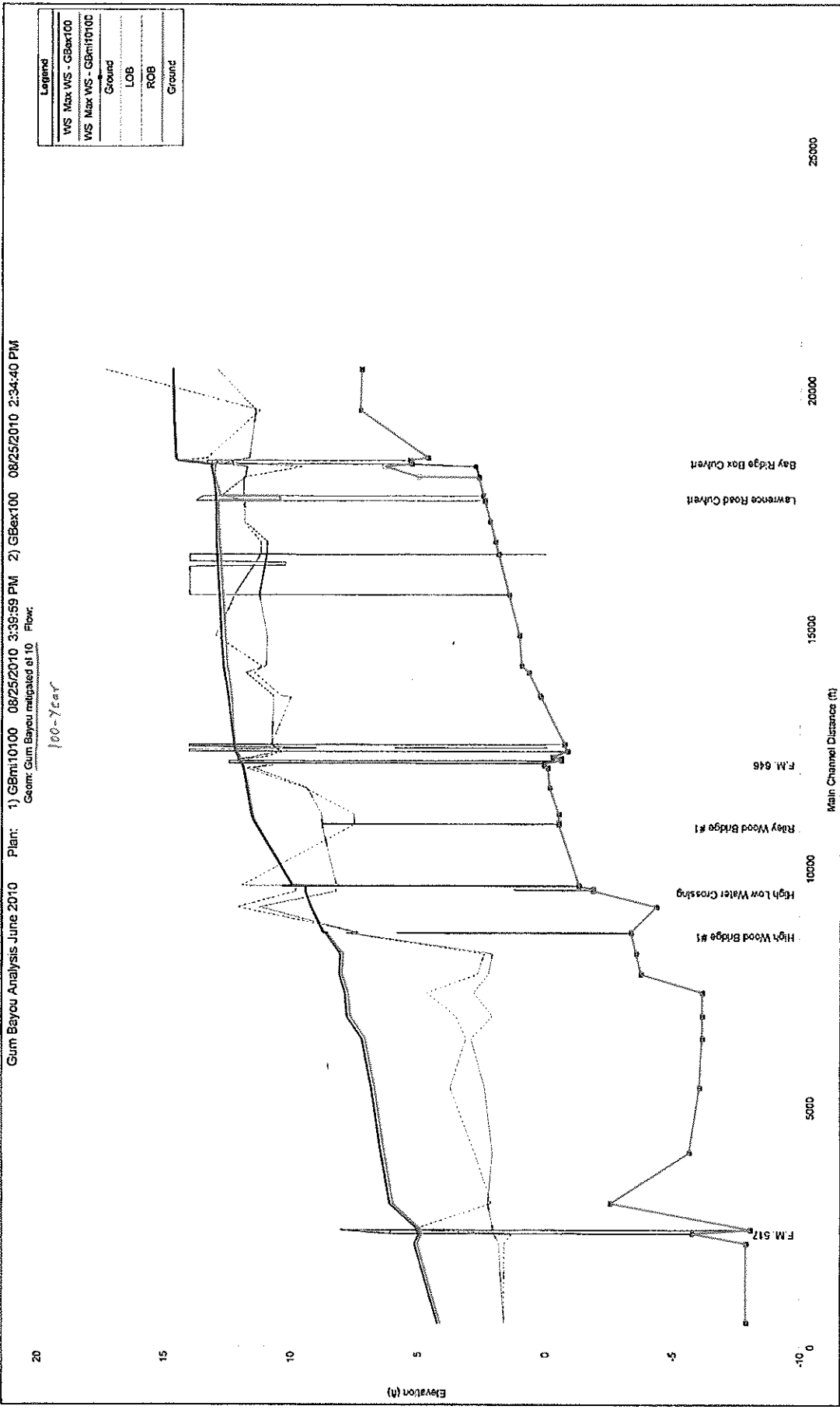
Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
RBBd	2.5389	1382.6	01Jan2008, 19:40	11.85
JBBc	2.7564	1547.3	01Jan2008, 19:10	11.85
RBBc	2.7564	1408.5	02Jan2008, 00:40	11.85
JBBb	3.6294	1768.5	01Jan2008, 22:30	11.85
RBBb	3.6294	1462.2	02Jan2008, 10:30	11.85
JBBa	4.4349	1579.9	01Jan2008, 17:00	11.9
RBBa	4.4349	1446.1	02Jan2008, 13:40	11.9
J100g	69.2256	13267	02Jan2008, 14:20	10.57
R100g	69.2256	13262.7	02Jan2008, 14:40	10.57
J100f	71.3589	13501.4	02Jan2008, 14:30	10.58
R100f	71.3589	13491.7	02Jan2008, 15:00	10.57
J100e	71.7608	13529.1	02Jan2008, 15:00	10.57
R100e	71.7608	13527.1	02Jan2008, 15:10	10.56
J100d	72.1863	13557.5	02Jan2008, 15:10	10.56
R100d	72.1863	13480.5	02Jan2008, 18:20	10.42
Gum Bayou	12.12	4718	01Jan2008, 20:10	12.14
DB100c	2.0856	464.9	01Jan2008, 21:30	10.21
J100c	86.3919	15064.5	02Jan2008, 07:20	10.66
R100c	86.3919	15046.3	02Jan2008, 10:00	10.53
DB100b1	2.4787	588.3	01Jan2008, 20:40	10.22
DB100b2	0.9668	344.8	01Jan2008, 19:20	11.04
J100b	89.8374	15579.7	02Jan2008, 09:10	10.52
R100b	89.8374	15577.6	02Jan2008, 10:40	10.47
DB118a	1.2724	424.2	01Jan2008, 19:40	10.95
DB118b	2.4501	686.6	01Jan2008, 19:50	10.63
DB118c	0.5656	255.6	01Jan2008, 18:40	11.31
J118c	0.5656	255.6	01Jan2008, 18:40	11.31
R118c	0.5656	223.1	02Jan2008, 02:30	11.29
J118b	3.0157	815	02Jan2008, 00:40	10.75
R118b	3.0157	730.5	02Jan2008, 10:40	10.73
J118a	4.2881	981	01Jan2008, 21:10	10.8
R118a	4.2881	877.5	03Jan2008, 11:40	10.53
J100a	94.1255	16119.3	02Jan2008, 11:10	10.48
R100a	94.1255	16112.1	02Jan2008, 12:40	10.38
DB100a	0.8551	248	01Jan2008, 19:50	10.79
Outlet	94.9806	16228.7	02Jan2008, 12:30	10.38

Gum Bayou Analysis June 2010 Plan: 1) GBm1010 08/25/2010 3:25:15 PM 2) GBex10 08/25/2010 2:24:49 PM
 Geom: Gum Bayou mitigated el 10 Flow:

Legend	
WS Max WS - GBex10	
WS Max WS - GBm1010	
Ground	
LOB	
ROB	
Ground	

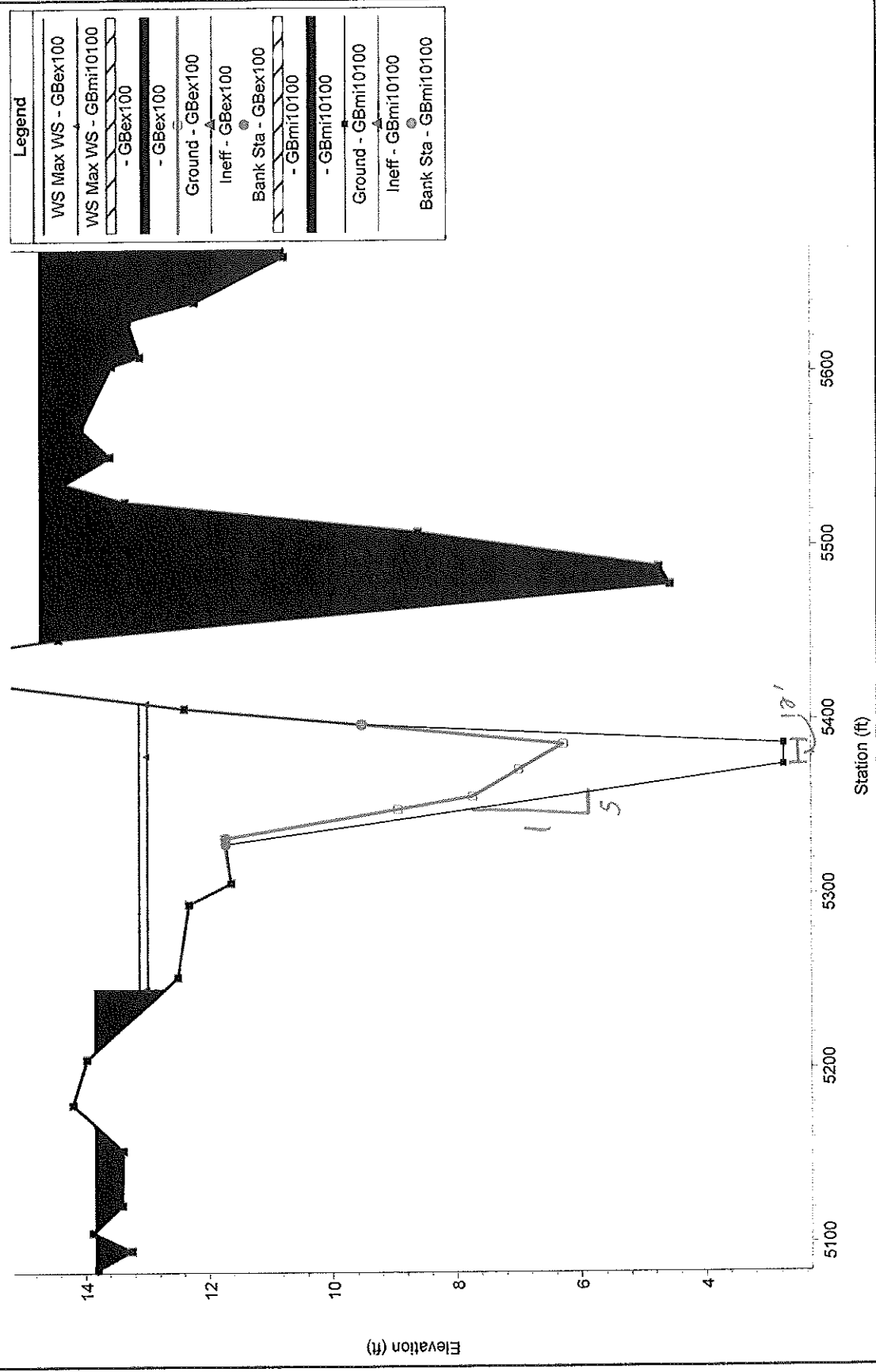


10-year



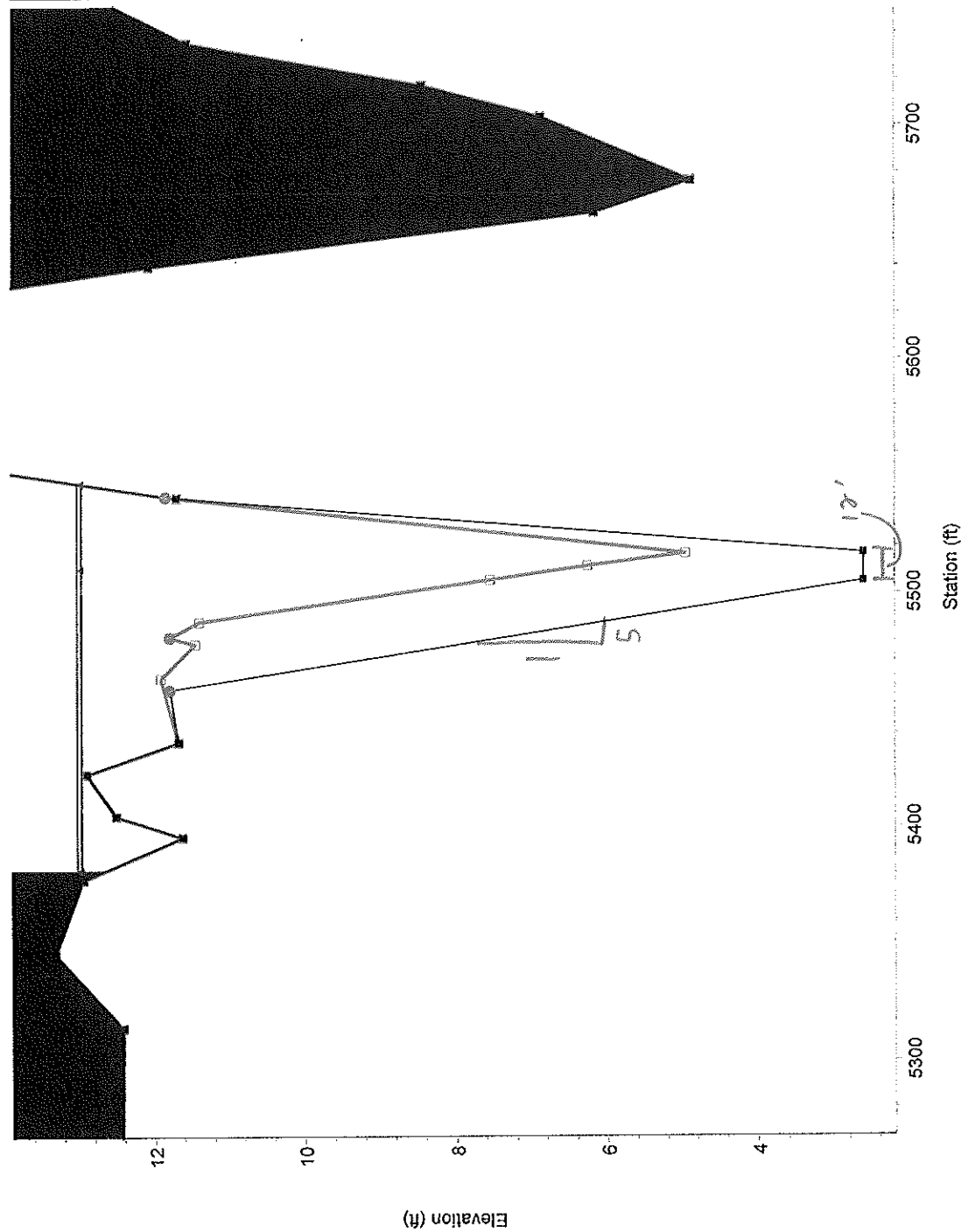
Gum Bayou Analysis June 2010 Plan: 1) GBmi10100 3:39:59 PM 2) GBEx100 2:34:40 PM

Geom: Gum Bayou mitigated el 10 Flow:
River = Gum Bayou Reach = Upper RS = 19385.99



Gum Bayou Analysis June 2010 Plan: 1) GBmi10100 3:39:59 PM 2) GBex100 2:34:40 PM

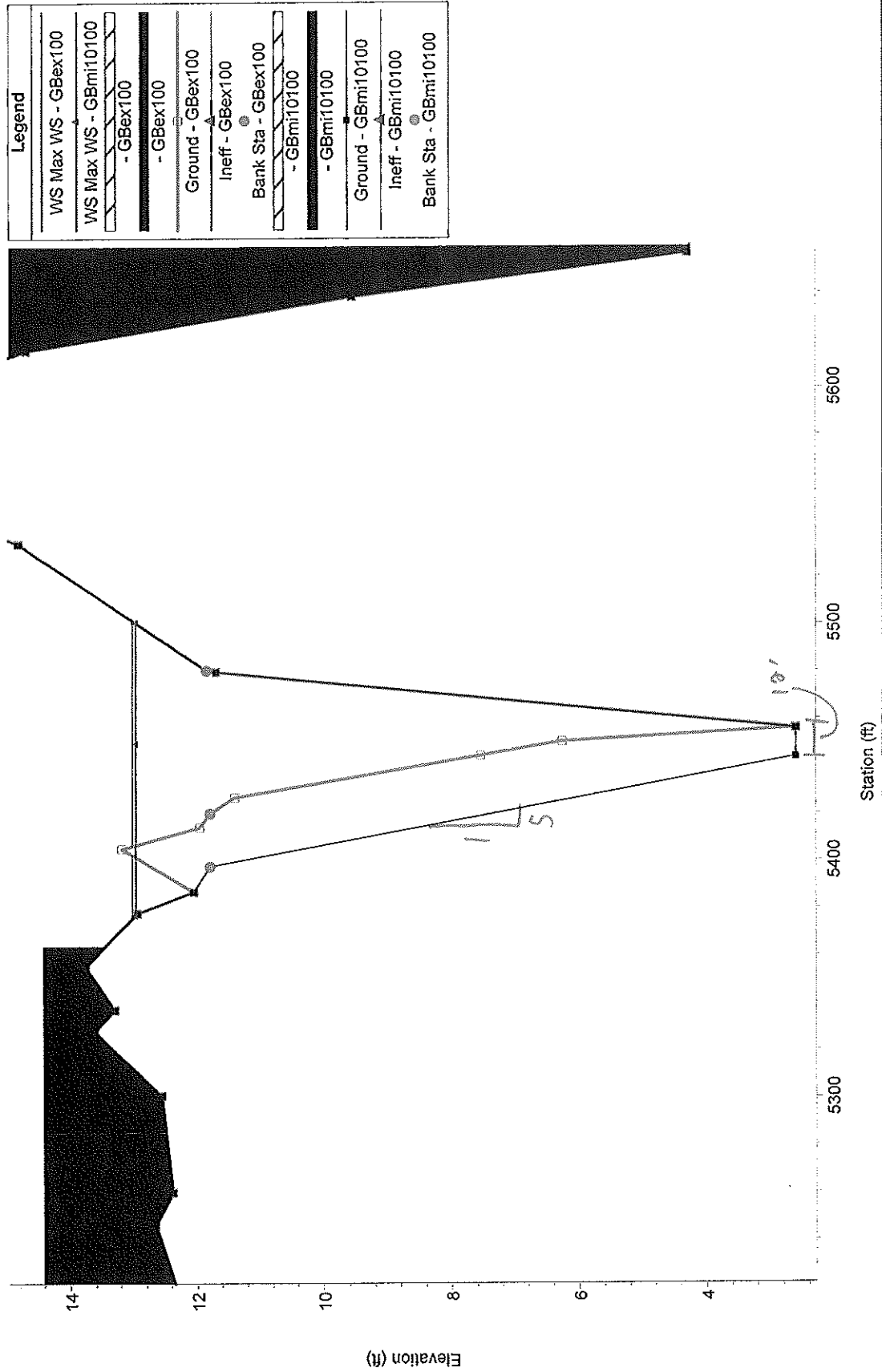
Geom: Gum Bayou mitigated el 10 Flow:
River = Gum Bayou Reach = Upper RS = 19162.52



Gum Bayou Analysis June 2010 Plan: 1) GBmi10100 3:39:59 PM 2) GBex100 2:34:40 PM

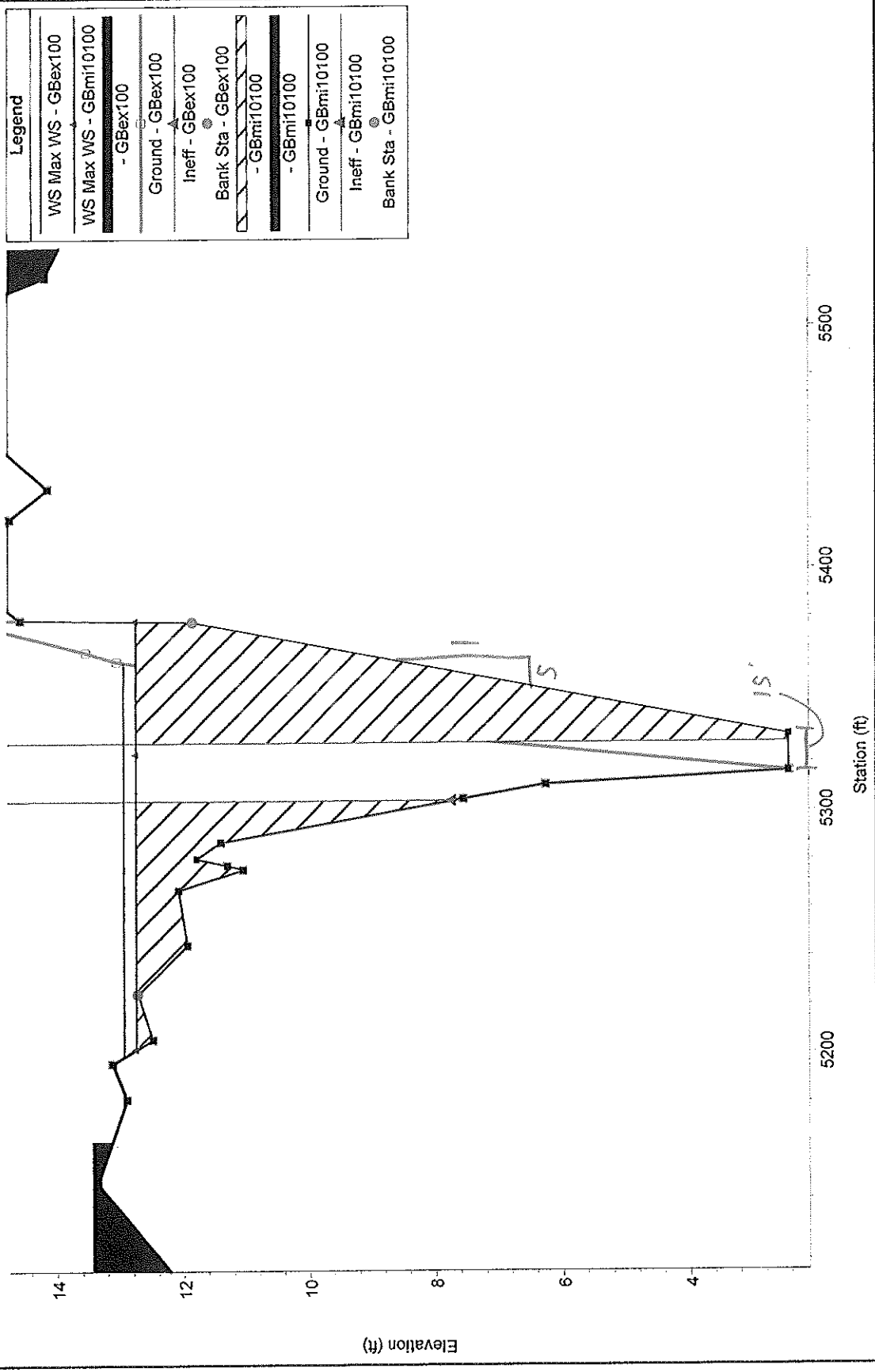
Geom: Gum Bayou mitigated el 10 Flow:

River = Gum Bayou Reach = Upper RS = 19152.51



Gum Bayou Analysis June 2010 Plan: 1) GBmi10100 3:39:59 PM 2) GBex100 2:34:40 PM

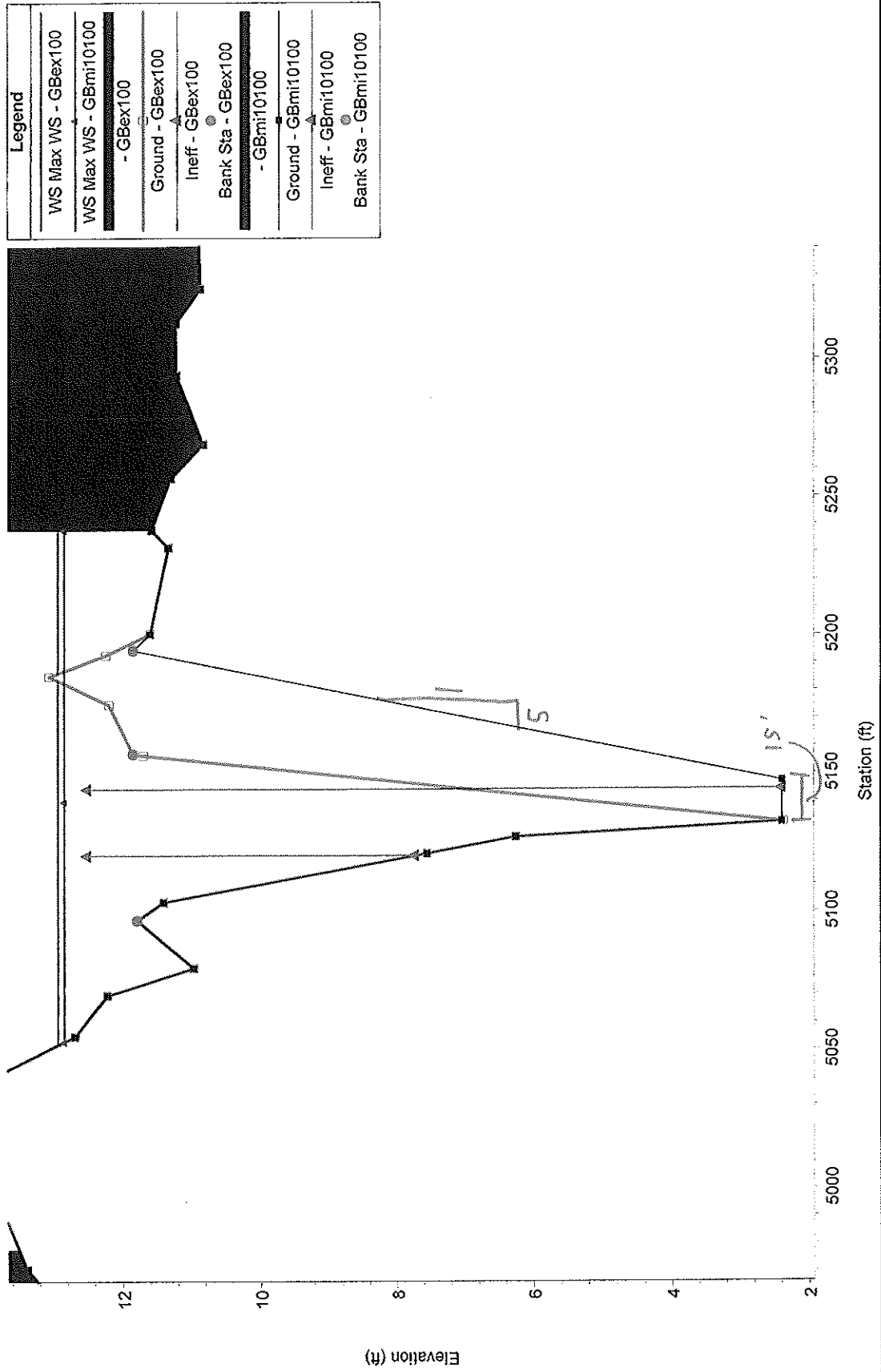
Geom: Gum Bayou mitigated el 10 Flow:
River = Gum Bayou Reach = Upper RS = 18769.25



Gum Bayou Analysis June 2010 Plan: 1) GBmi10100 3:39:59 PM 2) GBex100 2:34:40 PM

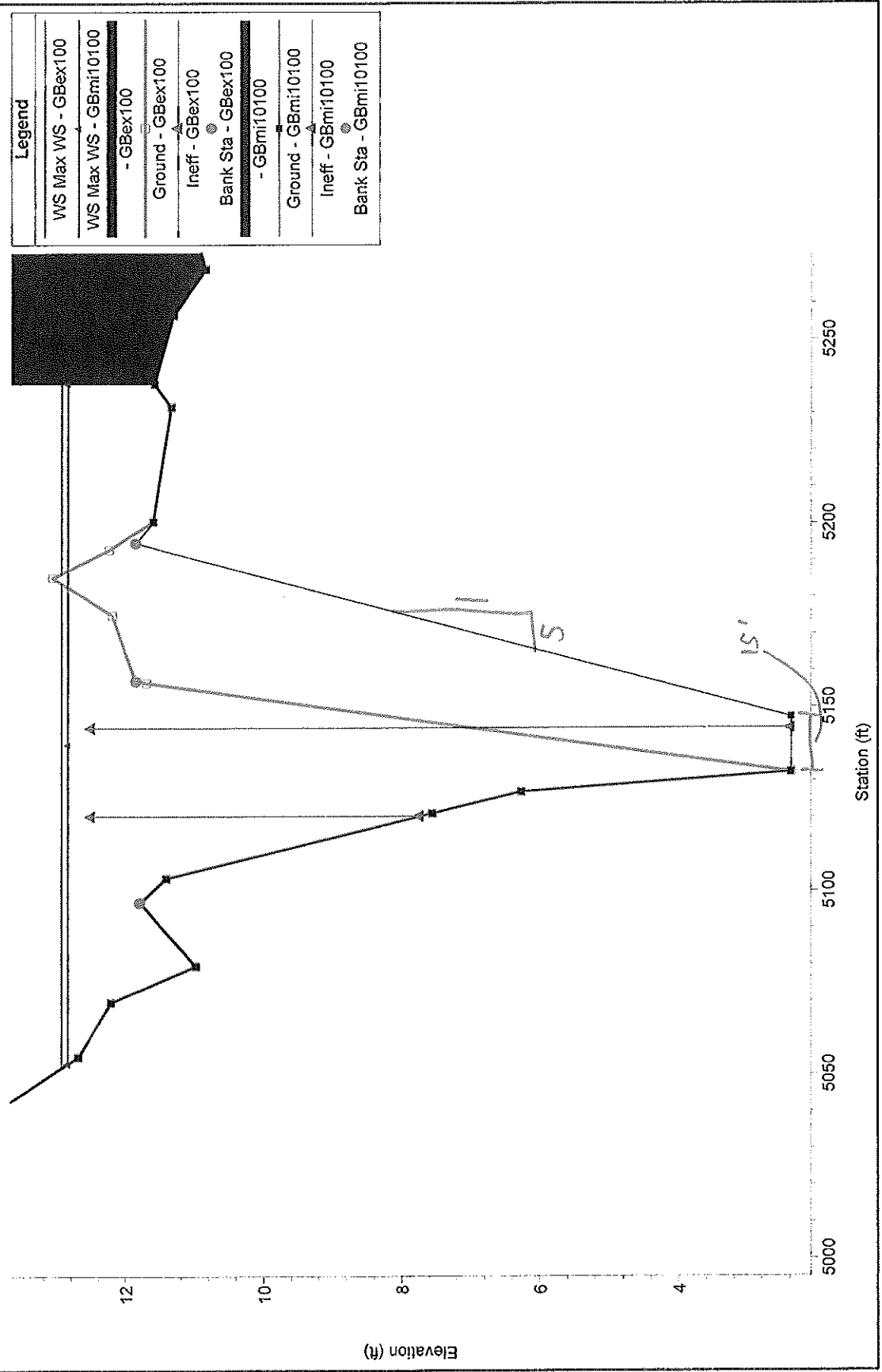
Geom: Gum Bayou mitigated el 10 Flow:

River = Gum Bayou Reach = Upper RS = 18668.74



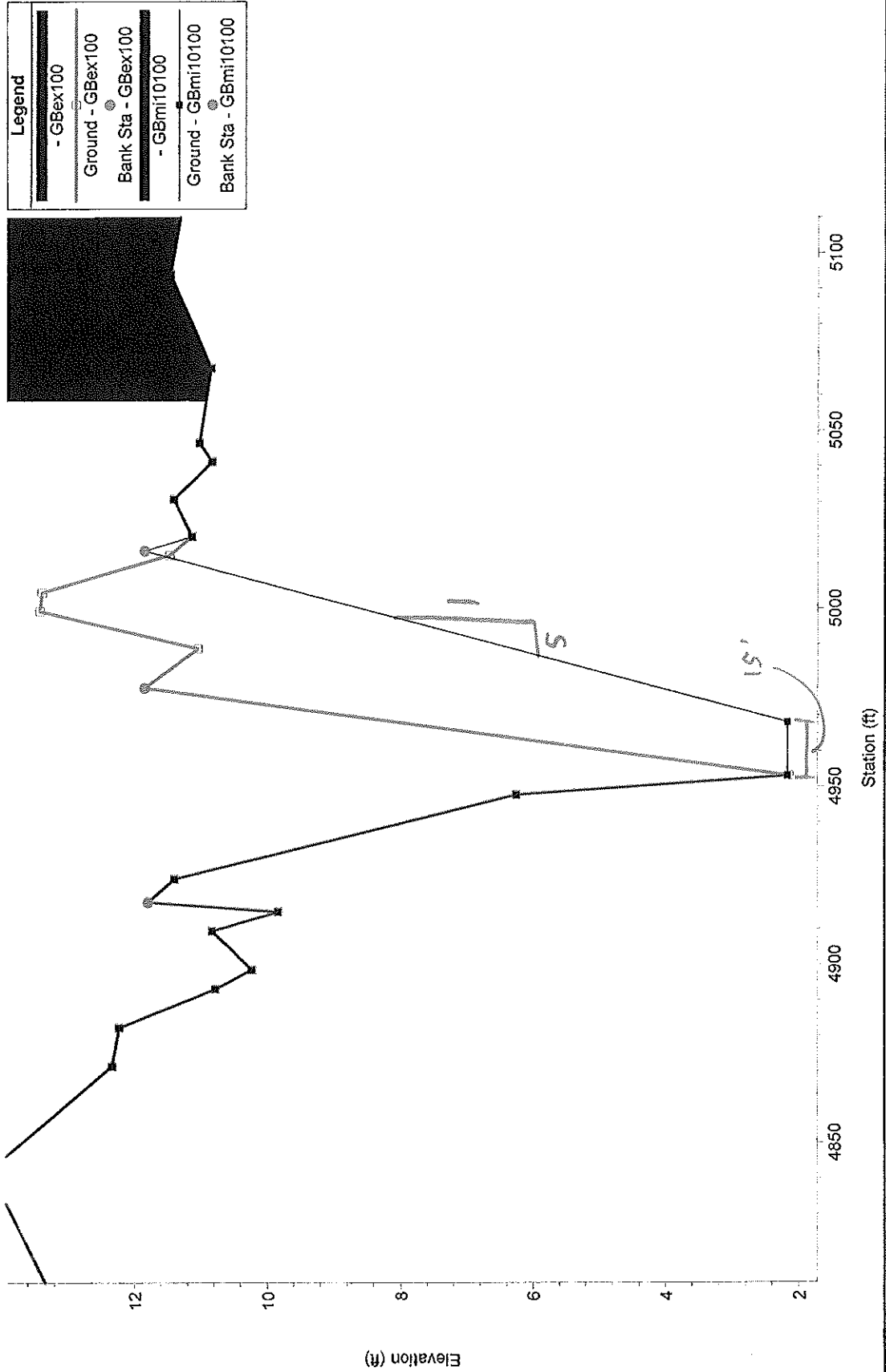
Gum Bayou Analysis June 2010 Plan: 1) GBmi10100 3:39:59 PM 2) GBex100 2:34:40 PM

Geom: Gum Bayou mitigated el 10 Flow:
 River = Gum Bayou Reach = Upper RS = 18658.74



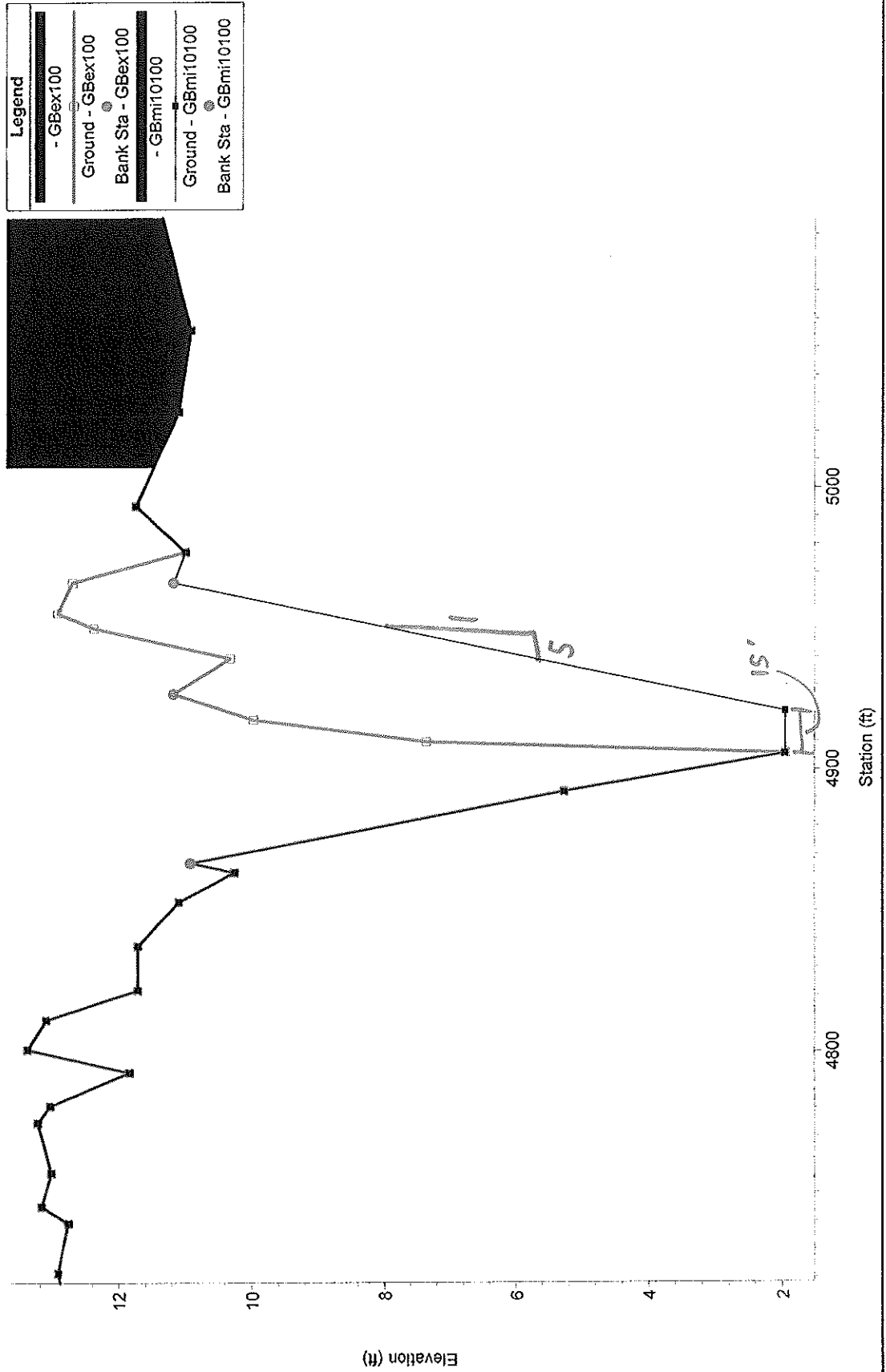
Gum Bayou Analysis June 2010 Plan: 1) GBmi10100 3:39:59 PM 2) GBex100 2:34:40 PM

Geom: Gum Bayou mitigated el 10 Flow:
River = Gum Bayou Reach = Upper RS = 18222.95



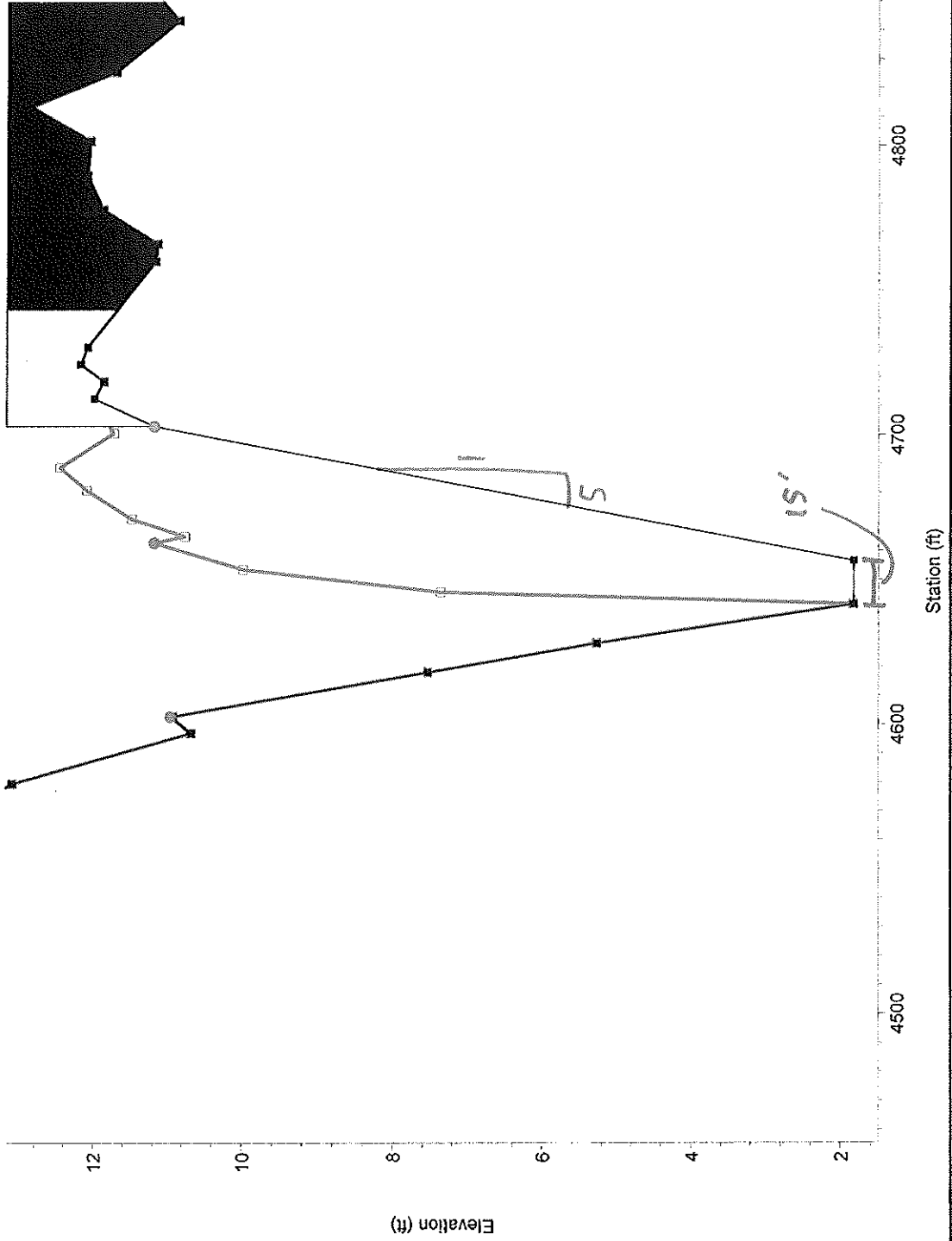
Gum Bayou Analysis June 2010 Plan: 1) GBmi10100 3:39:59 PM 2) GBex100 2:34:40 PM

Geom: Gum Bayou mitigated el 10 Flow:
River = Gum Bayou Reach = Upper RS = 17805.33



Gum Bayou Analysis June 2010 Plan: 1) GBmi10100 3:39:59 PM 2) GBex100 2:34:40 PM

Geom: Gum Bayou mitigated el 10 Flow:
River = Gum Bayou Reach = Upper RS = 17549.89



APPENDICE D

HEC-RAS Profile: Max WS

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Chl W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Cntl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Ch	Vel Total (ft/s)
East Fork	trib	535.4552	Max WS	GBmi1210	545.31	-1.25	7.92		7.94	0.000120	1.15	485.30	120.59	0.09	1.12
East Fork	trib	535.4552	Max WS	GBmi12100	797.28	-1.25	9.39		9.42	0.000103	1.26	683.91	160.74	0.09	1.17
East Fork	trib	540.4552	Max WS	GBmi1210	545.42	-1.25	7.92		7.95	0.000120	1.15	485.37	120.59	0.09	1.12
East Fork	trib	540.4552	Max WS	GBmi12100	797.28	-1.25	9.39		9.42	0.000103	1.26	683.99	160.74	0.09	1.17
East Fork	trib	774.9974	Max WS	GBmi1210	545.80	-1.79	7.95		8.00	0.000290	1.76	343.85	91.58	0.14	1.59
East Fork	trib	774.9974	Max WS	GBmi12100	797.23	-1.79	9.42		9.47	0.000262	1.87	526.45	224.30	0.14	1.51
East Fork	trib	1129.264	Max WS	GBmi1210	515.23	-1.57	8.04		8.09	0.000196	1.72	371.21	120.33	0.12	1.39
East Fork	trib	1129.264	Max WS	GBmi12100	745.32	-1.57	9.50		9.54	0.000166	1.82	576.84	173.16	0.11	1.29
East Fork	trib	1380.568	Max WS	GBmi1210	488.56	-1.94	8.10		8.15	0.000261	1.70	282.30	64.05	0.13	1.67
East Fork	trib	1380.568	Max WS	GBmi12100	700.80	-1.94	9.55		9.60	0.000233	1.86	409.11	141.83	0.13	1.71
East Fork	trib	1710.556	Max WS	GBmi1210	457.59	-1.04	8.21		8.27	0.000447	1.99	229.49	53.19	0.17	1.99
East Fork	trib	1710.556	Max WS	GBmi12100	649.41	-1.04	9.64		9.71	0.000371	2.08	322.00	79.29	0.16	2.02
East Fork	trib	1809.264			Lat Struct										
East Fork	trib	1907.972	Max WS	GBmi1210	438.45	-1.51	8.30		8.34	0.000179	1.63	349.08	96.77	0.11	1.26
East Fork	trib	1907.972	Max WS	GBmi12100	675.67	-1.51	9.74		9.78	0.000179	1.86	515.37	199.50	0.12	1.31
East Fork	trib	2219.039	Max WS	GBmi1210	408.41	-0.96	8.38		8.46	0.000556	2.18	189.05	46.96	0.18	2.16
East Fork	trib	2219.039	Max WS	GBmi12100	635.67	-0.96	9.81		9.90	0.000542	2.49	282.93	109.35	0.19	2.25
East Fork	trib	2461.718	Max WS	GBmi1210	381.41	-0.82	8.52		8.58	0.000397	1.96	194.75	43.20	0.16	1.96
East Fork	trib	2461.718	Max WS	GBmi12100	639.41	-0.82	9.95		10.05	0.000476	2.48	273.10	156.93	0.18	2.34
East Fork	trib	2678.052	Max WS	GBmi1210	362.50	-0.71	8.62		8.68	0.000421	1.99	182.27	38.84	0.16	1.99
East Fork	trib	2678.052	Max WS	GBmi12100	610.11	-0.71	10.06		10.16	0.000525	2.52	246.75	114.31	0.19	2.47
East Fork	trib	2935.596	Max WS	GBmi1210	338.04	-0.21	8.74		8.82	0.000599	2.25	150.30	34.19	0.19	2.25
East Fork	trib	2935.596	Max WS	GBmi12100	572.97	-0.21	10.24		10.36	0.000696	2.73	214.31	186.57	0.23	2.67
East Fork	trib	3033.514			Lat Struct										
East Fork	trib	3131.442	Max WS	GBmi1210	401.52	0.11	8.83		8.92	0.000756	2.48	161.61	38.85	0.21	2.48
East Fork	trib	3131.442	Max WS	GBmi12100	541.72	0.11	10.42		10.51	0.000604	2.36	235.92	343.31	0.18	2.30
East Fork	trib	3413.596	Max WS	GBmi1210	371.34	1.45	9.06		9.16	0.000807	2.56	146.27	35.13	0.22	2.56
East Fork	trib	3413.596	Max WS	GBmi12100	497.12	1.45	10.58		10.67	0.000538	2.41	220.64	221.05	0.19	2.25
East Fork	trib	3563.860	Max WS	GBmi1210	354.16	1.61	9.19		9.28	0.000673	2.33	151.72	37.21	0.20	2.33
East Fork	trib	3563.860	Max WS	GBmi12100	471.92	1.51	10.88		10.75	0.000445	2.13	262.58	239.91	0.17	1.80
East Fork	trib	3795.660	Max WS	GBmi1210	326.22	2.04	9.37		9.44	0.000590	2.16	150.80	37.76	0.19	2.16
East Fork	trib	3795.660	Max WS	GBmi12100	430.10	2.04	10.79		10.86	0.000425	2.06	209.23	308.94	0.17	2.06

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
East Fork	trib	4172.662	Max WS	GBmi1210	285.57	2.57	9.59		9.63	0.000360	1.70	168.42	42.71		1.70
East Fork	trib	4172.662	Max WS	GBmi12100	369.21	2.57	10.96		11.00	0.000247	1.59	232.04	148.02		1.59
East Fork	trib	4553.236	Max WS	GBmi1210	246.52	2.81	9.74		9.79	0.000385	1.76	140.45	36.93		1.76
East Fork	trib	4553.236	Max WS	GBmi12100	307.87	2.81	11.07		11.11	0.000240	1.63	191.06	67.58		1.61
East Fork	trib	4609.199	Max WS	GBmi1210	241.68	3.02	9.78		9.81	0.000180	1.29	187.86	62.89		1.29
East Fork	trib	4609.199	Max WS	GBmi12100	299.85	3.02	11.10		11.12	0.000130	1.21	247.06	267.61		1.21
East Fork	trib	4663.943		Bridge											
East Fork	trib	4718.687	Max WS	GBmi1210	241.94	2.01	9.80	5.68	9.84	0.000339	1.56	155.01	64.08	0.14	1.56
East Fork	trib	4718.687	Max WS	GBmi12100	300.05	2.01	11.12	6.01	11.15	0.000213	1.39	215.51	186.85	0.12	1.39
East Fork	trib	4830.163	Max WS	GBmi1210	238.36	2.74	9.84		9.89	0.000444	1.79	132.80	35.49	0.16	1.79
East Fork	trib	4830.163	Max WS	GBmi12100	293.96	2.74	11.14		11.18	0.000267	1.60	190.07	92.45	0.13	1.55
East Fork	trib	5612.320	Max WS	GBmi1210	218.59	4.79	10.16		10.20	0.000318	1.46	150.20	44.31	0.14	1.46
East Fork	trib	5612.320	Max WS	GBmi12100	258.09	4.79	11.34		11.36	0.000177	1.22	228.13	106.64	0.11	1.13
East Fork	trib	6569.710	Max WS	GBmi1210	203.47	5.79	10.59		10.64	0.000595	1.89	113.35	47.95	0.19	1.80
East Fork	trib	6569.710	Max WS	GBmi12100	230.61	5.79	11.56		11.60	0.000309	1.54	171.08	78.69	0.14	1.35
East Fork	trib	6733.530	Max WS	GBmi1210	200.99	5.78	10.89		10.73	0.000489	1.70	134.51	62.80	0.17	1.49
East Fork	trib	6733.530	Max WS	GBmi12100	237.09	5.78	11.62		11.65	0.000255	1.41	228.23	226.44	0.13	1.04
East Fork	trib	7010.956	Max WS	GBmi1210	194.86	5.77	10.82		10.86	0.000419	1.63	131.13	54.37	0.15	1.49
East Fork	trib	7010.956	Max WS	GBmi12100	228.27	5.77	11.69		11.72	0.000252	1.41	200.94	136.42	0.13	1.14
East Fork	trib	7185.773	Max WS	GBmi1210	191.43	5.76	10.89		10.93	0.000398	1.60	128.11	54.01	0.15	1.49
East Fork	trib	7185.773	Max WS	GBmi12100	223.50	5.76	11.74		11.77	0.000241	1.39	197.55	133.60	0.12	1.13
East Fork	trib	7575.182	Max WS	GBmi1210	183.96	5.75	11.04		11.07	0.000315	1.42	142.64	76.07	0.14	1.29
East Fork	trib	7575.182	Max WS	GBmi12100	217.81	5.75	11.83		11.84	0.000154	1.14	308.66	352.64	0.10	0.71
East Fork	trib	7815.951	Max WS	GBmi1210	179.18	5.74	11.11		11.12	0.000107	0.84	428.43	495.13	0.08	0.42
East Fork	trib	7815.951	Max WS	GBmi12100	214.07	5.74	11.86		11.86	0.000030	0.51	845.68	612.83	0.04	0.25
East Fork	trib	8045.906	Max WS	GBmi1210	174.03	5.73	11.14		11.15	0.000152	1.00	289.28	353.88	0.10	0.60
East Fork	trib	8045.906	Max WS	GBmi12100	207.40	5.73	11.87		11.87	0.000053	0.67	617.71	559.02	0.06	0.34
East Fork	trib	8154.852	Max WS	GBmi1210	171.70	6.06	11.15		11.17	0.000216	1.20	236.00	400.58	0.12	0.73
East Fork	trib	8154.852	Max WS	GBmi12100	205.10	6.06	11.87		11.88	0.000062	0.73	602.90	559.98	0.06	0.34
East Fork	trib	8365.465	Max WS	GBmi1210	166.95	5.51	11.19		11.20	0.000066	0.67	527.95	783.00	0.06	0.32
East Fork	trib	8365.465	Max WS	GBmi12100	199.21	5.51	11.88		11.88	0.000017	0.38	1333.02	1627.82	0.03	0.15

HEC-RAS Profile: Max WS (Continued)

River	Reach	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev. (ft)	Crt W.S. (ft)	E.G. Elev. (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
East Fork	trib	Max WS	GBml1210	162.31	5.42	11.21		11.22	0.000120	0.88	413.70	843.52	0.09	0.39
East Fork	trib	Max WS	GBml12100	193.07	5.42	11.89		11.89	0.000021	0.40	1276.63	1771.21	0.04	0.15
East Fork	trib	Max WS	GBml1210	158.21	5.53	11.23		11.24	0.000107	0.84	519.96	1915.05	0.08	0.30
East Fork	trib	Max WS	GBml12100	187.29	5.53	11.89		11.89	0.000009	0.27	2074.60	2475.84	0.02	0.09
East Fork	trib	Max WS	GBml1210	153.53	5.58	11.25		11.25	0.000044	0.53	881.10	2764.41	0.05	0.17
East Fork	trib	Max WS	GBml12100	180.85	5.58	11.89		11.89	0.000004	0.17	3243.08	3990.72	0.02	0.06
East Fork	trib	Max WS	GBml1210	149.01	5.87	11.26		11.26	0.000046	0.54	883.48	2649.61	0.05	0.17
East Fork	trib	Max WS	GBml12100	174.15	5.87	11.89		11.89	0.000004	0.17	3249.72	4227.29	0.02	0.05
East Fork	trib	Max WS	GBml1210	144.28	5.76	11.26		11.27	0.000040	0.52	973.75	3124.75	0.05	0.15
East Fork	trib	Max WS	GBml12100	167.52	5.76	11.89		11.89	0.000003	0.15	3775.39	5266.14	0.01	0.04
East Fork	trib	Max WS	GBml1210	139.80	6.24	11.27		11.27	0.000033	0.47	989.66	2711.86	0.05	0.14
East Fork	trib	Max WS	GBml12100	161.06	6.24	11.89		11.89	0.000003	0.16	3482.42	5055.05	0.01	0.05
East Fork	trib	Max WS	GBml1210	135.24	6.07	11.28		11.28	0.000040	0.52	647.37	1277.62	0.05	0.21
East Fork	trib	Max WS	GBml12100	154.49	6.07	11.89		11.89	0.000005	0.21	2572.56	4796.30	0.02	0.06
East Fork	trib	Max WS	GBml1210	130.61	6.10	11.29		11.29	0.000059	0.63	572.57	1467.70	0.06	0.23
East Fork	trib	Max WS	GBml12100	147.75	6.10	11.90		11.90	0.000006	0.23	2349.60	4783.76	0.02	0.06
East Fork	trib	Max WS	GBml1210	126.13	6.60	11.30		11.30	0.000082	0.66	522.92	1556.82	0.07	0.24
East Fork	trib	Max WS	GBml12100	141.09	6.60	11.90		11.90	0.000006	0.20	2502.75	5070.18	0.02	0.06
East Fork	trib	Max WS	GBml1210	121.55	6.53	11.31		11.31	0.000028	0.40	932.21	2464.60	0.04	0.13
East Fork	trib	Max WS	GBml12100	134.26	6.53	11.90		11.90	0.000002	0.13	3598.73	5973.00	0.01	0.04
East Fork	trib	Max WS	GBml1210	117.02	6.36	11.32		11.32	0.000016	0.30	1305.47	3361.84	0.03	0.09
East Fork	trib	Max WS	GBml12100	127.74	6.36	11.90		11.90	0.000001	0.10	4182.53	6594.01	0.01	0.03
East Fork	trib	Max WS	GBml1210	112.37	6.50	11.32		11.32	0.000006	0.19	2087.44	4673.98	0.02	0.05
East Fork	trib	Max WS	GBml12100	121.11	6.50	11.90		11.90	0.000001	0.07	5598.03	7127.43	0.01	0.02
East Fork	trib	Max WS	GBml1210	107.53	6.60	11.32		11.32	0.000004	0.15	2277.42	4549.51	0.02	0.05
East Fork	trib	Max WS	GBml12100	114.33	6.60	11.90		11.90	0.000000	0.06	5844.38	7719.40	0.01	0.02
East Fork	trib	Max WS	GBml1210	103.97	6.71	11.32		11.32	0.000005	0.17	1988.54	4077.48	0.02	0.05
East Fork	trib	Max WS	GBml12100	108.79	6.71	11.90		11.90	0.000001	0.06	4792.77	5731.78	0.01	0.02
East Fork	trib	Max WS	GBml1210	98.47	6.83	11.32		11.32	0.000008	0.20	1522.43	2947.12	0.02	0.06
East Fork	trib	Max WS	GBml12100	100.30	6.83	11.90		11.90	0.000001	0.07	3633.54	4050.86	0.01	0.03
East Fork	trib	Max WS	GBml1210	93.17	6.89	11.33		11.33	0.000016	0.29	1139.39	3188.87	0.03	0.08
East Fork	trib	Max WS	GBml12100	91.67	6.89	11.90		11.90	0.000001	0.06	3375.93	4376.88	0.01	0.03

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crt W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
East Fork	trib	11811.49	Max WS	GBmt1210	95.29	7.12	11.33		11.33	0.000025	0.35	981.01	2774.52	0.04	0.10
East Fork	trib	11811.49	Max WS	GBmt12100	91.62	7.12	11.90		11.90	0.000001	0.09	2989.90	4236.41	0.01	0.03
Gum Bayou	Lower	504.8711	Max WS	GBmt1210	2889.29	-7.92	2.75	-1.81	3.19	0.000601	5.55	689.42	352.41	0.34	4.19
Gum Bayou	Lower	504.8711	Max WS	GBmt12100	4784.04	-7.92	4.11	0.30	4.54	0.000600	6.14	1281.86	509.42	0.35	3.73
Gum Bayou	Lower	2161.939	Max WS	GBmt1210	2889.37	-7.92	3.68		3.80	0.000229	2.85	1082.15	274.54	0.24	2.67
Gum Bayou	Lower	2161.939	Max WS	GBmt12100	4784.20	-7.92	5.01		5.19	0.000284	3.50	1451.65	281.45	0.26	3.30
Gum Bayou	Lower	2372.100	Max WS	GBmt1210	2878.43	-5.82	3.57		3.94	0.000896	4.85	593.77	266.19	0.46	4.85
Gum Bayou	Lower	2372.100	Max WS	GBmt12100	4768.29	-5.82	4.83		5.37	0.001197	5.97	811.69	276.69	0.48	5.87
Gum Bayou	Lower	2434.526			Bridge										
Gum Bayou	Lower	2432.965	Max WS	GBmt1210	2878.62	-8.10	3.56	2.71	4.12	0.001794	5.96	483.02	241.53	0.81	5.96
Gum Bayou	Lower	2452.965	Max WS	GBmt12100	4768.53	-8.10	4.86	3.56	5.59	0.002093	6.84	697.33	254.77	0.59	6.84
Gum Bayou	Lower	2995.046	Max WS	GBmt1210	2845.83	-2.60	4.49		4.62	0.000334	3.06	1126.88	349.71	0.25	2.53
Gum Bayou	Lower	2995.046	Max WS	GBmt12100	4720.14	-2.60	5.97		6.15	0.000329	3.64	1693.25	413.85	0.26	2.79
Gum Bayou	Lower	4057.931	Max WS	GBmt1210	2781.83	-5.70	4.82		4.92	0.000226	2.77	1346.84	390.86	0.21	2.07
Gum Bayou	Lower	4057.931	Max WS	GBmt12100	4627.40	-5.70	6.31		6.45	0.000245	3.39	1983.55	490.39	0.23	2.33
Gum Bayou	Lower	5412.954	Max WS	GBmt1210	2696.29	-6.10	5.17		5.35	0.000365	3.79	946.05	262.33	0.27	2.85
Gum Bayou	Lower	5412.954	Max WS	GBmt12100	4503.57	-6.10	6.68		6.93	0.000394	4.54	1381.67	322.95	0.29	3.26
Gum Bayou	Lower	6445.483	Max WS	GBmt1210	2634.18	-6.20	5.54		5.86	0.000556	4.50	765.54	206.24	0.34	3.44
Gum Bayou	Lower	6445.483	Max WS	GBmt12100	4413.75	-6.20	7.07		7.55	0.000680	6.16	1108.81	243.28	0.39	3.98
Gum Bayou	Lower	6912.951	Max WS	GBmt1210	1714.34	-6.20	6.00		6.11	0.000205	2.86	836.24	225.69	0.21	2.05
Gum Bayou	Lower	6912.951	Max WS	GBmt12100	2866.40	-6.20	7.66		7.82	0.000234	3.49	1344.60	364.88	0.23	2.13
Gum Bayou	Lower	7407.249	Max WS	GBmt1210	1692.42	-6.20	6.07		6.30	0.000417	4.09	591.04	209.80	0.30	2.86
Gum Bayou	Lower	7407.249	Max WS	GBmt12100	2837.00	-6.20	7.74		8.05	0.000452	4.85	1020.42	309.21	0.31	2.78
Gum Bayou	Lower	7790.170	Max WS	GBmt1210	1678.17	-3.80	6.28		6.40	0.000203	3.05	701.00	187.92	0.20	2.39
Gum Bayou	Lower	7790.170	Max WS	GBmt12100	2819.08	-3.80	7.98		8.13	0.000219	3.66	1150.09	328.27	0.22	2.45
Gum Bayou	Lower	8218.802	Max WS	GBmt1210	1658.87	-3.60	6.26		6.66	0.000606	5.20	496.89	171.53	0.35	3.33
Gum Bayou	Lower	8218.802	Max WS	GBmt12100	2786.80	-3.60	7.94		8.49	0.000650	6.42	867.44	336.62	0.38	3.21
Gum Bayou	Lower	8648.945	Max WS	GBmt1210	1644.12	-3.40	6.83		7.00	0.001249	3.29	500.28	164.20	0.29	3.29
Gum Bayou	Lower	8648.945	Max WS	GBmt12100	2772.77	-3.40	8.57		8.71	0.001066	3.08	1005.42	430.94	0.27	2.76
Gum Bayou	Lower	8655.526			Bridge										
Gum Bayou	Lower	8661.260	Max WS	GBmt1210	1648.44	-3.40	7.13	3.58	7.27	0.001440	2.97	557.31	200.78	0.30	2.96
Gum Bayou	Lower	8661.260	Max WS	GBmt12100	2777.04	-3.40	8.68	5.27	8.82	0.000958	3.09	1037.24	412.95	0.25	2.68

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crtl W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Crtl	Vel Total (ft/s)
Gum Bayou	Lower	9189.580	Max WS	GBml1210	1627.10	-4.40	7.72		7.81	0.000595	2.85	766.70	191.09	0.22	2.12
Gum Bayou	Lower	9189.580	Max WS	GBml12100	2744.28	-4.40	9.16		9.29	0.000778	3.46	1130.95	464.45	0.26	2.43
Gum Bayou	Lower	9518.148	Max WS	GBml1210	1612.43	-1.93	7.91		7.94	0.000237	1.64	1425.70	614.69	0.13	1.13
Gum Bayou	Lower	9518.148	Max WS	GBml12100	2722.05	-1.93	9.39		9.42	0.000224	1.81	2932.70	1446.65	0.13	0.93
Gum Bayou	Lower	9528.148	Max WS	GBml1210	1612.00	-1.93	7.91		7.94	0.000236	1.64	1427.20	615.01	0.13	1.13
Gum Bayou	Lower	9528.148	Max WS	GBml12100	2721.33	-1.93	9.40		9.42	0.000224	1.81	2936.00	1447.63	0.13	0.93
Gum Bayou	Lower	9542.525			Culvert										
Gum Bayou	Lower	9558.148	Max WS	GBml1210	1611.97	-1.93	7.92		7.96	0.000296	1.83	1248.51	506.73	0.14	1.29
Gum Bayou	Lower	9558.148	Max WS	GBml12100	2721.42	-1.93	9.39		9.43	0.000320	2.16	2502.70	1555.25	0.16	1.09
Gum Bayou	Lower	9568.148	Max WS	GBml1210	1612.00	-1.93	7.92		7.96	0.000267	1.80	1275.58	506.94	0.14	1.26
Gum Bayou	Lower	9568.148	Max WS	GBml12100	2721.43	-1.93	9.39		9.43	0.000266	2.02	2535.96	1562.74	0.14	1.07
Gum Bayou	Upper	10598.35	Max WS	GBml1210	1066.69	-1.88	7.92		8.18	0.001074	4.04	269.54	48.35	0.26	3.96
Gum Bayou	Upper	10598.35	Max WS	GBml12100	1924.15	-1.88	9.39		9.87	0.001919	5.73	439.67	203.25	0.34	4.38
Gum Bayou	Upper	10608.35	Max WS	GBml1210	1066.87	-1.87	7.94		8.19	0.001072	4.03	269.84	48.55	0.26	3.95
Gum Bayou	Upper	10608.35	Max WS	GBml12100	1925.48	-1.87	9.42		9.89	0.001910	5.71	444.34	205.98	0.34	4.33
Gum Bayou	Upper	10617.53			Bridge										
Gum Bayou	Upper	10626.34	Max WS	GBml1210	1075.57	-1.85	8.22	2.85	8.38	0.000753	3.23	332.56	159.01	0.23	3.23
Gum Bayou	Upper	10626.34	Max WS	GBml12100	1933.61	-1.85	9.80	4.60	10.12	0.001179	4.59	428.18	819.78	0.30	4.52
Gum Bayou	Upper	11889.33	Max WS	GBml1210	1006.10	-0.55	9.39		9.55	0.001060	3.29	319.46	103.75	0.27	3.15
Gum Bayou	Upper	11889.33	Max WS	GBml12100	1813.72	-0.55	11.16		11.33	0.000807	3.56	926.10	1530.71	0.25	1.96
Gum Bayou	Upper	11909.2			Bridge										
Gum Bayou	Upper	11930.16	Max WS	GBml1210	1010.46	-0.55	9.71	5.99	9.85	0.000942	3.07	354.41	129.90	0.24	2.85
Gum Bayou	Upper	11930.16	Max WS	GBml12100	1813.72	-0.55	11.21	7.34	11.36	0.000748	3.44	1011.78	1735.61	0.24	1.79
Gum Bayou	Upper	12111.49	Max WS	GBml1210	999.73	-0.55	9.89		9.98	0.000565	2.57	524.33	285.19	0.20	1.91
Gum Bayou	Upper	12111.49	Max WS	GBml12100	1794.22	-0.55	11.36		11.43	0.000396	2.54	1455.58	1855.80	0.17	1.23
Gum Bayou	Upper	12571.33	Max WS	GBml1210	958.50	-0.19	10.16		10.22	0.000276	2.06	504.57	204.33	0.14	1.90
Gum Bayou	Upper	12571.33	Max WS	GBml12100	1725.46	-0.19	11.57		11.68	0.000396	2.82	723.90	1059.04	0.18	2.38
Gum Bayou	Upper	13089.39	Max WS	GBml1210	931.59	-0.11	10.29		10.37	0.000401	2.23	417.61	192.38	0.17	2.23
Gum Bayou	Upper	13089.39	Max WS	GBml12100	1683.14	-0.11	11.75		11.90	0.000636	3.12	559.00	844.81	0.22	3.04
Gum Bayou	Upper	13139.39	Max WS	GBml1210	929.09	0.03	10.32		10.39	0.000359	2.15	433.14	105.27	0.16	2.15
Gum Bayou	Upper	13139.39	Max WS	GBml12100	1676.44	0.03	11.78		11.93	0.000535	3.01	577.20	834.09	0.20	2.91

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
Gum Bayou	Upper	13229.52			Bridge										
Gum Bayou	Upper	13282.81	Max WS	GBm1210	930.62	-0.65	10.41	4.21	10.48	0.000366	2.05	456.08	1605.08	0.16	2.04
Gum Bayou	Upper	13282.81	Max WS	GBm12100	1678.44	-0.65	11.96	5.65	12.08	0.000543	2.76	627.31	2037.74	0.20	2.68
Gum Bayou	Upper	13315.93	Max WS	GBm1210	930.62	-0.29	10.41		10.49	0.000426	2.30	404.64	74.72	0.17	2.30
Gum Bayou	Upper	13315.93	Max WS	GBm12100	1677.49	-0.29	11.94		12.10	0.000631	3.17	541.40	368.49	0.22	3.10
Gum Bayou	Upper	13436.74	Max WS	GBm1210	931.64	-0.88	10.48		10.53	0.000248	1.85	510.64	1041.53	0.14	1.82
Gum Bayou	Upper	13436.74	Max WS	GBm12100	1681.32	-0.88	12.06		12.15	0.000328	2.49	744.47	1901.92	0.16	2.26
Gum Bayou	Upper	13508.5			Lat Struct										
Gum Bayou	Upper	13580.25	Max WS	GBm1210	700.88	-0.77	10.55		10.57	0.000127	1.30	676.74	1405.94	0.10	1.04
Gum Bayou	Upper	13580.25	Max WS	GBm12100	1116.94	-0.77	12.18		12.20	0.000089	1.28	1266.01	2153.92	0.08	0.88
Gum Bayou	Upper	14565.57	Max WS	GBm1210	701.13	0.16	10.72		10.78	0.000277	1.95	378.99	1094.70	0.14	1.85
Gum Bayou	Upper	14565.57	Max WS	GBm12100	1122.95	0.16	12.31		12.38	0.000257	2.19	627.02	3782.98	0.14	1.79
Gum Bayou	Upper	14600.39	Max WS	GBm1210	701.20	0.20	10.73		10.79	0.000284	1.89	387.54	1219.56	0.14	1.81
Gum Bayou	Upper	14600.39	Max WS	GBm12100	1129.19	0.20	12.32		12.39	0.000257	2.13	654.95	3918.44	0.14	1.72
Gum Bayou	Upper	15073.13	Max WS	GBm1210	702.48	0.64	10.86		10.90	0.000206	1.63	439.45	2437.62	0.12	1.60
Gum Bayou	Upper	15073.13	Max WS	GBm12100	1130.78	0.64	12.44		12.49	0.000220	1.93	662.67	4253.52	0.13	1.71
Gum Bayou	Upper	15216.53	Max WS	GBm1210	496.37	0.92	10.92		10.94	0.000101	1.12	487.30	2081.52	0.09	1.06
Gum Bayou	Upper	15216.53	Max WS	GBm12100	789.80	0.92	12.52		12.54	0.000093	1.27	723.38	3962.33	0.09	1.09
Gum Bayou	Upper	15845.97	Max WS	GBm1210	498.46	1.01	11.00		11.02	0.000144	1.22	431.35	2288.04	0.10	1.16
Gum Bayou	Upper	15845.97	Max WS	GBm12100	799.36	1.01	12.58		12.60	0.000123	1.32	697.33	3118.51	0.10	1.15
Gum Bayou	Upper	16699.70	Max WS	GBm1210	516.84	1.42	11.13		11.16	0.000193	1.46	356.92	188.92	0.12	1.45
Gum Bayou	Upper	16699.70	Max WS	GBm12100	815.54	1.42	12.70		12.74	0.000175	1.63	582.06	557.71	0.11	1.40
Gum Bayou	Upper	17124.8			Lat Struct										
Gum Bayou	Upper	17549.89	Max WS	GBm1210	722.53	1.83	11.26		11.28	0.000110	1.22	597.31	115.83	0.09	1.21
Gum Bayou	Upper	17549.89	Max WS	GBm12100	1166.32	1.83	12.80		12.84	0.000123	1.51	815.08	161.84	0.10	1.43
Gum Bayou	Upper	17805.33	Max WS	GBm1210	392.66	1.96	11.31		11.32	0.000033	0.66	601.38	136.72	0.05	0.65
Gum Bayou	Upper	17805.33	Max WS	GBm12100	625.73	1.96	12.85		12.85	0.000026	0.70	1618.73	1897.60	0.05	0.39
Gum Bayou	Upper	18222.95	Max WS	GBm1210	393.11	2.17	11.32		11.33	0.000053	0.79	518.11	148.10	0.06	0.76
Gum Bayou	Upper	18222.95	Max WS	GBm12100	647.45	2.17	12.86		12.87	0.000049	0.86	1156.63	1201.05	0.06	0.66
Gum Bayou	Upper	18658.74	Max WS	GBm1210	394.41	2.38	11.34		11.42	0.000287	2.27	173.95	106.34	0.15	2.27
Gum Bayou	Upper	18658.74	Max WS	GBm12100	651.36	2.38	12.88		12.89	0.000054	0.96	731.42	195.51	0.07	0.89

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Vel Total (ft/s)
Gum Bayou	Upper	18668.74	Max WS	GBml1210	394.41	2.39	11.35		11.43	0.000287	2.27	173.87	106.78		2.27
Gum Bayou	Upper	18668.74	Max WS	GBml12100	651.95	2.39	12.88		12.89	0.000064	0.98	730.81	185.51		0.98
Gum Bayou	Upper	18719.05			Culvert										
Gum Bayou	Upper	18769.25	Max WS	GBml1210	395.87	2.44	11.40		11.48	0.000286	2.27	174.33	98.59		2.27
Gum Bayou	Upper	18769.25	Max WS	GBml12100	651.95	2.44	12.79		12.94	0.000434	3.14	207.65	183.85		3.14
Gum Bayou	Upper	19152.51	Max WS	GBml1210	326.87	2.50	11.53		11.54	0.000053	0.79	413.10	80.49		0.79
Gum Bayou	Upper	19152.51	Max WS	GBml12100	559.73	2.50	13.00		13.02	0.000067	1.04	562.62	125.12		1.04
Gum Bayou	Upper	19162.52	Max WS	GBml1210	326.87	2.50	11.53		11.54	0.000053	0.79	413.14	80.50		0.79
Gum Bayou	Upper	19162.52	Max WS	GBml12100	559.77	2.50	13.00		13.02	0.000065	1.02	502.29	165.77		1.02
Gum Bayou	Upper	19385.99	Max WS	GBml1210	326.87	2.75	11.54		11.56	0.000066	0.90	368.78	74.25		0.90
Gum Bayou	Upper	19385.99	Max WS	GBml12100	561.98	2.75	13.02		13.04	0.000079	1.15	555.12	163.80		1.15
Gum Bayou	Upper	19441.26	Max WS	GBml1210	326.87	5.24	11.36		12.33	0.005832	7.91	41.30	61.77		7.91
Gum Bayou	Upper	19441.26	Max WS	GBml12100	562.07	5.24	12.96		13.12	0.001180	3.24	199.64	143.79		3.24
Gum Bayou	Upper	19477.05			Culvert										
Gum Bayou	Upper	19516.24	Max WS	GBml1210	326.90	5.32	13.13		13.23	0.000779	2.70	150.70	117.55		2.70
Gum Bayou	Upper	19516.24	Max WS	GBml12100	561.95	5.32	14.43		14.53	0.000650	2.92	298.09	148.31		2.92
Gum Bayou	Upper	19567.14	Max WS	GBml1210	326.90	4.61	13.21		13.22	0.000065	0.94	398.77	150.47		0.94
Gum Bayou	Upper	19567.14	Max WS	GBml12100	562.00	4.61	14.52		14.53	0.000094	1.11	602.05	155.85		1.11
Gum Bayou	Upper	20567.15	Max WS	GBml1210	326.94	7.26	13.30		13.31	0.000086	0.92	468.77	239.01		0.92
Gum Bayou	Upper	20567.15	Max WS	GBml12100	562.06	7.26	14.60		14.61	0.000052	0.85	1596.62	2248.90		0.85
Gum Bayou	Upper	21412.43	Max WS	GBml1210	327.58	7.22	13.39		13.40	0.000118	0.85	863.19	1349.12		0.85
Gum Bayou	Upper	21412.43	Max WS	GBml12100	563.72	7.22	14.53		14.64	0.000018	0.40	2900.13	1781.78		0.40

HEC-RAS Plan: GBmi12100 Profile: Max WS

Storage Area	Profile	W.S. Elev (ft)	SA Min EI (ft)	Net Flux (cfs)	SA Area (acres)	SA Volume (acre-ft)
MT-P2P3	Max WS	12.75	3.53	-336.08	24.72	179.32
MT-P4	Max WS	12.78	1.76	361.81	5.25	30.66
MT-P5	Max WS	12.76	-0.10	817.42	5.20	34.12
MT-P6_1	Max WS	12.78	2.12	-140.52	15.18	161.72
MT-P6_2	Max WS	12.78	1.93	-1214.26	4.79	52.00
SharedLake	Max WS	13.77	12.00	-47.05	47.17	83.37
EF detention	Max WS	10.33	2.40	6.98	12.91	102.37
Dummy	Max WS	13.19	10.00	-0.42	0.01	0.03
EF detention 2	Max WS	9.69	-0.40	19.24	3.55	35.82

Appendix D
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB100d	0.4255	93.4	01Jan2008, 18:20	6.08
DB117a	0.4019	65.7	01Jan2008, 19:10	5.36
DB100e	0.3817	54.3	01Jan2008, 19:10	5.5
DB116a	1.0145	146.9	01Jan2008, 19:30	5.25
DB115a	0.7371	95.2	01Jan2008, 19:40	5.15
DB100f	0.4351	64.9	01Jan2008, 19:10	5.56
DB100g	0.4314	99.1	01Jan2008, 18:30	5.96
BG100a	0.2239	249.4	01Jan2008, 16:40	6.36
DB100h2	0.7813	69.1	01Jan2008, 20:30	4.59
DB110a	0.7918	110.4	01Jan2008, 19:40	5.54
DB100h1	1.046	135.2	01Jan2008, 20:00	5.51
DB100i	1.1485	53.1	02Jan2008, 00:00	3.08
DB100j	0.8411	109.4	01Jan2008, 19:30	5.19
DB101a	0.26	46.1	01Jan2008, 18:40	5.53
DB100k	0.8664	44.2	02Jan2008, 00:10	3.36
DB107a	0.3073	58.8	01Jan2008, 18:30	5.46
DB100l	0.2722	45.6	01Jan2008, 19:10	5.38
DB100m	0.4097	42.3	01Jan2008, 20:10	5.13
DB106a	0.5802	93.4	01Jan2008, 19:00	5.35
DB100n	0.4055	58.4	01Jan2008, 19:20	5.24
DB100o	1.0802	133.3	01Jan2008, 19:30	5.05
DB100p	1.1671	150.3	01Jan2008, 19:50	5.1
DB100v	0.3414	71	01Jan2008, 18:30	5.5
DB100q	1.5445	201.4	01Jan2008, 19:50	5.16
DB100r	1.0674	147.4	01Jan2008, 19:20	5.37
DB100s	0.5783	79.6	01Jan2008, 19:20	5.19
J100z	0.5783	79.6	01Jan2008, 19:20	5.19
R100z	0.5783	74.9	02Jan2008, 06:20	5.12
DB100t	0.2557	57.5	01Jan2008, 18:00	5.52
J100ab	0.2557	57.5	01Jan2008, 18:00	5.52
R100ab	0.2557	49.1	02Jan2008, 03:20	5.47
J100y	1.9014	231.7	02Jan2008, 03:00	5.31
R100y	1.9014	231.5	02Jan2008, 04:10	5.3
DB100x	0.1482	37.6	01Jan2008, 17:40	5.54
J100aa	0.1482	37.6	01Jan2008, 17:40	5.54
R100aa	0.1482	27.4	02Jan2008, 05:30	5.54
J100x	2.0496	258.7	02Jan2008, 04:20	5.31
R100x	2.0496	258.1	02Jan2008, 05:40	5.27
DB100y	0.3291	81.7	01Jan2008, 18:00	6.19
J100ac	0.3291	81.7	01Jan2008, 18:00	6.19
R100ac	0.3291	80.5	01Jan2008, 21:00	6.17
J100w	3.9232	483.6	01Jan2008, 23:00	5.3
R100w	3.9232	483.6	01Jan2008, 23:00	5.3
DB100w	1.1203	92.5	01Jan2008, 20:30	4.42

Appendix D
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
J100ad	1.1203	92.5	01Jan2008, 20:30	4.42
R100ad	1.1203	91.5	02Jan2008, 01:00	4.21
J100v	5.3849	630.2	01Jan2008, 23:20	5.08
R100v	5.3849	618.7	02Jan2008, 03:40	5.04
DB101g	1.3033	173	01Jan2008, 19:20	5.15
DB101h	0.5994	86.7	01Jan2008, 19:10	5.25
DB101i	0.3999	75.7	01Jan2008, 18:30	5.46
DB101k	0.7138	108.5	01Jan2008, 19:00	5.52
DB101l	0.6079	99.4	01Jan2008, 19:00	5.69
DB101m	0.4682	103.8	01Jan2008, 18:10	5.93
DB101n	0.5905	65.6	01Jan2008, 19:30	5.04
DB101p	0.8115	99.4	01Jan2008, 19:50	5.23
DB101q	0.9593	102.5	01Jan2008, 19:30	4.94
DB101r	1.9095	85.1	02Jan2008, 00:20	2.98
Chigger	1.9095	28.4	02Jan2008, 00:20	0.99
R101o	1.9095	28.3	02Jan2008, 03:00	0.94
J101n	2.8688	125.6	01Jan2008, 22:40	2.28
R101n	2.8688	122.2	02Jan2008, 05:20	2.21
DB101o	0.4823	86.5	01Jan2008, 18:50	5.88
J101p	0.4823	86.5	01Jan2008, 18:50	5.88
R101p	0.4823	65.8	02Jan2008, 09:20	5.85
J101m	4.7531	314.6	02Jan2008, 03:30	3.45
R101m	4.7531	313.6	02Jan2008, 05:10	3.44
J101l	5.8292	464.8	01Jan2008, 22:00	3.87
R101l	5.8292	464.5	01Jan2008, 23:30	3.86
J101k	6.543	562.8	01Jan2008, 22:40	4.04
R101k	6.543	560.8	02Jan2008, 00:20	4.04
DB101j	0.3461	138.7	01Jan2008, 17:10	6.08
J101j	6.8891	643.7	01Jan2008, 21:50	4.14
R101j	6.8891	635.8	02Jan2008, 00:40	4.12
J101i	7.289	694.8	02Jan2008, 00:10	4.2
R101i	7.289	688.7	02Jan2008, 03:30	4.18
J101h	7.8884	753.6	02Jan2008, 02:50	4.26
R101h	7.8884	748.8	02Jan2008, 05:10	4.24
DB101s	0.4214	151.4	01Jan2008, 17:20	6.03
DB101t	0.6201	190.8	01Jan2008, 17:20	6.12
DB101u	0.7635	162.1	01Jan2008, 18:30	5.91
J101s	0.7635	162.1	01Jan2008, 18:30	5.91
R101s	0.7635	146.3	02Jan2008, 04:40	5.9
J101r	1.3836	277.2	01Jan2008, 18:20	6
R101r	1.3836	261.9	01Jan2008, 20:50	6
J101q	1.805	382.8	01Jan2008, 20:10	6
R101q	1.805	317.3	02Jan2008, 04:50	6
J101g	10.9967	1191.8	02Jan2008, 04:20	4.64

Appendix D
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R101g	10.9967	1184.3	02Jan2008, 05:40	4.63
J100u	17.5487	1909.9	02Jan2008, 04:20	4.79
R100u	17.5487	1888.2	02Jan2008, 06:20	4.77
Weir-Split	17.5487	1354.4	02Jan2008, 06:20	3.63
R100t	17.5487	1351.3	02Jan2008, 07:50	3.62
J100s2	18.6289	1440.1	02Jan2008, 07:10	3.7
R100s2	18.6289	1437.5	02Jan2008, 08:40	3.69
DB104a	0.8529	131	01Jan2008, 19:10	5.31
DB104b	1.8897	256	01Jan2008, 19:40	5.17
DB104c	1.5214	128.5	01Jan2008, 20:50	4.49
DB104d	0.7771	123	01Jan2008, 19:10	5.44
J104d	0.7771	123	01Jan2008, 19:10	5.44
R104d	0.7771	119.6	01Jan2008, 21:10	5.43
J104c	2.2985	248	01Jan2008, 21:10	4.8
R104c	2.2985	246.6	01Jan2008, 23:40	4.75
J104b	4.1882	485.8	01Jan2008, 22:30	4.94
R104b	4.1882	434.2	02Jan2008, 05:10	4.47
J104a	5.0411	521	02Jan2008, 04:50	4.61
R104a	5.0411	520.6	02Jan2008, 05:00	4.6
J100s1	24.0755	1966.2	02Jan2008, 06:40	3.91
R100s1	24.0755	1955.3	02Jan2008, 08:00	3.9
DB106b	0.9051	148.4	01Jan2008, 19:00	5.61
DB105a	1.0654	92.2	01Jan2008, 20:30	4.52
DB106c	0.638	132.9	01Jan2008, 18:30	5.59
DB106d	0.3265	55.5	01Jan2008, 19:00	5.39
J106b	0.9645	188.3	01Jan2008, 18:40	5.52
R106b	0.9645	186.9	01Jan2008, 20:20	5.51
DB105b	0.3873	64.8	01Jan2008, 19:00	5.63
DB105c	0.8905	147.6	01Jan2008, 19:00	5.37
J105b	0.8905	147.6	01Jan2008, 19:00	5.37
R105b	0.8905	143.9	01Jan2008, 22:40	5.35
J105a	1.2778	202.7	01Jan2008, 22:20	5.44
R105a	1.2778	199	02Jan2008, 01:00	5.41
J106a	4.2128	581.8	01Jan2008, 23:00	5.25
R106a	4.2128	581.2	02Jan2008, 00:00	5.24
J100r	29.2782	2481.7	02Jan2008, 05:40	4.14
R100r	29.2782	2480.6	02Jan2008, 06:10	4.13
DB107b	1.4378	188.1	01Jan2008, 19:40	5.2
DB107c	0.32	46.4	01Jan2008, 19:10	5.43
J107b	0.32	46.4	01Jan2008, 19:10	5.43
R107b	0.32	46.2	01Jan2008, 20:20	5.4
J107a	1.7578	234.1	01Jan2008, 19:50	5.24
R107a	1.7578	232.4	01Jan2008, 21:40	5.19
J100q	31.6155	2722.2	02Jan2008, 04:40	4.22

Appendix D
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100q	31.6155	2718.6	02Jan2008, 06:50	4.17
DB101b	0.4813	73.4	01Jan2008, 19:00	5.3
DB101c	0.4599	77	01Jan2008, 18:50	5.38
DB101d	2.4142	253.7	01Jan2008, 20:20	4.79
DB101e	1.1825	158.4	01Jan2008, 19:20	5.16
DB101f	0.8417	146.6	01Jan2008, 18:50	5.41
J101f	0.8417	146.6	01Jan2008, 18:50	5.41
R101f	0.8417	146.5	01Jan2008, 19:10	5.38
J101e	2.0242	304.9	01Jan2008, 19:20	5.25
R101e	2.0242	242	02Jan2008, 15:50	4.94
J101d	2.0242	707.1	02Jan2008, 08:30	14.86
R101d	2.0242	700.2	02Jan2008, 10:50	14.76
J101c	4.4384	867.9	02Jan2008, 10:10	9.34
R101c	4.4384	858.6	02Jan2008, 13:30	9.27
J101b	4.8983	887	02Jan2008, 13:20	8.91
R101b	4.8983	886.9	02Jan2008, 13:30	8.89
J101a	5.3796	917.1	02Jan2008, 13:20	8.57
R101a	5.3796	916.7	02Jan2008, 14:20	8.51
DB101v	0.5653	93.2	01Jan2008, 19:00	5.37
J100p	38.6868	3615.8	02Jan2008, 09:00	4.78
R100p	38.6868	3614.8	02Jan2008, 09:20	4.77
DB108b	0.5279	106.7	01Jan2008, 18:40	5.84
DB108a	1.2268	135.6	01Jan2008, 19:50	4.99
DB108c	0.6193	123.9	01Jan2008, 19:00	5.9
J108c	0.6193	123.9	01Jan2008, 19:00	5.9
R108c	0.6193	123.5	01Jan2008, 20:00	5.89
J108b	1.8461	259.1	01Jan2008, 19:50	5.29
R108b	1.8461	257.3	01Jan2008, 21:20	5.29
J108a	2.374	359.6	01Jan2008, 19:30	5.41
R108a	2.374	353.4	02Jan2008, 01:00	5.38
J100o	41.0608	3847.1	02Jan2008, 08:20	4.81
R100o	41.0608	3846.2	02Jan2008, 08:50	4.8
J100n	41.9019	3913.9	02Jan2008, 08:30	4.81
R100n	41.9019	3911	02Jan2008, 09:40	4.78
DB109a	0.6757	569	01Jan2008, 17:20	6.31
DB109b	0.182	39.2	01Jan2008, 18:20	5.6
DB109d	0.3999	89.1	01Jan2008, 18:20	5.88
DB109g	0.8689	119.2	01Jan2008, 19:50	5.48
DB109f	0.2845	94	01Jan2008, 17:10	6.15
DB109e	0.6993	114.8	01Jan2008, 19:20	5.69
J109f	0.9838	204.6	01Jan2008, 18:10	5.82
R109f	0.9838	203.7	01Jan2008, 19:20	5.81
J109c	1.8527	322.5	01Jan2008, 19:30	5.66
R109c	1.8527	320.4	01Jan2008, 20:50	5.65

Appendix D
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB109c	0.5646	114.3	01Jan2008, 18:40	5.84
DB109h	0.4721	151.9	01Jan2008, 17:30	6.31
J109e	0.4721	151.9	01Jan2008, 17:30	6.31
R109e	0.4721	137	02Jan2008, 02:00	6.31
J109d	1.0367	220.4	02Jan2008, 01:10	6.05
R109d	1.0367	218.5	02Jan2008, 02:40	6.05
J109b	3.4713	631.5	01Jan2008, 20:20	5.79
R109b	3.4713	628.8	01Jan2008, 21:00	5.79
J109a	4.147	906.5	01Jan2008, 18:00	5.87
R109a	4.147	897.2	01Jan2008, 18:50	5.87
J100m	47.1974	4346.6	02Jan2008, 07:20	4.83
R100m	47.1974	4343.3	02Jan2008, 08:00	4.8
DB112a	0.4975	85.4	01Jan2008, 19:10	5.4
DB112d	0.3564	57.2	01Jan2008, 19:10	5.63
J112b	0.3564	57.2	01Jan2008, 19:10	5.63
R112b	0.3564	56	02Jan2008, 00:20	5.59
DB112b	0.3748	127.3	01Jan2008, 17:30	6.29
DB112c	0.7429	103.6	01Jan2008, 19:30	5.47
DB112f	0.3175	42.7	01Jan2008, 19:20	5.37
DB112e	0.7645	119.8	01Jan2008, 19:20	5.43
J112f	1.082	162.5	01Jan2008, 19:20	5.41
R112f	1.082	162.2	01Jan2008, 20:10	5.4
J112e	1.8249	265.3	01Jan2008, 20:00	5.43
R112e	1.8249	265.3	01Jan2008, 20:10	5.42
J112d	1.8249	265.3	01Jan2008, 20:10	5.42
R112d	1.8249	264.1	01Jan2008, 21:30	5.4
J112c	2.1997	365.5	01Jan2008, 20:40	5.55
R112c	2.1997	365.1	01Jan2008, 21:10	5.54
J112a	3.0536	489.8	01Jan2008, 21:40	5.53
R112a	3.0536	475.8	02Jan2008, 02:00	5.49
J100l	52.0888	4891.8	02Jan2008, 06:30	4.87
R100l	52.0888	4890.1	02Jan2008, 07:00	4.85
J100k	52.8701	4945.6	02Jan2008, 07:00	4.85
R100k	52.8701	4943.3	02Jan2008, 07:30	4.83
BG100b	0.9681	286.6	01Jan2008, 17:40	6.24
BG100c	0.8305	353.7	01Jan2008, 17:00	6.31
BG100d	0.7905	107	01Jan2008, 19:20	5.39
JBGc	0.7905	107	01Jan2008, 19:20	5.39
RBGc	0.7905	66.3	02Jan2008, 18:10	4.51
JBGb	1.621	354.4	01Jan2008, 17:00	5.43
RBGb	1.621	243.1	02Jan2008, 05:40	5.28
JBGa	2.5891	408	01Jan2008, 21:40	5.64
RBGa	2.5891	402.9	02Jan2008, 00:20	5.58
J100j	55.6831	5294.4	02Jan2008, 07:10	4.88

Appendix D
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi ²)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100j	55.6831	5293.2	02Jan2008, 07:20	4.87
DB111a	0.2553	45.9	01Jan2008, 18:40	5.43
DB111b	1.2071	134.1	01Jan2008, 20:10	4.88
J111b	1.2071	134.1	01Jan2008, 20:10	4.88
R111b	1.2071	120.6	02Jan2008, 09:20	4.81
J111a	1.4624	141.7	02Jan2008, 08:00	4.92
R111a	1.4624	140.6	02Jan2008, 12:00	4.79
MB100a	0.4305	469.2	01Jan2008, 16:50	6.36
MB100b	0.6341	258.2	01Jan2008, 17:10	6.15
MB100h	0.5156	106.1	01Jan2008, 18:30	5.85
MB100c1	0.1197	80.5	01Jan2008, 16:40	6.19
MB100c2	0.3741	132.3	01Jan2008, 17:10	5.91
MB100d	1.2082	180.7	01Jan2008, 19:20	5.36
MB100e	0.5889	95.9	01Jan2008, 19:00	5.36
MB100f	1.3315	164.8	01Jan2008, 19:40	5.05
MB100g	0.4893	92.1	01Jan2008, 18:40	5.46
JMBi	0.4893	92.1	01Jan2008, 18:40	5.46
RMBi	0.4893	81.2	02Jan2008, 01:40	5.4
JMBg	2.4097	312.1	01Jan2008, 23:20	5.2
RMBg	2.4097	304.5	02Jan2008, 04:20	5.16
JMBe	3.6179	437.4	02Jan2008, 02:40	5.23
RMBe	3.6179	437.2	02Jan2008, 03:30	5.19
JMBd	3.992	487.1	02Jan2008, 01:30	5.26
RMBd	3.992	486.8	02Jan2008, 02:10	5.24
JMBc	4.6273	578.2	01Jan2008, 20:30	5.33
RMBc	4.6273	574.3	02Jan2008, 01:30	5.31
JMBb	5.2614	741.6	01Jan2008, 21:00	5.41
RMBb	5.2614	726.6	02Jan2008, 00:10	5.39
JMBa	5.6919	758.8	01Jan2008, 23:50	5.46
RMBa	5.6919	756.1	02Jan2008, 00:40	5.46
J100h	63.2688	6057.2	02Jan2008, 06:20	4.93
R100h	63.2688	6054.9	02Jan2008, 06:50	4.91
DB114a	0.6772	87.2	01Jan2008, 19:30	5.11
DB114b	0.4096	93.2	01Jan2008, 18:00	5.52
J114b	0.4096	93.2	01Jan2008, 18:00	5.52
R114b	0.4096	82.1	02Jan2008, 05:00	5.47
J114a	1.0868	147	02Jan2008, 04:10	5.25
R114a	1.0868	132.5	02Jan2008, 12:20	5.13
BB100a	0.8055	630.9	01Jan2008, 16:50	6.36
BB100b	0.873	273.8	01Jan2008, 17:30	6.12
BB100c	0.2175	188.2	01Jan2008, 16:50	6.12
BB100d	1.2851	298.6	01Jan2008, 18:20	6.1
BB100e	1.2538	326.1	01Jan2008, 18:00	6.12
JBBd	2.5389	624.4	01Jan2008, 18:10	6.11

Appendix D
Dickinson Bayou HEC-HMS Output - 10-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
RBBd	2.5389	601.9	01Jan2008, 19:50	6.11
JBBc	2.7564	694.7	01Jan2008, 18:50	6.11
RBBc	2.7564	681.3	01Jan2008, 21:00	6.11
JBBb	3.6294	910.9	01Jan2008, 20:30	6.11
RBBb	3.6294	842.5	02Jan2008, 02:20	6.11
JBBa	4.4349	977.8	01Jan2008, 18:30	6.15
RBBa	4.4349	957.8	02Jan2008, 00:30	6.15
J100g	69.2256	7021.8	02Jan2008, 04:20	5
R100g	69.2256	7020	02Jan2008, 04:30	4.99
J100f	71.3589	7236.2	02Jan2008, 04:30	5
R100f	71.3589	7233.6	02Jan2008, 04:40	4.99
J100e	71.7608	7276.4	02Jan2008, 04:40	4.99
R100e	71.7608	7273.7	02Jan2008, 05:00	4.98
J100d	72.1863	7323.8	02Jan2008, 04:50	4.99
R100d	72.1863	7236.7	02Jan2008, 08:40	4.89
Gum Bayou	12.12	2889	01Jan2008, 19:40	6.62
DB100c	2.0856	178.7	01Jan2008, 21:50	4.55
J100c	86.3919	8753.4	02Jan2008, 06:00	5.12
R100c	86.3919	8680.3	02Jan2008, 08:40	5.04
DB100b1	2.4787	222.6	01Jan2008, 20:50	4.52
DB100b2	0.9668	134.1	01Jan2008, 19:20	5.2
J100b	89.8374	8930.4	02Jan2008, 08:30	5.03
R100b	89.8374	8925.2	02Jan2008, 09:50	5
DB118a	1.2724	164	01Jan2008, 19:40	5.11
DB118b	2.4501	261.6	01Jan2008, 20:00	4.82
DB118c	0.5656	102.6	01Jan2008, 18:50	5.52
J118c	0.5656	102.6	01Jan2008, 18:50	5.52
R118c	0.5656	85.4	02Jan2008, 08:00	5.49
J118b	3.0157	319.9	01Jan2008, 20:40	4.95
R118b	3.0157	317.3	01Jan2008, 23:20	4.93
J118a	4.2881	471.7	01Jan2008, 22:40	4.98
R118a	4.2881	453.9	02Jan2008, 10:20	4.76
J100a	94.1255	9378.6	02Jan2008, 09:50	4.99
R100a	94.1255	9358.4	02Jan2008, 11:20	4.93
DB100a	0.8551	95.3	01Jan2008, 20:00	4.96
Outlet	94.9806	9417.7	02Jan2008, 11:20	4.93

Appendix D
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB100d	0.4255	215.6	01Jan2008, 18:10	11.85
DB117a	0.4019	166.3	01Jan2008, 19:00	11.16
DB100e	0.3817	135.9	01Jan2008, 19:10	11.37
DB116a	1.0145	375.9	01Jan2008, 19:30	11.07
DB115a	0.7371	245.6	01Jan2008, 19:30	10.99
DB100f	0.4351	161.9	01Jan2008, 19:10	11.42
DB100g	0.4314	231.5	01Jan2008, 18:20	11.7
BG100a	0.2239	394.7	01Jan2008, 16:40	12.11
DB100h2	0.7813	176.4	01Jan2008, 20:00	10.21
DB110a	0.7918	275.4	01Jan2008, 19:30	11.42
DB100h1	1.046	334.2	01Jan2008, 20:00	11.4
DB100i	1.1485	143.3	01Jan2008, 23:10	7.63
DB100j	0.8411	281.4	01Jan2008, 19:20	11.05
DB101a	0.26	114.1	01Jan2008, 18:40	11.32
DB100k	0.8664	117	01Jan2008, 23:20	8.1
DB107a	0.3073	146.2	01Jan2008, 18:30	11.21
DB100l	0.2722	115	01Jan2008, 19:10	11.18
DB100m	0.4097	104.9	01Jan2008, 19:50	10.9
DB106a	0.5802	236.8	01Jan2008, 18:50	11.16
DB100n	0.4055	149.7	01Jan2008, 19:10	11.07
DB100o	1.0802	346.3	01Jan2008, 19:20	10.89
DB100p	1.1671	388.5	01Jan2008, 19:40	10.94
DB100v	0.3414	175.1	01Jan2008, 18:30	11.21
DB100q	1.5445	519.1	01Jan2008, 19:40	11
DB100r	1.0674	373.6	01Jan2008, 19:20	11.23
DB100s	0.5783	204.9	01Jan2008, 19:10	11.03
J100z	0.5783	204.9	01Jan2008, 19:10	11.03
R100z	0.5783	178.8	02Jan2008, 04:30	10.96
DB100t	0.2557	140.5	01Jan2008, 17:50	11.21
J100ab	0.2557	140.5	01Jan2008, 17:50	11.21
R100ab	0.2557	67.6	02Jan2008, 20:30	11.21
J100y	1.9014	485.7	02Jan2008, 04:20	11.14
R100y	1.9014	470.3	02Jan2008, 06:40	11.13
DB100x	0.1482	90.5	01Jan2008, 17:40	11.21
J100aa	0.1482	90.5	01Jan2008, 17:40	11.21
R100aa	0.1482	43	02Jan2008, 14:30	11.21
J100x	2.0496	510.9	02Jan2008, 06:40	11.14
R100x	2.0496	505.1	02Jan2008, 08:20	11.09
DB100y	0.3291	191.8	01Jan2008, 17:50	11.93
J100ac	0.3291	191.8	01Jan2008, 17:50	11.93
R100ac	0.3291	166	02Jan2008, 03:10	11.93
J100w	3.9232	1075.1	01Jan2008, 22:30	11.13
R100w	3.9232	1074.6	01Jan2008, 22:50	11.12
DB100w	1.1203	243.9	01Jan2008, 20:00	10.05

Appendix D
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
J100ad	1.1203	243.9	01Jan2008, 20:00	10.05
R100ad	1.1203	226.1	02Jan2008, 07:20	9.71
J100v	5.3849	1379.3	01Jan2008, 22:50	10.84
R100v	5.3849	1329	02Jan2008, 06:30	10.78
DB101g	1.3033	443.6	01Jan2008, 19:10	10.98
DB101h	0.5994	222	01Jan2008, 19:10	11.08
DB101i	0.3999	188.6	01Jan2008, 18:20	11.21
DB101k	0.7138	271.1	01Jan2008, 19:00	11.37
DB101l	0.6079	243.3	01Jan2008, 19:00	11.54
DB101m	0.4682	245.6	01Jan2008, 18:00	11.67
DB101n	0.5905	168.7	01Jan2008, 19:20	10.87
DB101p	0.8115	252.6	01Jan2008, 19:40	11.08
DB101q	0.9593	264.7	01Jan2008, 19:20	10.75
DB101r	1.9095	230.2	02Jan2008, 00:00	7.43
Chigger	1.9095	76.7	02Jan2008, 00:00	2.48
R101o	1.9095	74.7	02Jan2008, 09:40	2.38
J101n	2.8688	297.8	01Jan2008, 20:20	5.18
R101n	2.8688	269.8	02Jan2008, 15:10	5.06
DB101o	0.4823	208.6	01Jan2008, 18:50	11.71
J101p	0.4823	208.6	01Jan2008, 18:50	11.71
R101p	0.4823	115.8	02Jan2008, 17:10	11.7
J101m	4.7531	590.7	01Jan2008, 23:10	7.49
R101m	4.7531	589.3	02Jan2008, 00:20	7.48
J101l	5.8292	997.1	01Jan2008, 20:30	8.24
R101l	5.8292	945.7	02Jan2008, 03:20	8.22
J101k	6.543	1127.3	02Jan2008, 02:20	8.56
R101k	6.543	1113.2	02Jan2008, 04:30	8.56
DB101j	0.3461	298	01Jan2008, 17:00	11.8
J101j	6.8891	1159.4	02Jan2008, 03:50	8.72
R101j	6.8891	1134.9	02Jan2008, 08:40	8.7
J101i	7.289	1193.8	02Jan2008, 08:10	8.83
R101i	7.289	1183.2	02Jan2008, 11:50	8.81
J101h	7.8884	1262.5	02Jan2008, 11:10	8.98
R101h	7.8884	1259.8	02Jan2008, 12:40	8.96
DB101s	0.4214	333.2	01Jan2008, 17:10	11.75
DB101t	0.6201	427.6	01Jan2008, 17:30	11.85
DB101u	0.7635	385.6	01Jan2008, 18:20	11.67
J101s	0.7635	385.6	01Jan2008, 18:20	11.67
R101s	0.7635	371.3	01Jan2008, 23:20	11.67
J101r	1.3836	642.1	01Jan2008, 22:20	11.75
R101r	1.3836	605.9	02Jan2008, 00:40	11.75
J101q	1.805	749	02Jan2008, 00:10	11.75
R101q	1.805	502.5	02Jan2008, 13:40	11.75
J101g	10.9967	1933.9	02Jan2008, 11:10	9.66

Appendix D
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R101g	10.9967	1931.3	02Jan2008, 12:10	9.65
J100u	17.5487	3459.4	02Jan2008, 06:00	10.08
R100u	17.5487	3438.5	02Jan2008, 07:50	10.06
Weir-Split	17.5487	2189.6	02Jan2008, 07:50	6.85
R100t	17.5487	2175.2	02Jan2008, 10:50	6.84
J100s2	18.6289	2335.8	02Jan2008, 10:10	7.07
R100s2	18.6289	2331	02Jan2008, 11:30	7.06
DB104a	0.8529	328.6	01Jan2008, 19:10	11.11
DB104b	1.8897	659.3	01Jan2008, 19:30	11.01
DB104c	1.5214	334.9	01Jan2008, 20:20	10.11
DB104d	0.7771	310.4	01Jan2008, 19:10	11.26
J104d	0.7771	310.4	01Jan2008, 19:10	11.26
R104d	0.7771	276.9	01Jan2008, 23:30	11.26
J104c	2.2985	603.8	01Jan2008, 22:40	10.5
R104c	2.2985	578	02Jan2008, 06:30	10.43
J104b	4.1882	1067.2	01Jan2008, 23:50	10.69
R104b	4.1882	1043	02Jan2008, 03:10	10.05
J104a	5.0411	1267.6	02Jan2008, 01:50	10.23
R104a	5.0411	1264.6	02Jan2008, 02:30	10.22
J100s1	24.0755	3444.7	02Jan2008, 09:50	7.79
R100s1	24.0755	3437.7	02Jan2008, 10:30	7.78
DB106b	0.9051	364.9	01Jan2008, 19:00	11.44
DB105a	1.0654	240.9	01Jan2008, 20:00	10.17
DB106c	0.638	326	01Jan2008, 18:20	11.31
DB106d	0.3265	139.7	01Jan2008, 19:00	11.18
J106b	0.9645	465.3	01Jan2008, 18:30	11.27
R106b	0.9645	439.9	01Jan2008, 22:40	11.27
DB105b	0.3873	159.7	01Jan2008, 19:00	11.46
DB105c	0.8905	373	01Jan2008, 19:00	11.17
J105b	0.8905	373	01Jan2008, 19:00	11.17
R105b	0.8905	346	02Jan2008, 01:00	11.16
J105a	1.2778	468	02Jan2008, 00:20	11.25
R105a	1.2778	418.4	02Jan2008, 08:10	11.23
J106a	4.2128	1270.6	01Jan2008, 23:00	11.02
R106a	4.2128	1260.7	02Jan2008, 01:30	11
J100r	29.2782	4713.9	02Jan2008, 03:50	8.35
R100r	29.2782	4697.1	02Jan2008, 05:00	8.35
DB107b	1.4378	483.3	01Jan2008, 19:40	11.05
DB107c	0.32	114.7	01Jan2008, 19:10	11.26
J107b	0.32	114.7	01Jan2008, 19:10	11.26
R107b	0.32	114	01Jan2008, 20:10	11.23
J107a	1.7578	596.6	01Jan2008, 19:40	11.08
R107a	1.7578	546.8	02Jan2008, 02:50	11.04
J100q	31.6155	5361.1	02Jan2008, 04:10	8.55

Appendix D
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100q	31.6155	5325.5	02Jan2008, 07:30	8.49
DB101b	0.4813	187.1	01Jan2008, 19:00	11.12
DB101c	0.4599	194.3	01Jan2008, 18:40	11.18
DB101d	2.4142	665.9	01Jan2008, 20:10	10.59
DB101e	1.1825	408.6	01Jan2008, 19:10	11
DB101f	0.8417	368.4	01Jan2008, 18:50	11.19
J101f	0.8417	368.4	01Jan2008, 18:50	11.19
R101f	0.8417	368.9	01Jan2008, 18:40	11.18
J101e	2.0242	776.7	01Jan2008, 19:00	11.07
R101e	2.0242	663.4	02Jan2008, 08:10	10.75
J101d	2.0242	1912.2	02Jan2008, 08:10	38.59
R101d	2.0242	1898.3	02Jan2008, 09:30	38.47
J101c	4.4384	2290.4	02Jan2008, 08:50	23.3
R101c	4.4384	2234.8	02Jan2008, 12:30	23.22
J101b	4.8983	2286.1	02Jan2008, 12:20	22.09
R101b	4.8983	2261	02Jan2008, 14:00	22.07
J101a	5.3796	2312.3	02Jan2008, 13:50	21.09
R101a	5.3796	2287	02Jan2008, 17:40	21.01
DB101v	0.5653	235.6	01Jan2008, 19:00	11.17
J100p	38.6868	7278.2	02Jan2008, 07:40	10.28
R100p	38.6868	7265.2	02Jan2008, 09:10	10.27
DB108b	0.5279	257.5	01Jan2008, 18:30	11.62
DB108a	1.2268	349.2	01Jan2008, 19:40	10.81
DB108c	0.6193	298.3	01Jan2008, 18:50	11.69
J108c	0.6193	298.3	01Jan2008, 18:50	11.69
R108c	0.6193	218.1	02Jan2008, 08:00	11.69
J108b	1.8461	556.6	01Jan2008, 20:10	11.11
R108b	1.8461	531.7	02Jan2008, 01:30	11.1
J108a	2.374	713	02Jan2008, 00:00	11.22
R108a	2.374	684.2	02Jan2008, 07:30	11.18
J100o	41.0608	7937.1	02Jan2008, 08:40	10.33
R100o	41.0608	7905.1	02Jan2008, 11:20	10.31
J100n	41.9019	8026.4	02Jan2008, 11:00	10.33
R100n	41.9019	7929.8	02Jan2008, 16:50	10.29
DB109a	0.6757	1082.5	01Jan2008, 17:20	12.05
DB109b	0.182	95.8	01Jan2008, 18:10	11.31
DB109d	0.3999	213	01Jan2008, 18:10	11.62
DB109g	0.8689	293	01Jan2008, 19:40	11.33
DB109f	0.2845	208.4	01Jan2008, 17:20	11.88
DB109e	0.6993	278.3	01Jan2008, 19:10	11.53
J109f	0.9838	475.6	01Jan2008, 18:10	11.63
R109f	0.9838	465.2	01Jan2008, 20:00	11.62
J109c	1.8527	757.8	01Jan2008, 20:00	11.49
R109c	1.8527	679.8	02Jan2008, 01:50	11.48

Appendix D
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi ²)	Peak Discharge (cfs)	Time of Peak	Volume (in)
DB109c	0.5646	273.7	01Jan2008, 18:40	11.62
DB109h	0.4721	328.6	01Jan2008, 17:40	12.05
J109e	0.4721	328.6	01Jan2008, 17:40	12.05
R109e	0.4721	284.7	02Jan2008, 03:20	12.05
J109d	1.0367	439.7	02Jan2008, 02:10	11.82
R109d	1.0367	423.6	02Jan2008, 06:00	11.82
J109b	3.4713	1229.6	02Jan2008, 01:40	11.59
R109b	3.4713	1220	02Jan2008, 03:30	11.58
J109a	4.147	1775	01Jan2008, 17:30	11.66
R109a	4.147	1593	01Jan2008, 19:30	11.65
J100m	47.1974	8685.7	02Jan2008, 09:50	10.35
R100m	47.1974	8562.8	02Jan2008, 12:20	10.31
DB112a	0.4975	211.8	01Jan2008, 19:00	11.18
DB112d	0.3564	141.8	01Jan2008, 19:10	11.48
J112b	0.3564	141.8	01Jan2008, 19:10	11.48
R112b	0.3564	124.3	02Jan2008, 09:10	11.44
DB112b	0.3748	274	01Jan2008, 17:30	12.03
DB112c	0.7429	255.2	01Jan2008, 19:30	11.32
DB112f	0.3175	107.9	01Jan2008, 19:20	11.23
DB112e	0.7645	300.6	01Jan2008, 19:10	11.25
J112f	1.082	408.4	01Jan2008, 19:10	11.25
R112f	1.082	382.9	02Jan2008, 00:50	11.24
J112e	1.8249	601.5	02Jan2008, 00:00	11.27
R112e	1.8249	597.2	02Jan2008, 01:00	11.27
J112d	1.8249	597.2	02Jan2008, 01:00	11.27
R112d	1.8249	585.5	02Jan2008, 04:10	11.25
J112c	2.1997	658.8	02Jan2008, 03:30	11.38
R112c	2.1997	651.3	02Jan2008, 05:40	11.37
J112a	3.0536	869.4	02Jan2008, 05:20	11.35
R112a	3.0536	855	02Jan2008, 10:40	11.31
J100l	52.0888	9669.5	02Jan2008, 12:00	10.41
R100l	52.0888	9591.2	02Jan2008, 14:00	10.39
J100k	52.8701	9689.3	02Jan2008, 14:00	10.38
R100k	52.8701	9666	02Jan2008, 14:50	10.36
BG100b	0.9681	650.8	01Jan2008, 17:40	11.98
BG100c	0.8305	773.7	01Jan2008, 16:50	12.05
BG100d	0.7905	268.9	01Jan2008, 19:20	11.26
JBGc	0.7905	268.9	01Jan2008, 19:20	11.26
RBGc	0.7905	204	02Jan2008, 06:10	10.11
JBGb	1.621	776.1	01Jan2008, 16:50	11.1
RBGb	1.621	479.5	01Jan2008, 22:40	10.89
JBGa	2.5891	909.4	01Jan2008, 22:40	11.3
RBGa	2.5891	838.6	02Jan2008, 01:20	11.21
J100j	55.6831	10043.6	02Jan2008, 14:30	10.41

Appendix D
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 12 Scenario

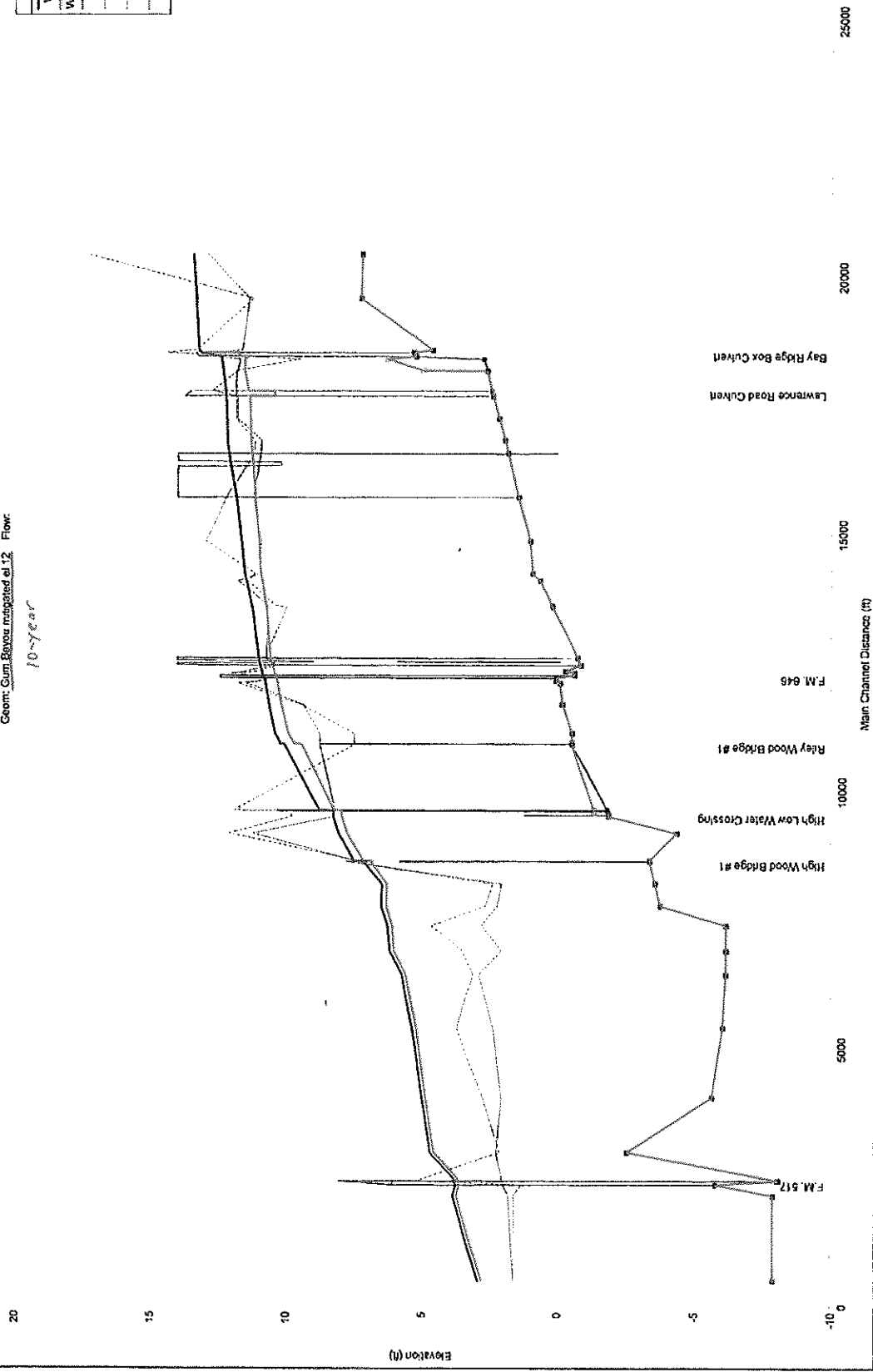
Hydrologic Element	Drainage Area (mi ²)	Peak Discharge (cfs)	Time of Peak	Volume (in)
R100j	55.6831	10041	02Jan2008, 14:50	10.4
DB111a	0.2553	114.8	01Jan2008, 18:30	11.2
DB111b	1.2071	350.9	01Jan2008, 20:00	10.7
J111b	1.2071	350.9	01Jan2008, 20:00	10.7
R111b	1.2071	324.1	02Jan2008, 05:20	10.61
J111a	1.4624	380.5	02Jan2008, 03:50	10.71
R111a	1.4624	301.2	02Jan2008, 21:50	10.56
MB100a	0.4305	744.7	01Jan2008, 16:50	12.11
MB100b	0.6341	556	01Jan2008, 17:10	11.88
MB100h	0.5156	253.7	01Jan2008, 18:20	11.62
MB100c1	0.1197	166.4	01Jan2008, 16:30	11.93
MB100c2	0.3741	299.9	01Jan2008, 17:10	11.62
MB100d	1.2082	459.2	01Jan2008, 19:10	11.2
MB100e	0.5889	242.8	01Jan2008, 19:00	11.16
MB100f	1.3315	427.9	01Jan2008, 19:30	10.89
MB100g	0.4893	229.5	01Jan2008, 18:30	11.21
JMBi	0.4893	229.5	01Jan2008, 18:30	11.21
RMBi	0.4893	202	02Jan2008, 00:30	11.19
JMBg	2.4097	792.8	01Jan2008, 22:10	11.02
RMBg	2.4097	774	02Jan2008, 03:00	10.98
JMBe	3.6179	1100.5	02Jan2008, 01:30	11.05
RMBe	3.6179	1063.6	02Jan2008, 06:10	11.02
JMBd	3.992	1102.3	02Jan2008, 05:40	11.07
RMBd	3.992	1077.5	02Jan2008, 08:40	11.06
JMBc	4.6273	1156.2	01Jan2008, 20:10	11.14
RMBc	4.6273	1128.4	02Jan2008, 12:40	11.12
JMBb	5.2614	1379.9	01Jan2008, 21:30	11.21
RMBb	5.2614	1308.5	02Jan2008, 06:40	11.19
JMBa	5.6919	1308.9	02Jan2008, 06:40	11.26
RMBa	5.6919	1307.6	02Jan2008, 07:40	11.26
J100h	63.2688	11562.5	02Jan2008, 14:20	10.49
R100h	63.2688	11553.8	02Jan2008, 15:00	10.47
DB114a	0.6772	225.7	01Jan2008, 19:20	10.95
DB114b	0.4096	227.5	01Jan2008, 18:00	11.21
J114b	0.4096	227.5	01Jan2008, 18:00	11.21
R114b	0.4096	192	02Jan2008, 06:30	11.21
J114a	1.0868	329	02Jan2008, 04:50	11.05
R114a	1.0868	253	02Jan2008, 22:30	10.94
BB100a	0.8055	1031	01Jan2008, 16:50	12.11
BB100b	0.873	609.3	01Jan2008, 17:30	11.85
BB100c	0.2175	305.9	01Jan2008, 16:50	11.85
BB100d	1.2851	692.4	01Jan2008, 18:20	11.85
BB100e	1.2538	762.8	01Jan2008, 18:00	11.85
JBBd	2.5389	1454.3	01Jan2008, 18:10	11.85

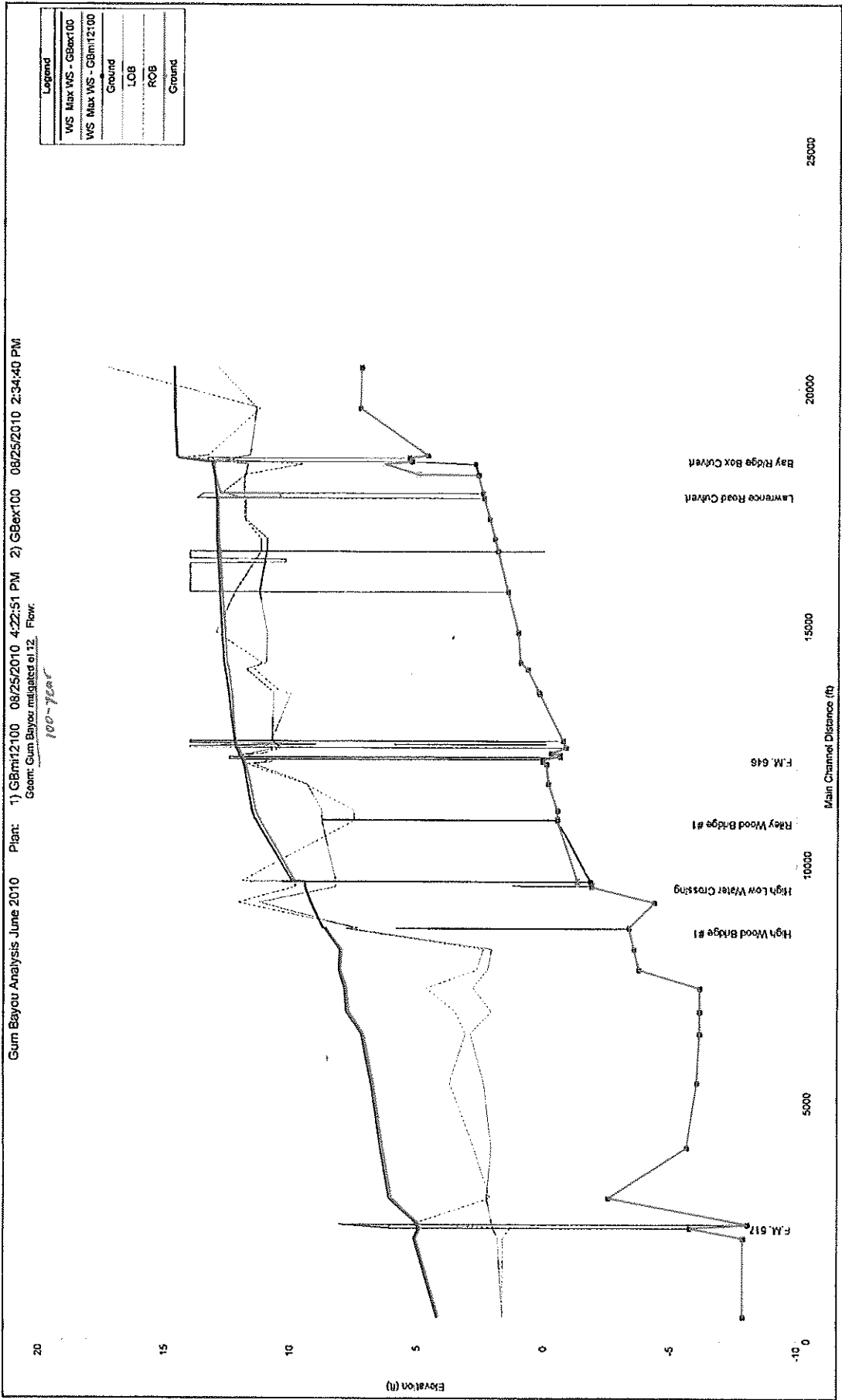
Appendix D
Dickinson Bayou HEC-HMS Output - 100-year Mitigated Conditions
Elevation 12 Scenario

Hydrologic Element	Drainage Area (mi2)	Peak Discharge (cfs)	Time of Peak	Volume (in)
RBBd	2.5389	1382.6	01Jan2008, 19:40	11.85
JBBc	2.7564	1547.3	01Jan2008, 19:10	11.85
RBBc	2.7564	1408.5	02Jan2008, 00:40	11.85
JBBb	3.6294	1768.5	01Jan2008, 22:30	11.85
RBBb	3.6294	1462.2	02Jan2008, 10:30	11.85
JBBa	4.4349	1579.9	01Jan2008, 17:00	11.9
RBBa	4.4349	1446.1	02Jan2008, 13:40	11.9
J100g	69.2256	13267	02Jan2008, 14:20	10.57
R100g	69.2256	13262.7	02Jan2008, 14:40	10.57
J100f	71.3589	13501.4	02Jan2008, 14:30	10.58
R100f	71.3589	13491.7	02Jan2008, 15:00	10.57
J100e	71.7608	13529.1	02Jan2008, 15:00	10.57
R100e	71.7608	13527.1	02Jan2008, 15:10	10.56
J100d	72.1863	13557.5	02Jan2008, 15:10	10.56
R100d	72.1863	13480.5	02Jan2008, 18:20	10.42
Gum Bayou	12.12	4783.7	01Jan2008, 21:40	12.15
DB100c	2.0856	464.9	01Jan2008, 21:30	10.21
J100c	86.3919	15072	02Jan2008, 06:00	10.66
R100c	86.3919	15051.2	02Jan2008, 09:40	10.53
DB100b1	2.4787	588.3	01Jan2008, 20:40	10.22
DB100b2	0.9668	344.8	01Jan2008, 19:20	11.04
J100b	89.8374	15594.8	02Jan2008, 08:50	10.52
R100b	89.8374	15592.4	02Jan2008, 10:20	10.47
DB118a	1.2724	424.2	01Jan2008, 19:40	10.95
DB118b	2.4501	686.6	01Jan2008, 19:50	10.63
DB118c	0.5656	255.6	01Jan2008, 18:40	11.31
J118c	0.5656	255.6	01Jan2008, 18:40	11.31
R118c	0.5656	223.1	02Jan2008, 02:30	11.29
J118b	3.0157	815	02Jan2008, 00:40	10.75
R118b	3.0157	730.5	02Jan2008, 10:40	10.73
J118a	4.2881	981	01Jan2008, 21:10	10.8
R118a	4.2881	877.5	03Jan2008, 11:40	10.53
J100a	94.1255	16128.1	02Jan2008, 10:40	10.48
R100a	94.1255	16120.4	02Jan2008, 12:20	10.38
DB100a	0.8551	248	01Jan2008, 19:50	10.79
Outlet	94.9806	16239.4	02Jan2008, 12:10	10.39

Gum Bayou Analysis June 2010 Plan: 1) GBm1210 08/25/2010 4:17:37 PM 2) GBex10 08/25/2010 2:24:49 PM
 Geom: Gum Bayou m1210.dwg Flow: 10 cfs

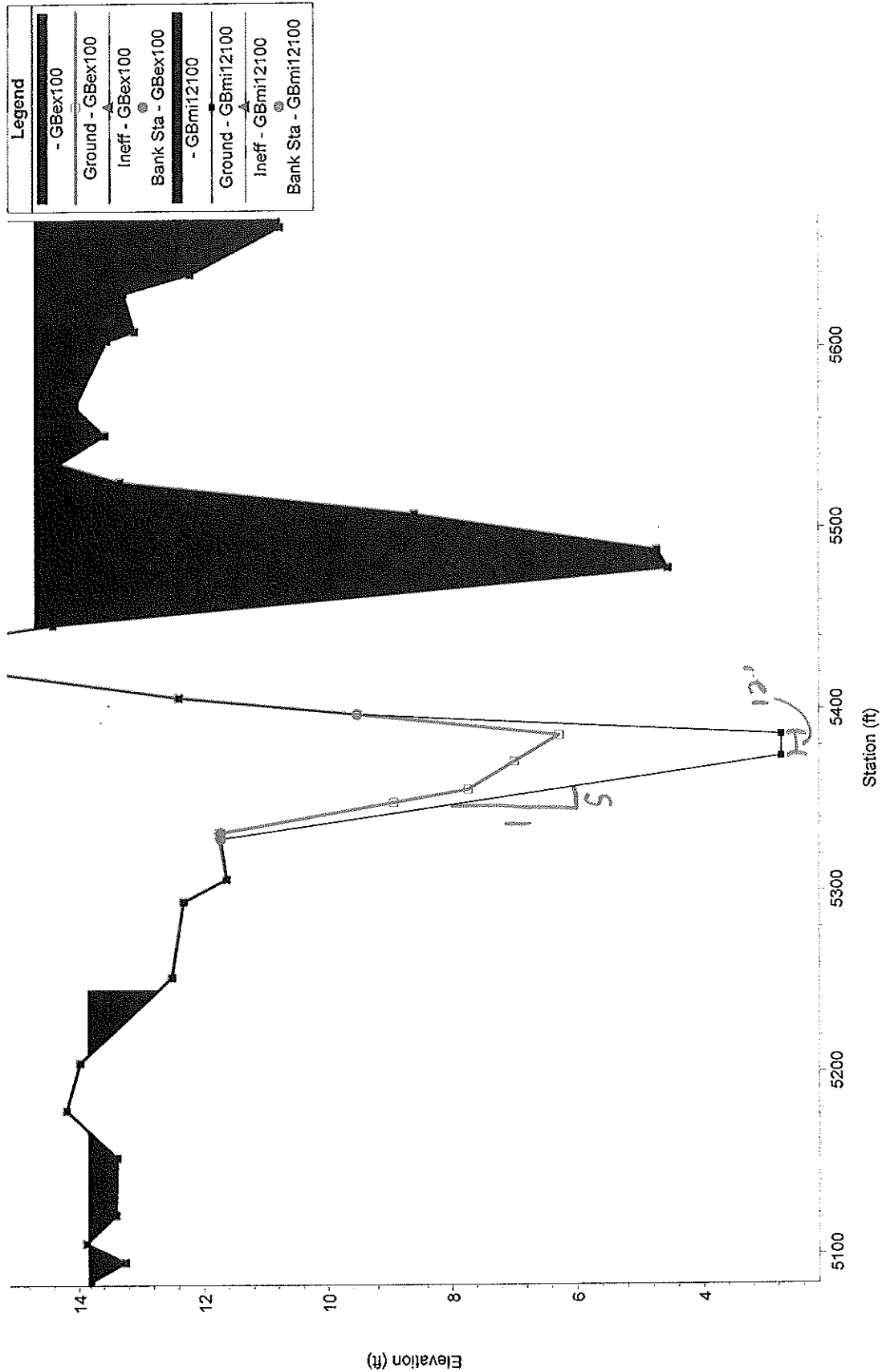
Legend	
WS Max WS - GBex10	
WS Max WS - GBm1210	
Ground	
LOS	
ROB	
Ground	





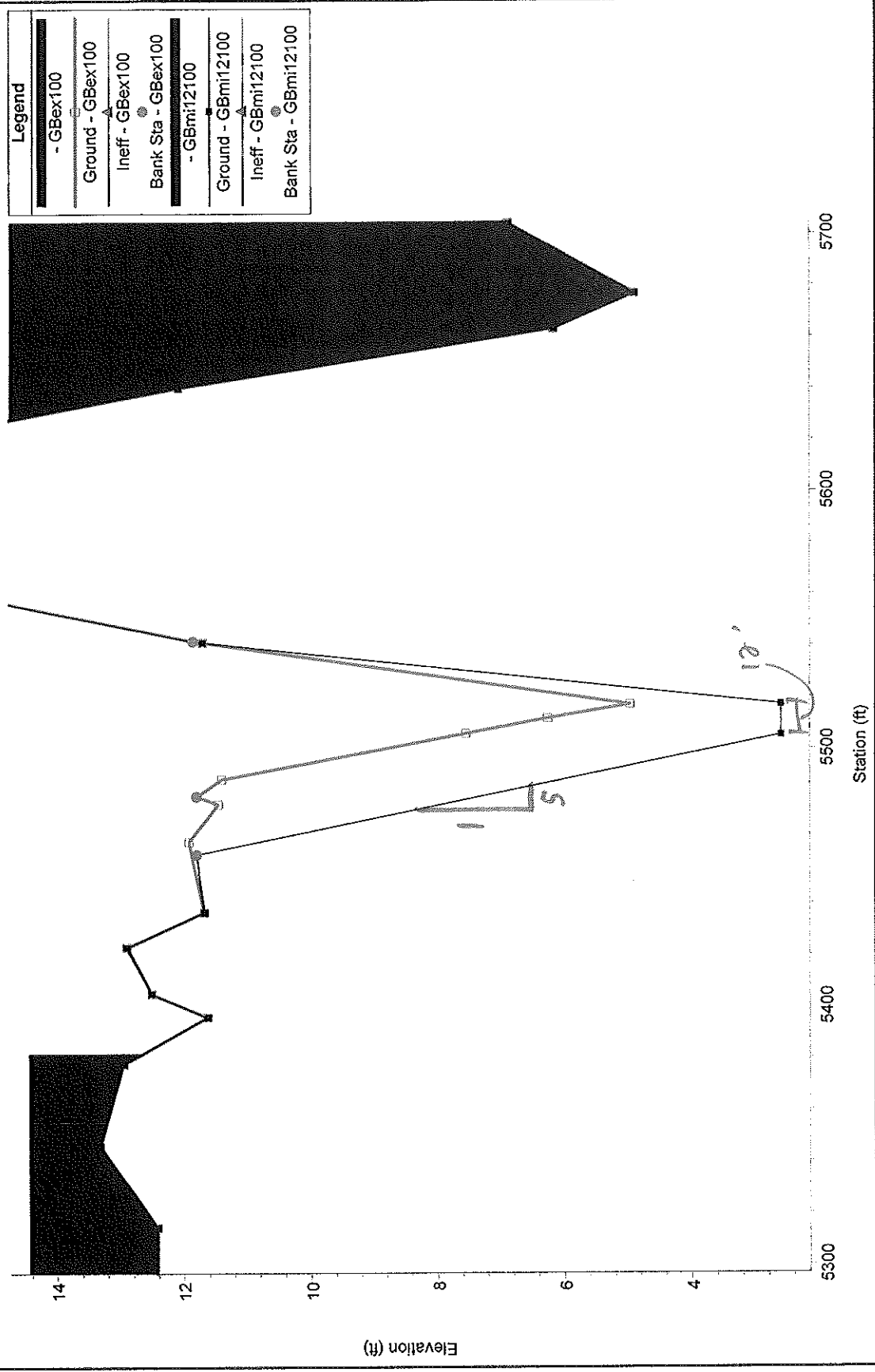
Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBex100 2:34:40 PM

Geom: Gum Bayou mitigated el 12 Flow:
River = Gum Bayou Reach = Upper RS = 19385.99



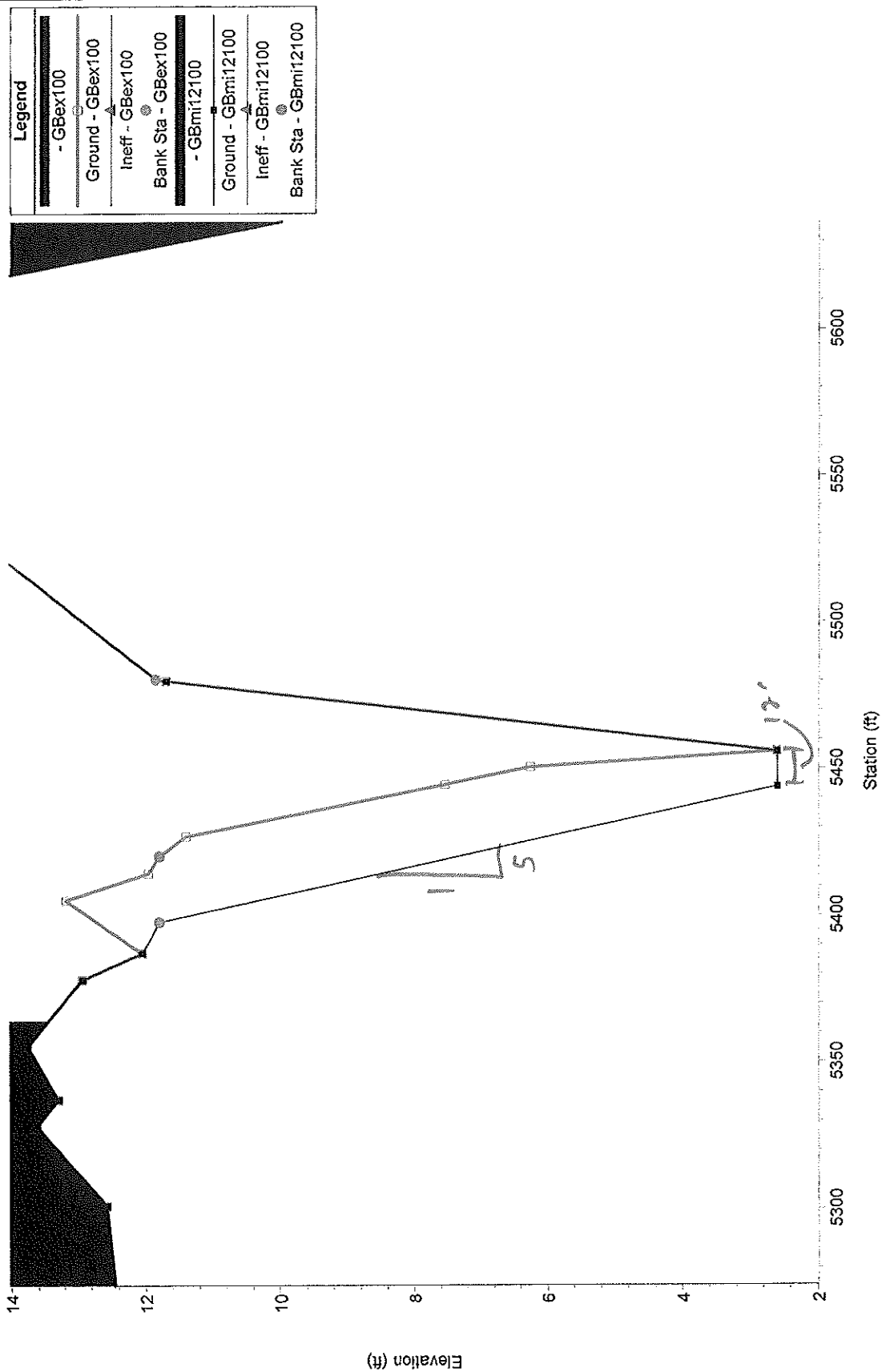
Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBex100 2:34:40 PM

Geom: Gum Bayou mitigated el 12 Flow:
River = Gum Bayou Reach = Upper RS = 19162.52



Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBEx100 2:34:40 PM

Geom: Gum Bayou mitigated el 12 Flow:
River = Gum Bayou Reach = Upper RS = 19152.51

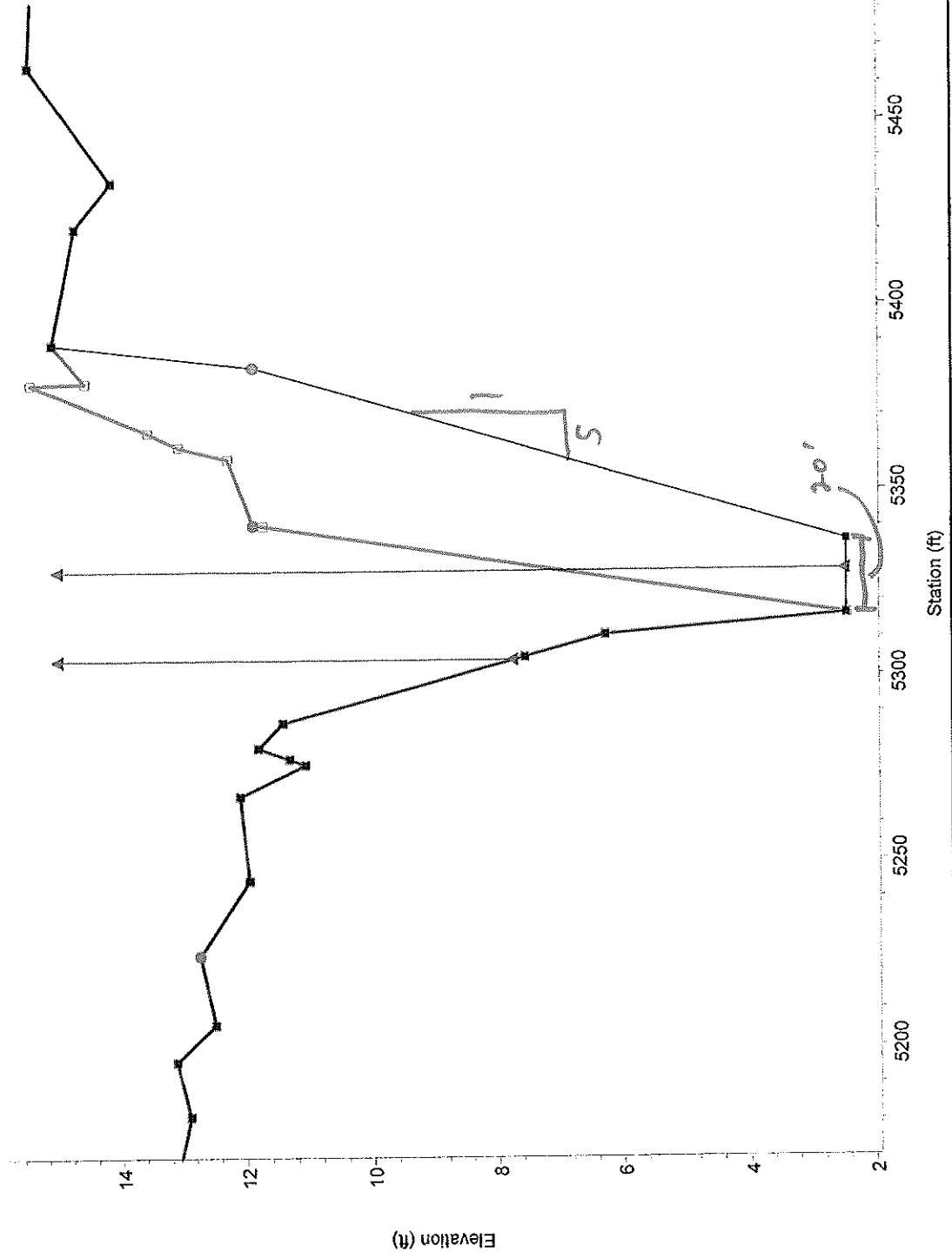


Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBEx100 2:34:40 PM

Geom: Gum Bayou mitigated el 12 Flow:

River = Gum Bayou Reach = Upper RS = 18769.25

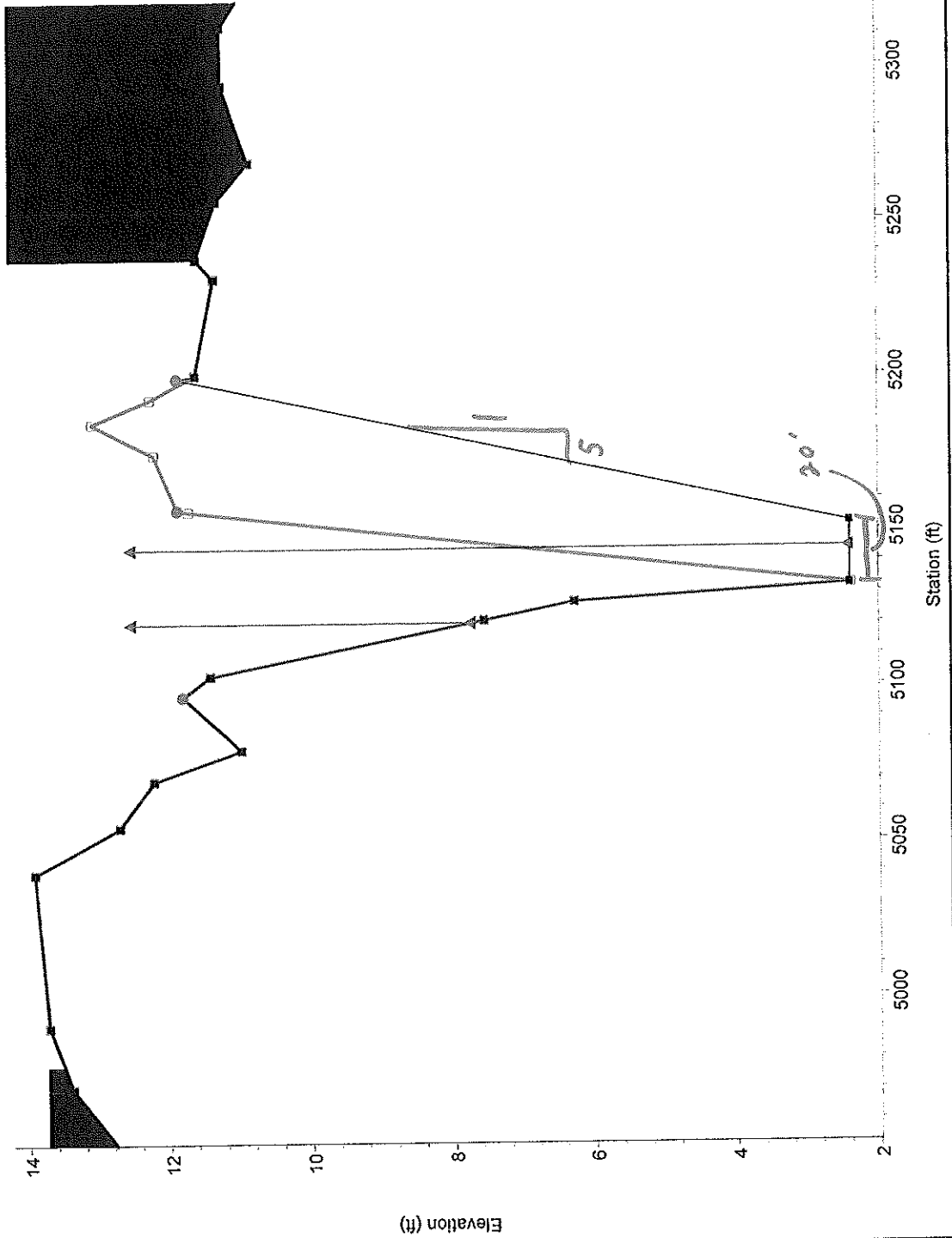
Legend	
	- GBEx100
	Ground - GBEx100
	Ineff - GBEx100
	Bank Sta - GBEx100
	- GBmi12100
	Ground - GBmi12100
	Ineff - GBmi12100
	Bank Sta - GBmi12100



Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBEx100 2:34:40 PM

Geom: Gum Bayou mitigated ei 12 Flow:
River = Gum Bayou Reach = Upper RS = 18668.74

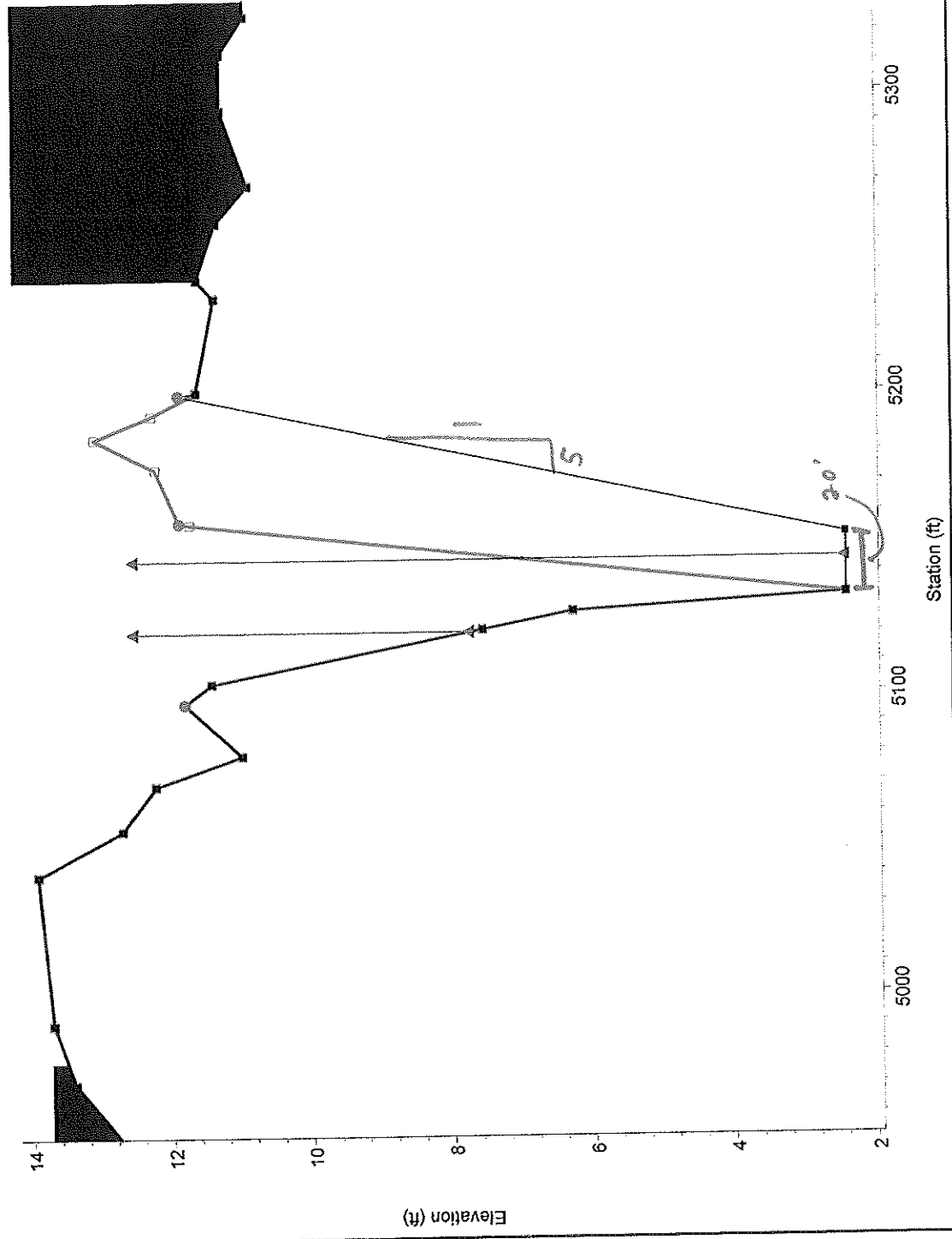
Legend	
	- GBEx100
	Ground - GBEx100
	Ineff - GBEx100
	Bank Sta - GBEx100
	- GBmi12100
	Ground - GBmi12100
	Ineff - GBmi12100
	Bank Sta - GBmi12100



Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBex100 2:34:40 PM

Geom: Gum Bayou mitigated el 12 Flow:
River = Gum Bayou Reach = Upper RS = 18658.74

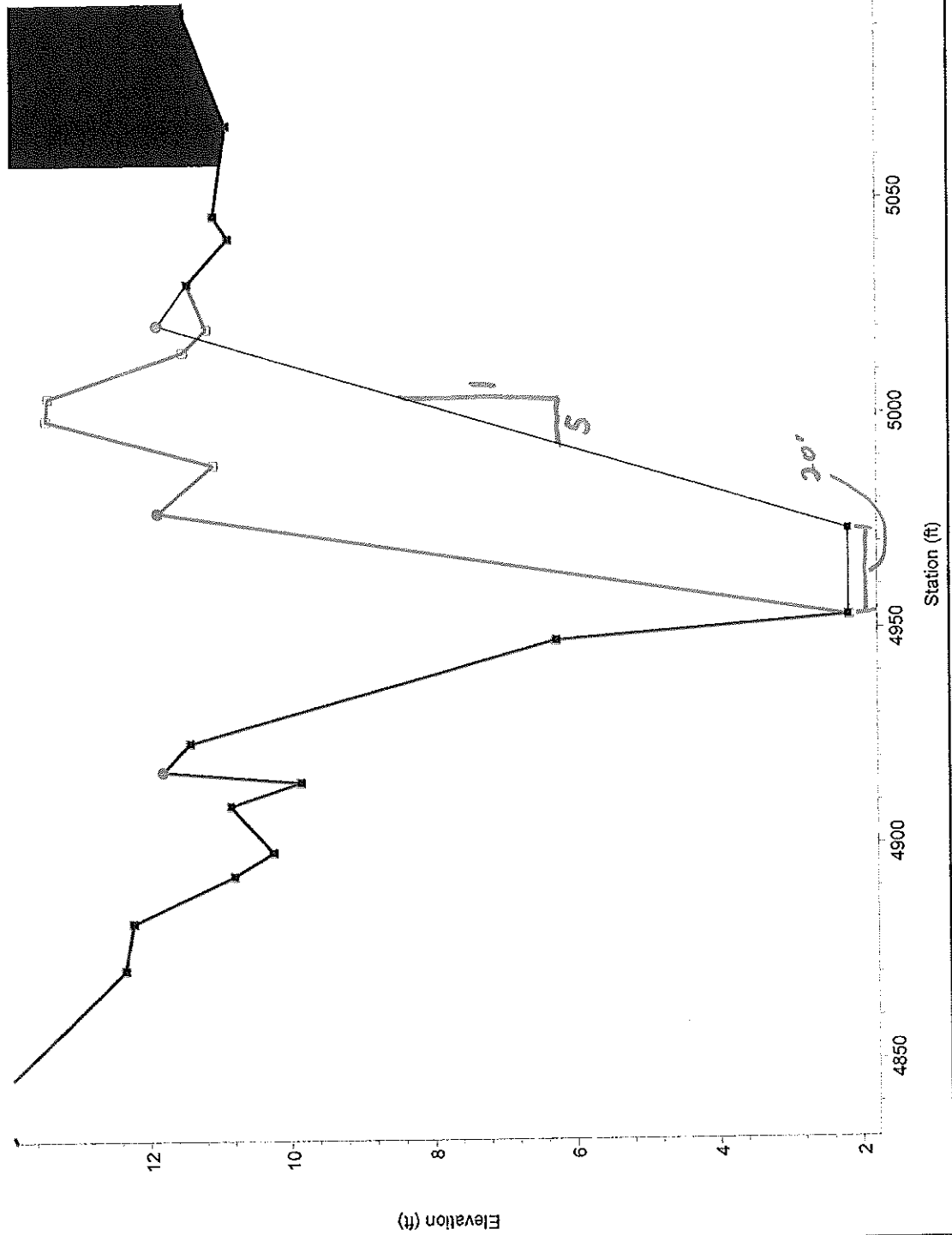
Legend	
	- GBex100
	Ground - GBex100
	Ineff - GBex100
	Bank Sta - GBex100
	- GBmi12100
	Ground - GBmi12100
	Ineff - GBmi12100
	Bank Sta - GBmi12100



Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBex100 2:34:40 PM

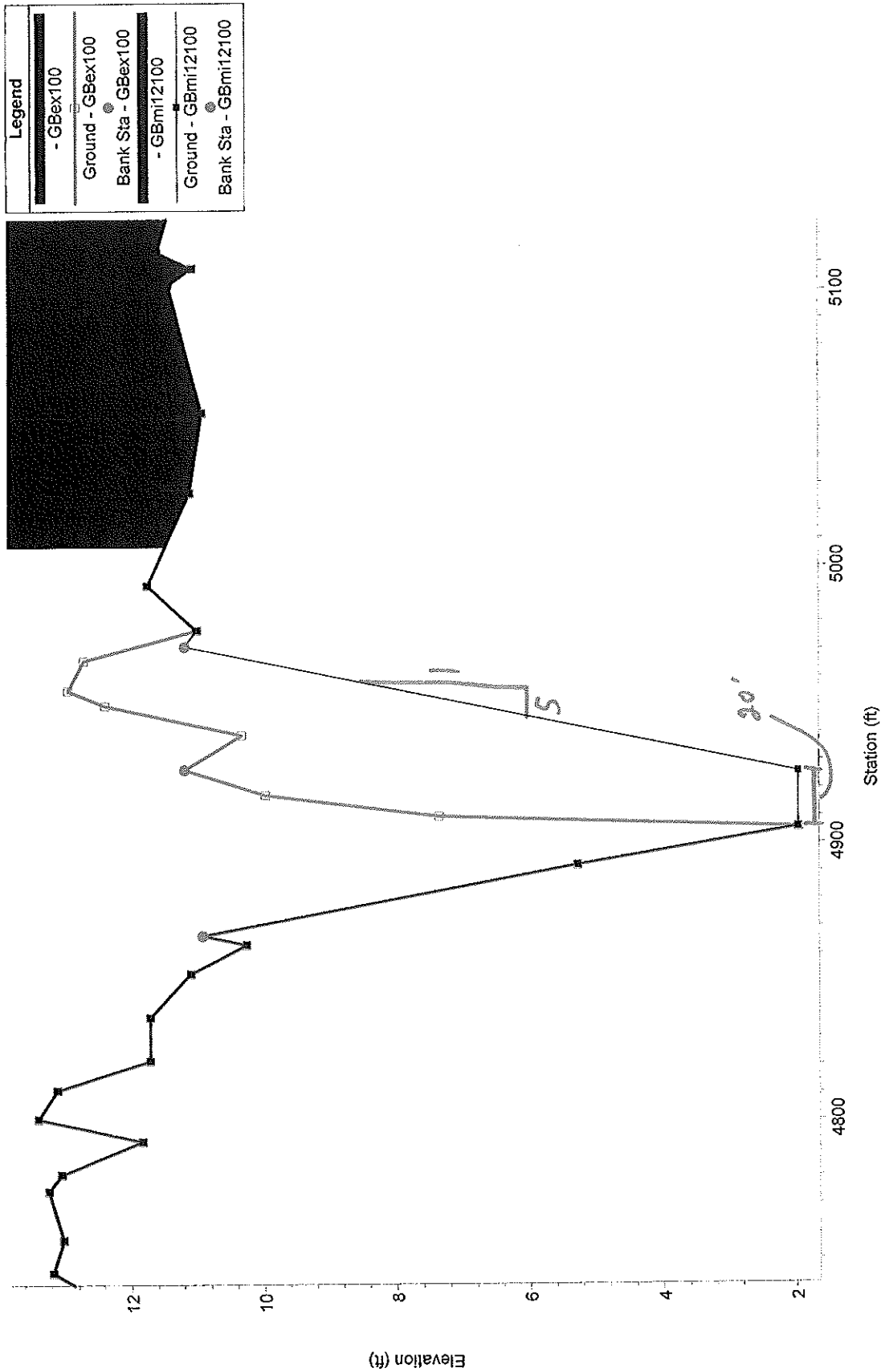
Geom: Gum Bayou mitigated el 12 Flow:
River = Gum Bayou Reach = Upper RS = 18222.95

Legend	
	- GBex100
	Ground - GBex100
	Bank Sta - GBex100
	- GBmi12100
	Ground - GBmi12100
	Bank Sta - GBmi12100



Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBex100 2:34:40 PM

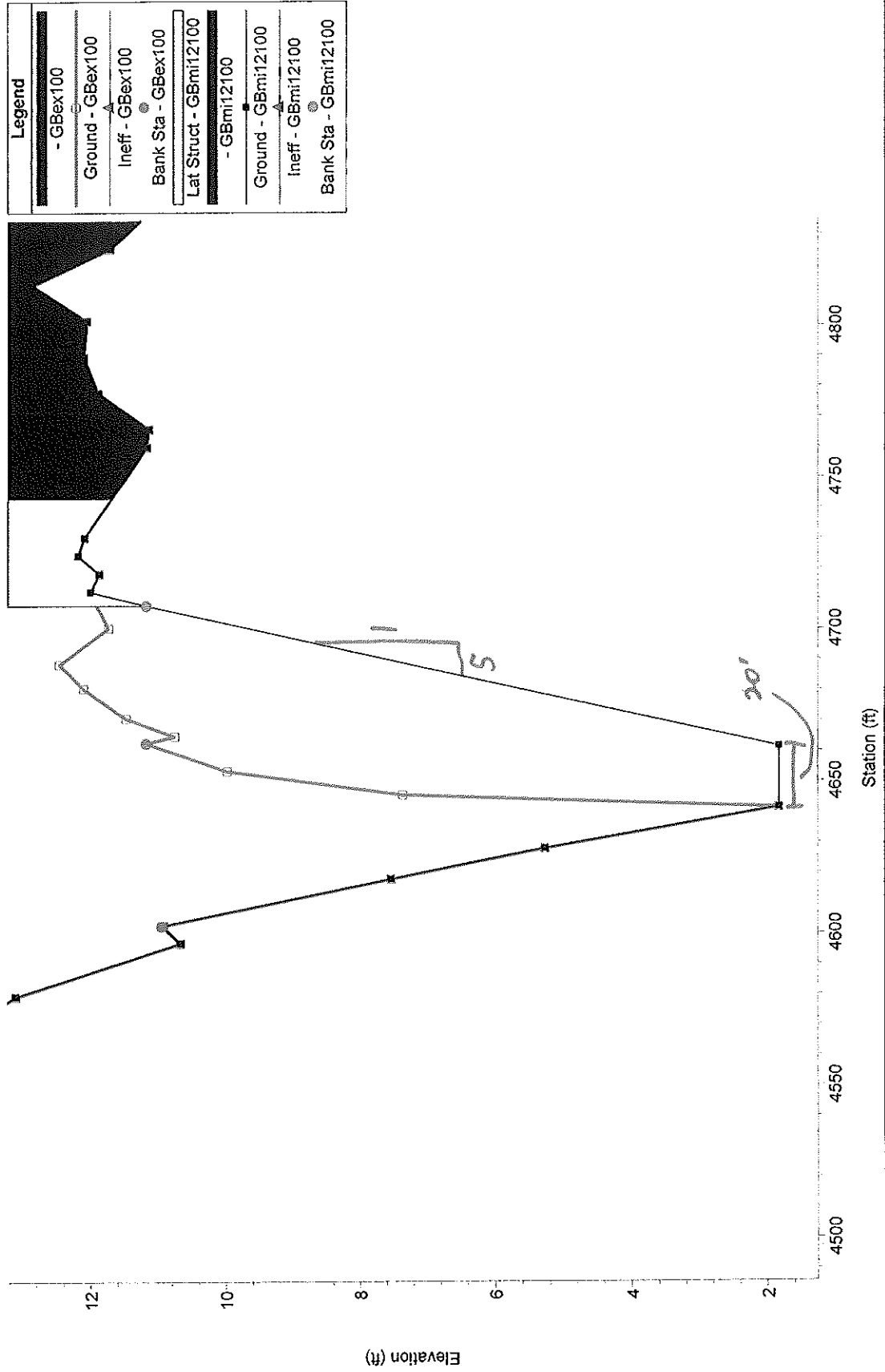
Geom: Gum Bayou mitigated el 12 Flow:
River = Gum Bayou Reach = Upper RS = 17805.33



Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBex100 2:34:40 PM

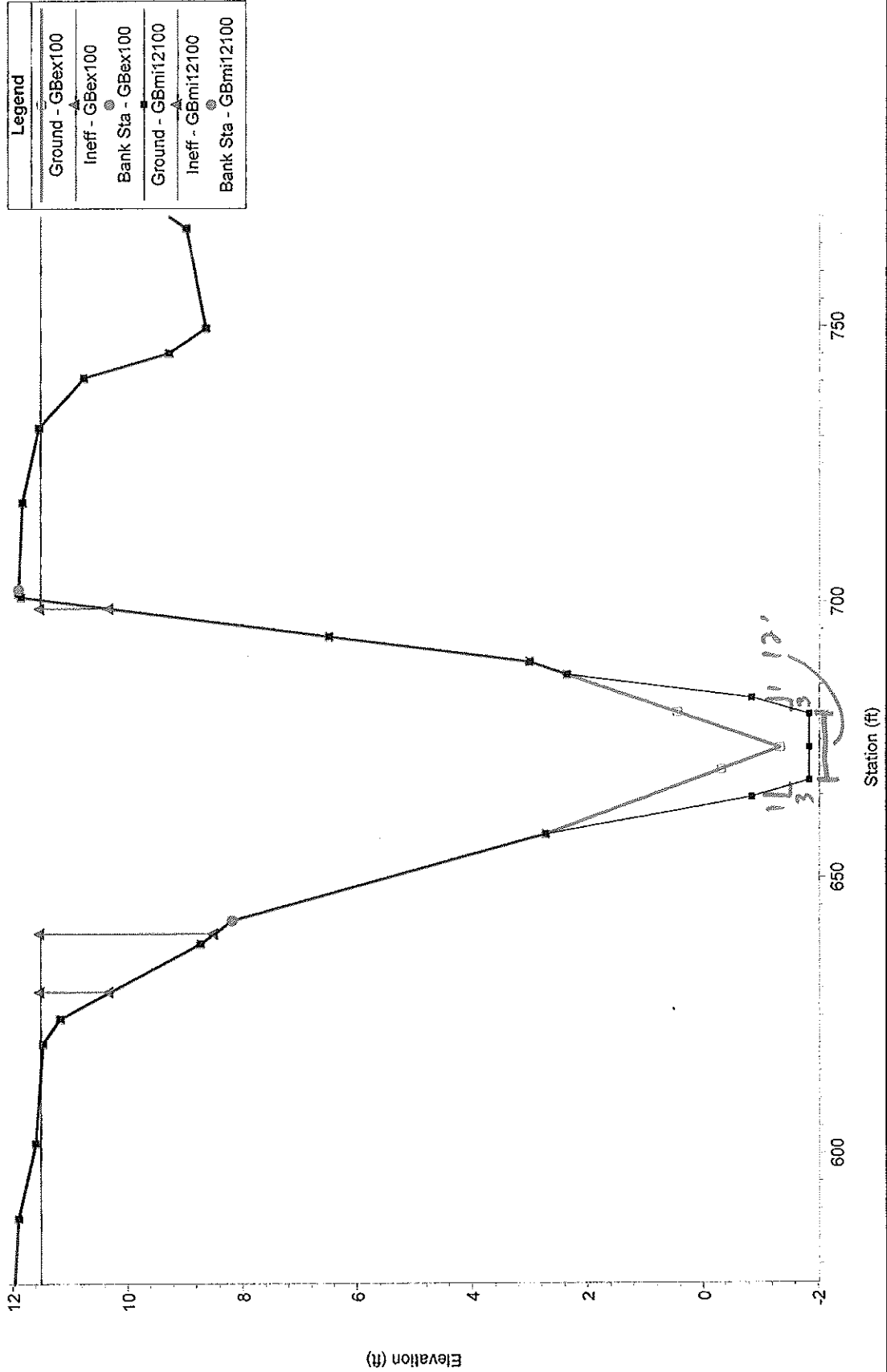
Geom: Gum Bayou mitigated el 12 Flow:

River = Gum Bayou Reach = Upper RS = 17549.89



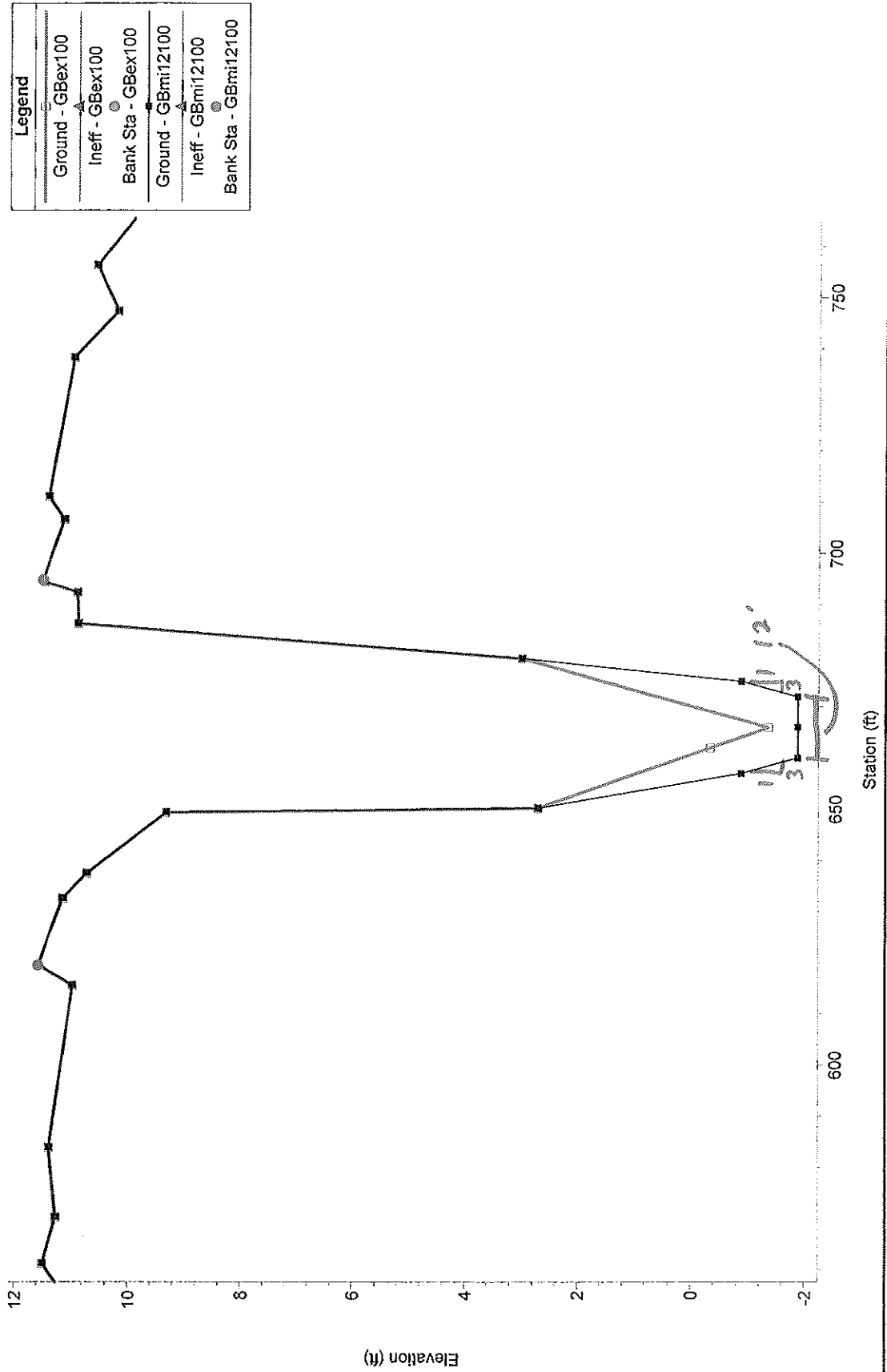
Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBex100 2:34:40 PM

Geom: Gum Bayou mitigated el 12 Flow:
River = Gum Bayou Reach = Upper RS = 10626.34



Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBex100 2:34:40 PM

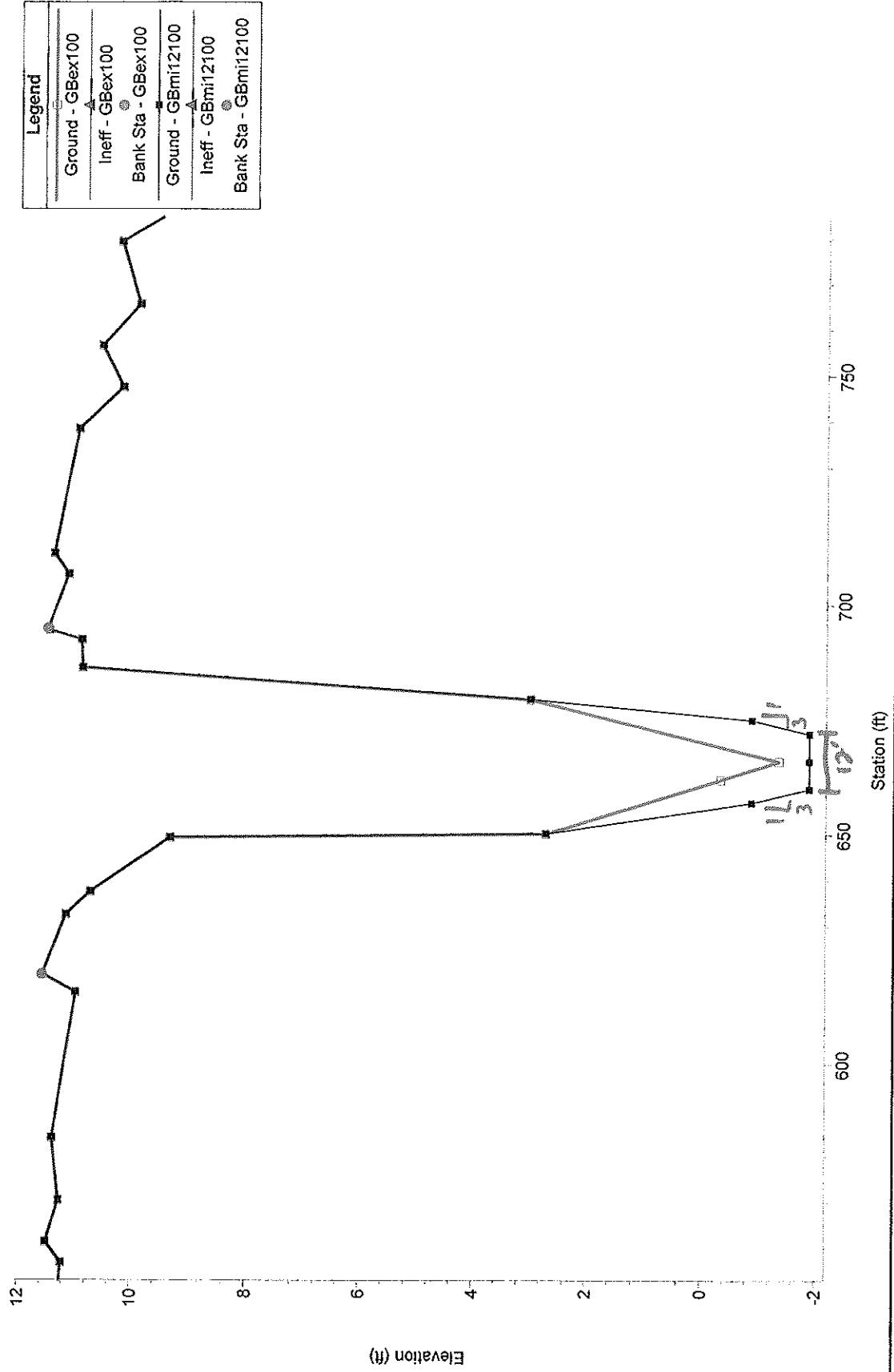
Geom: Gum Bayou mitigated el 12 Flow:
River = Gum Bayou Reach = Upper RS = 10608.35



Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBex100 2:34:40 PM

Geom: Gum Bayou mitigated el 12 Flow:

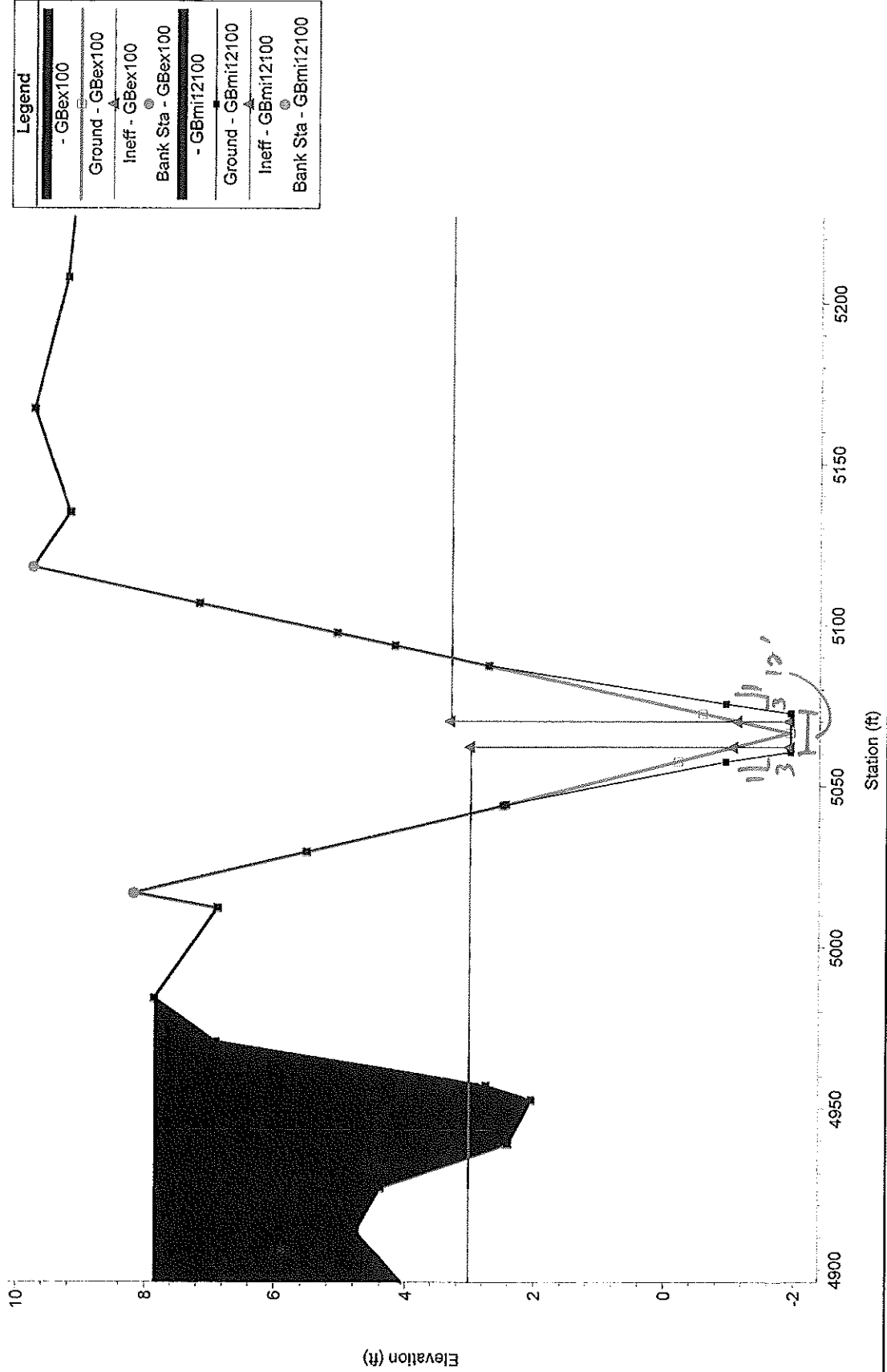
River = Gum Bayou Reach = Upper RS = 10598.35

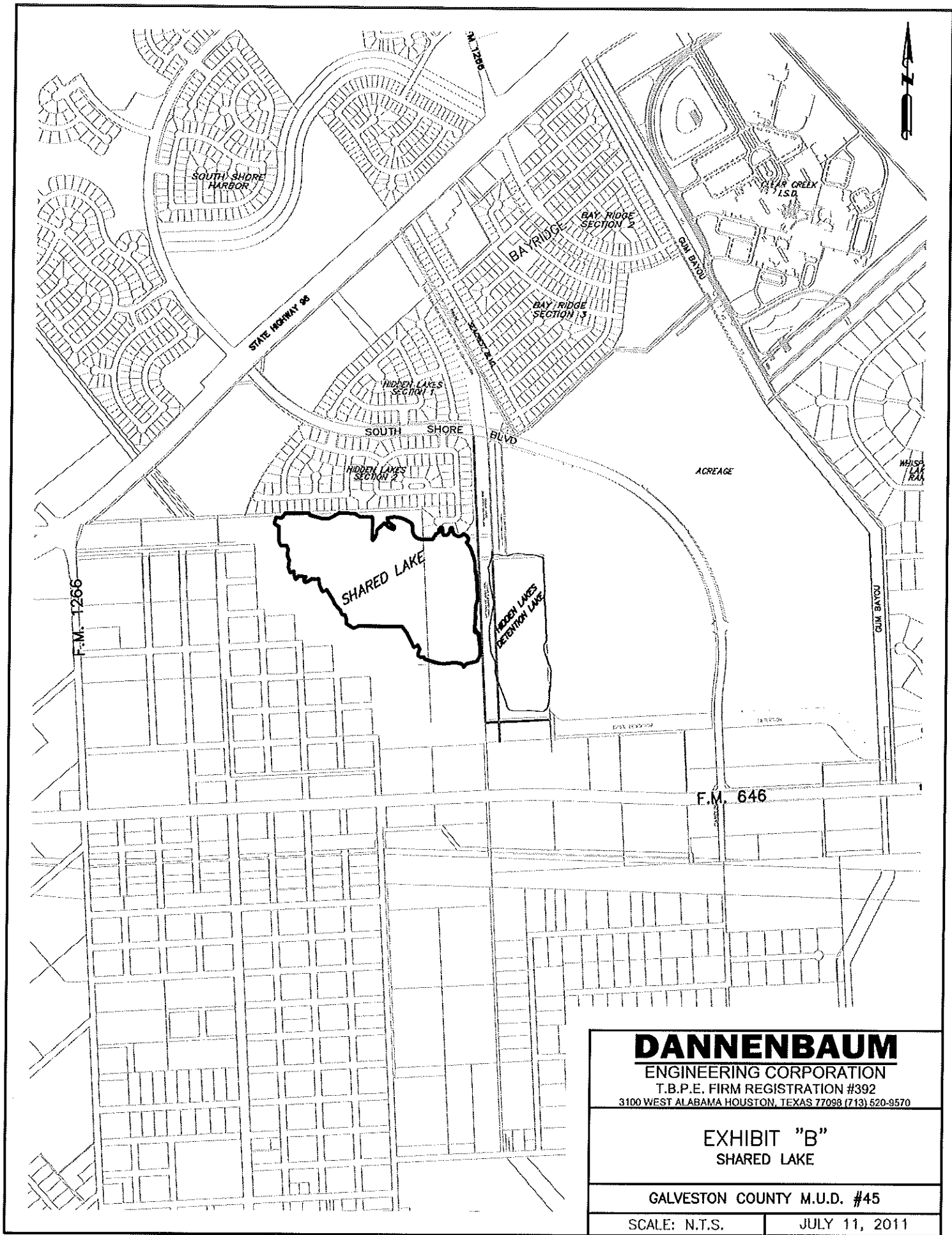


Gum Bayou Analysis June 2010 Plan: 1) GBmi12100 4:22:51 PM 2) GBex100 2:34:40 PM

Geom: Gum Bayou mitigated el 12 Flow:

River = Gum Bayou Reach = Lower RS = 9568.148





DANNENBAUM

ENGINEERING CORPORATION

T.B.P.E. FIRM REGISTRATION #392

3100 WEST ALABAMA HOUSTON, TEXAS 77098 (713) 520-9570

EXHIBIT "B"
SHARED LAKE

GALVESTON COUNTY M.U.D. #45

SCALE: N.T.S.

JULY 11, 2011