

# Lake Columbia Downstream Impacts Analysis

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Prepared for  
**Angelina and Neches  
River Authority and  
Texas Water  
Development Board**

ANR01289



**Freese and Nichols, Inc.**

4055 International Plaza, Suite 200  
Fort Worth, TX 76109  
Phone – (817) 735-7300  
Fax – (817) 735-7491



**ANGELINA AND NECHES RIVER AUTHORITY AND  
TEXAS WATER DEVELOPMENT BOARD**

**LAKE COLUMBIA**

**DOWNSTREAM IMPACTS ANALYSIS**

**SEPTEMBER 2005**

PREPARED BY



ANR01289



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## **1.0 INTRODUCTION**

### **1.1 Background**

The Angelina and Neches River Authority (ANRA) entered into an agreement with the Texas Water Development Board (TWDB) in March 2001 for a matching grant to conduct planning studies for the proposed Lake Columbia water supply project (TWDB Contract No. 2001-483-385) which was known then as Lake Eastex. Public coordination meetings were held in Jacksonville, Texas, in March and September 2001, and September 2002 during preparation of the planning studies report. A meeting was held at a special session of the ANRA Board of Directors in Lufkin on March 12, 2003, to present a summary of the draft planning studies report. In addition, ANRA provided periodic updates of the ongoing planning studies on its project web site, <http://www.lakeeastex.org>, as well as opportunity for visitors of the web site to provide comments on the planning studies and other aspects of the Lake Columbia project.

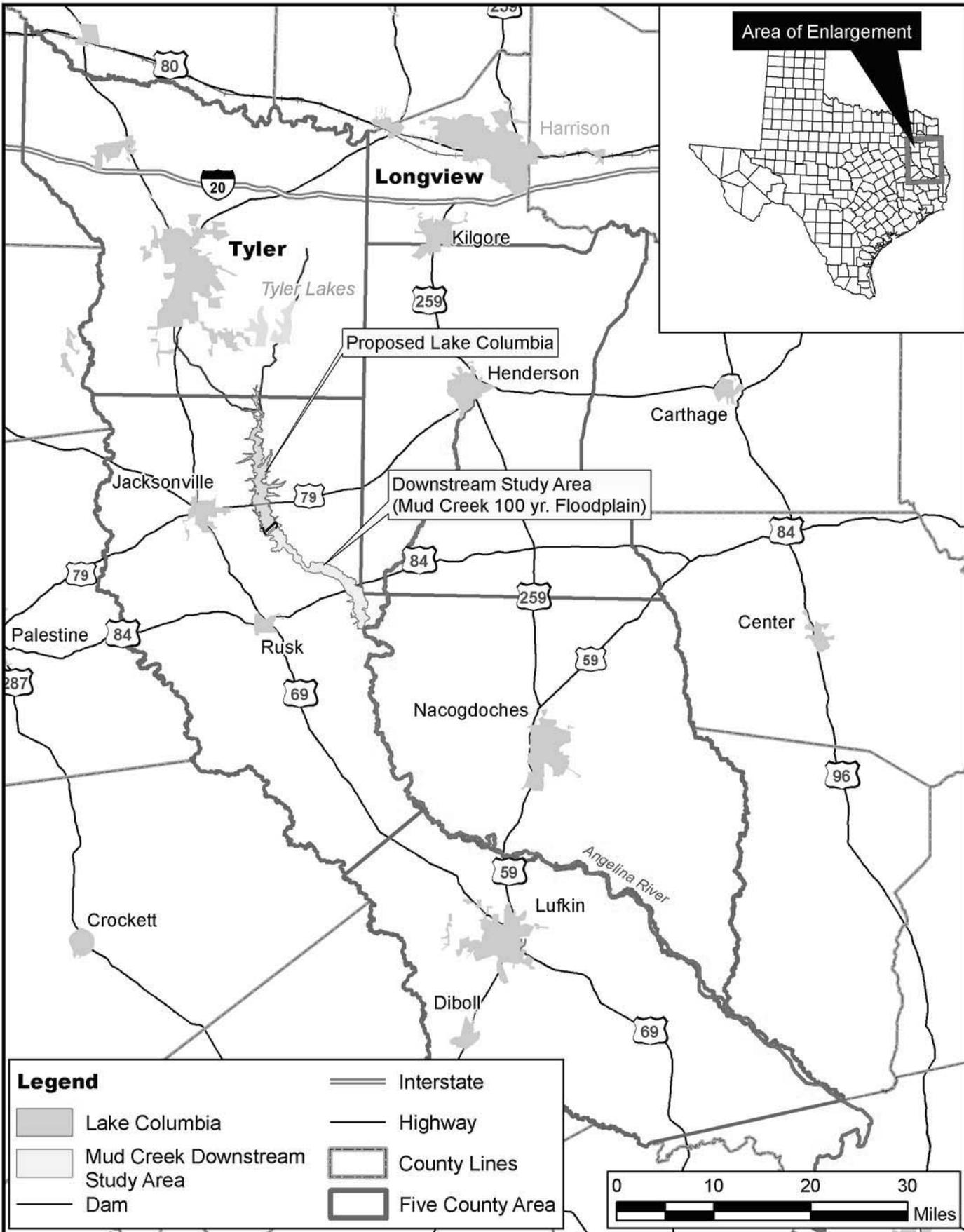
The final planning studies report (Freese and Nichols, 2003), which focused on the reservoir pool and immediate vicinity of the dam, was completed in May 2003.

The current study was spawned by inquiries of resource agency staff, including the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, Texas Commission on Environmental Quality, and Texas Parks and Wildlife, who participated in the 2001-2003 planning studies effort. They expressed questions about the area of potential effects of Lake Columbia on the stream corridor downstream of the proposed lake. Recognizing this as an important issue from a planning perspective, the ANRA proposed an amendment to the TWDB to add a study to define the area of potential downstream effects to the existing TWDB matching grant. Consequently, the Planning Studies contract between that ANRA and TWDB was modified in April 2003 to include the downstream impacts study. The ANRA contracted with Freese and Nichols, Inc. (FNI) in April 2003 to assist with the downstream study.

### **1.2 Purpose**

The primary purpose of the Lake Columbia Downstream Impacts Study was to identify the potential downstream area of effect in the Mud Creek floodplain based on expected reservoir operation conditions. The limits of the study area was defined as the existing 100-year floodplain of Mud Creek between the proposed dam site and the confluence with the Angelina River, although hydraulic modeling included a portion of the Angelina River upstream and downstream of the confluence in order to make the Mud Creek backwater model behave appropriately. Figure 1.1 shows the location of the study area.

Study components included 1) review of literature on downstream impacts of reservoirs, 2) computer simulation of reservoir operation, 3) hydraulic and hydrologic computer modeling to compare Mud Creek floodplain boundaries with and without the proposed reservoir, 4) delineation of land cover types in the area of effect using remotely sensed data, and 5) preliminary evaluation of impacts on selected natural resources. The study was intended to provide boundaries defining the limits of the area of potential changes in floodplain areas and a macro-scale evaluation of potential downstream impacts due to the proposed Lake Columbia.





**References**

Freese and Nichols, Inc. 2003. Lake Eastex Planning Studies Report. Prepared for Angelina and Neches River Authority and the Texas Water Development Board. Fort Worth, Texas.



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## **2.0 LITERATURE REVIEW**

The objective of the current study was to sample the large body of scientific literature pertaining to the downstream effects of dams with an emphasis on finding studies similar to Lake Columbia in terms of physiographic setting and operation. Downstream impacts of reservoirs having different operating characteristics and located in vastly different geographic regions may not be comparable with respect to type or magnitude of effect. Therefore, a primary objective of the literature survey was to identify downstream impacts studies for reservoirs similar in operation and geographic location to the proposed Lake Columbia.

The literature search yielded nearly 300 titles that were reviewed for this study. These included studies that related specifically to the hydrologic, morphologic, and ecologic downstream effects of dams (e.g., Gergel, 2002; Bergkamp et al. 2000; and Ligon et al., 1995; Hodges and Switzer, 1979; Light et al., 2002; and Trayler, 2000), as well as other papers describing floodplain ecology but not necessarily the impacts of dams (e.g., Batzer and Wissinger, 1996; and Guo et al., 1998). The list of publications reviewed is presented at the end of this section. Key papers are cited in the following discussion.

### **2.1 Common Downstream Effects of Dams**

The effects of dams on rivers have been studied extensively in the United States and elsewhere over the past several decades as dam construction has proliferated to meet the demands for flood control, water supply, hydroelectric power, irrigation, and other uses, and as awareness and interest in the environmental impacts of dams has increased in recent years.

In general, the downstream effects of any given dam may be reflected in several of the following ways:

- Changes in downstream hydrology
  - instream flows
  - flood regimes
  - seasonal flows
  - total flows
  - short-term fluctuations in flows
  - extreme high and low flows.
  - reduced overbank flooding
- Changes in downstream morphology
  - reduced size of active floodplain
  - reduced flood peaks and frequency
  - increased erosion
- Changes in downstream water quality
- Reduction in riverine/riparian/floodplain habitat diversity
  - riparian vegetation sensitive to minimum and maximum flows

- Changes in physical and biological processes
- Groundwater recharge

The magnitude of these changes, and indeed whether some of these effects occur at all, depends on the type of dam, how it is operated, and where it is located.

The Lake Columbia dam was described in the initial phase of the current planning study grant (Freese and Nichols, 2003). As noted, the dam will be a rolled earth fill embankment with a maximum height of 67 feet and a length of 6,880 feet. The outlet works will consist of two 48-inch conduits for intended releases. The dam will have an uncontrolled service spillway with a crest elevation of 315 feet National Geodetic Vertical Datum (NGVD) and an emergency spillway with a crest elevation of 324 feet NGVD. The reservoir is not designed for flood control. Thus, all inflows into Lake Columbia when the water surface elevation is at or above the conservation pool level (i.e., 315 feet NGVD), will spill downstream through the service and emergency spillways.

Many researchers have emphasized the difficulty of identifying or predicting the changes that a dam might have on the downstream corridor (Phillips, 2003). In a comprehensive study of the downstream effects of dams in the U.S., Williams and Wolman (1984) noted several common trends between 21 study sites:

“(1) Frequent occurrence of major changes right after dam closure; (2) appearance in many cases of the greatest change just downstream from the dam with progressive decrease or recovery downstream; (3) progressive change toward an apparent new stability at a site in the years after dam closure; (4) continuous or non-reversible character of the change at many locations; and (5) diversity of climatic and physiographic regions in which the [channel change] process has been observed.”

They also pointed out that the geologic record indicates that small changes in climatic factors can produce significant changes in channel morphology, and that these and other natural influences may mask the effects on channel morphology and vegetation that can be attributed solely to the effect of a given dam. As they noted, “some of the [observed] channel changes might well have occurred during the period of observation even in the absence of human interference” (Williams and Wolman, 1984), i.e., dam construction.

## **2.2 Effects on Hydrology, Sediment Transport, and Riparian Vegetation**

Streams are dynamic systems that reflect the effects of all the forces acting upon them, including climatic, geologic and human influences. If these forces remain constant for a relatively long period, a stream may reach a state of so-called dynamic equilibrium, where the channel morphology (e.g., width, depth, and sinuosity) becomes relatively constant.

The primary undisputed downstream impacts of a dam are on the hydrology and sediment transport of a stream (Brandt, 2000; Williams and Wolman, 1984 and others). A particular dam's impact depends on many site-specific factors, such as the dam's structure and operation, local hydrology, basin sediment characteristics, geomorphic constraints, climate, and attributes of the local biota (Bergkamp et al, 2000). A gated spillway dam operated for flood control by capturing peak flows and releasing the stored water gradually affects the hydrology differently than a non-gated dam with a passive spillway operated for water supply or recreation. Both dams will tend to reduce peak flows, but the gradual release of flood waters from the gated structure will prolong and possibly increase baseflow downstream, as observed in studies of Yegua Creek below Somerville Dam in the Brazos River basin, Texas (Chin et al., 2002). Dams built for hydroelectric power generation also may dampen peaks and result in highly variable daily flows, but they might not reduce annual discharge significantly (Jennings, 1999).

Dams alter sediment cycling in rivers by intercepting large masses of sediment that otherwise would be transported downstream (Nilsson and Berggren, 2000). The sediment removal efficiency of large dams often exceeds 99 percent (Williams and Wolman, 1984). The enhanced sediment carrying capacity of water discharged from a reservoir is typically evident by a scoured channel downstream of the dam, though the length of this effect varies greatly among streams and is dependent on the distance required for the stream to recover its pre-dam sediment loads or concentrations. Sediment sources downstream of the dam include the channel bed and banks and tributary inflows.

In a sediment transport study on Loco Bayou downstream of Lake Nacogdoches, Phillips (2001) concluded that, while the channel immediately below Loco Dam had experienced a net loss of sediment, the dam had no effect on sediment supplies at a study site approximately 10 miles downstream. The principal source of sediment at this location was believed to be contributed by erosion from the 14-square mile watershed between the dam and the study site. Furthermore, he observed no evidence of a significant change in channel or floodplain morphology, no reduction in alluvial sedimentation, nor did he find any other indication of a reduction in fluvial sediment supply at the study site 10 miles downstream.

Phillips (2001) raised the question of whether or not sediment from the upper basin was being transported to the lower basin prior to dam construction. He noted that a *decoupling* effect has been demonstrated in some larger basins whereby very little sediment actually migrated from the upper basin to the lower basin and speculated that this might be the case for Loco Bayou. Once a stream reaches its sediment carrying capacity, it is said to be *transport limited*, meaning that more sediment is available than the stream is able to carry. Therefore, any additional sediment input will result in deposition on the stream bed. Streams that have the capacity to transport additional sediment are classified as *sediment limited*.

Trush and McBain (2000) suggest that a river system's foundation is the interaction of flowing water, sediment and riparian vegetation. Chin et al. (2002) and Jennings (1999) studied the effects of Somerville Dam, a flood control dam with a gated spillway, on the hydrology, channel capacity, and floodplain vegetation of Yegua Creek, the boundary between Washington and Burleson counties, Texas. Chin et al. found that channel capacity in the 12-mile reach downstream of Somerville Dam had decreased by an average of 65 percent in 34 years following dam closure. The loss of capacity was attributed primarily to an average depth reduction of 61 percent, indicating sediment deposition due to transport limitation, with a decrease in average width of only 9 percent. The reduction in capacity corresponded to an 85 percent reduction in annual flood peaks. Jennings (1999) reported that riparian vegetation had increased in proximity to the Yegua Creek channel. This change was attributed to the change in hydrologic regime due to operation of the dam. The reduction of peak flows and increased availability of water through summer and early fall apparently provided favorable conditions for survival of seedlings in the riparian zone that, under pre-dam conditions, were lost to flooding or drought.

Chang and Crowley (1997) reported similar results from a study of the downstream effects of Sam Rayburn Dam on streamflow and vegetation in the Angelina River floodplain in East Texas. Sam Rayburn Reservoir is operated by the U.S. Army Corps of Engineers and was authorized by Congress in 1955 for the purposes of flood control, hydroelectric power generation, and conservation of water for municipal, industrial, agricultural, and recreational uses. The dam was originally completed in 1965 and modified in 1996, and includes two 18 feet by 26 feet power conduits and two 10 feet by 20 feet flood control gates through which water is released from the lake. The study compared streamflow and vegetation characteristics between study areas immediately downstream of the reservoir and a relatively undisturbed area along the Neches River approximately 12 miles to the west. The findings indicated that annual streamflow below the dam was not affected, but that flood peaks were lower and flow was higher in the summer months due to reservoir operation. Vegetation comparisons, including woody and herbaceous species in all strata of the forest stands at each site, indicated that the site downstream of the dam had greater species diversity, richness, and evenness. They concluded that reduced flooding and moderation of streamflow variation below the dam made the area a more diverse and stable ecosystem than the Neches River site (Chang and Crowley, 1997).

Conner et al. (1981) concluded that hydrology is the overriding factor controlling recruitment and survival of bottomland hardwood seedlings in their comparison of the effects of different flooding regimes on vegetative composition of three swamp sites in Louisiana. Theriot (1993) studied the relationship between relatively undisturbed bottomland forest species associations and their topographic position in floodplains of the southeastern United States. The study results supported the generally agreed notion that flooding is the dominant environmental factor influencing the makeup of bottomland

forests, due to its effects on regeneration success and soil saturation. Individual species were shown to have flood tolerance levels that reflected the species' optimum position along the hydrologic gradient in the bottomland forest.

Species associations of southern bottomland hardwoods described by Hodges and Switzer (1979) provide an indication of the potential shift in species composition that might be expected at the affected floodplain margins over time (Table 2.1). At the edges of the floodplain where the frequency of flooding might decrease after dam closure, there could be a shift in species composition to a slightly drier assemblage. In humid East Texas, such a shift in composition likely would occur gradually over a long period of time unless a disturbance such as logging or wildfire caused an opening in the existing stand and vegetation was allowed to regenerate unmanaged. Theriot (1993) observed that while established trees in relatively undisturbed areas served as reliable indicators for identifying hydrologic zones within a floodplain, such trees may remain for decades following hydrologic alteration. This is in contrast to the more immediate effects expected in water scarce semi-arid or sub-arctic regions where flood hydrology is typically more important for watering, fertilizing, cleaning, and sowing the land (Nilsson and Berggren, 2000).

**Table 2.1 Representative associations of southern bottomland hardwood species based on topographic position relative to minor streams in the southeastern U.S.**

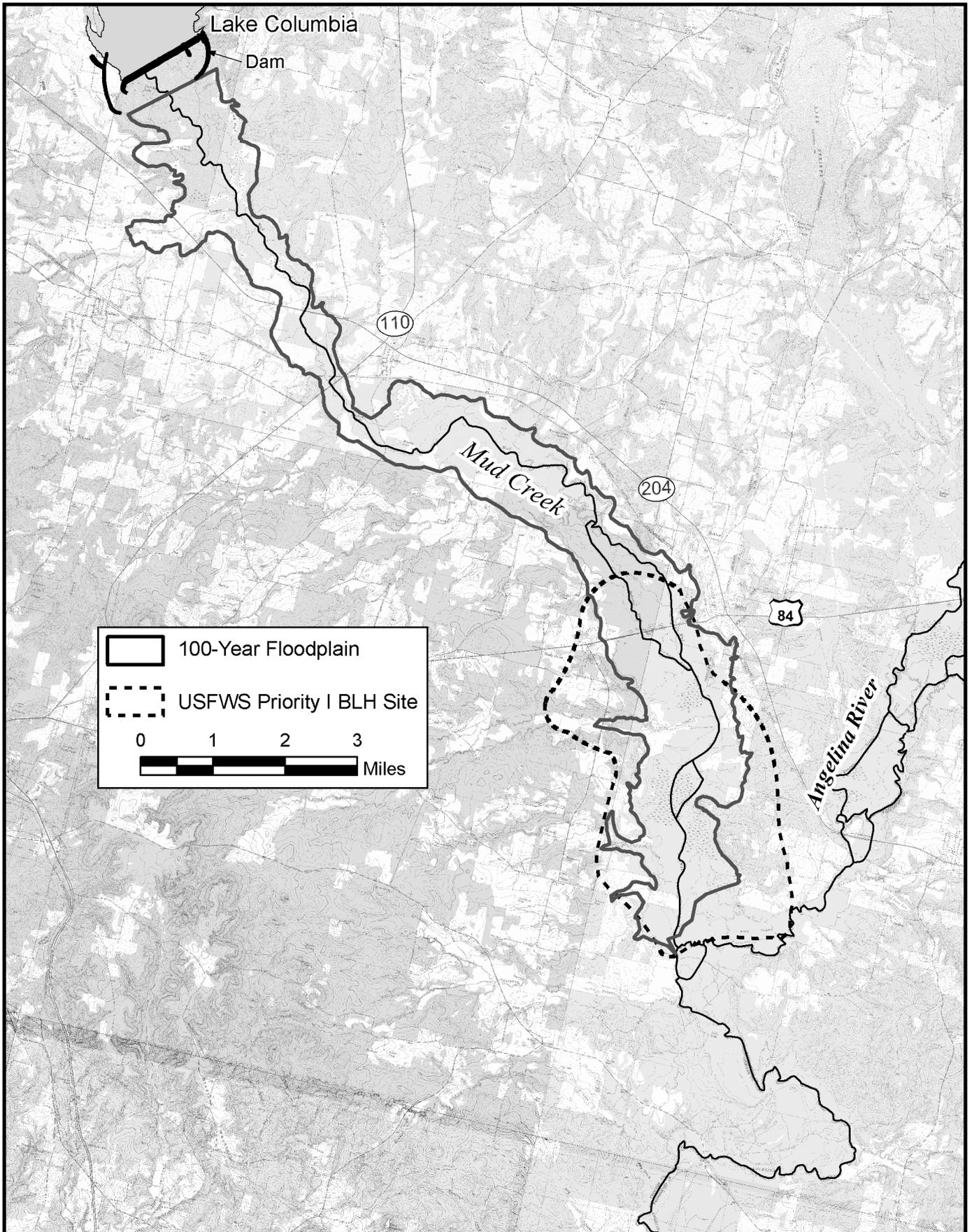
<b>Wetter Flats in Floodplains of Minor Streams</b>	<b>Drier Floodplain Zones of Minor Streams</b>	<b>Adjacent Terraces of Minor Streams</b>
overcup oak ( <i>Q. lyrata</i> ), willow oak ( <i>Q. phellos</i> ), and possibly Nuttall oak ( <i>Q. nuttallii</i> )	sweetgum ( <i>Liquidambar styraciflua</i> ), cherrybark oak ( <i>Quercus falcata</i> var. <i>pagodifolia</i> ), water oak ( <i>Q. nigra</i> ), swamp chestnut oak ( <i>Q. michauxii</i> ), blackgum ( <i>Nyssa sylvatica</i> ), winged elm ( <i>Ulmus alata</i> ), and hickories ( <i>Carya</i> spp.)	sweetgum, green ash ( <i>Fraxinus pennsylvanica</i> ), Nuttall oak, red maple ( <i>Acer rubra</i> ), white oak ( <i>Q. alba</i> ), southern red oak ( <i>Q. falcata</i> ), yellow poplar ( <i>Liriodendron tulipifera</i> ), many of the hickories, and possibly post oak ( <i>Q. stellata</i> ) and loblolly pine ( <i>Pinus taeda</i> )

Source: Hodges and Switzer, 1979

The Texas Bottomland Hardwood Preservation Program (U.S. Fish and Wildlife Service, 1984) proposed 62 bottomland areas for consideration of some level of habitat preservation or further study. These sites were considered to be important for maintaining populations of mallards (*Anas platyrhynchos*) and wood ducks (*Aix spinosa*). The Mud Creek site, classified as a "Priority 1" area (i.e., excellent quality bottomlands of high value to mallards and wood ducks), is located eleven stream miles downstream from the Lake Columbia site and encompasses the lower Mud Creek floodplain downstream of U.S. Highway 84 to the Mud Creek – Angelina River confluence. The location of the proposed Mud Creek Priority 1 site is shown relative to the existing Mud Creek 100-year floodplain in Figure 2.1. This area covers 4,099 acres of the 100-year floodplain, including 3,566 acres of forest, 527 acres of

grassland/pasture, and less than 10 acres of clearcut land and water. The boundaries of the proposed Priority 1 area appear to have been generously delineated, as they extend well beyond the 100-year floodplain identified in the current study. The report characterized the Mud Creek Priority 1 site as having no upstream reservoir, several large tributaries, a conspicuously braided stream channel, and a flat and fertile floodplain with frequent flooding. This characterization apparently overlooked, or deemed unimportant, the fact that the Tyler Lakes lie approximately 30 miles upstream and regulate 114 square miles of the 520 square mile watershed above U.S. Highway 84, the approximate upper boundary of the Priority 1 site.

In summary, the primary impact of dams on streams relates to their effects on hydrology and sediment transport. Other effects on riparian and floodplain flora, and the fauna that inhabit those areas, are dependent on the hydrologic and morphologic changes in the channel and floodplain that are driven by these processes. The magnitude of the effects and the downstream distance that such effects are manifested are site-specific and depend on the type of dam, its operation, and local variables such as climate, geology, basin sediment characteristics, floodplain vegetation, and human influences in the watershed.



**Freese and Nichols**  
 4055 International Plaza, Suite 200  
 Fort Worth, TX 76109 - 4895  
 Phone - (817) 735 - 7300



**Angelina and Neches River Authority  
 Lake Columbia Downstream Study**

**USFWS Priority I  
 Bottomland Hardwood Site**

PN JOB NO	ANR01289
FILE	Figure 2 1.mxd
DATE	February 7, 2005
SCALE	1:117,000
DESIGNED	BME
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**2.1**

**FIGURE**



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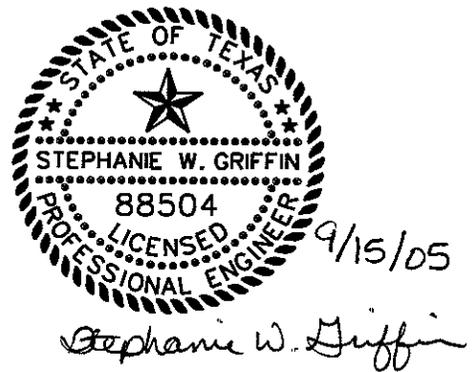
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### **3.0 RESERVOIR OPERATING ASSUMPTIONS**

In order to perform the hydrologic computer modeling, several assumptions must be made with regards to the reservoir operating policies. The reservoir operation model developed for Lake Columbia in 2003 was the basis for the operation analysis presented in this study (FNI 2003a). This model used a daily time-step analysis from January 1, 1940 through December 31, 1996. The Texas Water Development Board precipitation and evaporation data were applied, along with runoff developed in the naturalized flow portion of the Neches River Water Availability Model. The model was based on the water right permit, which does not require any releases for instream flow maintenance.

Two operating scenarios were assumed for this project – an early reservoir operation scenario and a mature reservoir operation scenario. The operation model was run for each scenario. The output of each model run was used to determine the impact of the proposed reservoir on flows downstream from the dam.

#### **3.1 Early Reservoir Operation Scenario**

The early reservoir operation scenario assumes an initial smaller demand for water on Lake Columbia during its initial operation. For this scenario, we assumed:

- a demand of 39,077 acre-feet per year (AF/Y),
- a return flow of 4.66 million gallons per day (MGD), and
- zero bypass for instream flows.

The demand of 39,077 AF/Y is based on the year 2010 demand as reported in Attachment A of the June 18, 2003 letter to Jennifer Walker of the U.S. Army Corps of Engineers (FNI 2003b). The return flow is based on the current amount of water being discharged from wastewater treatment plants above the reservoir. The assumption of a zero bypass requirement for instream flows is based on the provisions of Lake Columbia's water right.

#### **3.2 Mature Reservoir Operation Scenario**

The mature reservoir operation scenario for the proposed Lake Columbia reflects the higher water demands that are expected in the future. The mature scenario assumed:

- 50 years worth of sedimentation,

- a demand of 85,000 AF/Y,
- a return flow of 9.99 MGD, and
- zero bypass for instream flows.

Fifty years of sedimentation, an amount of 4,224 acre-feet, was used as a reasonable amount that could be expected to accumulate in the proposed reservoir by the time it reaches a mature status. The demand of 85,000 AF/Y is the currently permitted amount for the reservoir. The return flow of 9.99 mgd is the actual permitted amount of return flow from upstream wastewater treatment plants. Again, the assumption of a zero bypass requirement for instream flows is based on the provisions of the water right.

### 3.3 Summary

For each scenario, the operation model was applied to determine the daily water levels based on daily historical runoff data for the proposed Lake Columbia. The median of the daily lake levels was determined to be 314.5 feet NGVD for the early scenario and 312.5 feet NGVD for the mature scenario. The median information was then applied to the HEC modeling effort to determine the potential impacts downstream of the proposed Lake Columbia, which is discussed in Section 4 of this report.

**Summary of median lake levels**

Early scenario 314.5 ft  
Mature scenario 312.5 ft

**References**

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*Janis C. Murphy*

10/6/05

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## **4.0 LAKE COLUMBIA HYDROLOGIC AND HYDRAULIC MODELING**

### **4.1 Site Descriptions**

The Lake Columbia dam site is located on Mud Creek, approximately three miles downstream from U.S. Highway 79 in Cherokee County, Texas. The dam site is located approximately five miles southeast of Jacksonville, Texas as shown in Figure 1.1. The upper reaches of the reservoir will extend into Smith County. Mud Creek is a tributary of the Angelina River which is a tributary of the Neches River. The Mud Creek area at the dam site is a broad alluvial floodplain with a streambed elevation of 265 feet NGVD. The floodplain is broad and flat, in places approximately 6,000 feet wide, with a ground elevation of 270 feet NGVD. The abutments are steep slopes with elevations of 330 feet NGVD on the west side and 350 feet NGVD on the east abutment. The topography is generally rolling to hilly with broad, flat floodplains. The proposed lake would have a conservation pool elevation of 315 feet NGVD, which, when full, will have a surface area of approximately 10,000 acres and a storage volume of 195,500 acre-feet. The normal pool elevation and storage were based on a previous yield study of the reservoir site by Lockwood, Andrews and Newnam, Inc. (LAN, 1984). Area and capacity of the reservoir were determined by digitizing the contours on USGS quadrangle maps of the reservoir site.

### **4.2 Watershed Characteristics**

The drainage area for Lake Columbia is 384 square miles, of which the existing Tyler lakes control 114 square miles (approximately 30 percent of the total watershed) in the upper portion of the watershed. This includes approximately 46 square miles upstream from Whitehouse Dam and 68 square miles upstream from Mud Creek Dam (the Tyler Lakes). The drainage area downstream of Lake Columbia to the confluence of Mud Creek with the Angelina River is 169.5 square miles, making the total drainage area for Mud Creek 553.5 square miles. The watershed is mostly rural in nature but includes portions of the City of Tyler, along with the cities of Bullard, Troup, Jacksonville, and New Summerfield. Land use in the area is mostly agricultural and forest lands. For the hydrological analyses, the 553.5 square mile Mud Creek drainage area was subdivided into 10 subbasins as shown in Figure 4.1. The Angelina River was also included in the hydrologic model. It was included as a single drainage area to the confluence with Mud Creek to provide a more realistic simulation of the flows in Mud Creek by modeling the affects of the Angelina River on Mud Creek. It has a drainage area of 638.2 square miles. These drainage areas are summarized in Table 4.1.

**Table 4.1 Drainage areas.**

Description	Basin Number	Drainage Areas (sq. mi.)
Lake Tyler	PC2	45.7
Lake Tyler East	MC1	67.9
Kickapoo Creek and Mud Creek downstream of Lake Tyler	MC3	58.5
West Mud Creek	WMC4	91.6
Mud Creek downstream of West Mud Creek	MC5	112.8
Mud Creek downstream of U.S. Hwy. 79	MC6	7.5
Keys Creek / Mud Creek downstream of dam	MC7	39.5
Mud Creek above TX-110	MC8	51.5
Mud Creek above U.S. Hwy. 84	MC9	45.3
Mud Creek above Angelina River confluence	MC10	33.2
Angelina River above Mud Creek confluence	AR1	638.2

### 4.3 Hydrograph Development

The Corps of Engineers HEC-1 Flood Hydrograph Program (COE, 1985) was used to develop flood hydrographs for each subbasin for each of the flood events considered. The HEC-1 computer program was developed by the Corps of Engineers to derive runoff hydrographs for individual subbasins for each storm event. The subbasin watersheds are represented by basic model components which include precipitation runoff, channel routing, reservoir routing, diversion, and hydrograph combinations that are used to estimate hydrographs at various locations. Hydrographs are graphical representations of stream flow with respect to time at particular points of interest. Snyder's Unit Hydrograph was chosen as the most appropriate method within HEC-1 for developing flood hydrographs, as it is typically used for drainage areas over about 200 acres. Hydrologic properties required for the procedure include basin length, length to the centroid of the basin, and the basin slope. From these measured values, combined with the dimensionless parameter of  $C_t$ , the lag time of a unit hydrograph was developed for each subbasin. This method is detailed in the U.S. Army Corps of Engineers Engineering Manual (EM1110-2-1405) Flood Hydrograph and Analysis and Computations (COE, 1959). Snyder's empirical formula for computing watershed lag time is:

$$L = C_t(l \times l_{ca} / S^{0.5})^{0.33}$$

Where:

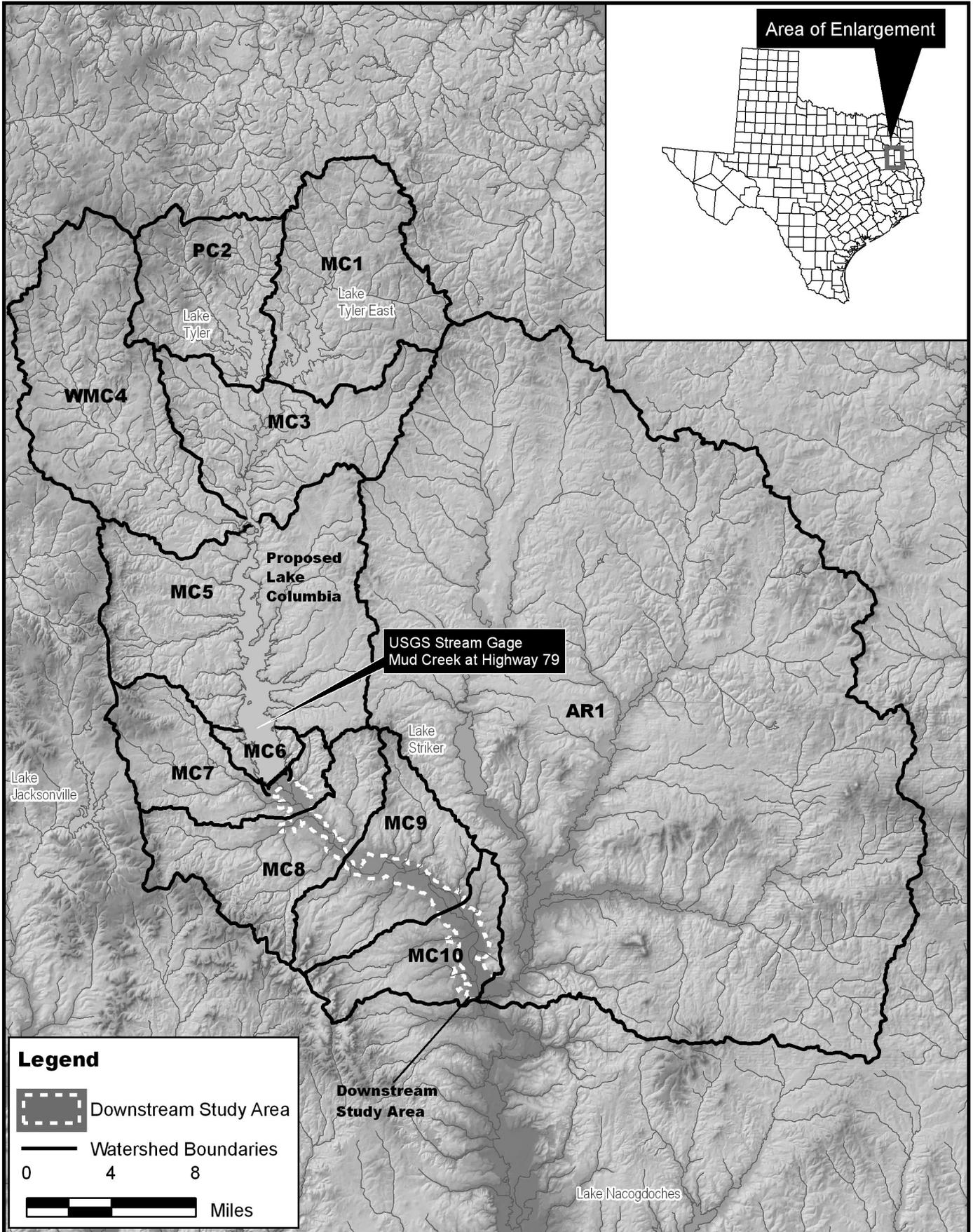
L = watershed lag time, in hours

l = hydraulic length of the watershed in miles

$l_{ca}$  = length along main channel to a point nearest the watershed centroid in miles

$C_t$  = coefficient derived from gauged watersheds in the same region

S = slope of the watershed in feet per mile



**Legend**

 Downstream Study Area  
 Watershed Boundaries  
 0      4      8  
 Miles



**Freese and Nichols**  
 4055 International Plaza, Suite 200  
 Fort Worth, TX 76109 - 4895  
 Phone - (817) 735 - 7300



**Angelina and Neches River Authority**  
**Lake Columbia Downstream Study**

**Drainage Area**

PROJECT NO	ANR01289
FILE	H:\Watershed Map.mxd
DATE	February 7, 2005
SCALE	1:310,000
DESIGNED	BME
DRAFTED	BME

4.1

FIGURE



The coefficient  $C_t$ , can be determined by calibration, or a regional value can be used where calibration is not possible. Typical values for this area range from about 2 to 6. A value for  $C_t$ , of 5.7 was calibrated for the Mud Creek watershed, as described in the engineering section of the Lake Eastex Planning Studies Final Report (FNI, 2003). Additional input data required for the calculation of flood hydrographs include the dimensionless shape factor,  $640C_p$ , for which a calibrated value of 512 was developed, and rainfall infiltration rates. Table 4.2 below shows the measured parameters for each subbasin in the Mud Creek watershed and the estimated lag time. A similar process was used for the Angelina River (AR1) watershed and the values are included in Table 4.2.

**Table 4.2 Subbasin hydrologic parameters.**

<b>Basin</b>	<b><math>l</math> (mi)</b>	<b><math>l_{ca}</math> (mi)</b>	<b>Slope (ft/mi)</b>	<b>Lag Time (hr)</b>
MC1	14.7	8.0	6.12	20.42
PC2	11.2	5.8	14.9	14.51
MC3	17.3	8.1	9.1	20.28
WMC4	27.2	15.0	6.8	30.15
MC5	21.5	13.8	7.3	26.84
MC6	5.8	2.2	17.5	8.22
MC7	15.8	8.5	16.2	18.16
MC8	14.4	7.1	15.4	16.70
MC9	15.4	6.5	16.7	16.42
MC10	14.5	7.0	15.7	16.65
AR1	50.4	30.7	2.9	54.12

The Mud Creek model was calibrated to the April 1966 storm using the gage information from the USGS gage (08034500) on Mud Creek at Highway 79. This was the historical storm of record for the gage. Regional loss rates of 1.5 inch initial loss and 0.05 inches per hour were utilized in the analysis. These values were also used for the Angelina River watershed.

#### **4.3.1 Rainfall**

Rainfall data for the various frequency floods were obtained from Hydro-35 (NWS, 1977) for the 5-, 15-, and 60-minute durations and from TP-40 (DOC, 1972) for the 2-, 3-, 6-, 12-, and 24-hour durations and were adjusted for the overall basin size. Data were generated for the 2-, 5-, 10-, 25-, 50- and 100-year storm events. Separate values were developed for the Mud Creek and Angelina River watershed. These values were utilized for the subbasins in the routing procedures. Rainfall amounts are shown in Tables 4.3 and 4.4. The rainfall amounts were then reduced in the HEC-1 model to account for the reduction of the point rainfall due to the size of the basin.

**Table 4.3 Rainfall in inches for Mud Creek watershed.**

<b>Duration</b>	<b>2-year</b>	<b>5-year</b>	<b>10-year</b>	<b>25-year</b>	<b>50-year</b>	<b>100-year</b>
5 minutes	0.52	0.60	0.65	0.74	0.81	0.88
15 minutes	1.12	1.28	1.41	1.60	1.75	1.90
60 minutes	2.02	2.47	2.80	3.27	3.63	4.00
2 hours	2.52	3.27	3.83	4.40	4.88	5.41
3 hours	2.77	3.55	4.19	4.87	5.42	6.00
6 hours	3.28	4.31	5.05	5.95	6.77	7.57
12 hours	3.88	5.13	6.15	7.05	8.02	9.04
24 hours	4.48	5.99	7.12	8.32	9.44	10.51

**Table 4.4 Rainfall in inches for Angelina River watershed.**

<b>Duration</b>	<b>2-year</b>	<b>5-year</b>	<b>10-year</b>	<b>25-year</b>	<b>50-year</b>	<b>100-year</b>
5 minutes	0.53	0.60	0.65	0.74	0.81	0.87
15 minutes	1.13	1.29	1.42	1.61	1.76	1.91
60 minutes	2.04	2.50	2.83	3.30	3.67	4.04
2 hours	2.56	3.32	3.84	4.41	4.91	5.45
3 hours	2.82	3.63	4.25	4.91	5.44	6.08
6 hours	3.34	4.37	5.00	6.03	6.78	7.64
12 hours	3.96	5.25	6.28	7.25	8.25	9.26
24 hours	4.57	6.14	7.32	8.56	9.68	10.74

### 4.3.2 Discharges

The HEC-1 model was run for the without project conditions. The routed peak discharges at the selected points in the drainage area are summarized in Table 4.5 for the various frequency storm events. These peak discharges are the routed flows to that point in the watershed. The point for the Lake Columbia dam site location is immediately downstream of the dam. Station 126600 and Station 121050 are located 1.15 miles and 2.20 miles downstream of the dam site, respectively.

**Table 4.5 Existing conditions (without dam) discharges.**

Location	Storm Frequency					
	2-year (cfs)	5-year (cfs)	10-year (cfs)	25-year (cfs)	50-year (cfs)	100-year (cfs)
<b>Mud Creek</b>						
Lake Columbia Dam Site	10,079	17,155	23,112	29,771	36,287	42,679
Sta. 126600	11,103	18,666	24,784	31,764	38,606	45,306
Sta. 121050	12,209	20,412	26,532	33,468	40,489	47,404
SH 110	13,205	22,096	28,697	35,693	42,302	48,800
U.S. 84	13,992	23,373	30,349	37,724	44,687	51,392

In order to evaluate the impact of the construction of Lake Columbia Dam on the flows in the watershed, the runoff hydrographs were routed through Lake Columbia. Lake Columbia was modeled using the area capacity data and a spillway rating curve developed in the Lake Eastex Planning Studies Final Report (FNI, 2003). As described in that report, the dam will include a 200-foot wide service spillway with a crest elevation of 315.0 feet NGVD and a 1,100-foot wide emergency spillway at elevation 324.0 feet NGVD. For this configuration, the peak 100-year flood elevation was 322.59 feet NGVD and the peak Probable Maximum Flood (PMF) level was 334.08 feet NGVD. The peak discharges for the 100-year and PMF events are 15,490 cfs and 142,626 cfs, respectively. Based on this, a top of dam of 336 feet NGVD was assumed. Table 4.6 contains a summary of the simulated storm water discharges with Lake Columbia in place based on the historical hydrology for Mud Creek.

**Table 4.6 Modeled discharges with Lake Columbia.**

Location	Storm Frequency					
	2-year (cfs)	5-year (cfs)	10-year (cfs)	25-year (cfs)	50-year (cfs)	100-year (cfs)
<b>Mud Creek</b>						
Lake Columbia Dam Site	2,296	5,036	7,570	10,318	12,941	15,824
Sta. 126600	2,844	5,140	7,727	10,539	13,222	16,180
Sta. 121050	5,735	9,539	12,497	15,593	18,537	21,805
SH 110	8,204	13,590	17,650	21,950	26,031	30,331
U.S. 84	9,783	16,202	20,998	26,068	30,901	35,899

The impacts of Lake Columbia on the watershed were evaluated using the HEC-1 model run with the various operating scenarios as described in Section 3 of this report. The reservoir operation model assumed two operating scenarios, an early reservoir operation where initial water supply demands are included and a mature operation scenario where full utilization of the water from the reservoir is included. These operation scenarios resulted in a median daily lake level of 314.5 feet NGVD for the early scenario and 312.5 feet NGVD for the mature scenario. Also included was the normal pool

scenario, which assumes the lake is at elevation 315.0 feet NGVD. The HEC-1 model used the storage capacity data developed for the reservoir and the median lake levels as the starting water surface elevation and included the detention effects of the lake on the discharges. The discharges for the two scenarios are shown in Tables 4.7 and 4.8.

**Table 4.7 Discharges with Lake Columbia early operating scenario.**

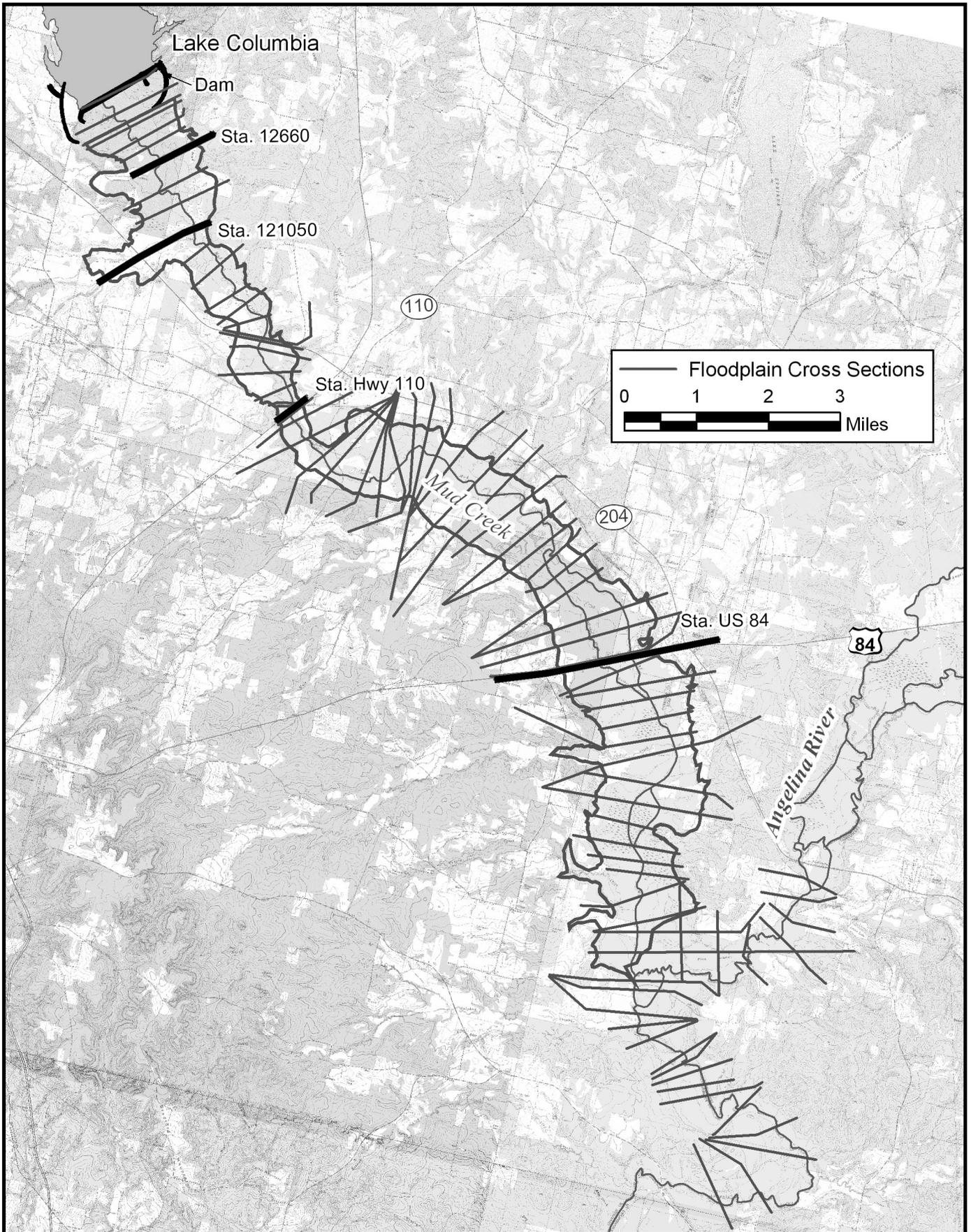
Location	Storm Frequency					
	2-year (cfs)	5-year (cfs)	10-year (cfs)	25-year (cfs)	50-year (cfs)	100-year (cfs)
<b>Mud Creek</b>						
Lake Columbia Dam Site	1,800	4,469	6,899	9,720	12,330	15,219
Sta. 126600	2,472	4,549	7,027	9,915	12,584	15,548
Sta. 121050	5,358	9,138	11,943	14,964	17,890	21,068
SH 110	7,851	13,212	17,213	21,386	25,409	29,660
U.S. 84	9,468	15,823	20,596	25,573	30,317	35,255

**Table 4.8 Discharges with Lake Columbia mature operating scenario.**

Location	Storm Frequency					
	2-year	5-year	10-year	25-year	50-year	100-year
<b>Mud Creek</b>						
Lake Columbia Dam Site	303	2,417	4,563	7,303	9,977	12,866
Sta. 126600	2,268	3,760	4,870	7,409	10,143	13,103
Sta. 121050	5,303	8,784	11,369	14,059	16,607	19,162
SH 110	7,842	12,984	16,800	20,766	24,523	28,175
U.S. 84	9,467	15,670	20,280	25,082	29,635	34,050

#### 4.4 Hydraulic Modeling

The hydraulic model for Mud Creek and a portion of the Angelina River was developed in HEC-RAS (COE, 2001). HEC-RAS was developed by the Corps of Engineers as a one-dimensional backwater model. The program consists of a graphical user interface, hydraulic analysis components, data management, and graphic capabilities. The backwater analysis is a water surface profile approximation based on the geometric and friction loss characteristics of the channel. The HEC-RAS model for the current study used 64 cross sections to model 16.9 miles of stream on Mud Creek and 23 cross sections to model 13.4 miles of the Angelina River. The Angelina River was modeled both upstream and downstream of the confluence with Mud Creek. Cross sections were obtained from USGS 7-1/2 minute topographical maps. Cross sections were drawn upstream and downstream of bridge crossings to model the hydraulic effects of bridge flow restrictions. A map showing the locations of the cross-sections is shown in Figure 4.2.



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 Fort Worth, TX 76109 - 4895  
 Phone - (817) 735 - 7300



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**100-Year Floodplain Cross-Sections**

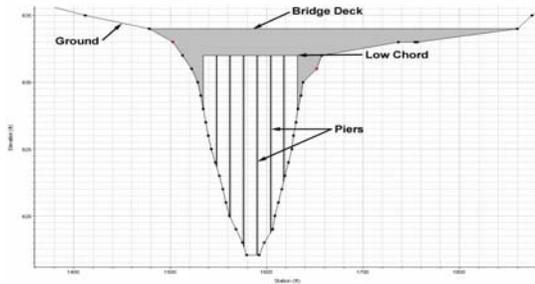
PROJECT NO.	ANR01289
FILE	Figure 4 2.mxd
DATE	February 7, 2005
SCALE	1:117,000
DESIGNED	BME
DRAFTED	BME

**4.2**

**FIGURE**



HEC-RAS also utilizes bridge information in the analysis. For this study five bridges were modeled along Mud Creek and the Angelina River. The modeled bridges included those at State Highway 204, State Highway 110, County Road 1301, U.S. Highway 84, and County Road 1209. Data gathered from each of the bridges from field visits include the low chord and deck of the bridge, the opening length, and pier description. These data were input into the HEC-RAS model to more accurately describe the hydraulic effects of the bridges. These bridges also represented study points from which runoff hydrographs were developed.



Manning's roughness coefficients (n-values) were determined for the river downstream of the dam. Estimates for Manning's roughness coefficients were made according to the standard procedures outlined by the Natural Resource Conservation Service (NRCS). These values were calculated using an estimation process based on Supplement B to the Hydraulics Section of the Engineering Handbook (NRCS, 1956). The estimation begins with a basic value of roughness coefficients for a straight, smooth channel in the study area. Then factors such as irregularity of the surfaces of the channel sides and bottom, variations in the shape and size of cross sections, obstructions, vegetation, and meandering of the channel are considered based on evaluation of the area from the aerial photographs and critical judgment. These factors are used to generate Manning's roughness coefficients for the channel and overbank areas. Initial estimates of the n-values were verified by a visual inspection of the river at road crossings. HEC-RAS model runs were performed for Mud Creek and the Angelina River using the estimated Manning's coefficients.

#### **4.5 Modeling Results**

The steady state function of the HEC-RAS model was run with the 2-, 5-, 10-, 25-, 50-, and 100-year frequency storm events and the various operating scenarios as described previously. The starting water surface elevation in the lake were assumed to be 315 feet NGVD for normal pool, 314.5 feet NGVD for early median operation and 312.5 feet NGVD for mature median operation. Using these elevations as starting water surface includes the detention effects of the reservoir on flows. Tables 4.9, 4.10, 4.11, 4.12, 4.13, and 4.14 provide water surface elevations at selected points in the watershed for the respective storm events.

**Table 4.9 2-year water surface elevations (feet NGVD) at selected downstream locations.**

Location	Operating Scenario			
	Existing Conditions (without dam)	Normal Pool Elevation	Early Median Operation	Mature Median Operation
<b>Mud Creek</b>				
Lake Columbia Dam Site	271.6	269.9	269.7	269.3
Sta. 126600	271.3	269.5	269.3	269.3
Sta. 121050	271.0	269.2	269.0	269.0
SH 110	268.9	267.3	267.1	267.1
U.S. 84	249.7	248.7	248.6	248.6

**Table 4.10 5-year water surface elevations (feet NGVD) at selected downstream locations.**

Location	Operating Scenario			
	Existing Conditions (without dam)	Normal Pool Elevation	Early Median Operation	Mature Median Operation
<b>Mud Creek</b>				
Lake Columbia Dam Site	273.2	270.9	270.8	270.6
Sta. 126600	273.0	270.7	270.6	270.5
Sta. 121050	272.8	270.6	270.4	270.4
SH 110	271.1	269.1	268.9	268.9
U.S. 84	251.8	250.2	250.1	250.0

**Table 4.11 10-year water surface elevations (feet NGVD) at selected downstream locations.**

Location	Operating Scenario			
	Existing Conditions (without dam)	Normal Pool Elevation	Early Median Operation	Mature Median Operation
<b>Mud Creek</b>				
Lake Columbia Dam Site	274.4	271.7	271.6	271.4
Sta. 126600	274.2	271.6	271.5	271.3
Sta. 121050	274.0	271.4	271.3	271.2
SH 110	272.3	270.1	270.0	269.9
U.S. 84	253.2	251.4	251.3	251.1

**Table 4.12 25-year water surface elevations (feet NGVD) at selected downstream locations.**

Location	Operating Scenario			
	Existing Conditions (without dam)	Normal Pool Elevation	Early Median Operation	Mature Median Operation
<b>Mud Creek</b>				
Lake Columbia Dam Site	275.5	272.5	272.4	272.2
Sta. 126600	275.3	272.4	272.3	272.1
Sta. 121050	275.1	272.3	272.1	272.0
SH 110	273.3	271.0	270.9	270.8
U.S. 84	254.5	252.5	252.4	252.1

**Table 4.13 50-year water surface elevations (feet NGVD) at selected downstream locations.**

Location	Operating Scenario			
	Existing Conditions (without dam)	Normal Pool Elevation	Early Median Operation	Mature Median Operation
<b>Mud Creek</b>				
Lake Columbia Dam Site	276.5	273.2	273.1	272.8
Sta. 126600	276.3	273.1	273.0	272.8
Sta. 121050	276.1	273.0	272.9	272.7
SH 110	274.2	271.8	271.7	271.5
U.S. 84	255.6	253.4	253.3	253.1

**Table 4.14 100-year water surface elevations (feet NGVD) at selected downstream locations.**

Location	Operating Scenario			
	Existing Conditions (without dam)	Normal Pool Elevation	Early Median Operation	Mature Median Operation
<b>Mud Creek</b>				
Lake Columbia Dam Site	277.4	274.0	273.8	273.5
Sta. 126600	277.3	273.9	273.7	273.4
Sta. 121050	277.1	273.7	273.6	273.3
SH 110	275.0	272.5	272.4	272.2
U.S. 84	256.7	254.3	254.2	253.9

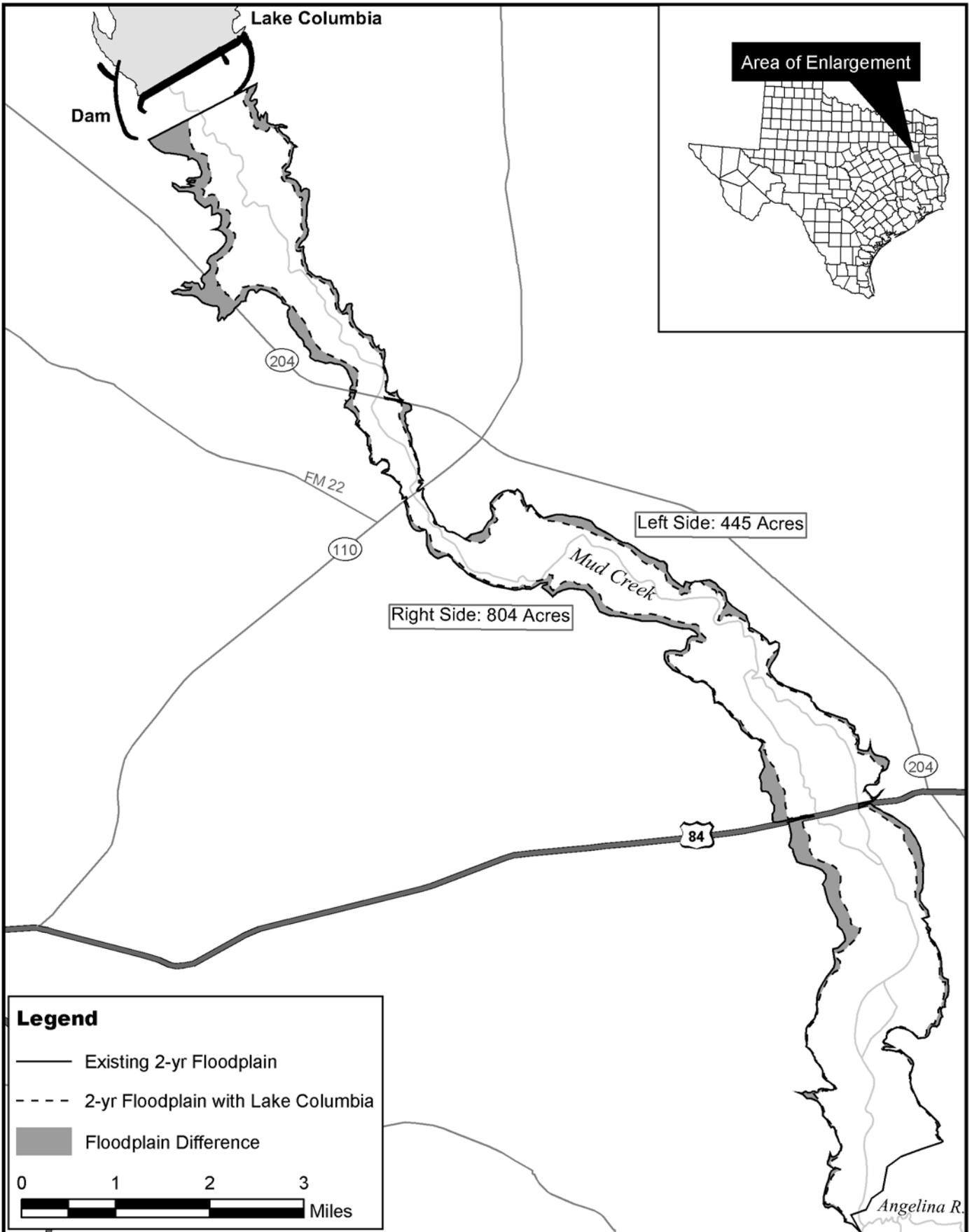
As can be seen from the tables, there is little difference in water surface elevations between the early and mature median operation scenarios. In addition to the scenarios described above a sensitivity analysis was made to determine the effect of the storage in Lake Columbia on the discharges. The lowest simulated lake elevations occurred in the month of October and resulted in lake elevations of 313.1 feet NGVD for the early operation scenario and 310.8 for the mature operation scenario. Utilizing these values for the HEC-1 model did not result in a significant difference in discharges and resulted in a very small amount of difference in downstream water surface elevations in the HEC-RAS model.

One other scenario was employed to evaluate the potential impacts of the reservoir on water surface elevations in the basin. This sensitivity analysis involved revision of the spillway rating curve to include a 300-foot wide service spillway and a 1,100-foot emergency spillway. This evaluation did not result in a significant change in downstream water surface elevations from the other scenarios evaluated. The HEC-RAS output data for the existing conditions (without Lake Columbia), normal pool, and all of the operations scenarios used in the analysis are included in Appendix 1. Since the operation scenarios evaluated did not result in a substantial difference in water surface elevations, the mature median scenario was used for the graphical representations of each of these flood events. Figures 4.3 through 4.8 compare the Mud Creek existing conditions floodplains to the mature median operating scenario floodplains (with Lake Columbia) for the 2-, 5-, 10-, 25-, 50-, and 100-year frequency storm events, respectively.

#### **4.6 Impacted Area**

The Mud Creek floodplain delineations which are included in Figures 4.3 through 4.8 as part of this report provide a graphic representation of the area differences in the floodplain for the with and without project conditions. These differences are summarized the Table 4.15.

As previously discussed, the Mud Creek watershed is a broad, alluvial floodplain. A comparison of the average top width of the floodplain for the different frequency storm events was made to provide information for the evaluation of the potential impact of Lake Columbia on the Mud Creek watershed. Figure 4.9 graphically represents the percentage change in floodplain for the different frequency storms evaluated.



**Freese and Nichols**  
4055 International Plaza, Suite 200  
Fort Worth, TX 76109 - 4895  
Phone - (817) 735 - 7300



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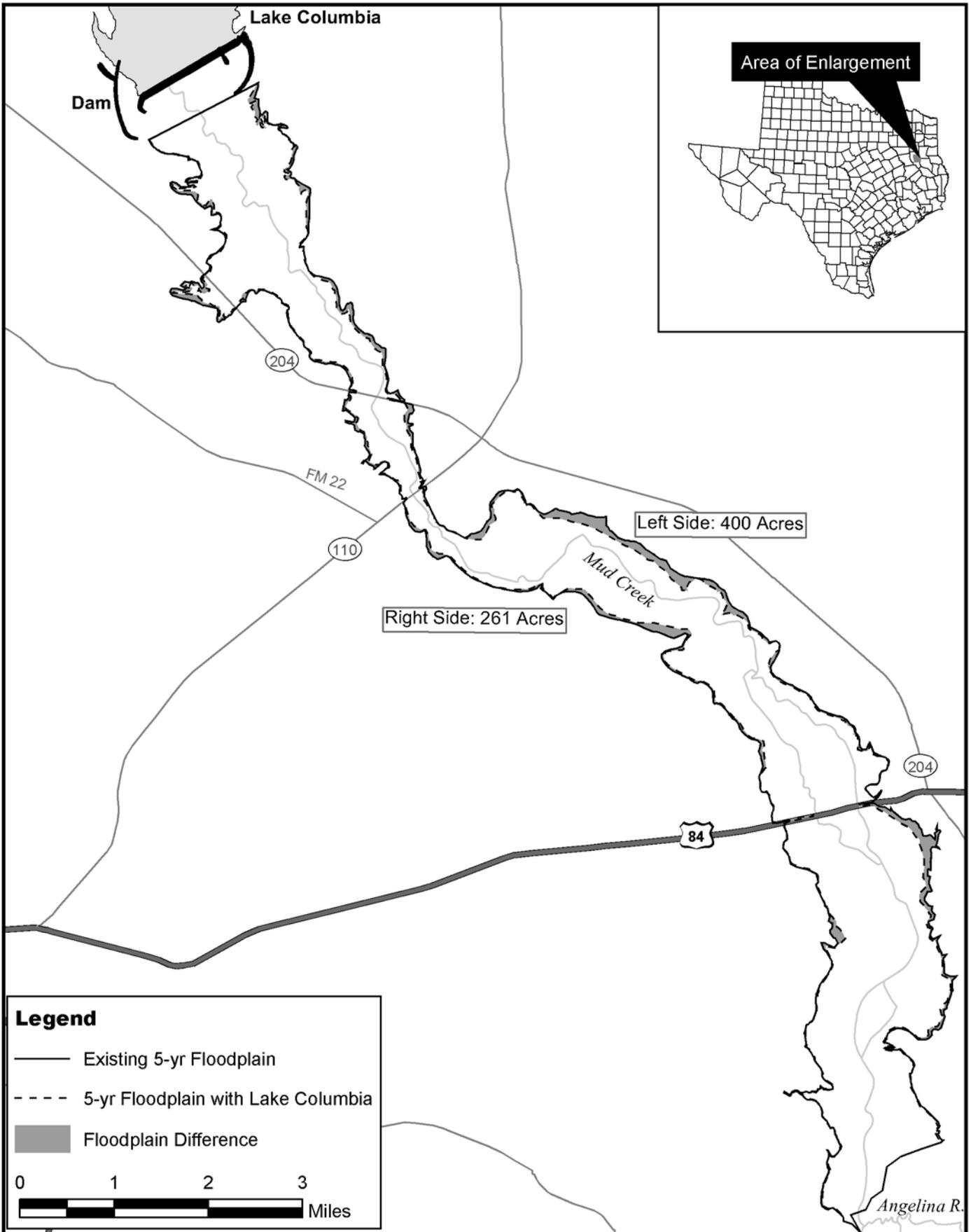
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DATE	February 28, 2005
SCALE	1:90,000
DESIGNED	BME
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**4.3**

**FIGURE**





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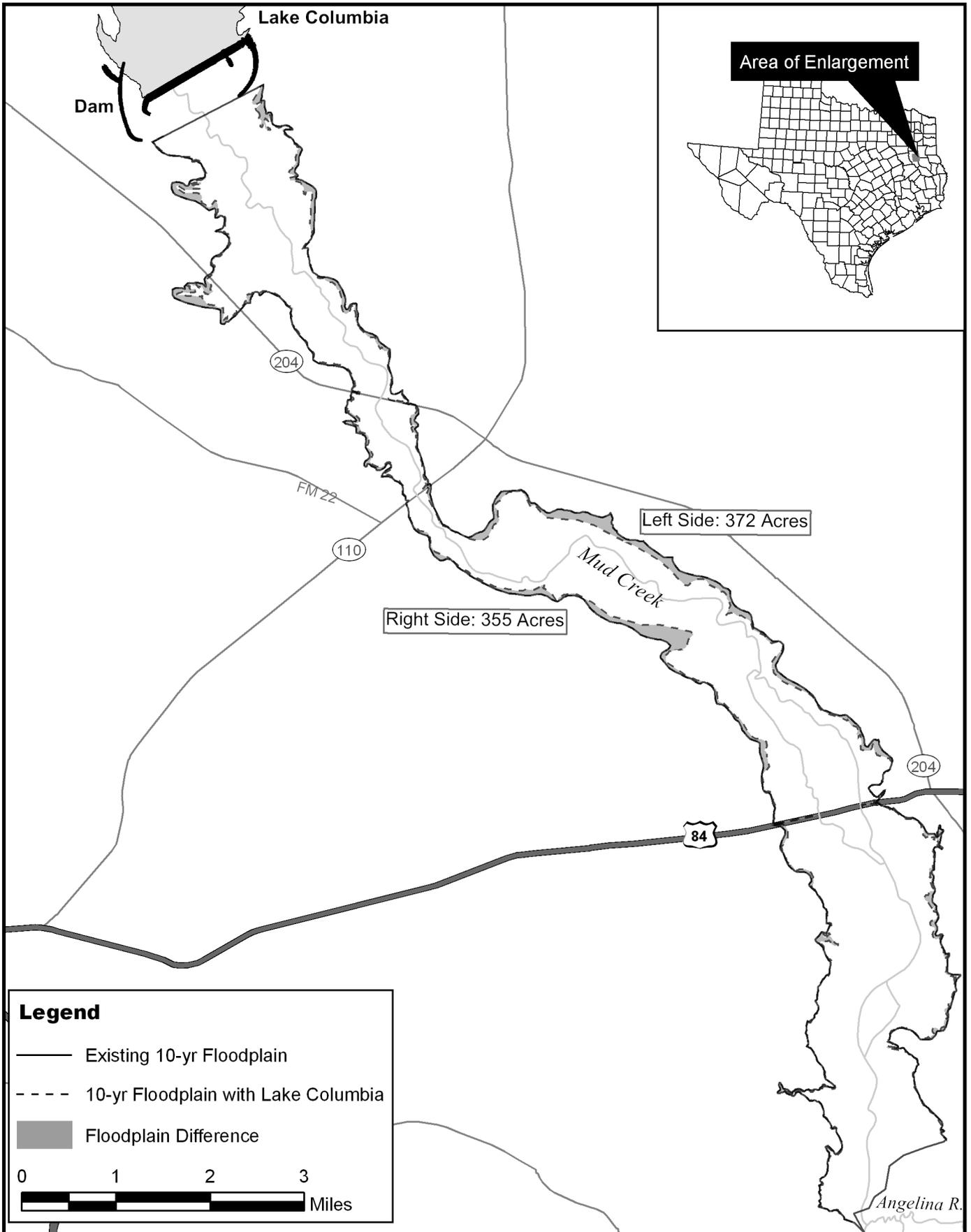
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FILE	5yrMatureFloodplain.mxd
DATE	February 28, 2005
SCALE	1:90,000
DESIGNED	BME
DRAFTED	BME

**4.4**

**FIGURE**





**Legend**

- Existing 10-yr Floodplain
- - - 10-yr Floodplain with Lake Columbia
- Floodplain Difference

0 1 2 3 Miles



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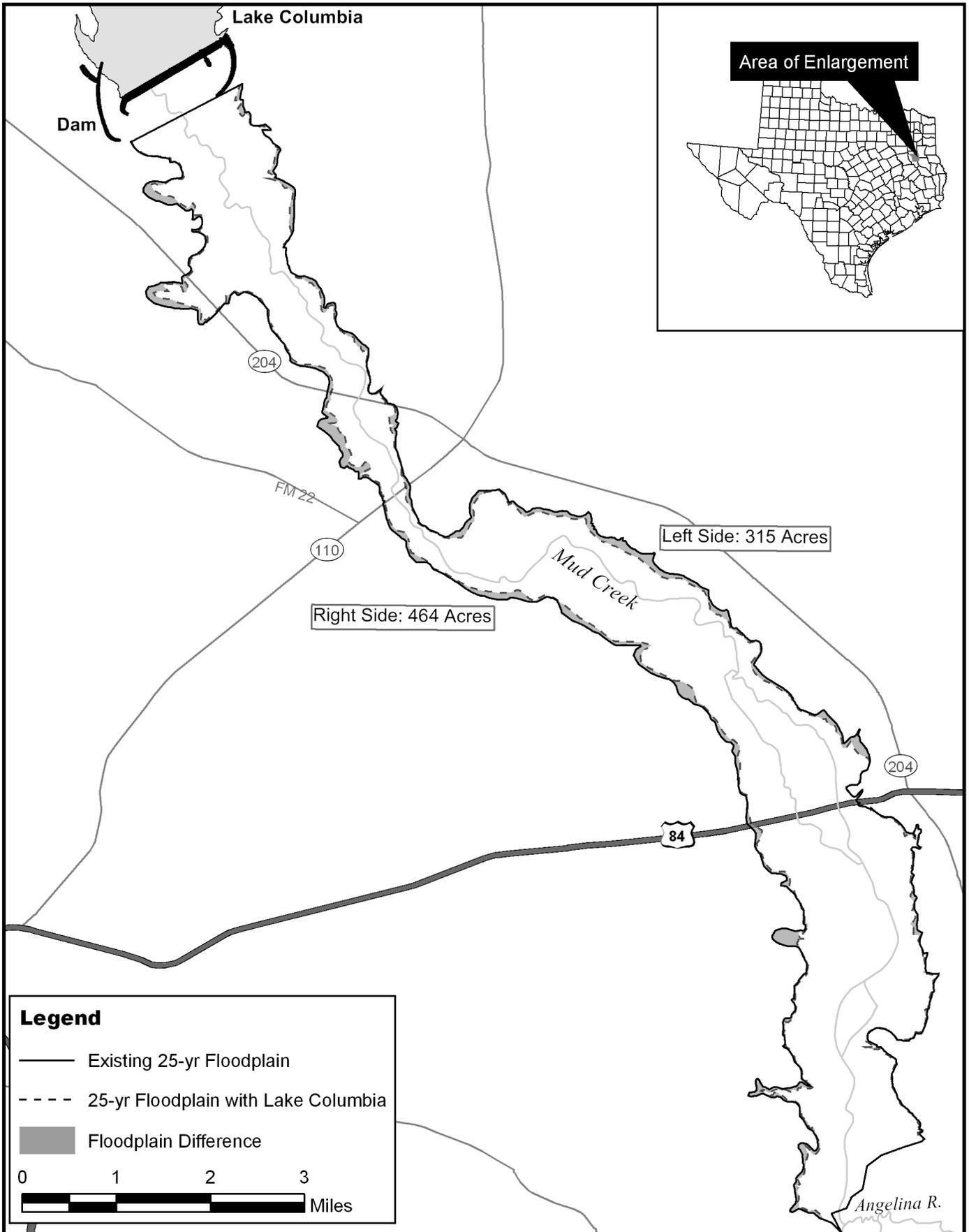
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**10-Year Existing and Future Floodplains**

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FILE	10YrMatureFloodplain.mxd
DATE	February 28, 2005
SCALE	1:90,000
DESIGNED	BME
DRAFTED	BME

**4.5**  
**FIGURE**





**Legend**

- Existing 25-yr Floodplain
  - - - 25-yr Floodplain with Lake Columbia
  - █ Floodplain Difference
- 0 1 2 3 Miles



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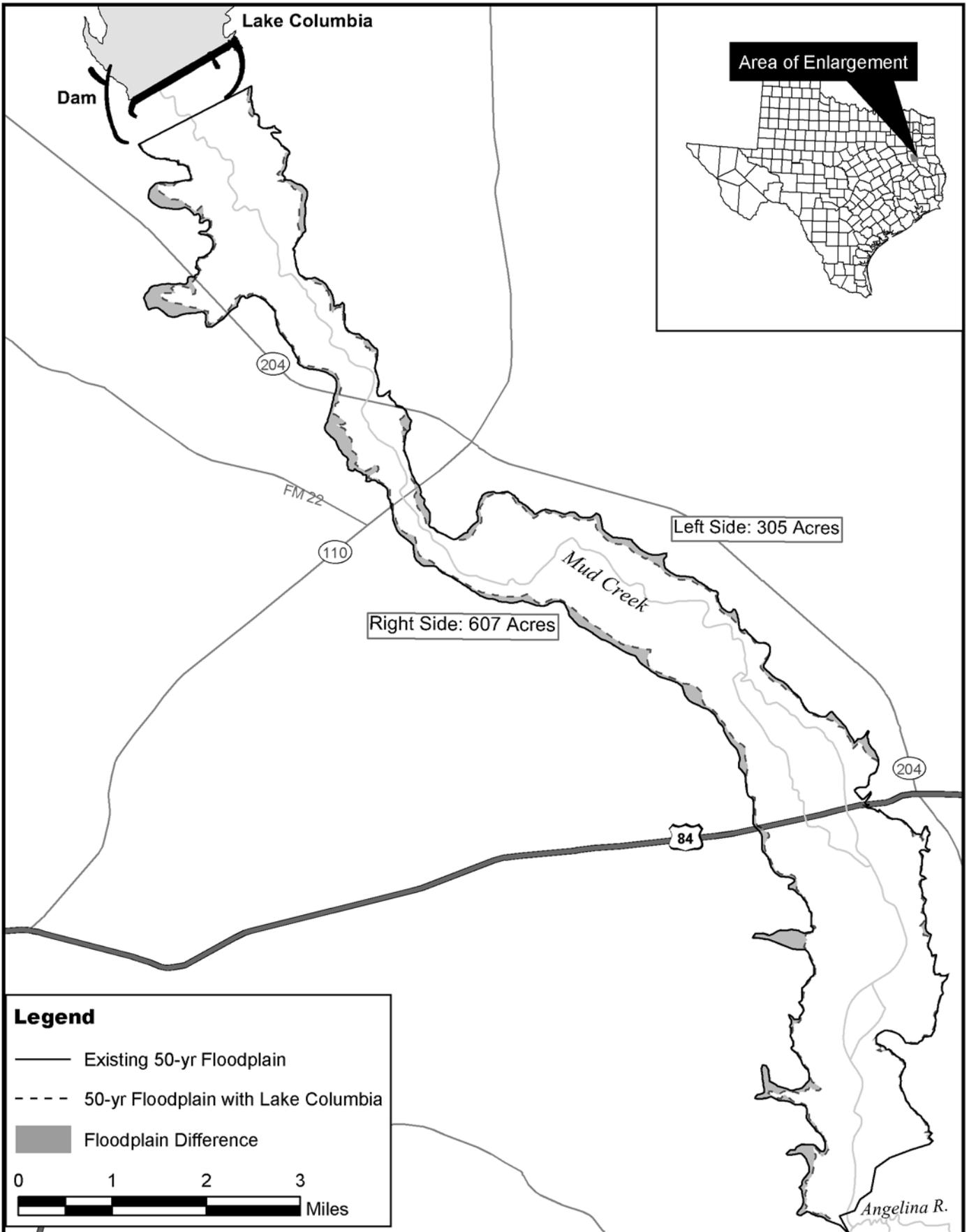
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FILE	25yrMatureFloodplain.mxd
DATE	February 28, 2005
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DESIGNED	BME
DRAFTED	BME

**4.6**

**FIGURE**





**Legend**

- Existing 50-yr Floodplain
- - - 50-yr Floodplain with Lake Columbia
- Floodplain Difference

0 1 2 3 Miles

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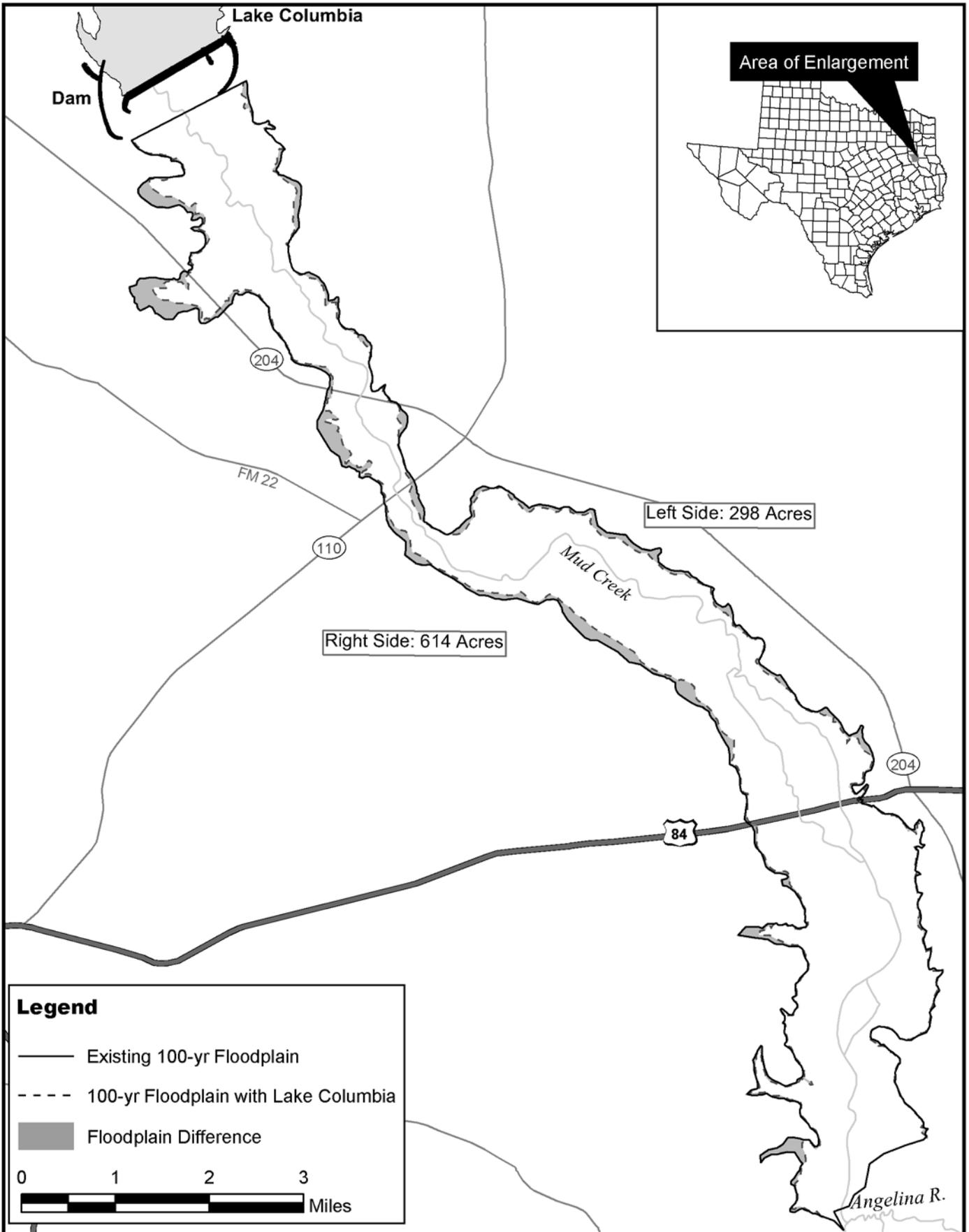
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DATE	February 28, 2005
SCALE	1:90,000
DESIGNED	BME
DRAFTED	BME

**4.7**

**FIGURE**





**Legend**

- Existing 100-yr Floodplain
- - - 100-yr Floodplain with Lake Columbia
- Floodplain Difference



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**100-Year Existing and Future Floodplains**

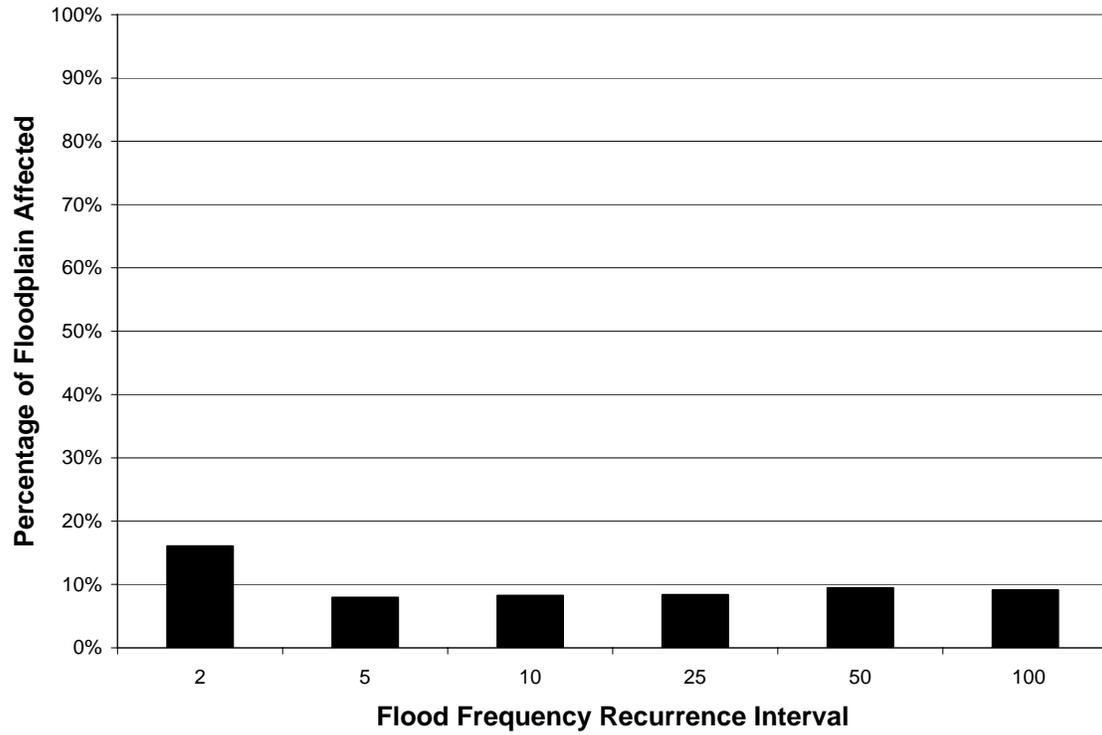
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FILE	100yrMatureFloodplain.mxd
DATE	February 28, 2005
SCALE	1:90,000
DESIGNED	BME
DRAFTED	BME

**4.8**

**FIGURE**



**Figure 4.9** Percentage of the Downstream Mud Creek Floodplain Potentially Affected with Lake Columbia





**Table 4.15 Comparison of simulated floodplain areas with (proposed) and without (existing) the proposed Lake Columbia.**

Flood Frequency	Mud Creek (acres)		
	Existing	Proposed	Difference
<b>2-year</b>	7,773	6,524	1,249
<b>5-year</b>	8,309	7,648	661
<b>10-year</b>	8,790	8,063	727
<b>25-year</b>	9,273	8,494	779
<b>50-year</b>	9,636	8,724	912
<b>100-year</b>	10,000	9,088	912

**Table 4.16 Average floodplain top width comparison.**

Flood Frequency	Mud Creek (feet)		
	Existing	Proposed	Difference
<b>2-year</b>	4,125	3,462	663
<b>5-year</b>	4,410	4,059	351
<b>10-year</b>	4,665	4,279	386
<b>25-year</b>	4,921	4,508	413
<b>50-year</b>	5,114	4,630	484
<b>100-year</b>	5,307	4,823	484



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## **5.0 DOWNSTREAM IMPACTS DISCUSSION**

### **5.1 Land Cover Classification**

Remote sensing techniques were used to delineate vegetation cover types within the downstream study area. ESRI ArcView, ArcGIS and ArcInfo Geographic Information Systems (GIS) were used to compile and analyze raster and vector datasets including satellite imagery, digital elevation models (DEM), digital raster graphs (DRG), digital topographical maps, and digital orthophoto quadrangles (DOQ). Current satellite imagery was acquired and incorporated into a GIS database for analysis. The resulting geospatial database was used to develop numeric data sets and maps to illustrate current land cover types and map floodplain boundaries. All data are provided in Appendix 2 on CD-ROM in ArcReader format.

New digital color infrared (CIR) satellite imagery was collected for the study area. Heads-up digitizing, or visual interpretation, of the cover classes was conducted utilizing ESRI GIS software previously mentioned. Existing aerial imagery (DOQs) were used for verification of portions of the satellite image that was obscured by cloud cover or for areas outside satellite coverage.

Satellite imagery was obtained from DigitalGlobe™ using their QuickBird satellite to collect the area of interest. The tasking date was set to start on July 16, 2003. Standard specifications were set for the imagery and included a pan-sharpened color infrared image with a 60 cm pixel resolution. The image was to be no more than 15 degrees off nadir and would have no more than 10 percent cloud cover. The 16 bit orthorectified image was projected to UTM Zone 15 NAD 27 coordinates. Due to the satellite path, revisit time and cloud cover, the study area photography was collected in two scenes on two separate dates. The western portion of the study area was collected on July 21, 2003 and the eastern portion was collected on October, 1, 2003. These scenes were then used to complete the land cover classification.

Heads-up digitizing of the imagery resulted in five distinct land cover classes; forest, pine plantation, grassland/pasture, clearcut forest, and open water. Figure 5.1 presents the results of the classification and a detailed tabulation of cover types affected by the various flood events is included in Table 5.1.

**Table 5.1 Summary of acreages of each land cover class by flood event in the Mud Creek Downstream Study Area. "Existing" and "Proposed" indicate without and with the dam, respectively.**

Flood event	Forest (F)		Pine Plantation (PP)		Grassland/Pasture (GP)		Clearcut Forest (CC)		Open Water (W)	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
2-year	7,100	6,083	73	61	590	371	0.5	0	9	9
5-year	7,489	7,012	73	66	730	561	7	0	9	9
10-year	7,822	7,320	74	67	872	665	10	0	12	11
25-year	8,118	7,623	74	69	1,055	787	13	4	13	11
50-year	8,333	7,773	75	70	1,200	861	15	9	13	12
100-year	8,552	7,999	76	72	1,338	993	21	12	13	12

## 5.2 Hydric Soils

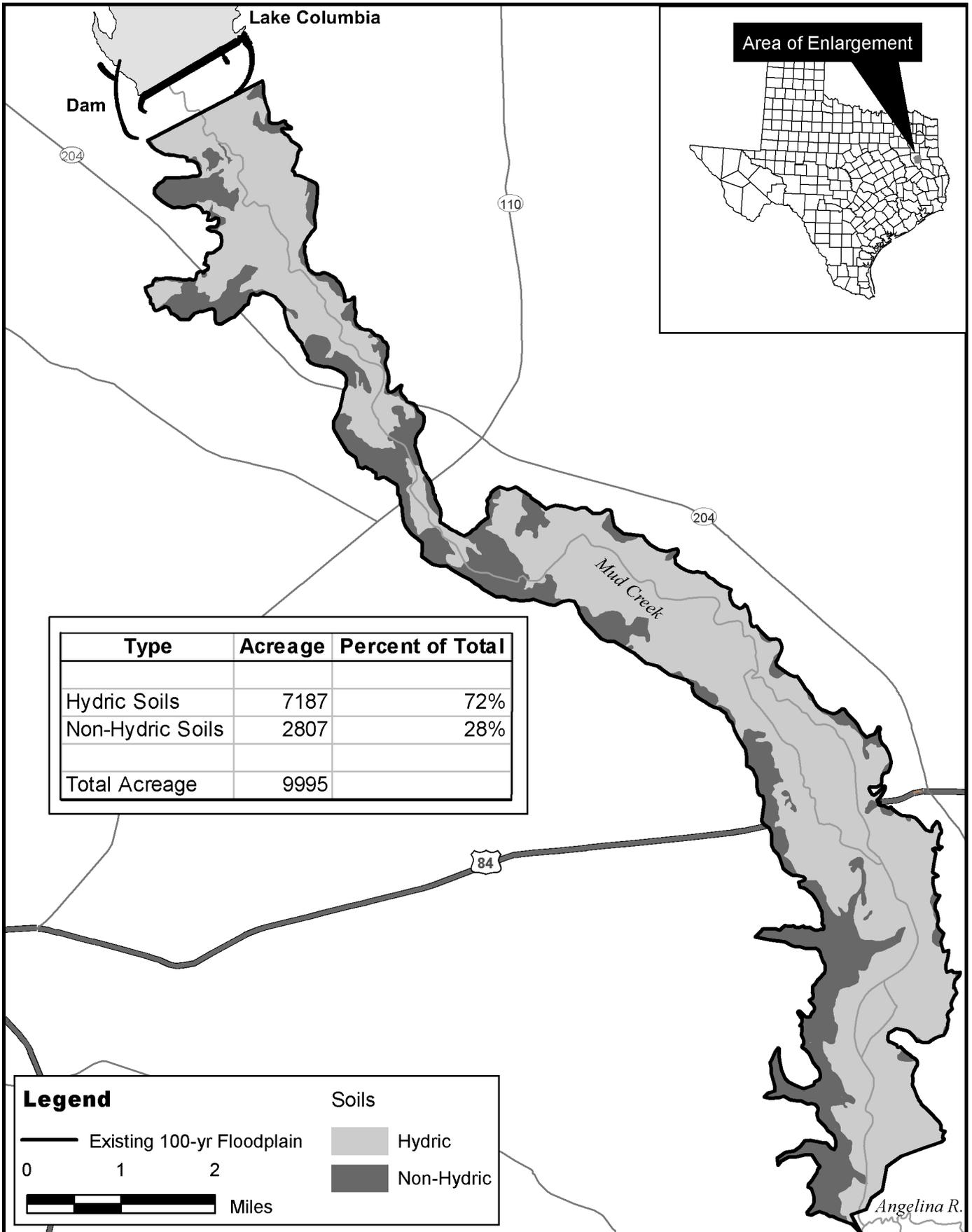
One of the three primary indicators of wetlands is hydric soil. While all areas within a hydric soil series are not necessarily jurisdictional wetlands, the soils can provide insight into the potential for wetlands to exist. Soils data for Cherokee County were obtained from the Natural Resources Conservation Service online database (<http://soildatamart.nrcs.usda.gov/>). These data were in digital format and were incorporated into the GIS. Cherokee County has three soils listed as hydric and an additional three with inclusions of hydric soils. The three hydric soils are Bibb clay loam (Ba), Bibb fine sandy loam (Bb) and Percilla (Pa). The Marsh land type is also listed as hydric and is delineated within Cherokee County. Those soil series containing inclusions are Caddo fine sandy loam, level (Ca), Caddo very fine sandy loam, mound phase (Cc), and Iuka clay loam (Id). The Marsh land type and the Percilla series do not exist in the downstream study area. Maps showing areas of hydric soils in the downstream study also were prepared and used to calculate the area of hydric soils for each flood event (Table 5.2, Figure 5.2). Series with only hydric inclusions were not considered expansive enough to warrant further desktop investigation.

**Table 5.2 Summary of acreages of hydric and non-hydric soils by flood event in the Mud Creek Downstream Study Area. "Existing" and "Proposed" indicate without and with the dam, respectively.**

Flood event	Hydric		Non-hydric	
	Existing	Proposed	Existing	Proposed
2-year	6,348	5,548	1,425	975
5-year	6,684	6,290	1,625	1,358
10-year	6,873	6,495	1,917	1,568
25-year	7,006	6,741	2,266	1,753
50-year	7,096	6,848	2,539	1,878
100-year	7,187	6,946	2,807	2,142

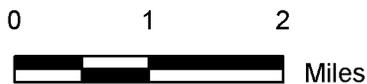






**Legend**

Existing 100-yr Floodplain



**Soils**

- Hydric
- Non-Hydric

**Freese and Nichols**  
 4055 International Plaza, Suite 200  
 Fort Worth, TX 76109 - 4895  
 Phone - (817) 735 - 7300



Angelina and Neches River Authority  
 Lake Columbia Downstream Study

**Hydric and Non-Hydric Soils  
 Within the 100-Year Floodplain**

PN JOB NO	ANR01289
FILE	Soils.mxd
DATE	February 7, 2005
SCALE	1:90,000
DESIGNED	BME
DRAFTED	BME

**5.2**

**FIGURE**



### **5.3 Downstream Impacts Analysis**

The following conclusions regarding the downstream effects of Lake Columbia are based on extrapolation of impacts reported in the literature and the results of hydrologic and hydraulic modeling conducted in the current study:

1. The area of potentially affected floodplain is relatively small (16 percent or less of the existing, downstream floodplain area) for both frequent (i.e., 2-year and 5-year) and less-frequent (i.e., 10-, 25-, 50-, and 100-year) flood events based on the results of simulated reservoir operation scenarios assuming full withdrawal for water supply.
2. The Mud Creek floodplain is broad and flat with abrupt side slopes in many places along its margin. This topography tends to minimize the reduction in downstream floodplain width and area that might occur due to the Lake Columbia dam.
3. Based on the conclusions of a comprehensive study of the downstream effects of dams by Williams and Wolman (1984), any major changes to the Mud Creek channel downstream of the dam would be expected to occur soon after completion of the dam, with the more visible effects likely occurring near the dam and becoming less visible with distance downstream. In addition, a new stability or dynamic equilibrium condition is expected to become established downstream in response to the new flow regime below the dam.
4. The passive nature of the operation of Lake Columbia dam, with its uncontrolled service and emergency spillways, will allow normal inflows to pass through the reservoir when its water surface elevation is at or above the normal pool level of 315 feet msl.
5. Lake Columbia is expected to act as an effective sediment trap for water borne sediment carried by Mud Creek and its tributaries upstream of the dam. Of the 553.5 square mile Mud Creek watershed, the Tyler Lakes control sediment contributions from 114 square miles. Lake Columbia will control 270 square miles, leaving nearly 170 square miles of the watershed as a source area for sediment input downstream of the dam.
6. The Loco Bayou site downstream of Lake Nacogdoches studied by Phillips (2001) is approximately 30 miles southeast of the Lake Columbia study area. The proposed Lake Columbia is similar to Lake Nacogdoches in that both are water supply reservoirs, they have uncontrolled service spillways, they occur in the same climatic and physiographic regions; and both are situated on alluvial tributaries of the Angelina River. Because of their proximity and similarities, it is expected that the observable downstream impacts of Lake Columbia on Mud Creek channel or floodplain morphology will be limited to a relatively short distance.

7. Water discharged from the Lake Columbia dam is expected to be sediment limited due to sediment capture by the lake. Thus, water leaving Lake Columbia is expected to have the capacity to transport sediment from immediately below the dam to some point downstream where the creek becomes transport limited. The braided nature of Mud Creek and its broad, flat floodplain, indicate a low gradient fluvial system which suggests that transport limitation might occur in a relatively short distance downstream of the dam. This expectation is supported by the findings of Phillips (2001) in the nearby Loco Bayou.
8. It is likely, based on the low-gradient, braided character of the system, that the decoupling effect described by Phillips (2001) in the Loco Bayou watershed is active in Mud Creek. Decoupling refers to the limited ability of low-energy stream systems to effectively transport sediment from the upper watershed to lower segments. If decoupling is a factor in sediment dynamics in Mud Creek, the dam should have little impact on sediment loads downstream of the dam because the source areas tend to be localized rather than from long distances upstream.
9. The predicted incremental reduction in width of the floodplain for the various flood profiles modeled are not expected to result in a detectable change in forest species composition in the foreseeable future. The change likely would be imperceptible over decades (Theriot, 1993) and likely would not affect any forest stands beyond the 100-year floodplain. If there is an effect, it would probably occur as a long-term shift to the next drier species assemblage at the edge of the floodplain (Hodges and Switzer, 1979).
10. Because no measurable effect on forest species composition is expected within the limits of the 100-year floodplain due to the Lake Columbia dam, no adverse impacts are expected on the U.S. Fish and Wildlife Service (1984) proposed Priority 1 Bottomland Hardwood site on Mud Creek downstream from the dam.
11. Hydraulic modeling results indicated that the downstream floodplain area for any given flood event is not overly sensitive to the starting water surface elevation in Lake Columbia.
12. Using the hydric soils within the 100-year floodplain as an indicator of the extent of wetlands, a maximum of 72 percent of the area (7,187 acres) may be wetlands. It should be emphasized that the regulatory definition of wetlands requires the presence of the three criteria, including hydric soils as well as hydrophytic vegetation and wetland hydrology in order to classify an area as wetlands. Hydric soils were used as an indicator of the potential area of wetlands because they were readily available. The non-hydric soils, which would indicate non-wetland areas, cover the remaining 28 percent (2,807 acres) of the floodplain. The non-hydric areas (Figure 5.2) are more prevalent along the right side of the floodplain (facing downstream), which is

- consistent with the wider floodplain difference between existing (without dam) and future (with dam) floodplains on the right side (Figure 4.8).
13. Assuming that wetlands correlate to the hydric soils within the Mud Creek floodplain, wetlands could occur as far out as the edge of the 100-year floodplain along much of the downstream study area. Local conditions such as precipitation or drainage from upland slopes controls wetland hydrology in the Mud Creek floodplain rather than flooding, because such infrequent flooding would not be adequate to sustain wetlands. Therefore, the Lake Columbia dam likely will have negligible impact on wetland hydrology in the downstream corridor.



## **References**

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**APPENDIX 1**  
**HEC-RAS OUTPUT**



HEC-RAS Output  
Existing Conditions



## HEC-RAS Plan: Ex

River	Reach	River Sta	Profile	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
Mud Creek	1000	132650	2 YR	10079.00	268.46	271.95		271.97	0.000203	1.03	9987.14	3872.49	0.11
Mud Creek	1000	132650	5 YR	17155.00	268.46	273.43		273.45	0.000136	1.13	15872.68	4115.63	0.10
Mud Creek	1000	132650	10 YR	23112.00	268.46	274.51		274.53	0.000113	1.20	20495.21	4293.50	0.09
Mud Creek	1000	132650	25 YR	29771.00	268.46	275.60		275.62	0.000099	1.27	25181.90	4473.31	0.09
Mud Creek	1000	132650	50 YR	36287.00	268.46	276.60		276.63	0.000089	1.33	29761.91	4639.17	0.09
Mud Creek	1000	132650	100 YR	42679.00	268.46	277.53		277.56	0.000081	1.37	34153.95	4792.83	0.08
Mud Creek	1000	131150	2 YR	10079.00	267.94	271.73		271.74	0.000119	0.69	15887.44	6427.12	0.07
Mud Creek	1000	131150	5 YR	17155.00	267.94	273.29		273.30	0.000072	0.73	26101.70	6676.56	0.06
Mud Creek	1000	131150	10 YR	23112.00	267.94	274.40		274.40	0.000060	0.77	33570.79	6853.22	0.06
Mud Creek	1000	131150	25 YR	29771.00	267.94	275.50		275.51	0.000052	0.81	41249.50	7030.21	0.06
Mud Creek	1000	131150	50 YR	36287.00	267.94	276.52		276.53	0.000047	0.85	48479.98	7192.88	0.05
Mud Creek	1000	131150	100 YR	42679.00	267.94	277.46		277.47	0.000043	0.88	55309.53	7343.23	0.05
Mud Creek	1000	130250	2 YR	10079.00	267.94	271.64		271.65	0.000080	0.73	15323.76	6413.08	0.08
Mud Creek	1000	130250	5 YR	17155.00	267.94	273.24		273.25	0.000046	0.76	25753.91	6668.22	0.06
Mud Creek	1000	130250	10 YR	23112.00	267.94	274.35		274.36	0.000038	0.80	33276.46	6846.34	0.06
Mud Creek	1000	130250	25 YR	29771.00	267.94	275.46		275.47	0.000033	0.85	40984.87	7024.18	0.06
Mud Creek	1000	130250	50 YR	36287.00	267.94	276.48		276.50	0.000030	0.88	48235.10	7187.43	0.06
Mud Creek	1000	130250	100 YR	42679.00	267.94	277.43		277.44	0.000027	0.92	55077.89	7338.18	0.06
Mud Creek	1000	129850	2 YR	10079.00	267.48	271.60		271.61	0.000129	0.74	15517.03	6418.45	0.08
Mud Creek	1000	129850	5 YR	17155.00	267.48	273.22		273.22	0.000075	0.76	25997.79	6587.68	0.06
Mud Creek	1000	129850	10 YR	23112.00	267.48	274.33		274.34	0.000062	0.80	33425.03	6705.01	0.06
Mud Creek	1000	129850	25 YR	29771.00	267.48	275.45		275.46	0.000054	0.84	40959.45	6821.98	0.06
Mud Creek	1000	129850	50 YR	36287.00	267.48	276.47		276.48	0.000049	0.88	47986.38	6929.29	0.06
Mud Creek	1000	129850	100 YR	42679.00	267.48	277.41		277.42	0.000045	0.91	54569.91	7028.35	0.05
Mud Creek	1000	128750	2 YR	10079.00	267.10	271.49		271.50	0.000086	0.71	14395.39	5036.19	0.07
Mud Creek	1000	128750	5 YR	17155.00	267.10	273.14		273.15	0.000055	0.76	22897.79	5242.98	0.06
Mud Creek	1000	128750	10 YR	23112.00	267.10	274.27		274.28	0.000048	0.82	28889.70	5383.94	0.06
Mud Creek	1000	128750	25 YR	29771.00	267.10	275.39		275.40	0.000043	0.88	34997.24	5523.92	0.06
Mud Creek	1000	128750	50 YR	36287.00	267.10	276.42		276.43	0.000040	0.93	40730.75	5652.17	0.06
Mud Creek	1000	128750	100 YR	42679.00	267.10	277.36		277.38	0.000038	0.97	46134.78	5770.45	0.06
Mud Creek	1000	127950	2 YR	10079.00	266.82	271.41		271.42	0.000117	0.83	12322.97	4277.37	0.08
Mud Creek	1000	127950	5 YR	17155.00	266.82	273.09		273.10	0.000075	0.90	19595.07	4369.88	0.07
Mud Creek	1000	127950	10 YR	23112.00	266.82	274.22		274.24	0.000066	0.97	24584.68	4432.24	0.07
Mud Creek	1000	127950	25 YR	29771.00	266.82	275.35		275.36	0.000060	1.05	29597.25	4494.01	0.07
Mud Creek	1000	127950	50 YR	36287.00	266.82	276.37		276.39	0.000056	1.11	34247.32	4550.56	0.07
Mud Creek	1000	127950	100 YR	42679.00	266.82	277.32		277.34	0.000053	1.16	38584.70	4602.69	0.07
Mud Creek	1000	126600	2 YR	11103.00	266.35	271.33		271.33	0.000041	0.59	19079.82	6271.62	0.06
Mud Creek	1000	126600	5 YR	18666.00	266.35	273.04		273.04	0.000027	0.64	30117.49	6622.59	0.05
Mud Creek	1000	126600	10 YR	24784.00	266.35	274.18		274.19	0.000023	0.68	37812.69	6856.65	0.05
Mud Creek	1000	126600	25 YR	31764.00	266.35	275.31		275.32	0.000022	0.73	45677.57	7087.90	0.05
Mud Creek	1000	126600	50 YR	38606.00	266.35	276.34		276.35	0.000020	0.77	53101.32	7299.46	0.05
Mud Creek	1000	126600	100 YR	45306.00	266.35	277.29		277.30	0.000019	0.81	60133.20	7494.34	0.05
Mud Creek	1000	124600	2 YR	11103.00	265.65	271.21		271.22	0.000083	0.76	14597.65	4390.53	0.07
Mud Creek	1000	124600	5 YR	18666.00	265.65	272.96		272.97	0.000058	0.84	22386.54	4521.63	0.07
Mud Creek	1000	124600	10 YR	24784.00	265.65	274.11		274.12	0.000052	0.91	27637.10	4607.90	0.06
Mud Creek	1000	124600	25 YR	31764.00	265.65	275.24		275.25	0.000049	0.99	32900.38	4692.78	0.06
Mud Creek	1000	124600	50 YR	38606.00	265.65	276.27		276.29	0.000046	1.05	37795.70	4770.38	0.06
Mud Creek	1000	124600	100 YR	45306.00	265.65	277.22		277.24	0.000045	1.10	42373.43	4841.81	0.06
Mud Creek	1000	123150	2 YR	11103.00	265.14	271.10		271.10	0.000074	0.64	17350.18	5036.94	0.06
Mud Creek	1000	123150	5 YR	18666.00	265.14	272.88		272.88	0.000053	0.71	26520.21	5259.59	0.05
Mud Creek	1000	123150	10 YR	24784.00	265.14	274.04		274.04	0.000048	0.78	32697.71	5404.41	0.05
Mud Creek	1000	123150	25 YR	31764.00	265.14	275.17		275.18	0.000045	0.84	38918.55	5546.43	0.05
Mud Creek	1000	123150	50 YR	38606.00	265.14	276.21		276.22	0.000043	0.90	44743.57	5676.19	0.05
Mud Creek	1000	123150	100 YR	45306.00	265.14	277.16		277.18	0.000042	0.94	50223.03	5795.60	0.05
Mud Creek	1000	121050	2 YR	12209.00	264.41	270.97		270.97	0.000052	0.58	21763.04	6417.94	0.05
Mud Creek	1000	121050	5 YR	20412.00	264.41	272.79		272.79	0.000038	0.64	33795.13	6826.74	0.05
Mud Creek	1000	121050	10 YR	26532.00	264.41	273.95		273.96	0.000033	0.68	41929.16	7089.76	0.05
Mud Creek	1000	121050	25 YR	33468.00	264.41	275.10		275.10	0.000031	0.73	50169.91	7346.64	0.05
Mud Creek	1000	121050	50 YR	40489.00	264.41	276.14		276.15	0.000029	0.77	57946.73	7581.07	0.05
Mud Creek	1000	121050	100 YR	47404.00	264.41	277.10		277.11	0.000028	0.81	65315.32	7796.70	0.05
Mud Creek	1000	119350	2 YR	12209.00	263.81	270.74		270.77	0.000443	1.47	8292.89	2178.53	0.13
Mud Creek	1000	119350	5 YR	20412.00	263.81	272.60		272.64	0.000330	1.66	12389.99	2225.05	0.12
Mud Creek	1000	119350	10 YR	26532.00	263.81	273.78		273.83	0.000297	1.78	15031.22	2254.53	0.12
Mud Creek	1000	119350	25 YR	33468.00	263.81	274.92		274.98	0.000282	1.92	17622.75	2283.09	0.12
Mud Creek	1000	119350	50 YR	40489.00	263.81	275.96		276.03	0.000274	2.05	20008.65	2309.06	0.12
Mud Creek	1000	119350	100 YR	47404.00	263.81	276.92		276.99	0.000268	2.17	22224.75	2332.93	0.12
Mud Creek	1000	117350	2 YR	12209.00	263.11	270.39		270.41	0.000097	1.03	11903.83	3137.30	0.09
Mud Creek	1000	117350	5 YR	20412.00	263.11	272.36		272.38	0.000068	1.13	18261.04	3324.23	0.08
Mud Creek	1000	117350	10 YR	26532.00	263.11	273.57		273.59	0.000061	1.21	22348.05	3439.04	0.08
Mud Creek	1000	117350	25 YR	33468.00	263.11	274.73		274.75	0.000058	1.31	26390.22	3548.95	0.08
Mud Creek	1000	117350	50 YR	40489.00	263.11	275.77		275.80	0.000056	1.40	30163.26	3648.55	0.08
Mud Creek	1000	117350	100 YR	47404.00	263.11	276.74		276.77	0.000055	1.48	33718.74	3739.98	0.08
Mud Creek	1000	114900	2 YR	12209.00	262.26	270.16		270.18	0.000091	1.03	11894.71	2958.90	0.09
Mud Creek	1000	114900	5 YR	20412.00	262.26	272.20		272.22	0.000065	1.14	18030.06	3070.83	0.08

## HEC-RAS Plan: Ex (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	114900	10 YR	26532.00	262.26	273.42		273.44	0.000059	1.23	21829.76	3138.15	0.08
Mud Creek	1000	114900	25 YR	33468.00	262.26	274.58		274.61	0.000057	1.34	25514.75	3202.08	0.08
Mud Creek	1000	114900	50 YR	40489.00	262.26	275.63		275.67	0.000057	1.43	28910.00	3259.88	0.08
Mud Creek	1000	114900	100 YR	47404.00	262.26	276.60		276.63	0.000056	1.52	32078.54	3312.90	0.08
Mud Creek	1000	113800	2 YR	12209.00	261.87	270.05		270.07	0.000110	1.14	10693.46	2605.02	0.10
Mud Creek	1000	113800	5 YR	20412.00	261.87	272.11		272.14	0.000079	1.27	16297.48	2821.88	0.09
Mud Creek	1000	113800	10 YR	26532.00	261.87	273.34		273.37	0.000072	1.37	19847.31	2951.01	0.09
Mud Creek	1000	113800	25 YR	33468.00	261.87	274.51		274.54	0.000070	1.49	23352.29	3073.19	0.09
Mud Creek	1000	113800	50 YR	40489.00	261.87	275.56		275.60	0.000069	1.60	26639.71	3183.53	0.09
Mud Creek	1000	113800	100 YR	47404.00	261.87	276.52		276.57	0.000068	1.69	29757.78	3284.76	0.09
Mud Creek	1000	112200	2 YR	12209.00	261.31	269.79		269.82	0.000230	1.48	8269.08	1950.96	0.13
Mud Creek	1000	112200	5 YR	20412.00	261.31	271.92		271.96	0.000166	1.63	12609.98	2086.34	0.11
Mud Creek	1000	112200	10 YR	26532.00	261.31	273.16		273.21	0.000153	1.76	15234.03	2142.19	0.11
Mud Creek	1000	112200	25 YR	33468.00	261.31	274.32		274.38	0.000150	1.92	17757.42	2194.55	0.11
Mud Creek	1000	112200	50 YR	40489.00	261.31	275.37		275.44	0.000149	2.07	20082.38	2241.72	0.12
Mud Creek	1000	112200	100 YR	47404.00	261.31	276.33		276.41	0.000149	2.20	22258.42	2284.99	0.12
Mud Creek	1000	110300	2 YR	12209.00	260.65	269.55	263.85	269.56	0.000086	0.93	13131.76	2950.88	0.08
Mud Creek	1000	110300	5 YR	20412.00	260.65	271.75	264.58	271.77	0.000064	1.02	20006.31	3196.33	0.07
Mud Creek	1000	110300	10 YR	26532.00	260.65	273.01	265.02	273.03	0.000059	1.11	24069.70	3265.50	0.07
Mud Creek	1000	110300	25 YR	33468.00	260.65	274.18	265.44	274.20	0.000058	1.22	27927.52	3329.84	0.07
Mud Creek	1000	110300	50 YR	40489.00	260.65	275.23	265.82	275.26	0.000059	1.31	31460.13	3387.69	0.07
Mud Creek	1000	110300	100 YR	47404.00	260.65	276.20	266.16	276.23	0.000059	1.40	34754.53	3440.76	0.07
Mud Creek	1000	110200		Bridge									
Mud Creek	1000	110050	2 YR	12209.00	260.56	269.43		269.44	0.000051	0.81	14989.75	3381.25	0.07
Mud Creek	1000	110050	5 YR	20412.00	260.56	271.61		271.62	0.000038	0.90	22930.97	3792.80	0.06
Mud Creek	1000	110050	10 YR	26532.00	260.56	272.84		272.86	0.000035	0.97	27703.89	3940.92	0.06
Mud Creek	1000	110050	25 YR	33468.00	260.56	273.98		274.00	0.000035	1.06	32267.74	4077.52	0.06
Mud Creek	1000	110050	50 YR	40489.00	260.56	274.95		274.97	0.000036	1.15	36284.89	4194.08	0.07
Mud Creek	1000	110050	100 YR	47404.00	260.56	275.82		275.84	0.000037	1.24	39974.54	4298.35	0.07
Mud Creek	1000	109550	2 YR	12209.00	260.38	269.40		269.41	0.000047	0.79	15443.64	3423.33	0.07
Mud Creek	1000	109550	5 YR	20412.00	260.38	271.59		271.60	0.000036	0.87	23582.58	3935.97	0.06
Mud Creek	1000	109550	10 YR	26532.00	260.38	272.82		272.84	0.000033	0.95	28583.51	4158.39	0.06
Mud Creek	1000	109550	25 YR	33468.00	260.38	273.96		273.98	0.000033	1.04	33434.85	4363.34	0.06
Mud Creek	1000	109550	50 YR	40489.00	260.38	274.93		274.95	0.000034	1.12	37756.68	4538.12	0.06
Mud Creek	1000	109550	100 YR	47404.00	260.38	275.80		275.82	0.000034	1.20	41766.79	4694.49	0.07
Mud Creek	1000	107750	2 YR	12209.00	259.75	269.29		269.31	0.000078	0.96	12672.65	2522.66	0.08
Mud Creek	1000	107750	5 YR	20412.00	259.75	271.50		271.51	0.000067	1.10	18831.55	3058.95	0.07
Mud Creek	1000	107750	10 YR	26532.00	259.75	272.73		272.76	0.000064	1.20	22804.72	3356.23	0.07
Mud Creek	1000	107750	25 YR	33468.00	259.75	273.87		273.90	0.000065	1.32	26774.20	3629.00	0.08
Mud Creek	1000	107750	50 YR	40489.00	259.75	274.84		274.87	0.000067	1.44	30394.98	3861.04	0.08
Mud Creek	1000	107750	100 YR	47404.00	259.75	275.70		275.74	0.000069	1.54	33823.78	4068.59	0.08
Mud Creek	1000	105150	2 YR	12209.00	258.80	269.10		269.11	0.000072	1.20	12246.07	1723.09	0.07
Mud Creek	1000	105150	5 YR	20412.00	258.80	271.28		271.32	0.000092	1.57	16221.67	1909.16	0.08
Mud Creek	1000	105150	10 YR	26532.00	258.80	272.51		272.55	0.000106	1.80	18621.04	2013.15	0.09
Mud Creek	1000	105150	25 YR	33468.00	258.80	273.62		273.68	0.000123	2.05	20916.34	2107.84	0.10
Mud Creek	1000	105150	50 YR	40489.00	258.80	274.56		274.63	0.000141	2.29	22939.00	2187.88	0.11
Mud Creek	1000	105150	100 YR	47404.00	258.80	275.41		275.49	0.000156	2.51	24811.83	2259.47	0.11
Mud Creek	1000	104100	2 YR	12209.00	258.42	269.02		269.05	0.000054	1.37	11289.80	1617.07	0.08
Mud Creek	1000	104100	5 YR	20412.00	258.42	271.19		271.23	0.000070	1.80	14979.23	1780.34	0.09
Mud Creek	1000	104100	10 YR	26532.00	258.42	272.40		272.45	0.000082	2.07	17176.48	1861.79	0.10
Mud Creek	1000	104100	25 YR	33468.00	258.42	273.49		273.56	0.000095	2.37	19253.06	1935.61	0.11
Mud Creek	1000	104100	50 YR	40489.00	258.42	274.41		274.50	0.000109	2.65	21063.45	1997.75	0.12
Mud Creek	1000	104100	100 YR	47404.00	258.42	275.23		275.34	0.000122	2.91	22729.58	2053.27	0.13
Mud Creek	1000	103850	2 YR	12209.00	258.33	269.01		269.04	0.000059	1.43	10053.33	1345.36	0.08
Mud Creek	1000	103850	5 YR	20412.00	258.33	271.16		271.21	0.000079	1.91	13093.30	1481.45	0.10
Mud Creek	1000	103850	10 YR	26532.00	258.33	272.36		272.43	0.000093	2.21	14920.36	1565.40	0.11
Mud Creek	1000	103850	25 YR	33468.00	258.33	273.45		273.54	0.000110	2.54	16659.85	1641.34	0.12
Mud Creek	1000	103850	50 YR	40489.00	258.33	274.36		274.47	0.000128	2.86	18184.39	1705.12	0.13
Mud Creek	1000	103850	100 YR	47404.00	258.33	275.17		275.31	0.000144	3.15	19594.30	1762.05	0.14
Mud Creek	1000	103350	2 YR	13205.00	258.15	268.94	262.30	268.99	0.000125	2.08	9244.93	1488.22	0.12
Mud Creek	1000	103350	5 YR	22096.00	258.15	271.07	263.29	271.15	0.000157	2.68	12641.93	1685.38	0.14
Mud Creek	1000	103350	10 YR	28697.00	258.15	272.25	263.92	272.36	0.000179	3.06	14690.33	1779.96	0.15
Mud Creek	1000	103350	25 YR	35693.00	258.15	273.32	264.53	273.46	0.000201	3.43	16640.92	1865.57	0.16
Mud Creek	1000	103350	50 YR	42302.00	258.15	274.22	265.07	274.38	0.000219	3.73	18354.21	1937.65	0.17
Mud Creek	1000	103350	100 YR	48800.00	258.15	275.03	265.53	275.21	0.000236	4.01	19939.74	2002.04	0.18
Mud Creek	1000	103200		Bridge									
Mud Creek	1000	103100	2 YR	13205.00	258.06	268.77		268.87	0.000403	2.83	6343.77	1013.78	0.17
Mud Creek	1000	103100	5 YR	22096.00	258.06	270.80		270.97	0.000527	3.70	8562.57	1195.87	0.20
Mud Creek	1000	103100	10 YR	28697.00	258.06	271.90		272.12	0.000621	4.28	9948.45	1327.67	0.22
Mud Creek	1000	103100	25 YR	35693.00	258.06	272.88		273.15	0.000710	4.81	11306.54	1445.22	0.23
Mud Creek	1000	103100	50 YR	42302.00	258.06	273.69		274.01	0.000784	5.26	12523.40	1542.95	0.25
Mud Creek	1000	103100	100 YR	48800.00	258.06	274.41		274.77	0.000850	5.67	13662.60	1629.14	0.26

## HEC-RAS Plan: Ex (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	102550	2 YR	13205.00	257.86	268.29		268.46	0.001214	5.00	5404.16	1177.82	0.29
Mud Creek	1000	102550	5 YR	22096.00	257.86	270.26		270.48	0.001290	5.85	7977.35	1441.70	0.31
Mud Creek	1000	102550	10 YR	28697.00	257.86	271.31		271.56	0.001382	6.42	9584.03	1610.17	0.32
Mud Creek	1000	102550	25 YR	35693.00	257.86	272.26		272.54	0.001451	6.91	11177.21	1761.38	0.33
Mud Creek	1000	102550	50 YR	42302.00	257.86	273.04		273.35	0.001502	7.31	12608.79	1886.95	0.34
Mud Creek	1000	102550	100 YR	48800.00	257.86	273.73		274.06	0.001545	7.65	13950.04	1997.44	0.35
Mud Creek	1000	101050	2 YR	13205.00	257.31	263.77		264.94	0.007897	9.80	2126.12	784.67	0.76
Mud Creek	1000	101050	5 YR	22096.00	257.31	264.76	264.76	266.54	0.010251	12.57	2980.81	938.44	0.90
Mud Creek	1000	101050	10 YR	28697.00	257.31	265.57	265.57	267.49	0.009970	13.46	3786.79	1063.26	0.90
Mud Creek	1000	101050	25 YR	35693.00	257.31	266.28	266.28	268.35	0.009913	14.32	4581.08	1173.35	0.91
Mud Creek	1000	101050	50 YR	42302.00	257.31	266.87	266.87	269.07	0.009915	15.05	5297.05	1264.40	0.93
Mud Creek	1000	101050	100 YR	48800.00	257.31	267.40	267.40	269.71	0.009877	15.67	5990.96	1346.78	0.93
Mud Creek	1000	99150	2 YR	13205.00	256.62	263.49		263.50	0.000246	1.99	17267.94	5410.86	0.15
Mud Creek	1000	99150	5 YR	22096.00	256.62	264.48		264.50	0.000295	2.45	22782.23	5698.74	0.17
Mud Creek	1000	99150	10 YR	28697.00	256.62	265.08		265.11	0.000322	2.72	26285.79	5874.33	0.18
Mud Creek	1000	99150	25 YR	35693.00	256.62	265.65		265.68	0.000346	2.98	29678.18	6039.48	0.19
Mud Creek	1000	99150	50 YR	42302.00	256.62	266.14		266.17	0.000364	3.19	32661.53	6181.07	0.20
Mud Creek	1000	99150	100 YR	48800.00	256.62	266.59		266.62	0.000380	3.38	35437.79	6309.98	0.21
Mud Creek	1000	97950	2 YR	13205.00	256.19	263.30		263.32	0.000302	2.21	15907.24	5125.95	0.17
Mud Creek	1000	97950	5 YR	22096.00	256.19	264.25		264.28	0.000363	2.71	20900.01	5335.93	0.19
Mud Creek	1000	97950	10 YR	28697.00	256.19	264.84		264.87	0.000398	3.02	24050.29	5464.28	0.20
Mud Creek	1000	97950	25 YR	35693.00	256.19	265.39		265.42	0.000428	3.30	27089.36	5585.29	0.22
Mud Creek	1000	97950	50 YR	42302.00	256.19	265.86		265.90	0.000451	3.53	29752.99	5689.24	0.22
Mud Creek	1000	97950	100 YR	48800.00	256.19	266.29		266.34	0.000471	3.74	32225.31	5784.06	0.23
Mud Creek	1000	96975	2 YR	13205.00	255.84	263.22	260.64	263.23	0.000233	2.01	17300.00	5185.38	0.15
Mud Creek	1000	96975	5 YR	22096.00	255.84	264.16	260.95	264.18	0.000300	2.53	22245.64	5391.13	0.18
Mud Creek	1000	96975	10 YR	28697.00	255.84	264.73	261.16	264.75	0.000338	2.85	25366.31	5517.01	0.19
Mud Creek	1000	96975	25 YR	35693.00	255.84	265.27	261.34	265.30	0.000371	3.13	28378.48	5635.84	0.20
Mud Creek	1000	96975	50 YR	42302.00	255.84	265.73	261.46	265.77	0.000398	3.38	31019.58	5738.01	0.21
Mud Creek	1000	96975	100 YR	48800.00	255.84	266.16	261.61	266.20	0.000420	3.59	33471.98	5831.28	0.22
Mud Creek	1000	96950		Bridge									
Mud Creek	1000	96925	2 YR	13205.00	255.82	263.16		263.19	0.000619	2.33	11843.07	4706.20	0.18
Mud Creek	1000	96925	5 YR	22096.00	255.82	264.09		264.13	0.000664	2.71	16347.66	4930.57	0.20
Mud Creek	1000	96925	10 YR	28697.00	255.82	264.66		264.71	0.000693	2.94	19199.43	5067.49	0.20
Mud Creek	1000	96925	25 YR	35693.00	255.82	265.20		265.26	0.000717	3.16	21962.19	5196.69	0.21
Mud Creek	1000	96925	50 YR	42302.00	255.82	265.66		265.72	0.000736	3.34	24392.26	5307.73	0.22
Mud Creek	1000	96925	100 YR	48800.00	255.82	266.08		266.15	0.000752	3.50	26655.29	5409.09	0.22
Mud Creek	1000	95200	2 YR	13205.00	255.19	262.38		262.42	0.000734	2.49	11175.93	4672.06	0.20
Mud Creek	1000	95200	5 YR	22096.00	255.19	263.30		263.34	0.000772	2.86	15543.31	4891.27	0.21
Mud Creek	1000	95200	10 YR	28697.00	255.19	263.84		263.90	0.000805	3.11	18254.42	5022.53	0.22
Mud Creek	1000	95200	25 YR	35693.00	255.19	264.36		264.42	0.000832	3.33	20889.57	5146.91	0.23
Mud Creek	1000	95200	50 YR	42302.00	255.19	264.81		264.88	0.000853	3.52	23212.09	5254.09	0.23
Mud Creek	1000	95200	100 YR	48800.00	255.19	265.22		265.29	0.000869	3.69	25382.37	5352.31	0.24
Mud Creek	1000	93700	2 YR	13205.00	254.65	261.53		261.59	0.000995	2.35	8763.13	4278.64	0.20
Mud Creek	1000	93700	5 YR	22096.00	254.65	262.46		262.54	0.001027	2.73	12878.69	4539.99	0.21
Mud Creek	1000	93700	10 YR	28697.00	254.65	262.99		263.08	0.001086	2.99	15292.16	4686.47	0.22
Mud Creek	1000	93700	25 YR	35693.00	254.65	263.49		263.59	0.001129	3.23	17664.36	4826.12	0.23
Mud Creek	1000	93700	50 YR	42302.00	254.65	263.92		264.03	0.001159	3.42	19766.80	4946.60	0.23
Mud Creek	1000	93700	100 YR	48800.00	254.65	264.31		264.43	0.001180	3.59	21748.36	5057.52	0.24
Mud Creek	1000	91800	2 YR	13205.00	253.96	259.65		259.72	0.001196	2.24	5888.77	2071.19	0.23
Mud Creek	1000	91800	5 YR	22096.00	253.96	260.74		260.84	0.001067	2.55	10042.43	4674.11	0.23
Mud Creek	1000	91800	10 YR	28697.00	253.96	261.32		261.43	0.001011	2.73	12810.34	4811.26	0.23
Mud Creek	1000	91800	25 YR	35693.00	253.96	261.86		261.98	0.000977	2.90	15427.35	4937.43	0.23
Mud Creek	1000	91800	50 YR	42302.00	253.96	262.32		262.45	0.000953	3.05	17721.39	5045.43	0.23
Mud Creek	1000	91800	100 YR	48800.00	253.96	262.75		262.88	0.000931	3.17	19896.12	5145.73	0.23
Mud Creek	1000	90600	2 YR	13205.00	253.52	258.87		258.89	0.000437	1.30	10149.58	3796.04	0.14
Mud Creek	1000	90600	5 YR	22096.00	253.52	259.99		260.02	0.000443	1.49	14855.18	4592.46	0.15
Mud Creek	1000	90600	10 YR	28697.00	253.52	260.62		260.66	0.000415	1.62	17787.64	4778.34	0.15
Mud Creek	1000	90600	25 YR	35693.00	253.52	261.16		261.21	0.000412	1.76	20440.54	4936.72	0.15
Mud Creek	1000	90600	50 YR	42302.00	253.52	261.62		261.68	0.000413	1.89	22750.89	5070.62	0.15
Mud Creek	1000	90600	100 YR	48800.00	253.52	262.06		262.12	0.000412	1.99	24970.72	5196.03	0.15
Mud Creek	1000	89850	2 YR	13205.00	253.25	258.57		258.60	0.000353	1.34	9858.66	3705.28	0.14
Mud Creek	1000	89850	5 YR	22096.00	253.25	259.69		259.73	0.000357	1.53	14433.77	4483.34	0.15
Mud Creek	1000	89850	10 YR	28697.00	253.25	260.33		260.37	0.000343	1.65	17427.78	4769.43	0.15
Mud Creek	1000	89850	25 YR	35693.00	253.25	260.88		260.93	0.000334	1.78	20087.29	4885.12	0.15
Mud Creek	1000	89850	50 YR	42302.00	253.25	261.34		261.40	0.000332	1.91	22367.42	4982.18	0.15
Mud Creek	1000	89850	100 YR	48800.00	253.25	261.78		261.84	0.000329	2.01	24551.27	5073.39	0.16
Mud Creek	1000	88850	2 YR	13205.00	252.89	258.23		258.26	0.000321	1.46	9023.65	3379.70	0.16
Mud Creek	1000	88850	5 YR	22096.00	252.89	259.34		259.38	0.000328	1.68	13159.85	4081.43	0.16
Mud Creek	1000	88850	10 YR	28697.00	252.89	259.98		260.03	0.000333	1.80	15925.08	4489.80	0.17
Mud Creek	1000	88850	25 YR	35693.00	252.89	260.55		260.61	0.000316	1.93	18494.58	4612.35	0.17
Mud Creek	1000	88850	50 YR	42302.00	252.89	261.01		261.08	0.000310	2.06	20663.20	4707.75	0.17
Mud Creek	1000	88850	100 YR	48800.00	252.89	261.45		261.52	0.000303	2.16	22748.02	4797.68	0.17



## HEC-RAS Plan: Ex (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	68650	2 YR	13992.00	243.77	249.30		249.32	0.000200	1.04	13505.43	4883.22	0.11
Mud Creek	1000	68650	5 YR	23373.00	243.77	251.60		251.61	0.000074	0.90	26103.66	5700.25	0.07
Mud Creek	1000	68650	10 YR	30349.00	243.77	252.98		252.99	0.000053	0.90	34069.24	5872.32	0.06
Mud Creek	1000	68650	25 YR	37724.00	243.77	254.29		254.30	0.000043	0.92	41851.91	6035.72	0.06
Mud Creek	1000	68650	50 YR	44687.00	243.77	255.42		255.44	0.000037	0.94	48797.54	6177.89	0.06
Mud Creek	1000	68650	100 YR	51392.00	243.77	256.44		256.46	0.000033	0.97	55169.43	6305.49	0.06
Mud Creek	1000	67650	2 YR	13992.00	243.26	249.15		249.16	0.000122	0.84	16608.03	5637.98	0.09
Mud Creek	1000	67650	5 YR	23373.00	243.26	251.55		251.55	0.000047	0.74	31786.34	6546.66	0.06
Mud Creek	1000	67650	10 YR	30349.00	243.26	252.94		252.95	0.000034	0.74	40963.88	6633.70	0.05
Mud Creek	1000	67650	25 YR	37724.00	243.26	254.25		254.26	0.000028	0.76	49741.65	6715.89	0.05
Mud Creek	1000	67650	50 YR	44687.00	243.26	255.40		255.41	0.000025	0.79	57450.38	6787.25	0.05
Mud Creek	1000	67650	100 YR	51392.00	243.26	256.42		256.43	0.000023	0.81	64431.11	6851.23	0.05
Mud Creek	1000	66450	2 YR	13992.00	242.65	249.07		249.07	0.000047	0.64	21999.84	6855.13	0.06
Mud Creek	1000	66450	5 YR	23373.00	242.65	251.51		251.52	0.000020	0.57	42302.32	8925.69	0.04
Mud Creek	1000	66450	10 YR	30349.00	242.65	252.92		252.92	0.000015	0.58	54863.02	8995.77	0.04
Mud Creek	1000	66450	25 YR	37724.00	242.65	254.24		254.24	0.000012	0.59	66778.57	9061.76	0.04
Mud Creek	1000	66450	50 YR	44687.00	242.65	255.38		255.39	0.000011	0.61	77181.95	9118.98	0.04
Mud Creek	1000	66450	100 YR	51392.00	242.65	256.41		256.41	0.000010	0.63	86559.17	9170.25	0.03
Mud Creek	1000	64850	2 YR	13992.00	241.83	248.99		248.99	0.000053	0.72	19434.27	5431.05	0.07
Mud Creek	1000	64850	5 YR	23373.00	241.83	251.48		251.48	0.000026	0.68	34521.55	6266.38	0.05
Mud Creek	1000	64850	10 YR	30349.00	241.83	252.88		252.89	0.000021	0.70	43400.17	6329.82	0.05
Mud Creek	1000	64850	25 YR	37724.00	241.83	254.21		254.22	0.000018	0.73	51817.69	6389.38	0.04
Mud Creek	1000	64850	50 YR	44687.00	241.83	255.35		255.36	0.000016	0.76	59172.59	6440.97	0.04
Mud Creek	1000	64850	100 YR	51392.00	241.83	256.38		256.39	0.000015	0.79	65808.77	6487.17	0.04
Mud Creek	1000	63250	2 YR	13992.00	241.02	248.89		248.90	0.000066	0.65	21402.22	5436.28	0.06
Mud Creek	1000	63250	5 YR	23373.00	241.02	251.43		251.43	0.000036	0.64	36725.84	6257.08	0.05
Mud Creek	1000	63250	10 YR	30349.00	241.02	252.85		252.85	0.000030	0.67	45645.52	6313.84	0.04
Mud Creek	1000	63250	25 YR	37724.00	241.02	254.17		254.18	0.000026	0.70	54068.80	6366.98	0.04
Mud Creek	1000	63250	50 YR	44687.00	241.02	255.32		255.33	0.000024	0.73	61413.04	6412.96	0.04
Mud Creek	1000	63250	100 YR	51392.00	241.02	256.35		256.36	0.000023	0.76	68029.64	6454.09	0.04
Mud Creek	1000	61950	2 YR	13992.00	240.36	248.84		248.84	0.000033	0.64	21982.24	5187.27	0.05
Mud Creek	1000	61950	5 YR	23373.00	240.36	251.39		251.40	0.000020	0.64	36724.10	5997.50	0.05
Mud Creek	1000	61950	10 YR	30349.00	240.36	252.82		252.82	0.000017	0.67	45338.84	6097.22	0.04
Mud Creek	1000	61950	25 YR	37724.00	240.36	254.15		254.16	0.000015	0.71	53518.48	6190.42	0.04
Mud Creek	1000	61950	50 YR	44687.00	240.36	255.30		255.31	0.000014	0.75	60689.93	6270.99	0.04
Mud Creek	1000	61950	100 YR	51392.00	240.36	256.33		256.34	0.000013	0.78	67183.07	6343.05	0.04
Mud Creek	1000	60750	2 YR	13992.00	239.83	248.78		248.79	0.000053	1.33	25915.71	5493.89	0.08
Mud Creek	1000	60750	5 YR	23373.00	239.83	251.36		251.37	0.000041	1.38	41527.24	6322.09	0.07
Mud Creek	1000	60750	10 YR	30349.00	239.83	252.79		252.80	0.000038	1.44	50652.22	6450.68	0.07
Mud Creek	1000	60750	25 YR	37724.00	239.83	254.12		254.13	0.000036	1.50	59335.60	6570.71	0.07
Mud Creek	1000	60750	50 YR	44687.00	239.83	255.27		255.28	0.000035	1.56	66967.59	6674.43	0.07
Mud Creek	1000	60750	100 YR	51392.00	239.83	256.30		256.31	0.000034	1.61	73893.19	6767.18	0.07
Mud Creek	1000	58800	2 YR	13992.00	239.18	248.76		248.77	0.000005	0.42	43870.95	6567.68	0.02
Mud Creek	1000	58800	5 YR	23373.00	239.18	251.34		251.34	0.000006	0.52	61747.10	7110.10	0.03
Mud Creek	1000	58800	10 YR	30349.00	239.18	252.76		252.77	0.000006	0.58	71940.90	7174.33	0.03
Mud Creek	1000	58800	25 YR	37724.00	239.18	254.10		254.10	0.000007	0.64	81539.90	7234.28	0.03
Mud Creek	1000	58800	50 YR	44687.00	239.18	255.25		255.25	0.000007	0.70	89899.60	7286.10	0.03
Mud Creek	1000	58800	100 YR	51392.00	239.18	256.28		256.28	0.000007	0.74	97425.79	7332.43	0.03
Mud Creek	1000	57200	2 YR	13992.00	238.64	248.76		248.76	0.000003	0.27	57134.03	7039.26	0.02
Mud Creek	1000	57200	5 YR	23373.00	238.64	251.33		251.33	0.000003	0.35	75802.05	7386.45	0.02
Mud Creek	1000	57200	10 YR	30349.00	238.64	252.76		252.76	0.000004	0.40	86406.20	7479.18	0.02
Mud Creek	1000	57200	25 YR	37724.00	238.64	254.09		254.09	0.000004	0.45	96425.20	7565.75	0.02
Mud Creek	1000	57200	50 YR	44687.00	238.64	255.24		255.24	0.000004	0.49	105176.80	7640.57	0.02
Mud Creek	1000	57200	100 YR	51392.00	238.64	256.27		256.27	0.000005	0.53	113076.10	7707.48	0.02
Mud Creek	1000	55600	2 YR	13992.00	238.10	248.75		248.75	0.000005	0.41	36047.62	4100.10	0.02
Mud Creek	1000	55600	5 YR	23373.00	238.10	251.32		251.32	0.000006	0.54	46782.66	4210.56	0.03
Mud Creek	1000	55600	10 YR	30349.00	238.10	252.75		252.75	0.000007	0.62	52789.63	4221.96	0.03
Mud Creek	1000	55600	25 YR	37724.00	238.10	254.08		254.08	0.000007	0.70	58411.66	4232.60	0.03
Mud Creek	1000	55600	50 YR	44687.00	238.10	255.22		255.23	0.000008	0.77	63281.56	4241.80	0.03
Mud Creek	1000	55600	100 YR	51392.00	238.10	256.25		256.26	0.000009	0.83	67645.45	4250.02	0.04
Mud Creek	1000	53900	2 YR	13992.00	237.53	248.75		248.75	0.000002	0.26	56735.06	6174.78	0.01
Mud Creek	1000	53900	5 YR	23373.00	237.53	251.32		251.32	0.000002	0.34	72865.14	6339.49	0.02
Mud Creek	1000	53900	10 YR	30349.00	237.53	252.74		252.74	0.000003	0.40	81925.31	6382.23	0.02
Mud Creek	1000	53900	25 YR	37724.00	237.53	254.07		254.07	0.000003	0.45	90438.26	6422.12	0.02
Mud Creek	1000	53900	50 YR	44687.00	237.53	255.22		255.22	0.000003	0.49	97838.37	6456.59	0.02
Mud Creek	1000	53900	100 YR	51392.00	237.53	256.25		256.25	0.000003	0.53	104489.80	6487.42	0.02
Mud Creek	1000	52600	2 YR	13992.00	237.09	248.74		248.75	0.000002	0.30	48414.42	4941.85	0.02
Mud Creek	1000	52600	5 YR	23373.00	237.09	251.31		251.31	0.000003	0.39	61214.72	5015.97	0.02
Mud Creek	1000	52600	10 YR	30349.00	237.09	252.74		252.74	0.000003	0.46	68374.48	5043.14	0.02
Mud Creek	1000	52600	25 YR	37724.00	237.09	254.06		254.07	0.000004	0.52	75093.04	5068.51	0.02
Mud Creek	1000	52600	50 YR	44687.00	237.09	255.21		255.22	0.000004	0.57	80926.80	5090.44	0.02
Mud Creek	1000	52600	100 YR	51392.00	237.09	256.24		256.25	0.000005	0.62	86165.11	5110.05	0.03
Mud Creek	1000	51700	2 YR	13992.00	236.78	248.74		248.74	0.000005	0.33	44273.09	4655.64	0.02
Mud Creek	1000	51700	5 YR	23373.00	236.78	251.31		251.31	0.000006	0.44	56525.34	4934.48	0.02

## HEC-RAS Plan: Ex (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	51700	10 YR	30349.00	236.78	252.73		252.73	0.000007	0.51	63688.32	5135.08	0.02
Mud Creek	1000	51700	25 YR	37724.00	236.78	254.06		254.06	0.000008	0.58	70632.61	5322.34	0.03
Mud Creek	1000	51700	50 YR	44687.00	236.78	255.21		255.21	0.000009	0.63	76834.96	5484.19	0.03
Mud Creek	1000	51700	100 YR	51392.00	236.78	256.23		256.24	0.000010	0.68	82538.97	5628.94	0.03
Mud Creek	1000	49500	2 YR	13992.00	236.04	248.74		248.74	0.000002	0.28	51701.89	5005.77	0.01
Mud Creek	1000	49500	5 YR	23373.00	236.04	251.30		251.30	0.000002	0.37	64655.35	5095.53	0.02
Mud Creek	1000	49500	10 YR	30349.00	236.04	252.72		252.73	0.000003	0.43	71933.27	5145.28	0.02
Mud Creek	1000	49500	25 YR	37724.00	236.04	254.05		254.05	0.000003	0.49	78791.22	5191.72	0.02
Mud Creek	1000	49500	50 YR	44687.00	236.04	255.20		255.20	0.000004	0.55	84768.44	5231.86	0.02
Mud Creek	1000	49500	100 YR	51392.00	236.04	256.22		256.23	0.000004	0.59	90152.91	5267.76	0.02
Mud Creek	1000	47200	2 YR	13992.00	235.27	248.73		248.73	0.000003	0.39	55650.91	6534.14	0.02
Mud Creek	1000	47200	5 YR	23373.00	235.27	251.29		251.30	0.000004	0.50	72859.41	6821.12	0.02
Mud Creek	1000	47200	10 YR	30349.00	235.27	252.71		252.72	0.000005	0.58	82601.05	6899.22	0.03
Mud Creek	1000	47200	25 YR	37724.00	235.27	254.04		254.04	0.000006	0.65	91795.56	6972.14	0.03
Mud Creek	1000	47200	50 YR	44687.00	235.27	255.18		255.19	0.000006	0.71	99821.08	7035.16	0.03
Mud Creek	1000	47200	100 YR	51392.00	235.27	256.21		256.22	0.000006	0.76	107059.90	7091.53	0.03
Mud Creek	1000	46450	2 YR	13992.00	235.02	248.73		248.73	0.000004	0.39	66206.47	8816.37	0.02
Mud Creek	1000	46450	5 YR	23373.00	235.02	251.29		251.29	0.000005	0.48	89779.57	9377.39	0.02
Mud Creek	1000	46450	10 YR	30349.00	235.02	252.71		252.71	0.000006	0.54	103153.60	9462.57	0.02
Mud Creek	1000	46450	25 YR	37724.00	235.02	254.04		254.04	0.000006	0.60	115748.80	9542.10	0.03
Mud Creek	1000	46450	50 YR	44687.00	235.02	255.18		255.18	0.000007	0.65	126721.40	9610.85	0.03
Mud Creek	1000	46450	100 YR	51392.00	235.02	256.21		256.21	0.000007	0.69	136601.70	9672.33	0.03
Mud Creek	1000	44950	2 YR	13992.00	234.51	248.72		248.72	0.000003	0.29	97994.03	13397.34	0.01
Mud Creek	1000	44950	5 YR	23373.00	234.51	251.28		251.29	0.000003	0.34	133785.30	14279.83	0.02
Mud Creek	1000	44950	10 YR	30349.00	234.51	252.70		252.70	0.000004	0.38	154194.90	14478.54	0.02
Mud Creek	1000	44950	25 YR	37724.00	234.51	254.03		254.03	0.000004	0.42	173504.30	14664.06	0.02
Mud Creek	1000	44950	50 YR	44687.00	234.51	255.17		255.18	0.000004	0.45	190394.80	14824.44	0.02
Mud Creek	1000	44950	100 YR	51392.00	234.51	256.20		256.20	0.000004	0.47	205657.40	14967.89	0.02
Angelina River	Upstream	71106	2 YR	12944.00	246.00	252.15		252.19	0.000293	1.64	7955.89	1984.90	0.14
Angelina River	Upstream	71106	5 YR	21707.00	246.00	253.78		253.84	0.000270	1.97	11259.08	2054.09	0.14
Angelina River	Upstream	71106	10 YR	28205.00	246.00	254.90		254.97	0.000251	2.13	13584.09	2101.43	0.14
Angelina River	Upstream	71106	25 YR	35110.00	246.00	256.03		256.11	0.000233	2.28	15970.57	2148.93	0.14
Angelina River	Upstream	71106	50 YR	41349.00	246.00	257.02		257.10	0.000218	2.38	18117.51	2190.78	0.14
Angelina River	Upstream	71106	100 YR	47334.00	246.00	257.93		258.02	0.000206	2.46	20129.94	2229.30	0.14
Angelina River	Upstream	69124	2 YR	12944.00	245.00	251.43		251.50	0.000422	2.17	6836.48	2301.91	0.19
Angelina River	Upstream	69124	5 YR	21707.00	245.00	253.20		253.28	0.000310	2.38	11003.08	2409.10	0.18
Angelina River	Upstream	69124	10 YR	28205.00	245.00	254.39		254.48	0.000265	2.50	13904.38	2481.01	0.17
Angelina River	Upstream	69124	25 YR	35110.00	245.00	255.57		255.66	0.000233	2.61	16863.01	2552.26	0.16
Angelina River	Upstream	69124	50 YR	41349.00	245.00	256.60		256.69	0.000210	2.68	19524.57	2614.69	0.16
Angelina River	Upstream	69124	100 YR	47334.00	245.00	257.54		257.64	0.000194	2.75	22012.58	2671.73	0.15
Angelina River	Upstream	67228	2 YR	12944.00	244.00	250.83		250.87	0.000264	1.69	7677.80	2027.76	0.15
Angelina River	Upstream	67228	5 YR	21707.00	244.00	252.77		252.83	0.000188	1.87	11674.61	2085.86	0.14
Angelina River	Upstream	67228	10 YR	28205.00	244.00	254.02		254.08	0.000165	2.00	14296.58	2123.11	0.13
Angelina River	Upstream	67228	25 YR	35110.00	244.00	255.23		255.30	0.000150	2.12	16900.39	2159.47	0.13
Angelina River	Upstream	67228	50 YR	41349.00	244.00	256.29		256.37	0.000138	2.20	19205.26	2191.15	0.13
Angelina River	Upstream	67228	100 YR	47334.00	244.00	257.25		257.34	0.000130	2.28	21327.47	2219.92	0.13
Angelina River	Upstream	65531	2 YR	12944.00	242.00	250.47		250.49	0.000184	1.19	10898.11	2520.65	0.10
Angelina River	Upstream	65531	5 YR	21707.00	242.00	252.51		252.54	0.000146	1.36	16419.75	2902.65	0.09
Angelina River	Upstream	65531	10 YR	28205.00	242.00	253.79		253.82	0.000133	1.46	20281.77	3142.36	0.09
Angelina River	Upstream	65531	25 YR	35110.00	242.00	255.03		255.06	0.000123	1.55	24321.05	3374.90	0.09
Angelina River	Upstream	65531	50 YR	41349.00	242.00	256.10		256.14	0.000114	1.61	28069.78	3577.21	0.09
Angelina River	Upstream	65531	100 YR	47334.00	242.00	257.08		257.12	0.000108	1.67	31653.42	3760.46	0.09
Angelina River	Upstream	58835	2 YR	12944.00	241.00	248.95		248.98	0.000287	1.37	9431.14	2373.07	0.12
Angelina River	Upstream	58835	5 YR	21707.00	241.00	251.49		251.51	0.000160	1.35	16113.67	2724.17	0.10
Angelina River	Upstream	58835	10 YR	28205.00	241.00	252.90		252.93	0.000133	1.42	19991.90	2759.53	0.09
Angelina River	Upstream	58835	25 YR	35110.00	241.00	254.22		254.26	0.000119	1.49	23665.90	2792.61	0.09
Angelina River	Upstream	58835	50 YR	41349.00	241.00	255.37		255.40	0.000109	1.55	26870.63	2821.16	0.09
Angelina River	Upstream	58835	100 YR	47334.00	241.00	256.39		256.43	0.000103	1.61	29766.40	2846.70	0.09
Angelina River	Upstream	53947	2 YR	12944.00	236.00	248.75		248.75	0.000026	0.91	32106.98	4710.76	0.05
Angelina River	Upstream	53947	5 YR	21707.00	236.00	251.31		251.32	0.000026	1.07	44793.14	5040.40	0.05
Angelina River	Upstream	53947	10 YR	28205.00	236.00	252.73		252.74	0.000027	1.17	51976.60	5066.84	0.05
Angelina River	Upstream	53947	25 YR	35110.00	236.00	254.06		254.07	0.000028	1.26	58716.65	5091.53	0.06
Angelina River	Upstream	53947	50 YR	41349.00	236.00	255.21		255.21	0.000029	1.33	64565.45	5112.85	0.06
Angelina River	Upstream	53947	100 YR	47334.00	236.00	256.23		256.24	0.000029	1.39	69816.88	5131.92	0.06
Angelina River	Upstream	50340	2 YR	12944.00	235.00	248.72		248.72	0.000006	0.38	62497.52	7932.90	0.02
Angelina River	Upstream	50340	5 YR	21707.00	235.00	251.28		251.28	0.000006	0.47	83342.05	8281.99	0.02
Angelina River	Upstream	50340	10 YR	28205.00	235.00	252.70		252.70	0.000007	0.53	95187.06	8410.29	0.02
Angelina River	Upstream	50340	25 YR	35110.00	235.00	254.03		254.03	0.000008	0.58	106410.00	8530.07	0.03
Angelina River	Upstream	50340	50 YR	41349.00	235.00	255.17		255.17	0.000008	0.63	116238.90	8633.60	0.03
Angelina River	Upstream	50340	100 YR	47334.00	235.00	256.20		256.20	0.000009	0.66	125130.40	8726.21	0.03
Angelina River	Downstream	43601	2 YR	23600.00	234.06	248.65		248.70	0.000158	2.74	25003.10	5356.31	0.14
Angelina River	Downstream	43601	5 YR	39850.00	234.06	251.22		251.26	0.000129	2.83	40294.95	6211.10	0.13
Angelina River	Downstream	43601	10 YR	52500.00	234.06	252.64		252.68	0.000124	2.95	49148.71	6281.97	0.13
Angelina River	Downstream	43601	25 YR	66389.00	234.06	253.96		254.00	0.000123	3.11	57491.59	6348.02	0.13

## HEC-RAS Plan: Ex (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Downstream	43601	50 YR	79424.00	234.06	255.10		255.15	0.000122	3.23	64773.52	6405.12	0.13
Angelina River	Downstream	43601	100 YR	92066.00	234.06	256.12		256.17	0.000122	3.35	71339.48	6456.18	0.14
Angelina River	Downstream	43600	2 YR	23600.00	234.06	248.65	243.23	248.70	0.000158	2.74	25002.20	5356.21	0.14
Angelina River	Downstream	43600	5 YR	39850.00	234.06	251.22	244.52	251.26	0.000129	2.83	40294.09	6211.09	0.13
Angelina River	Downstream	43600	10 YR	52500.00	234.06	252.64	245.24	252.68	0.000124	2.95	49147.94	6281.96	0.13
Angelina River	Downstream	43600	25 YR	66389.00	234.06	253.96	245.85	254.00	0.000123	3.11	57490.81	6348.02	0.13
Angelina River	Downstream	43600	50 YR	79424.00	234.06	255.10	246.32	255.15	0.000123	3.23	64772.74	6405.12	0.13
Angelina River	Downstream	43600	100 YR	92066.00	234.06	256.12	246.80	256.17	0.000122	3.35	71338.70	6456.17	0.14
Angelina River	Downstream	43250		Bridge									
Angelina River	Downstream	42900	2 YR	23600.00	233.82	248.52		248.54	0.000127	2.14	25198.81	3971.93	0.11
Angelina River	Downstream	42900	5 YR	39850.00	233.82	251.10		251.13	0.000136	2.54	36253.18	4563.74	0.12
Angelina River	Downstream	42900	10 YR	52500.00	233.82	252.51		252.55	0.000150	2.84	42892.91	4839.13	0.13
Angelina River	Downstream	42900	25 YR	66389.00	233.82	253.82		253.87	0.000163	3.12	49421.71	5095.43	0.13
Angelina River	Downstream	42900	50 YR	79424.00	233.82	254.96		255.01	0.000171	3.34	55345.45	5317.30	0.14
Angelina River	Downstream	42900	100 YR	92066.00	233.82	255.98		256.03	0.000177	3.53	60857.85	5515.75	0.14
Angelina River	Downstream	40400	2 YR	23600.00	232.98	248.23		248.25	0.000167	2.47	26165.16	4782.24	0.13
Angelina River	Downstream	40400	5 YR	39850.00	232.98	250.81		250.84	0.000161	2.77	39974.34	5820.21	0.13
Angelina River	Downstream	40400	10 YR	52500.00	232.98	252.22		252.25	0.000156	2.90	48192.31	5855.41	0.13
Angelina River	Downstream	40400	25 YR	66389.00	232.98	253.52		253.56	0.000156	3.07	55854.23	5888.03	0.13
Angelina River	Downstream	40400	50 YR	79424.00	232.98	254.65		254.69	0.000156	3.20	62540.49	5916.35	0.13
Angelina River	Downstream	40400	100 YR	92066.00	232.98	255.67		255.71	0.000157	3.32	68549.48	5941.69	0.13
Angelina River	Downstream	39350	2 YR	23600.00	232.63	248.18		248.18	0.000039	1.04	47653.03	7170.89	0.05
Angelina River	Downstream	39350	5 YR	39850.00	232.63	250.76		250.76	0.000040	1.21	67224.93	7837.87	0.06
Angelina River	Downstream	39350	10 YR	52500.00	232.63	252.16		252.17	0.000043	1.34	78293.24	7908.16	0.06
Angelina River	Downstream	39350	25 YR	66389.00	232.63	253.47		253.48	0.000047	1.47	88636.08	7973.29	0.06
Angelina River	Downstream	39350	50 YR	79424.00	232.63	254.60		254.61	0.000049	1.57	97690.84	8029.87	0.06
Angelina River	Downstream	39350	100 YR	92066.00	232.63	255.61		255.62	0.000051	1.66	105847.20	8080.50	0.07
Angelina River	Downstream	36950	2 YR	23600.00	231.82	247.95		248.04	0.000247	3.50	16554.12	3006.95	0.18
Angelina River	Downstream	36950	5 YR	39850.00	231.82	250.52		250.63	0.000259	4.07	25395.14	4115.50	0.19
Angelina River	Downstream	36950	10 YR	52500.00	231.82	251.92		252.03	0.000258	4.32	31185.01	4157.49	0.19
Angelina River	Downstream	36950	25 YR	66389.00	231.82	253.21		253.33	0.000263	4.60	36572.27	4196.19	0.19
Angelina River	Downstream	36950	50 YR	79424.00	231.82	254.33		254.46	0.000265	4.81	41300.48	4229.86	0.20
Angelina River	Downstream	36950	100 YR	92066.00	231.82	255.33		255.47	0.000267	5.01	45560.09	4259.96	0.20
Angelina River	Downstream	33750	2 YR	23600.00	230.74	246.59		246.88	0.000811	5.09	8477.30	1831.33	0.25
Angelina River	Downstream	33750	5 YR	39850.00	230.74	249.12		249.45	0.000850	5.86	13883.65	2439.02	0.26
Angelina River	Downstream	33750	10 YR	52500.00	230.74	250.52		250.86	0.000870	6.28	17506.99	2668.25	0.27
Angelina River	Downstream	33750	25 YR	66389.00	230.74	251.82		252.16	0.000866	6.58	20991.26	2713.57	0.27
Angelina River	Downstream	33750	50 YR	79424.00	230.74	252.95		253.30	0.000852	6.79	24095.28	2753.31	0.27
Angelina River	Downstream	33750	100 YR	92066.00	230.74	253.96		254.32	0.000845	7.00	26885.88	2788.56	0.27
Angelina River	Downstream	32550	2 YR	23600.00	230.34	246.06		246.21	0.000616	4.52	11323.75	2270.43	0.24
Angelina River	Downstream	32550	5 YR	39850.00	230.34	248.68		248.84	0.000552	4.94	17919.72	2755.97	0.24
Angelina River	Downstream	32550	10 YR	52500.00	230.34	250.09		250.27	0.000569	5.36	21977.02	3004.35	0.24
Angelina River	Downstream	32550	25 YR	66389.00	230.34	251.39		251.59	0.000583	5.73	25930.65	3069.44	0.25
Angelina River	Downstream	32550	50 YR	79424.00	230.34	252.54		252.74	0.000584	6.00	29485.48	3126.81	0.25
Angelina River	Downstream	32550	100 YR	92066.00	230.34	253.55		253.77	0.000586	6.25	32685.00	3177.56	0.26
Angelina River	Downstream	30950	2 YR	23600.00	229.81	242.59		244.27	0.003004	10.66	2956.89	868.32	0.59
Angelina River	Downstream	30950	5 YR	39850.00	229.81	244.74		246.99	0.003510	13.11	5403.18	1413.04	0.66
Angelina River	Downstream	30950	10 YR	52500.00	229.81	246.57		248.57	0.002926	13.14	8414.16	1877.84	0.62
Angelina River	Downstream	30950	25 YR	66389.00	229.81	248.43		250.07	0.002316	12.71	12358.68	2351.61	0.56
Angelina River	Downstream	30950	50 YR	79424.00	229.81	250.03		251.40	0.001890	12.24	16446.76	2759.50	0.52
Angelina River	Downstream	30950	100 YR	92066.00	229.81	251.48		252.58	0.001520	11.58	20756.24	3193.83	0.47
Angelina River	Downstream	29800	2 YR	23600.00	229.43	242.87		243.01	0.000311	3.12	10112.02	2092.62	0.19
Angelina River	Downstream	29800	5 YR	39850.00	229.43	245.37		245.55	0.000315	3.73	15669.25	2347.92	0.20
Angelina River	Downstream	29800	10 YR	52500.00	229.43	247.08		247.28	0.000306	4.05	19817.48	2521.70	0.20
Angelina River	Downstream	29800	25 YR	66389.00	229.43	248.75		248.97	0.000298	4.33	24173.12	2692.12	0.20
Angelina River	Downstream	29800	50 YR	79424.00	229.43	250.20		250.44	0.000288	4.55	28346.81	3544.61	0.20
Angelina River	Downstream	29800	100 YR	92066.00	229.43	251.53		251.78	0.000273	4.67	33157.81	3705.20	0.20
Angelina River	Downstream	29000	2 YR	23600.00	229.18	242.26		242.53	0.001102	5.41	10955.64	4167.29	0.28
Angelina River	Downstream	29000	5 YR	39850.00	229.18	245.06		245.18	0.000506	4.24	23422.78	4722.64	0.20
Angelina River	Downstream	29000	10 YR	52500.00	229.18	246.85		246.93	0.000375	3.94	32166.13	5075.99	0.17
Angelina River	Downstream	29000	25 YR	66389.00	229.18	248.57		248.65	0.000303	3.80	41221.13	5417.70	0.16
Angelina River	Downstream	29000	50 YR	79424.00	229.18	250.06		250.13	0.000281	3.86	49497.78	6155.42	0.15
Angelina River	Downstream	29000	100 YR	92066.00	229.18	251.42		251.48	0.000239	3.72	57964.01	6284.73	0.14
Angelina River	Downstream	22700	2 YR	23600.00	227.14	241.56		241.59	0.000094	1.99	22712.83	2620.22	0.10
Angelina River	Downstream	22700	5 YR	39850.00	227.14	244.41		244.46	0.000113	2.49	30370.10	2748.58	0.11
Angelina River	Downstream	22700	10 YR	52500.00	227.14	246.23		246.28	0.000125	2.81	35443.96	2830.43	0.12
Angelina River	Downstream	22700	25 YR	66389.00	227.14	247.98		248.05	0.000135	3.11	40467.86	2909.21	0.12
Angelina River	Downstream	22700	50 YR	79424.00	227.14	249.46		249.53	0.000143	3.37	44809.27	2975.61	0.13
Angelina River	Downstream	22700	100 YR	92066.00	227.14	250.84		250.92	0.000152	3.62	49001.11	3151.37	0.14
Angelina River	Downstream	18600	2 YR	23600.00	225.81	241.06		241.11	0.000236	3.18	20566.28	4352.87	0.15
Angelina River	Downstream	18600	5 YR	39850.00	225.81	243.97		244.02	0.000167	3.05	33473.13	4498.68	0.13
Angelina River	Downstream	18600	10 YR	52500.00	225.81	245.81		245.85	0.000149	3.10	41809.83	4590.41	0.13
Angelina River	Downstream	18600	25 YR	66389.00	225.81	247.57		247.61	0.000139	3.19	49960.29	4678.34	0.13

HEC-RAS Plan: Ex (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Downstream	18600	50 YR	79424.00	225.81	249.05		249.09	0.000134	3.29	56936.58	4752.31	0.13
Angelina River	Downstream	18600	100 YR	92066.00	225.81	250.43		250.47	0.000130	3.38	63545.82	4855.32	0.13
Angelina River	Downstream	14400	2 YR	23600.00	224.45	240.96		240.96	0.000032	1.05	40163.93	4009.51	0.05
Angelina River	Downstream	14400	5 YR	39850.00	224.45	243.86		243.87	0.000045	1.40	52600.58	4567.74	0.06
Angelina River	Downstream	14400	10 YR	52500.00	224.45	245.69		245.70	0.000052	1.62	61276.84	4919.82	0.07
Angelina River	Downstream	14400	25 YR	66389.00	224.45	247.44		247.46	0.000057	1.81	70207.52	5257.65	0.07
Angelina River	Downstream	14400	50 YR	79424.00	224.45	248.92		248.94	0.000062	1.97	78184.01	5542.01	0.07
Angelina River	Downstream	14400	100 YR	92066.00	224.45	250.28		250.30	0.000077	2.29	86115.84	6539.33	0.08
Angelina River	Downstream	5700	2 YR	23600.00	221.64	240.73		240.74	0.000100	1.94	23985.68	2878.65	0.09
Angelina River	Downstream	5700	5 YR	39850.00	221.64	243.56		243.59	0.000121	2.39	32438.83	3088.32	0.10
Angelina River	Downstream	5700	10 YR	52500.00	221.64	245.35		245.39	0.000132	2.67	38093.65	3220.97	0.11
Angelina River	Downstream	5700	25 YR	66389.00	221.64	247.08		247.12	0.000142	2.92	43756.88	3348.55	0.11
Angelina River	Downstream	5700	50 YR	79424.00	221.64	248.53		248.58	0.000149	3.14	48703.97	3456.15	0.12
Angelina River	Downstream	5700	100 YR	92066.00	221.64	249.83		249.89	0.000155	3.32	53270.94	3552.59	0.12
Angelina River	Downstream	1000	2 YR	23600.00	220.12	239.97	233.25	240.12	0.000350	4.20	12545.56	2118.88	0.19
Angelina River	Downstream	1000	5 YR	39850.00	220.12	242.75	235.59	242.91	0.000350	4.70	19082.76	2457.79	0.20
Angelina River	Downstream	1000	10 YR	52500.00	220.12	244.51	236.80	244.68	0.000350	5.01	23531.56	2591.02	0.20
Angelina River	Downstream	1000	25 YR	66389.00	220.12	246.21	237.88	246.39	0.000350	5.30	28038.22	2719.34	0.20
Angelina River	Downstream	1000	50 YR	79424.00	220.12	247.64	238.71	247.83	0.000351	5.54	32012.73	2827.67	0.21
Angelina River	Downstream	1000	100 YR	92066.00	220.12	248.93	239.50	249.13	0.000350	5.74	35715.46	2925.00	0.21

HEC-RAS Output  
Proposed Normal Pool



River	Reach	River Sta	Profile	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
Mud Creek	1000	132650	2 YR	2296.00	315.00	317.12		317.57	0.012619	5.43	423.16	199.99	0.66
Mud Creek	1000	132650	5 YR	5036.00	315.00	318.57		319.34	0.010780	7.05	714.77	199.99	0.66
Mud Creek	1000	132650	10 YR	7570.00	315.00	319.70		320.71	0.009905	8.05	940.21	199.99	0.65
Mud Creek	1000	132650	25 YR	10318.00	315.00	320.79		322.02	0.009341	8.92	1157.09	200.00	0.65
Mud Creek	1000	132650	50 YR	12941.00	315.00	321.73		323.17	0.008984	9.61	1345.94	200.00	0.65
Mud Creek	1000	132650	100 YR	15824.00	315.00	322.70		324.34	0.008689	10.28	1539.40	200.00	0.65
Mud Creek	1000	132350.*	2 YR	2296.00	309.12	310.93	310.77	311.53	0.021547	6.21	369.68	229.54	0.86
Mud Creek	1000	132350.*	5 YR	5036.00	309.12	312.00	311.82	312.99	0.020838	8.00	629.30	259.63	0.91
Mud Creek	1000	132350.*	10 YR	7570.00	309.12	312.75	312.58	314.03	0.020664	9.10	831.95	280.88	0.93
Mud Creek	1000	132350.*	25 YR	10318.00	309.12	313.38	313.29	314.98	0.021524	10.17	1015.01	298.79	0.97
Mud Creek	1000	132350.*	50 YR	12941.00	309.12	313.93	313.89	315.78	0.021729	10.93	1183.65	314.38	0.99
Mud Creek	1000	132350.*	100 YR	15824.00	309.12	314.49	314.49	316.58	0.021626	11.59	1364.81	330.32	1.01
Mud Creek	1000	132050.*	2 YR	2296.00	303.23	305.12		305.60	0.017976	5.58	411.17	278.92	0.81
Mud Creek	1000	132050.*	5 YR	5036.00	303.23	306.03	305.85	306.85	0.019822	7.29	691.10	337.85	0.90
Mud Creek	1000	132050.*	10 YR	7570.00	303.23	306.63	306.52	307.71	0.021062	8.36	905.55	376.82	0.95
Mud Creek	1000	132050.*	25 YR	10318.00	303.23	307.20	307.12	308.49	0.021151	9.12	1130.94	413.83	0.97
Mud Creek	1000	132050.*	50 YR	12941.00	303.23	307.63	307.63	309.13	0.021927	9.83	1315.87	441.89	1.00
Mud Creek	1000	132050.*	100 YR	15824.00	303.23	308.12	308.12	309.76	0.021338	10.28	1538.87	473.52	1.01
Mud Creek	1000	131750.*	2 YR	2296.00	297.35	299.07	298.99	299.58	0.022534	5.74	400.08	330.55	0.92
Mud Creek	1000	131750.*	5 YR	5036.00	297.35	299.92	299.84	300.68	0.021289	6.97	723.03	427.65	0.94
Mud Creek	1000	131750.*	10 YR	7570.00	297.35	300.49	300.41	301.41	0.020671	7.68	986.11	492.81	0.96
Mud Creek	1000	131750.*	25 YR	10318.00	297.35	300.95	300.93	302.06	0.021405	8.43	1223.29	544.91	0.99
Mud Creek	1000	131750.*	50 YR	12941.00	297.35	301.36	301.35	302.59	0.021142	8.90	1453.43	591.10	1.00
Mud Creek	1000	131750.*	100 YR	15824.00	297.35	301.75	301.75	303.10	0.020877	9.34	1694.97	635.97	1.01
Mud Creek	1000	131450.*	2 YR	2296.00	291.47	293.21	293.04	293.57	0.017676	4.87	471.67	430.69	0.82
Mud Creek	1000	131450.*	5 YR	5036.00	291.47	293.89	293.77	294.49	0.019673	6.21	810.76	556.55	0.91
Mud Creek	1000	131450.*	10 YR	7570.00	291.47	294.33	294.27	295.11	0.021085	7.08	1069.90	636.17	0.96
Mud Creek	1000	131450.*	25 YR	10318.00	291.47	294.75	294.70	295.65	0.020926	7.63	1351.44	712.65	0.98
Mud Creek	1000	131450.*	50 YR	12941.00	291.47	295.05	295.05	296.10	0.021740	8.20	1577.52	768.58	1.01
Mud Creek	1000	131450.*	100 YR	15824.00	291.47	295.39	295.39	296.53	0.021176	8.55	1851.03	831.23	1.01
Mud Creek	1000	131150.*	2 YR	2296.00	285.59	287.07	287.04	287.47	0.023669	5.08	452.09	518.53	0.96
Mud Creek	1000	131150.*	5 YR	5036.00	285.59	287.71	287.67	288.27	0.021835	6.02	836.89	700.52	0.97
Mud Creek	1000	131150.*	10 YR	7570.00	285.59	288.12	288.08	288.79	0.020787	6.55	1155.95	821.39	0.97
Mud Creek	1000	131150.*	25 YR	10318.00	285.59	288.45	288.45	289.25	0.021587	7.18	1436.91	914.70	1.01
Mud Creek	1000	131150.*	50 YR	12941.00	285.59	288.74	288.74	289.62	0.020998	7.52	1719.97	999.94	1.01
Mud Creek	1000	131150.*	100 YR	15824.00	285.59	289.03	289.03	289.99	0.020463	7.84	2018.98	1082.72	1.01
Mud Creek	1000	130850.*	2 YR	2296.00	279.71	281.10	281.00	281.37	0.017423	4.19	547.70	718.28	0.85
Mud Creek	1000	130850.*	5 YR	5036.00	279.71	281.58	281.52	282.02	0.019661	5.34	942.51	940.44	0.94
Mud Creek	1000	130850.*	10 YR	7570.00	279.71	281.87	281.86	282.45	0.021314	6.10	1240.99	1078.43	1.00
Mud Creek	1000	130850.*	25 YR	10318.00	279.71	282.17	282.17	282.83	0.020937	6.55	1575.63	1214.64	1.01
Mud Creek	1000	130850.*	50 YR	12941.00	279.71	282.43	282.43	283.14	0.019773	6.78	1907.63	1336.12	1.00
Mud Creek	1000	130850.*	100 YR	15824.00	279.71	282.66	282.66	283.44	0.019250	7.06	2240.40	1447.69	1.00
Mud Creek	1000	130550.*	2 YR	2296.00	273.82	274.89	274.89	275.18	0.024830	4.32	531.98	943.45	1.01
Mud Creek	1000	130550.*	5 YR	5036.00	273.82	275.31	275.31	275.71	0.022485	5.06	994.87	1289.44	1.02
Mud Creek	1000	130550.*	10 YR	7570.00	273.82	275.58	275.58	276.05	0.021199	5.48	1380.65	1518.73	1.01
Mud Creek	1000	130550.*	25 YR	10318.00	273.82	275.83	275.83	276.35	0.020119	5.81	1776.04	1722.34	1.01
Mud Creek	1000	130550.*	50 YR	12941.00	273.82	276.02	276.02	276.60	0.019659	6.10	2123.17	1883.04	1.01
Mud Creek	1000	130550.*	100 YR	15824.00	273.82	276.21	276.21	276.83	0.019180	6.35	2491.72	2039.84	1.01
Mud Creek	1000	130250	2 YR	2296.00	267.94	269.85		269.86	0.000163	0.53	4340.33	4509.19	0.10
Mud Creek	1000	130250	5 YR	5036.00	267.94	270.91		270.92	0.000060	0.47	10704.38	6296.12	0.06
Mud Creek	1000	130250	10 YR	7570.00	267.94	271.73		271.73	0.000037	0.48	15895.34	6426.68	0.05
Mud Creek	1000	130250	25 YR	10318.00	267.94	272.52		272.53	0.000028	0.50	21047.40	6553.69	0.05
Mud Creek	1000	130250	50 YR	12941.00	267.94	273.23		273.24	0.000023	0.51	25737.74	6667.22	0.05
Mud Creek	1000	130250	100 YR	15824.00	267.94	273.95		273.96	0.000020	0.53	30569.89	6782.19	0.04
Mud Creek	1000	129850	2 YR	2296.00	267.48	269.78		269.78	0.000210	0.51	4462.80	3879.84	0.08
Mud Creek	1000	129850	5 YR	5036.00	267.48	270.88		270.89	0.000092	0.52	10917.15	6342.76	0.06
Mud Creek	1000	129850	10 YR	7570.00	267.48	271.71		271.71	0.000064	0.53	16194.17	6428.52	0.05
Mud Creek	1000	129850	25 YR	10318.00	267.48	272.51		272.51	0.000050	0.55	21360.38	6513.34	0.05
Mud Creek	1000	129850	50 YR	12941.00	267.48	273.22		273.22	0.000043	0.57	26024.32	6588.10	0.05
Mud Creek	1000	129850	100 YR	15824.00	267.48	273.94		273.94	0.000037	0.59	30795.79	6663.71	0.05
Mud Creek	1000	128750	2 YR	2296.00	267.10	269.63		269.63	0.000098	0.43	5349.77	4230.14	0.07
Mud Creek	1000	128750	5 YR	5036.00	267.10	270.81		270.81	0.000052	0.46	10998.35	4951.16	0.05
Mud Creek	1000	128750	10 YR	7570.00	267.10	271.65		271.66	0.000040	0.50	15228.26	5056.82	0.05
Mud Creek	1000	128750	25 YR	10318.00	267.10	272.46		272.47	0.000034	0.54	19352.84	5157.77	0.05
Mud Creek	1000	128750	50 YR	12941.00	267.10	273.18		273.18	0.000031	0.57	23085.71	5247.46	0.05
Mud Creek	1000	128750	100 YR	15824.00	267.10	273.90		273.91	0.000028	0.60	26916.65	5337.94	0.05
Mud Creek	1000	127950	2 YR	2296.00	266.82	269.54		269.55	0.000116	0.49	4664.17	3425.46	0.07
Mud Creek	1000	127950	5 YR	5036.00	266.82	270.76		270.77	0.000066	0.53	9574.64	4241.89	0.06
Mud Creek	1000	127950	10 YR	7570.00	266.82	271.62		271.62	0.000052	0.58	13221.21	4288.91	0.06
Mud Creek	1000	127950	25 YR	10318.00	266.82	272.43		272.44	0.000045	0.63	16723.71	4333.59	0.06
Mud Creek	1000	127950	50 YR	12941.00	266.82	273.15		273.16	0.000041	0.67	19860.29	4373.22	0.05
Mud Creek	1000	127950	100 YR	15824.00	266.82	273.88		273.88	0.000038	0.71	23048.86	4413.14	0.05
Mud Creek	1000	126600	2 YR	2844.00	266.35	269.46		269.47	0.000039	0.36	7972.40	5119.64	0.05
Mud Creek	1000	126600	5 YR	5140.00	266.35	270.72		270.72	0.000018	0.34	15333.82	6147.96	0.04

## HEC-RAS Plan: NP (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	126600	10 YR	7727.00	266.35	271.58		271.59	0.000015	0.38	20710.87	6324.71	0.04
Mud Creek	1000	126600	25 YR	10539.00	266.35	272.40		272.40	0.000014	0.41	25943.31	6492.09	0.04
Mud Creek	1000	126600	50 YR	13222.00	266.35	273.12		273.13	0.000013	0.44	30692.85	6640.38	0.04
Mud Creek	1000	126600	100 YR	16180.00	266.35	273.85		273.86	0.000012	0.47	35580.93	6789.60	0.03
Mud Creek	1000	124600	2 YR	2844.00	265.65	269.37		269.37	0.000055	0.42	6845.73	3678.87	0.05
Mud Creek	1000	124600	5 YR	5140.00	265.65	270.67		270.68	0.000032	0.42	12267.00	4350.54	0.04
Mud Creek	1000	124600	10 YR	7727.00	265.65	271.54		271.54	0.000029	0.48	16067.80	4415.57	0.04
Mud Creek	1000	124600	25 YR	10539.00	265.65	272.36		272.36	0.000028	0.54	19709.85	4477.01	0.04
Mud Creek	1000	124600	50 YR	13222.00	265.65	273.09		273.09	0.000027	0.58	22976.81	4531.41	0.04
Mud Creek	1000	124600	100 YR	16180.00	265.65	273.81		273.82	0.000026	0.62	26300.99	4586.10	0.04
Mud Creek	1000	123150	2 YR	2844.00	265.14	269.31		269.31	0.000038	0.32	8752.50	4201.09	0.04
Mud Creek	1000	123150	5 YR	5140.00	265.14	270.63		270.64	0.000025	0.34	15036.88	4979.21	0.03
Mud Creek	1000	123150	10 YR	7727.00	265.14	271.50		271.51	0.000025	0.40	19411.56	5087.84	0.04
Mud Creek	1000	123150	25 YR	10539.00	265.14	272.32		272.33	0.000024	0.45	23627.72	5190.39	0.04
Mud Creek	1000	123150	50 YR	13222.00	265.14	273.05		273.05	0.000024	0.49	27432.50	5281.23	0.04
Mud Creek	1000	123150	100 YR	16180.00	265.14	273.78		273.78	0.000023	0.53	31322.31	5372.51	0.04
Mud Creek	1000	121050	2 YR	5735.00	264.41	269.18		269.19	0.000073	0.50	11416.60	4782.68	0.06
Mud Creek	1000	121050	5 YR	9539.00	264.41	270.55		270.56	0.000047	0.51	19118.33	6324.54	0.05
Mud Creek	1000	121050	10 YR	12497.00	264.41	271.44		271.44	0.000036	0.52	24783.22	6522.96	0.04
Mud Creek	1000	121050	25 YR	15593.00	264.41	272.26		272.27	0.000031	0.54	30258.52	6709.17	0.04
Mud Creek	1000	121050	50 YR	18537.00	264.41	272.99		273.00	0.000027	0.56	35226.52	6873.76	0.04
Mud Creek	1000	121050	100 YR	21805.00	264.41	273.73		273.73	0.000025	0.58	40329.09	7038.80	0.04
Mud Creek	1000	119350	2 YR	5735.00	263.81	268.89		268.92	0.000072	1.27	4506.55	1773.45	0.14
Mud Creek	1000	119350	5 YR	9539.00	263.81	270.35		270.38	0.000385	1.28	7451.02	2168.85	0.12
Mud Creek	1000	119350	10 YR	12497.00	263.81	271.27		271.30	0.000301	1.32	9455.90	2191.83	0.11
Mud Creek	1000	119350	25 YR	15593.00	263.81	272.12		272.15	0.000259	1.38	11318.54	2212.98	0.11
Mud Creek	1000	119350	50 YR	18537.00	263.81	272.86		272.89	0.000235	1.44	12966.31	2231.51	0.10
Mud Creek	1000	119350	100 YR	21805.00	263.81	273.60		273.63	0.000219	1.50	14621.50	2249.98	0.10
Mud Creek	1000	117350	2 YR	5735.00	263.11	268.45		268.46	0.000120	0.89	6416.05	2402.81	0.10
Mud Creek	1000	117350	5 YR	9539.00	263.11	270.06		270.07	0.000080	0.88	10867.11	3105.74	0.08
Mud Creek	1000	117350	10 YR	12497.00	263.11	271.05		271.07	0.000060	0.90	14001.70	3200.19	0.07
Mud Creek	1000	117350	25 YR	15593.00	263.11	271.93		271.95	0.000051	0.93	16851.96	3283.71	0.07
Mud Creek	1000	117350	50 YR	18537.00	263.11	272.69		272.71	0.000047	0.97	19377.81	3355.99	0.07
Mud Creek	1000	117350	100 YR	21805.00	263.11	273.45		273.46	0.000044	1.02	21924.87	3427.33	0.07
Mud Creek	1000	114900	2 YR	5735.00	262.26	268.19		268.20	0.000095	0.86	6701.31	2260.14	0.09
Mud Creek	1000	114900	5 YR	9539.00	262.26	269.88		269.89	0.000069	0.86	11059.31	2903.49	0.08
Mud Creek	1000	114900	10 YR	12497.00	262.26	270.92		270.93	0.000054	0.89	14140.80	3000.36	0.07
Mud Creek	1000	114900	25 YR	15593.00	262.26	271.81		271.83	0.000047	0.93	16856.12	3049.73	0.07
Mud Creek	1000	114900	50 YR	18537.00	262.26	272.58		272.60	0.000044	0.97	19223.71	3092.13	0.07
Mud Creek	1000	114900	100 YR	21805.00	262.26	273.34		273.36	0.000042	1.02	21579.22	3133.75	0.07
Mud Creek	1000	113800	2 YR	5735.00	261.87	268.08		268.09	0.000106	0.93	6160.62	1985.04	0.09
Mud Creek	1000	113800	5 YR	9539.00	261.87	269.79		269.81	0.000080	0.95	10038.82	2533.95	0.08
Mud Creek	1000	113800	10 YR	12497.00	261.87	270.85		270.86	0.000064	0.98	12812.85	2689.09	0.08
Mud Creek	1000	113800	25 YR	15593.00	261.87	271.75		271.77	0.000056	1.03	15289.30	2784.11	0.08
Mud Creek	1000	113800	50 YR	18537.00	261.87	272.53		272.55	0.000052	1.08	17477.98	2865.46	0.07
Mud Creek	1000	113800	100 YR	21805.00	261.87	273.29		273.31	0.000050	1.13	19681.86	2945.12	0.07
Mud Creek	1000	112200	2 YR	5735.00	261.31	267.84		267.86	0.000205	1.17	4905.15	1502.61	0.11
Mud Creek	1000	112200	5 YR	9539.00	261.31	269.61		269.63	0.000157	1.20	7927.13	1910.20	0.10
Mud Creek	1000	112200	10 YR	12497.00	261.31	270.70		270.72	0.000129	1.24	10097.71	2031.43	0.10
Mud Creek	1000	112200	25 YR	15593.00	261.31	271.62		271.64	0.000114	1.31	11985.12	2072.81	0.09
Mud Creek	1000	112200	50 YR	18537.00	261.31	272.40		272.43	0.000107	1.37	13620.10	2108.01	0.09
Mud Creek	1000	112200	100 YR	21805.00	261.31	273.16		273.19	0.000103	1.45	15238.48	2142.28	0.09
Mud Creek	1000	110300	2 YR	5735.00	260.65	267.64	263.01	267.65	0.000069	0.71	8098.15	2317.30	0.07
Mud Creek	1000	110300	5 YR	9539.00	260.65	269.45	263.55	269.46	0.000055	0.74	12848.74	2918.91	0.06
Mud Creek	1000	110300	10 YR	12497.00	260.65	270.57	263.88	270.58	0.000047	0.77	16268.18	3131.35	0.06
Mud Creek	1000	110300	25 YR	15593.00	260.65	271.51	264.18	271.52	0.000042	0.81	19220.80	3182.78	0.06
Mud Creek	1000	110300	50 YR	18537.00	260.65	272.30	264.43	272.31	0.000040	0.86	21754.06	3226.26	0.06
Mud Creek	1000	110300	100 YR	21805.00	260.65	273.06	264.69	273.07	0.000039	0.91	24241.98	3268.40	0.06
Mud Creek	1000	110200		Bridge									
Mud Creek	1000	110050	2 YR	5735.00	260.56	267.56		267.57	0.000039	0.61	9355.61	2671.26	0.06
Mud Creek	1000	110050	5 YR	9539.00	260.56	269.38		269.38	0.000032	0.64	14822.95	3362.39	0.05
Mud Creek	1000	110050	10 YR	12497.00	260.56	270.49		270.50	0.000027	0.67	18765.91	3658.65	0.05
Mud Creek	1000	110050	25 YR	15593.00	260.56	271.42		271.42	0.000025	0.71	22209.39	3769.90	0.05
Mud Creek	1000	110050	50 YR	18537.00	260.56	272.20		272.21	0.000023	0.74	25193.84	3863.73	0.05
Mud Creek	1000	110050	100 YR	21805.00	260.56	272.95		272.96	0.000023	0.79	28146.27	3954.37	0.05
Mud Creek	1000	109550	2 YR	5735.00	260.38	267.55		267.55	0.000035	0.59	9743.06	2719.08	0.05
Mud Creek	1000	109550	5 YR	9539.00	260.38	269.36		269.37	0.000029	0.62	15305.01	3407.93	0.05
Mud Creek	1000	109550	10 YR	12497.00	260.38	270.48		270.48	0.000025	0.65	19313.99	3735.67	0.05
Mud Creek	1000	109550	25 YR	15593.00	260.38	271.40		271.41	0.000023	0.69	22859.66	3902.77	0.05
Mud Creek	1000	109550	50 YR	18537.00	260.38	272.19		272.20	0.000022	0.72	25968.94	4043.64	0.05
Mud Creek	1000	109550	100 YR	21805.00	260.38	272.94		272.95	0.000021	0.77	29075.50	4179.64	0.05
Mud Creek	1000	107750	2 YR	5735.00	259.75	267.47		267.48	0.000050	0.68	8493.36	2067.41	0.06
Mud Creek	1000	107750	5 YR	9539.00	259.75	269.29		269.30	0.000048	0.75	12678.42	2523.23	0.06

HEC-RAS Plan: NP (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	107750	10 YR	12497.00	259.75	270.41		270.42	0.000044	0.80	15660.64	2799.13	0.06
Mud Creek	1000	107750	25 YR	15593.00	259.75	271.35		271.36	0.000042	0.86	18374.32	3022.86	0.06
Mud Creek	1000	107750	50 YR	18537.00	259.75	272.13		272.14	0.000041	0.91	20818.39	3211.05	0.06
Mud Creek	1000	107750	100 YR	21805.00	259.75	272.88		272.90	0.000041	0.97	23312.80	3392.37	0.06
Mud Creek	1000	105150	2 YR	5735.00	258.80	267.37		267.37	0.000033	0.71	9394.00	1576.13	0.05
Mud Creek	1000	105150	5 YR	9539.00	258.80	269.18		269.19	0.000042	0.93	12385.38	1729.95	0.05
Mud Creek	1000	105150	10 YR	12497.00	258.80	270.29		270.31	0.000048	1.07	14365.92	1824.67	0.06
Mud Creek	1000	105150	25 YR	15593.00	258.80	271.22		271.24	0.000055	1.20	16092.06	1903.38	0.06
Mud Creek	1000	105150	50 YR	18537.00	258.80	271.99		272.02	0.000061	1.32	17598.52	1969.50	0.07
Mud Creek	1000	105150	100 YR	21805.00	258.80	272.74		272.77	0.000067	1.45	19093.97	2033.02	0.07
Mud Creek	1000	104100	2 YR	5735.00	258.42	267.33		267.34	0.000025	0.81	8678.48	1473.43	0.05
Mud Creek	1000	104100	5 YR	9539.00	258.42	269.13		269.15	0.000032	1.06	11468.07	1626.41	0.06
Mud Creek	1000	104100	10 YR	12497.00	258.42	270.24		270.26	0.000036	1.22	13321.54	1716.34	0.07
Mud Creek	1000	104100	25 YR	15593.00	258.42	271.16		271.19	0.000041	1.38	14926.78	1778.35	0.07
Mud Creek	1000	104100	50 YR	18537.00	258.42	271.93		271.96	0.000046	1.52	16318.72	1830.42	0.08
Mud Creek	1000	104100	100 YR	21805.00	258.42	272.67		272.71	0.000051	1.66	17691.41	1880.36	0.08
Mud Creek	1000	103850	2 YR	5735.00	258.33	267.33		267.34	0.000026	0.84	7871.36	1252.99	0.05
Mud Creek	1000	103850	5 YR	9539.00	258.33	269.12		269.14	0.000035	1.10	10211.49	1351.81	0.06
Mud Creek	1000	103850	10 YR	12497.00	258.33	270.23		270.25	0.000040	1.28	11739.92	1416.05	0.07
Mud Creek	1000	103850	25 YR	15593.00	258.33	271.15		271.18	0.000046	1.46	13066.10	1480.16	0.08
Mud Creek	1000	103850	50 YR	18537.00	258.33	271.91		271.95	0.000052	1.61	14224.59	1533.97	0.08
Mud Creek	1000	103850	100 YR	21805.00	258.33	272.65		272.69	0.000058	1.77	15373.70	1585.54	0.09
Mud Creek	1000	103350	2 YR	8204.00	258.15	267.27	261.62	267.31	0.000102	1.64	6915.38	1313.62	0.11
Mud Creek	1000	103350	5 YR	13590.00	258.15	269.05	262.35	269.10	0.000126	2.11	9411.44	1499.92	0.12
Mud Creek	1000	103350	10 YR	17650.00	258.15	270.14	262.83	270.21	0.000140	2.39	11111.00	1611.07	0.13
Mud Creek	1000	103350	25 YR	21950.00	258.15	271.04	263.26	271.12	0.000156	2.67	12593.05	1683.06	0.14
Mud Creek	1000	103350	50 YR	26031.00	258.15	271.79	263.68	271.89	0.000171	2.91	13885.45	1743.41	0.15
Mud Creek	1000	103350	100 YR	30331.00	258.15	272.52	264.06	272.63	0.000185	3.15	15166.61	1801.24	0.16
Mud Creek	1000	103200		Bridge									
Mud Creek	1000	103100	2 YR	8204.00	258.06	267.16		267.22	0.000323	2.23	4803.36	901.17	0.14
Mud Creek	1000	103100	5 YR	13590.00	258.06	268.88		268.98	0.000408	2.87	6453.08	1021.30	0.17
Mud Creek	1000	103100	10 YR	17650.00	258.06	269.93		270.06	0.000455	3.26	7563.69	1094.78	0.18
Mud Creek	1000	103100	25 YR	21950.00	258.06	270.77		270.94	0.000525	3.69	8530.03	1192.60	0.19
Mud Creek	1000	103100	50 YR	26031.00	258.06	271.47		271.67	0.000586	4.06	9397.92	1276.94	0.21
Mud Creek	1000	103100	100 YR	30331.00	258.06	272.14		272.37	0.000642	4.41	10277.57	1357.09	0.22
Mud Creek	1000	102550	2 YR	8204.00	257.86	266.73		266.88	0.001172	4.35	3727.92	975.42	0.27
Mud Creek	1000	102550	5 YR	13590.00	257.86	268.40		268.57	0.001215	5.04	5528.37	1191.45	0.29
Mud Creek	1000	102550	10 YR	17650.00	257.86	269.43		269.62	0.001210	5.38	6828.90	1325.78	0.29
Mud Creek	1000	102550	25 YR	21950.00	257.86	270.23		270.45	0.001288	5.83	7939.70	1437.52	0.31
Mud Creek	1000	102550	50 YR	26031.00	257.86	270.91		271.14	0.001352	6.21	8941.22	1544.98	0.32
Mud Creek	1000	102550	100 YR	30331.00	257.86	271.55		271.81	0.001399	6.54	9969.79	1648.06	0.32
Mud Creek	1000	101050	2 YR	8204.00	257.31	263.17		263.85	0.005176	7.30	1681.13	691.20	0.61
Mud Creek	1000	101050	5 YR	13590.00	257.31	263.81		265.01	0.008115	9.98	2154.72	790.30	0.77
Mud Creek	1000	101050	10 YR	17650.00	257.31	264.11		265.79	0.010705	11.91	2401.58	837.32	0.90
Mud Creek	1000	101050	25 YR	21950.00	257.31	264.75	264.75	266.51	0.010255	12.54	2963.17	935.52	0.90
Mud Creek	1000	101050	50 YR	26031.00	257.31	265.27	265.27	267.12	0.009988	13.08	3477.34	1017.15	0.90
Mud Creek	1000	101050	100 YR	30331.00	257.31	265.75	265.75	267.70	0.009943	13.67	3977.05	1090.64	0.90
Mud Creek	1000	99150	2 YR	8204.00	256.62	262.77		262.78	0.000203	1.64	13485.39	5204.18	0.14
Mud Creek	1000	99150	5 YR	13590.00	256.62	263.54		263.55	0.000248	2.01	17536.46	5425.23	0.16
Mud Creek	1000	99150	10 YR	17650.00	256.62	264.02		264.03	0.000273	2.23	20178.97	5564.69	0.16
Mud Creek	1000	99150	25 YR	21950.00	256.62	264.46		264.48	0.000294	2.44	22700.17	5694.57	0.17
Mud Creek	1000	99150	50 YR	26031.00	256.62	264.85		264.87	0.000312	2.62	24915.01	5806.26	0.18
Mud Creek	1000	99150	100 YR	30331.00	256.62	265.22		265.25	0.000328	2.79	27104.09	5914.59	0.19
Mud Creek	1000	97950	2 YR	8204.00	256.19	262.62		262.63	0.000248	1.83	12470.67	4976.27	0.15
Mud Creek	1000	97950	5 YR	13590.00	256.19	263.35		263.36	0.000305	2.24	16151.84	5136.44	0.17
Mud Creek	1000	97950	10 YR	17650.00	256.19	263.81		263.83	0.000335	2.48	18549.82	5238.14	0.18
Mud Creek	1000	97950	25 YR	21950.00	256.19	264.24		264.26	0.000363	2.71	20825.94	5332.88	0.19
Mud Creek	1000	97950	50 YR	26031.00	256.19	264.61		264.64	0.000385	2.90	22819.75	5414.51	0.20
Mud Creek	1000	97950	100 YR	30331.00	256.19	264.97		265.00	0.000405	3.09	24784.49	5493.76	0.21
Mud Creek	1000	96975	2 YR	8204.00	255.84	262.56	260.46	262.56	0.000177	1.61	13904.02	5039.24	0.13
Mud Creek	1000	96975	5 YR	13590.00	255.84	263.27	260.70	263.28	0.000236	2.03	17542.52	5195.66	0.15
Mud Creek	1000	96975	10 YR	17650.00	255.84	263.72	260.84	263.74	0.000269	2.29	19918.25	5295.30	0.16
Mud Creek	1000	96975	25 YR	21950.00	255.84	264.14	260.96	264.16	0.000299	2.52	22172.28	5388.13	0.18
Mud Creek	1000	96975	50 YR	26031.00	255.84	264.51	261.06	264.53	0.000323	2.72	24147.37	5468.18	0.18
Mud Creek	1000	96975	100 YR	30331.00	255.84	264.86	261.18	264.89	0.000346	2.92	26093.87	5545.94	0.19
Mud Creek	1000	96950		Bridge									
Mud Creek	1000	96925	2 YR	8204.00	255.82	262.49		262.51	0.000577	2.04	8754.54	4545.97	0.17
Mud Creek	1000	96925	5 YR	13590.00	255.82	263.20		263.24	0.000621	2.35	12063.93	4717.45	0.19
Mud Creek	1000	96925	10 YR	17650.00	255.82	263.66		263.69	0.000642	2.53	14226.61	4826.23	0.19
Mud Creek	1000	96925	25 YR	21950.00	255.82	264.08		264.12	0.000663	2.70	16280.87	4927.32	0.20
Mud Creek	1000	96925	50 YR	26031.00	255.82	264.44		264.49	0.000682	2.85	18084.57	5014.41	0.20
Mud Creek	1000	96925	100 YR	30331.00	255.82	264.79		264.84	0.000699	2.99	19865.86	5098.95	0.21

HEC-RAS Plan: NP (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	95200	2 YR	8204.00	255.19	261.72		261.75	0.000714	2.22	8128.51	4512.80	0.19
Mud Creek	1000	95200	5 YR	13590.00	255.19	262.43		262.47	0.000734	2.50	11399.77	4683.54	0.20
Mud Creek	1000	95200	10 YR	17650.00	255.19	262.88		262.92	0.000747	2.68	13519.73	4790.95	0.21
Mud Creek	1000	95200	25 YR	21950.00	255.19	263.28		263.33	0.000771	2.86	15479.89	4888.15	0.21
Mud Creek	1000	95200	50 YR	26031.00	255.19	263.63		263.68	0.000792	3.01	17197.28	4971.76	0.22
Mud Creek	1000	95200	100 YR	30331.00	255.19	263.97		264.03	0.000812	3.16	18889.97	5052.81	0.22
Mud Creek	1000	93700	2 YR	8204.00	254.65	260.76		260.82	0.001082	2.14	5549.52	4062.90	0.20
Mud Creek	1000	93700	5 YR	13590.00	254.65	261.59		261.65	0.000984	2.36	9007.63	4294.61	0.20
Mud Creek	1000	93700	10 YR	17650.00	254.65	262.06		262.13	0.000980	2.52	11066.35	4426.80	0.20
Mud Creek	1000	93700	25 YR	21950.00	254.65	262.45		262.53	0.001026	2.72	12822.05	4536.49	0.21
Mud Creek	1000	93700	50 YR	26031.00	254.65	262.79		262.87	0.001063	2.89	14356.03	4630.20	0.22
Mud Creek	1000	93700	100 YR	30331.00	254.65	263.11		263.20	0.001097	3.05	15863.45	4720.48	0.22
Mud Creek	1000	91800	2 YR	8204.00	253.96	258.77		258.83	0.001132	1.95	4207.94	1750.83	0.22
Mud Creek	1000	91800	5 YR	13590.00	253.96	259.70		259.78	0.001201	2.26	6009.22	2092.27	0.24
Mud Creek	1000	91800	10 YR	17650.00	253.96	260.25		260.34	0.001172	2.43	7757.84	4557.80	0.24
Mud Creek	1000	91800	25 YR	21950.00	253.96	260.73		260.82	0.001070	2.55	9971.56	4670.54	0.23
Mud Creek	1000	91800	50 YR	26031.00	253.96	261.10		261.20	0.001030	2.66	11735.33	4758.46	0.23
Mud Creek	1000	91800	100 YR	30331.00	253.96	261.46		261.57	0.001001	2.78	13447.71	4842.29	0.23
Mud Creek	1000	90600	2 YR	8204.00	253.52	258.00		258.02	0.000434	1.15	7120.06	3179.42	0.14
Mud Creek	1000	90600	5 YR	13590.00	253.52	258.92		258.95	0.000438	1.31	10367.13	3836.51	0.14
Mud Creek	1000	90600	10 YR	17650.00	253.52	259.47		259.51	0.000440	1.40	12584.91	4226.99	0.14
Mud Creek	1000	90600	25 YR	21950.00	253.52	259.97		260.01	0.000443	1.48	14783.51	4581.37	0.15
Mud Creek	1000	90600	50 YR	26031.00	253.52	260.38		260.42	0.000421	1.56	16672.09	4710.15	0.14
Mud Creek	1000	90600	100 YR	30331.00	253.52	260.75		260.79	0.000413	1.65	18442.02	4817.89	0.15
Mud Creek	1000	89850	2 YR	8204.00	253.25	257.70		257.73	0.000351	1.19	6908.15	3101.65	0.14
Mud Creek	1000	89850	5 YR	13590.00	253.25	258.63		258.66	0.000353	1.35	10069.87	3744.76	0.15
Mud Creek	1000	89850	10 YR	17650.00	253.25	259.18		259.21	0.000355	1.44	12227.45	4126.48	0.15
Mud Creek	1000	89850	25 YR	21950.00	253.25	259.67		259.71	0.000357	1.53	14364.35	4472.55	0.15
Mud Creek	1000	89850	50 YR	26031.00	253.25	260.09		260.13	0.000354	1.60	16278.70	4718.56	0.15
Mud Creek	1000	89850	100 YR	30331.00	253.25	260.47		260.51	0.000339	1.68	18093.38	4798.64	0.15
Mud Creek	1000	88850	2 YR	8204.00	252.89	257.37		257.39	0.000317	1.29	6344.03	2833.80	0.15
Mud Creek	1000	88850	5 YR	13590.00	252.89	258.29		258.32	0.000321	1.47	9214.32	3415.22	0.16
Mud Creek	1000	88850	10 YR	17650.00	252.89	258.83		258.87	0.000325	1.58	11167.60	3759.81	0.16
Mud Creek	1000	88850	25 YR	21950.00	252.89	259.32		259.37	0.000328	1.68	13097.53	4071.75	0.16
Mud Creek	1000	88850	50 YR	26031.00	252.89	259.74		259.79	0.000331	1.75	14839.46	4334.07	0.17
Mud Creek	1000	88850	100 YR	30331.00	252.89	260.13		260.18	0.000327	1.83	16577.63	4526.35	0.17
Mud Creek	1000	87600	2 YR	8204.00	252.43	256.97		256.99	0.000327	1.16	7075.68	3117.83	0.14
Mud Creek	1000	87600	5 YR	13590.00	252.43	257.88		257.91	0.000338	1.33	10194.95	3742.49	0.14
Mud Creek	1000	87600	10 YR	17650.00	252.43	258.42		258.45	0.000345	1.43	12310.81	4112.56	0.15
Mud Creek	1000	87600	25 YR	21950.00	252.43	258.90		258.94	0.000352	1.52	14395.35	4447.13	0.15
Mud Creek	1000	87600	50 YR	26031.00	252.43	259.31		259.35	0.000357	1.60	16277.73	4728.96	0.15
Mud Creek	1000	87600	100 YR	30331.00	252.43	259.71		259.75	0.000360	1.67	18183.64	4998.15	0.15
Mud Creek	1000	85350	2 YR	8204.00	251.62	256.12		256.15	0.000435	1.16	7083.70	3144.86	0.14
Mud Creek	1000	85350	5 YR	13590.00	251.62	256.99		257.02	0.000469	1.35	10061.24	3747.97	0.15
Mud Creek	1000	85350	10 YR	17650.00	251.62	257.50		257.53	0.000487	1.46	12066.79	4104.56	0.15
Mud Creek	1000	85350	25 YR	21950.00	251.62	257.96		258.00	0.000502	1.56	14045.06	4428.25	0.15
Mud Creek	1000	85350	50 YR	26031.00	251.62	258.36		258.40	0.000512	1.64	15847.48	4703.82	0.16
Mud Creek	1000	85350	100 YR	30331.00	251.62	258.74		258.78	0.000518	1.71	17689.30	4969.65	0.16
Mud Creek	1000	83800	2 YR	8204.00	251.05	255.36		255.39	0.000550	1.26	6488.59	3010.36	0.15
Mud Creek	1000	83800	5 YR	13590.00	251.05	256.15		256.18	0.000616	1.50	9082.33	3561.58	0.17
Mud Creek	1000	83800	10 YR	17650.00	251.05	256.62		256.66	0.000647	1.63	10844.21	3891.73	0.17
Mud Creek	1000	83800	25 YR	21950.00	251.05	257.06		257.10	0.000672	1.74	12594.46	4194.05	0.18
Mud Creek	1000	83800	50 YR	26031.00	251.05	257.43		257.49	0.000682	1.83	14234.29	4458.73	0.18
Mud Creek	1000	83800	100 YR	30331.00	251.05	257.81		257.86	0.000684	1.90	15947.92	4719.50	0.18
Mud Creek	1000	82200	2 YR	8204.00	250.47	253.42		253.52	0.003901	2.61	3141.31	2132.79	0.38
Mud Creek	1000	82200	5 YR	13590.00	250.47	254.17		254.28	0.003189	2.75	4946.78	2676.42	0.36
Mud Creek	1000	82200	10 YR	17650.00	250.47	254.65		254.77	0.002808	2.80	6312.60	3023.41	0.34
Mud Creek	1000	82200	25 YR	21950.00	250.47	255.14		255.26	0.002400	2.78	7884.51	3378.94	0.32
Mud Creek	1000	82200	50 YR	26031.00	250.47	255.62		255.74	0.001993	2.71	9606.47	3729.71	0.30
Mud Creek	1000	82200	100 YR	30331.00	250.47	256.15		256.26	0.001604	2.60	11688.10	4114.01	0.27
Mud Creek	1000	80150	2 YR	8204.00	249.62	252.25		252.26	0.000234	0.85	9686.92	4312.29	0.10
Mud Creek	1000	80150	5 YR	13590.00	249.62	253.00		253.01	0.000248	1.05	12932.87	4349.77	0.11
Mud Creek	1000	80150	10 YR	17650.00	249.62	253.53		253.55	0.000243	1.16	15259.56	4376.43	0.11
Mud Creek	1000	80150	25 YR	21950.00	249.62	254.14		254.16	0.000221	1.22	17944.06	4406.99	0.11
Mud Creek	1000	80150	50 YR	26031.00	249.62	254.75		254.78	0.000196	1.26	20648.95	4437.58	0.10
Mud Creek	1000	80150	100 YR	30331.00	249.62	255.40		255.43	0.000174	1.29	23543.02	4470.06	0.10
Mud Creek	1000	78800	2 YR	8204.00	248.93	251.90		251.92	0.000274	1.00	8383.91	4194.45	0.12
Mud Creek	1000	78800	5 YR	13590.00	248.93	252.64		252.66	0.000270	1.22	11533.88	4309.28	0.13
Mud Creek	1000	78800	10 YR	17650.00	248.93	253.19		253.22	0.000249	1.32	13926.44	4394.50	0.13
Mud Creek	1000	78800	25 YR	21950.00	248.93	253.84		253.87	0.000212	1.37	16824.42	4495.55	0.12
Mud Creek	1000	78800	50 YR	26031.00	248.93	254.49		254.52	0.000179	1.39	19785.21	4596.50	0.11
Mud Creek	1000	78800	100 YR	30331.00	248.93	255.18		255.21	0.000153	1.41	22963.20	4702.45	0.11
Mud Creek	1000	77500	2 YR	8204.00	248.27	251.43		251.47	0.000445	1.56	6267.71	3215.00	0.18
Mud Creek	1000	77500	5 YR	13590.00	248.27	252.16		252.21	0.000461	1.91	8644.08	3298.91	0.19

HEC-RAS Plan: NP (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	77500	10 YR	17650.00	248.27	252.75		252.81	0.000419	2.05	10589.79	3366.05	0.19
Mud Creek	1000	77500	25 YR	21950.00	248.27	253.47		253.53	0.000343	2.09	13040.58	3448.77	0.18
Mud Creek	1000	77500	50 YR	26031.00	248.27	254.17		254.23	0.000284	2.10	15508.67	3530.11	0.17
Mud Creek	1000	77500	100 YR	30331.00	248.27	254.90		254.96	0.000241	2.12	18102.93	3613.63	0.16
Mud Creek	1000	76300	2 YR	8204.00	247.66	250.87		250.90	0.000499	1.34	6212.93	3196.30	0.16
Mud Creek	1000	76300	5 YR	13590.00	247.66	251.60		251.64	0.000491	1.62	8596.17	3359.88	0.17
Mud Creek	1000	76300	10 YR	17650.00	247.66	252.27		252.31	0.000399	1.69	10882.14	3509.63	0.16
Mud Creek	1000	76300	25 YR	21950.00	247.66	253.10		253.14	0.000294	1.68	13876.70	3696.62	0.14
Mud Creek	1000	76300	50 YR	26031.00	247.66	253.88		253.92	0.000232	1.67	16834.30	3872.46	0.13
Mud Creek	1000	76300	100 YR	30331.00	247.66	254.65		254.70	0.000192	1.67	19910.90	4047.27	0.12
Mud Creek	1000	74900	2 YR	8204.00	246.95	250.18		250.21	0.000482	1.33	6157.39	3634.13	0.18
Mud Creek	1000	74900	5 YR	13590.00	246.95	251.03		251.07	0.000344	1.47	9308.57	3791.16	0.16
Mud Creek	1000	74900	10 YR	17650.00	246.95	251.86		251.89	0.000226	1.44	12506.56	3944.13	0.14
Mud Creek	1000	74900	25 YR	21950.00	246.95	252.82		252.85	0.000151	1.39	16366.88	4121.22	0.12
Mud Creek	1000	74900	50 YR	26031.00	246.95	253.66		253.69	0.000116	1.37	19917.19	4277.62	0.11
Mud Creek	1000	74900	100 YR	30331.00	246.95	254.48		254.51	0.000096	1.37	23467.20	4428.49	0.10
Mud Creek	1000	72400	2 YR	8204.00	245.67	249.27		249.28	0.000297	0.95	8668.90	4819.11	0.12
Mud Creek	1000	72400	5 YR	13590.00	245.67	250.50		250.51	0.000152	0.88	15475.37	5889.87	0.09
Mud Creek	1000	72400	10 YR	17650.00	245.67	251.55		251.56	0.000084	0.82	21763.34	6079.00	0.07
Mud Creek	1000	72400	25 YR	21950.00	245.67	252.62		252.63	0.000056	0.79	28341.78	6270.77	0.06
Mud Creek	1000	72400	50 YR	26031.00	245.67	253.51		253.52	0.000044	0.78	34007.00	6431.33	0.06
Mud Creek	1000	72400	100 YR	30331.00	245.67	254.35		254.36	0.000037	0.79	39487.96	6582.94	0.05
Mud Creek	1000	71200	2 YR	8204.00	245.06	249.01		249.02	0.000166	0.75	10900.67	5518.27	0.09
Mud Creek	1000	71200	5 YR	13590.00	245.06	250.37		250.37	0.000087	0.69	19582.99	6933.05	0.07
Mud Creek	1000	71200	10 YR	17650.00	245.06	251.48		251.48	0.000049	0.65	27334.44	7032.96	0.06
Mud Creek	1000	71200	25 YR	21950.00	245.06	252.57		252.57	0.000033	0.63	35050.65	7131.02	0.05
Mud Creek	1000	71200	50 YR	26031.00	245.06	253.47		253.48	0.000027	0.63	41519.71	7212.20	0.05
Mud Creek	1000	71200	100 YR	30331.00	245.06	254.32		254.32	0.000023	0.64	47667.96	7288.52	0.04
Mud Creek	1000	69000	2 YR	9783.00	243.94	248.68	245.83	248.69	0.000139	0.89	11010.18	4649.80	0.10
Mud Creek	1000	69000	5 YR	16202.00	243.94	250.17	246.25	250.19	0.000085	0.85	19064.78	5964.79	0.08
Mud Creek	1000	69000	10 YR	20998.00	243.94	251.37	246.52	251.38	0.000050	0.80	26230.02	6066.03	0.07
Mud Creek	1000	69000	25 YR	26068.00	243.94	252.49	246.73	252.50	0.000036	0.79	33086.94	6161.37	0.06
Mud Creek	1000	69000	50 YR	30901.00	243.94	253.40	246.94	253.41	0.000030	0.81	38760.32	6239.14	0.06
Mud Creek	1000	69000	100 YR	35899.00	243.94	254.26	247.12	254.27	0.000027	0.82	44128.34	6311.85	0.05
Mud Creek	1000	68800		Bridge									
Mud Creek	1000	68650	2 YR	9783.00	243.77	248.09		248.11	0.000368	1.19	8221.33	3809.99	0.14
Mud Creek	1000	68650	5 YR	16202.00	243.77	249.86		249.88	0.000160	0.99	16385.42	5378.75	0.10
Mud Creek	1000	68650	10 YR	20998.00	243.77	251.14		251.16	0.000084	0.90	23498.69	5642.83	0.08
Mud Creek	1000	68650	25 YR	26068.00	243.77	252.29		252.31	0.000058	0.87	30079.31	5786.77	0.07
Mud Creek	1000	68650	50 YR	30901.00	243.77	253.22		253.23	0.000048	0.88	35465.48	5901.97	0.06
Mud Creek	1000	68650	100 YR	35899.00	243.77	254.07		254.08	0.000043	0.90	40558.80	6008.88	0.06
Mud Creek	1000	67650	2 YR	9783.00	243.26	247.80		247.81	0.000240	0.99	9847.16	4341.31	0.12
Mud Creek	1000	67650	5 YR	16202.00	243.26	249.74		249.75	0.000098	0.81	20108.55	6203.76	0.08
Mud Creek	1000	67650	10 YR	20998.00	243.26	251.08		251.09	0.000053	0.73	28736.39	6517.48	0.06
Mud Creek	1000	67650	25 YR	26068.00	243.26	252.25		252.26	0.000037	0.72	36411.75	6590.67	0.05
Mud Creek	1000	67650	50 YR	30901.00	243.26	253.18		253.19	0.000032	0.73	42562.36	6648.74	0.05
Mud Creek	1000	67650	100 YR	35899.00	243.26	254.04		254.05	0.000028	0.75	48300.84	6702.47	0.05
Mud Creek	1000	66450	2 YR	9783.00	242.65	247.64		247.64	0.000089	0.74	13276.53	5325.35	0.08
Mud Creek	1000	66450	5 YR	16202.00	242.65	249.67		249.68	0.000039	0.61	26353.50	7502.83	0.06
Mud Creek	1000	66450	10 YR	20998.00	242.65	251.04		251.05	0.000022	0.56	38102.57	8902.13	0.05
Mud Creek	1000	66450	25 YR	26068.00	242.65	252.22		252.23	0.000016	0.56	48661.66	8961.24	0.04
Mud Creek	1000	66450	50 YR	30901.00	242.65	253.16		253.16	0.000014	0.57	57048.64	9007.91	0.04
Mud Creek	1000	66450	100 YR	35899.00	242.65	254.02		254.03	0.000012	0.58	64833.69	9051.02	0.04
Mud Creek	1000	64850	2 YR	9783.00	241.83	247.49		247.50	0.000090	0.80	12160.75	4296.16	0.08
Mud Creek	1000	64850	5 YR	16202.00	241.83	249.61		249.61	0.000045	0.71	22940.14	5900.62	0.06
Mud Creek	1000	64850	10 YR	20998.00	241.83	251.00		251.01	0.000028	0.67	31552.26	6245.02	0.05
Mud Creek	1000	64850	25 YR	26068.00	241.83	252.19		252.20	0.000021	0.67	39030.41	6298.68	0.05
Mud Creek	1000	64850	50 YR	30901.00	241.83	253.13		253.14	0.000019	0.69	44952.88	6340.85	0.05
Mud Creek	1000	64850	100 YR	35899.00	241.83	253.99		254.00	0.000018	0.72	50448.93	6379.73	0.04
Mud Creek	1000	63250	2 YR	9783.00	241.02	247.34		247.35	0.000104	0.71	13780.83	4362.25	0.07
Mud Creek	1000	63250	5 YR	16202.00	241.02	249.52		249.53	0.000059	0.65	24966.63	5871.55	0.06
Mud Creek	1000	63250	10 YR	20998.00	241.02	250.95		250.95	0.000039	0.62	33736.59	6237.94	0.05
Mud Creek	1000	63250	25 YR	26068.00	241.02	252.15		252.16	0.000031	0.63	41276.32	6286.10	0.04
Mud Creek	1000	63250	50 YR	30901.00	241.02	253.09		253.10	0.000028	0.66	47212.50	6323.76	0.04
Mud Creek	1000	63250	100 YR	35899.00	241.02	253.96		253.97	0.000026	0.68	52707.64	6358.43	0.04
Mud Creek	1000	61950	2 YR	9783.00	240.36	247.25		247.26	0.000048	0.67	14526.35	4216.78	0.06
Mud Creek	1000	61950	5 YR	16202.00	240.36	249.47		249.48	0.000030	0.64	25405.64	5576.58	0.05
Mud Creek	1000	61950	10 YR	20998.00	240.36	250.91		250.92	0.000021	0.62	33850.29	5963.87	0.05
Mud Creek	1000	61950	25 YR	26068.00	240.36	252.12		252.13	0.000017	0.64	41124.04	6048.64	0.04
Mud Creek	1000	61950	50 YR	30901.00	240.36	253.07		253.07	0.000016	0.66	46865.15	6114.72	0.04
Mud Creek	1000	61950	100 YR	35899.00	240.36	253.94		253.94	0.000015	0.69	52198.69	6175.48	0.04
Mud Creek	1000	60750	2 YR	9783.00	239.83	247.18		247.19	0.000066	1.29	17854.77	4564.22	0.08
Mud Creek	1000	60750	5 YR	16202.00	239.83	249.42		249.43	0.000051	1.37	29544.67	5864.50	0.08

HEC-RAS Plan: NP (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	60750	10 YR	20998.00	239.83	250.87		250.88	0.000042	1.35	38491.73	6278.73	0.07
Mud Creek	1000	60750	25 YR	26068.00	239.83	252.09		252.10	0.000037	1.37	46197.90	6388.23	0.07
Mud Creek	1000	60750	50 YR	30901.00	239.83	253.04		253.05	0.000036	1.41	52280.84	6473.36	0.07
Mud Creek	1000	60750	100 YR	35899.00	239.83	253.91		253.92	0.000035	1.47	57939.50	6551.56	0.07
Mud Creek	1000	58800	2 YR	9783.00	239.18	247.16		247.16	0.000005	0.36	33845.86	5942.63	0.02
Mud Creek	1000	58800	5 YR	16202.00	239.18	249.40		249.40	0.000005	0.45	48141.45	6816.56	0.03
Mud Creek	1000	58800	10 YR	20998.00	239.18	250.85		250.86	0.000005	0.49	58334.05	7088.46	0.03
Mud Creek	1000	58800	25 YR	26068.00	239.18	252.07		252.07	0.000005	0.54	66987.80	7143.19	0.03
Mud Creek	1000	58800	50 YR	30901.00	239.18	253.02		253.02	0.000006	0.58	73756.72	7185.71	0.03
Mud Creek	1000	58800	100 YR	35899.00	239.18	253.88		253.89	0.000006	0.62	80008.63	7224.75	0.03
Mud Creek	1000	57200	2 YR	9783.00	238.64	247.16		247.16	0.000002	0.23	46122.89	6702.72	0.01
Mud Creek	1000	57200	5 YR	16202.00	238.64	249.40		249.40	0.000003	0.29	61666.94	7173.21	0.02
Mud Creek	1000	57200	10 YR	20998.00	238.64	250.85		250.85	0.000003	0.33	72260.94	7355.22	0.02
Mud Creek	1000	57200	25 YR	26068.00	238.64	252.07		252.07	0.000003	0.36	81251.60	7434.25	0.02
Mud Creek	1000	57200	50 YR	30901.00	238.64	253.01		253.01	0.000004	0.40	88301.23	7495.63	0.02
Mud Creek	1000	57200	100 YR	35899.00	238.64	253.88		253.88	0.000004	0.43	94826.38	7552.00	0.02
Mud Creek	1000	55600	2 YR	9783.00	238.10	247.15		247.15	0.000004	0.35	29583.47	3971.97	0.02
Mud Creek	1000	55600	5 YR	16202.00	238.10	249.39		249.39	0.000005	0.45	38676.35	4151.07	0.02
Mud Creek	1000	55600	10 YR	20998.00	238.10	250.84		250.84	0.000005	0.51	44764.20	4206.73	0.03
Mud Creek	1000	55600	25 YR	26068.00	238.10	252.06		252.06	0.000006	0.57	49879.65	4216.44	0.03
Mud Creek	1000	55600	50 YR	30901.00	238.10	253.00		253.00	0.000006	0.62	53859.41	4223.99	0.03
Mud Creek	1000	55600	100 YR	35899.00	238.10	253.86		253.87	0.000007	0.68	57519.73	4230.91	0.03
Mud Creek	1000	53900	2 YR	9783.00	237.53	247.15		247.15	0.000002	0.22	46974.93	6014.64	0.01
Mud Creek	1000	53900	5 YR	16202.00	237.53	249.38		249.39	0.000002	0.28	60688.55	6238.48	0.02
Mud Creek	1000	53900	10 YR	20998.00	237.53	250.84		250.84	0.000002	0.32	69829.63	6325.11	0.02
Mud Creek	1000	53900	25 YR	26068.00	237.53	252.05		252.05	0.000002	0.36	77533.16	6361.55	0.02
Mud Creek	1000	53900	50 YR	30901.00	237.53	252.99		253.00	0.000003	0.40	83544.04	6389.83	0.02
Mud Creek	1000	53900	100 YR	35899.00	237.53	253.86		253.86	0.000003	0.43	89086.51	6415.80	0.02
Mud Creek	1000	52600	2 YR	9783.00	237.09	247.14		247.14	0.000002	0.25	40552.71	4879.26	0.01
Mud Creek	1000	52600	5 YR	16202.00	237.09	249.38		249.38	0.000002	0.32	51568.69	4966.74	0.02
Mud Creek	1000	52600	10 YR	20998.00	237.09	250.83		250.84	0.000003	0.37	58814.16	5006.82	0.02
Mud Creek	1000	52600	25 YR	26068.00	237.09	252.05		252.05	0.000003	0.41	64906.08	5030.00	0.02
Mud Creek	1000	52600	50 YR	30901.00	237.09	252.99		252.99	0.000003	0.46	69653.89	5047.98	0.02
Mud Creek	1000	52600	100 YR	35899.00	237.09	253.85		253.86	0.000004	0.50	74027.72	5064.50	0.02
Mud Creek	1000	51700	2 YR	9783.00	236.78	247.14		247.14	0.000004	0.27	36917.75	4535.60	0.02
Mud Creek	1000	51700	5 YR	16202.00	236.78	249.38		249.38	0.000005	0.36	47250.90	4703.36	0.02
Mud Creek	1000	51700	10 YR	20998.00	236.78	250.83		250.83	0.000006	0.41	54179.52	4866.99	0.02
Mud Creek	1000	51700	25 YR	26068.00	236.78	252.04		252.05	0.000006	0.46	60188.89	5038.07	0.02
Mud Creek	1000	51700	50 YR	30901.00	236.78	252.98		252.99	0.000007	0.51	64995.51	5170.85	0.02
Mud Creek	1000	51700	100 YR	35899.00	236.78	253.85		253.85	0.000008	0.56	69518.24	5292.74	0.02
Mud Creek	1000	49500	2 YR	9783.00	236.04	247.14		247.14	0.000002	0.23	43738.86	4949.78	0.01
Mud Creek	1000	49500	5 YR	16202.00	236.04	249.37		249.37	0.000002	0.30	54891.64	5028.02	0.02
Mud Creek	1000	49500	10 YR	20998.00	236.04	250.82		250.82	0.000002	0.35	62223.39	5078.80	0.02
Mud Creek	1000	49500	25 YR	26068.00	236.04	252.04		252.04	0.000003	0.39	68407.45	5121.24	0.02
Mud Creek	1000	49500	50 YR	30901.00	236.04	252.98		252.98	0.000003	0.43	73240.74	5154.17	0.02
Mud Creek	1000	49500	100 YR	35899.00	236.04	253.84		253.84	0.000003	0.48	77704.63	5184.39	0.02
Mud Creek	1000	47200	2 YR	9783.00	235.27	247.13		247.13	0.000003	0.33	45421.11	6262.34	0.02
Mud Creek	1000	47200	5 YR	16202.00	235.27	249.37		249.37	0.000004	0.42	59835.85	6642.13	0.02
Mud Creek	1000	47200	10 YR	20998.00	235.27	250.82		250.82	0.000004	0.47	69608.95	6794.86	0.02
Mud Creek	1000	47200	25 YR	26068.00	235.27	252.03		252.03	0.000004	0.52	77882.98	6861.51	0.02
Mud Creek	1000	47200	50 YR	30901.00	235.27	252.97		252.97	0.000005	0.57	84356.05	6913.20	0.03
Mud Creek	1000	47200	100 YR	35899.00	235.27	253.83		253.83	0.000005	0.62	90340.13	6960.65	0.03
Mud Creek	1000	46450	2 YR	9783.00	235.02	247.13		247.13	0.000004	0.34	52597.90	8208.89	0.02
Mud Creek	1000	46450	5 YR	16202.00	235.02	249.36		249.36	0.000005	0.42	71881.70	9057.68	0.02
Mud Creek	1000	46450	10 YR	20998.00	235.02	250.81		250.81	0.000005	0.46	85310.91	9348.75	0.02
Mud Creek	1000	46450	25 YR	26068.00	235.02	252.02		252.03	0.000005	0.50	96682.12	9421.45	0.02
Mud Creek	1000	46450	50 YR	30901.00	235.02	252.96		252.97	0.000006	0.54	105561.60	9477.83	0.02
Mud Creek	1000	46450	100 YR	35899.00	235.02	253.83		253.83	0.000006	0.58	113758.00	9529.57	0.03
Mud Creek	1000	44950	2 YR	9783.00	234.51	247.12		247.12	0.000003	0.25	77281.30	12518.18	0.01
Mud Creek	1000	44950	5 YR	16202.00	234.51	249.36		249.36	0.000003	0.30	106609.20	13746.47	0.02
Mud Creek	1000	44950	10 YR	20998.00	234.51	250.81		250.81	0.000003	0.33	126989.60	14213.04	0.02
Mud Creek	1000	44950	25 YR	26068.00	234.51	252.02		252.02	0.000003	0.35	144311.30	14382.65	0.02
Mud Creek	1000	44950	50 YR	30901.00	234.51	252.96		252.96	0.000004	0.38	157884.00	14514.17	0.02
Mud Creek	1000	44950	100 YR	35899.00	234.51	253.82		253.82	0.000004	0.41	170449.50	14634.87	0.02
Angelina River	Upstream	71106	2 YR	12944.00	246.00	252.10		252.14	0.000306	1.66	7854.78	1982.75	0.14
Angelina River	Upstream	71106	5 YR	21707.00	246.00	253.53		253.60	0.000314	2.06	10737.49	2043.32	0.15
Angelina River	Upstream	71106	10 YR	28205.00	246.00	254.47		254.55	0.000312	2.28	12676.08	2083.07	0.16
Angelina River	Upstream	71106	25 YR	35110.00	246.00	255.40		255.49	0.000308	2.47	14623.19	2122.24	0.16
Angelina River	Upstream	71106	50 YR	41349.00	246.00	256.18		256.28	0.000304	2.63	16296.99	2155.34	0.16
Angelina River	Upstream	71106	100 YR	47334.00	246.00	256.90		257.02	0.000299	2.76	17868.21	2185.96	0.16
Angelina River	Upstream	69124	2 YR	12944.00	245.00	251.33		251.41	0.000465	2.24	6602.52	2295.74	0.20
Angelina River	Upstream	69124	5 YR	21707.00	245.00	252.81		252.91	0.000400	2.59	10065.99	2385.42	0.20
Angelina River	Upstream	69124	10 YR	28205.00	245.00	253.79		253.89	0.000368	2.77	12418.43	2444.45	0.19
Angelina River	Upstream	69124	25 YR	35110.00	245.00	254.74		254.86	0.000342	2.94	14788.80	2502.52	0.19

## HEC-RAS Plan: NP (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Upstream	69124	50 YR	41349.00	245.00	255.55		255.68	0.000325	3.08	16826.10	2551.38	0.19
Angelina River	Upstream	69124	100 YR	47334.00	245.00	256.30		256.43	0.000310	3.19	18747.52	2596.62	0.19
Angelina River	Upstream	67228	2 YR	12944.00	244.00	250.63		250.68	0.000314	1.78	7282.97	2021.93	0.16
Angelina River	Upstream	67228	5 YR	21707.00	244.00	252.23		252.29	0.000263	2.07	10540.58	2069.54	0.16
Angelina River	Upstream	67228	10 YR	28205.00	244.00	253.25		253.32	0.000244	2.25	12668.04	2100.05	0.16
Angelina River	Upstream	67228	25 YR	35110.00	244.00	254.24		254.33	0.000230	2.41	14768.64	2129.75	0.16
Angelina River	Upstream	67228	50 YR	41349.00	244.00	255.07		255.17	0.000222	2.54	16543.52	2154.52	0.16
Angelina River	Upstream	67228	100 YR	47334.00	244.00	255.83		255.94	0.000214	2.66	18203.07	2177.43	0.16
Angelina River	Upstream	65531	2 YR	12944.00	242.00	250.20		250.22	0.000227	1.27	10216.94	2469.43	0.11
Angelina River	Upstream	65531	5 YR	21707.00	242.00	251.85		251.88	0.000210	1.52	14545.15	2778.85	0.11
Angelina River	Upstream	65531	10 YR	28205.00	242.00	252.89		252.94	0.000202	1.66	17552.16	2974.94	0.11
Angelina River	Upstream	65531	25 YR	35110.00	242.00	253.91		253.96	0.000195	1.79	20664.73	3165.14	0.11
Angelina River	Upstream	65531	50 YR	41349.00	242.00	254.75		254.81	0.000190	1.89	23399.71	3323.29	0.11
Angelina River	Upstream	65531	100 YR	47334.00	242.00	255.53		255.59	0.000184	1.97	26050.47	3469.70	0.11
Angelina River	Upstream	58835	2 YR	12944.00	241.00	247.62		247.68	0.000763	1.98	6535.22	1975.41	0.19
Angelina River	Upstream	58835	5 YR	21707.00	241.00	249.82		249.88	0.000462	1.87	11623.35	2634.47	0.16
Angelina River	Upstream	58835	10 YR	28205.00	241.00	251.22		251.27	0.000316	1.84	15381.99	2717.44	0.14
Angelina River	Upstream	58835	25 YR	35110.00	241.00	252.41		252.46	0.000260	1.89	18634.12	2747.20	0.13
Angelina River	Upstream	58835	50 YR	41349.00	241.00	253.34		253.40	0.000236	1.96	21210.93	2770.55	0.12
Angelina River	Upstream	58835	100 YR	47334.00	241.00	254.20		254.26	0.000219	2.02	23591.85	2791.95	0.12
Angelina River	Upstream	53947	2 YR	12944.00	236.00	247.18		247.19	0.000052	1.17	25033.06	4329.20	0.07
Angelina River	Upstream	53947	5 YR	21707.00	236.00	249.42		249.43	0.000055	1.39	35325.19	4874.47	0.07
Angelina River	Upstream	53947	10 YR	28205.00	236.00	250.87		250.88	0.000052	1.47	42560.18	5032.16	0.07
Angelina River	Upstream	53947	25 YR	35110.00	236.00	252.08		252.09	0.000052	1.57	48679.71	5054.73	0.07
Angelina River	Upstream	53947	50 YR	41349.00	236.00	253.02		253.03	0.000054	1.65	53448.20	5072.24	0.08
Angelina River	Upstream	53947	100 YR	47334.00	236.00	253.89		253.90	0.000054	1.73	57835.07	5088.30	0.08
Angelina River	Upstream	50340	2 YR	12944.00	235.00	247.13		247.13	0.000011	0.49	50095.43	7642.59	0.03
Angelina River	Upstream	50340	5 YR	21707.00	235.00	249.36		249.36	0.000012	0.59	67613.13	8049.60	0.03
Angelina River	Upstream	50340	10 YR	28205.00	235.00	250.81		250.81	0.000013	0.64	79445.03	8239.34	0.03
Angelina River	Upstream	50340	25 YR	35110.00	235.00	252.02		252.03	0.000013	0.70	89492.20	8348.85	0.03
Angelina River	Upstream	50340	50 YR	41349.00	235.00	252.96		252.96	0.000014	0.76	97373.27	8433.75	0.03
Angelina River	Upstream	50340	100 YR	47334.00	235.00	253.82		253.83	0.000015	0.80	104675.30	8511.66	0.03
Angelina River	Downstream	43601	2 YR	16070.00	234.06	247.05		247.10	0.000175	2.61	17185.22	4411.91	0.15
Angelina River	Downstream	43601	5 YR	27082.00	234.06	249.29		249.33	0.000152	2.78	28524.58	5731.09	0.14
Angelina River	Downstream	43601	10 YR	36162.00	234.06	250.74		250.78	0.000133	2.81	37336.77	6187.24	0.13
Angelina River	Downstream	43601	25 YR	46042.00	234.06	251.96		252.00	0.000125	2.88	44869.99	6247.82	0.13
Angelina River	Downstream	43601	50 YR	55051.00	234.06	252.89		252.93	0.000124	2.98	50746.70	6294.67	0.13
Angelina River	Downstream	43601	100 YR	64110.00	234.06	253.75		253.79	0.000123	3.08	56174.74	6337.64	0.13
Angelina River	Downstream	43600	2 YR	16070.00	234.06	247.05	242.36	247.10	0.000175	2.61	17184.41	4411.80	0.15
Angelina River	Downstream	43600	5 YR	27082.00	234.06	249.29	243.57	249.33	0.000152	2.78	28523.71	5731.00	0.14
Angelina River	Downstream	43600	10 YR	36162.00	234.06	250.74	244.28	250.78	0.000133	2.81	37335.93	6187.23	0.13
Angelina River	Downstream	43600	25 YR	46042.00	234.06	251.96	244.86	252.00	0.000125	2.88	44869.22	6247.81	0.13
Angelina River	Downstream	43600	50 YR	55051.00	234.06	252.89	245.31	252.93	0.000124	2.98	50745.93	6294.67	0.13
Angelina River	Downstream	43600	100 YR	64110.00	234.06	253.75	245.76	253.79	0.000123	3.08	56173.97	6337.64	0.13
Angelina River	Downstream	43250		Bridge									
Angelina River	Downstream	42900	2 YR	16070.00	233.82	246.90		246.92	0.000124	1.92	19097.23	3558.71	0.11
Angelina River	Downstream	42900	5 YR	27082.00	233.82	249.16		249.18	0.000129	2.24	27790.98	4135.00	0.11
Angelina River	Downstream	42900	10 YR	36162.00	233.82	250.62		250.65	0.000133	2.45	34099.59	4470.77	0.12
Angelina River	Downstream	42900	25 YR	46042.00	233.82	251.83		251.86	0.000143	2.69	39648.92	4706.60	0.12
Angelina River	Downstream	42900	50 YR	55051.00	233.82	252.76		252.80	0.000153	2.89	44122.13	4888.42	0.13
Angelina River	Downstream	42900	100 YR	64110.00	233.82	253.62		253.66	0.000161	3.08	48372.98	5055.14	0.13
Angelina River	Downstream	40400	2 YR	16070.00	232.98	246.60		246.62	0.000178	2.31	18899.31	4121.22	0.13
Angelina River	Downstream	40400	5 YR	27082.00	232.98	248.87		248.90	0.000164	2.54	29319.77	5042.34	0.13
Angelina River	Downstream	40400	10 YR	36162.00	232.98	250.33		250.36	0.000165	2.75	37192.76	5808.25	0.13
Angelina River	Downstream	40400	25 YR	46042.00	232.98	251.54		251.57	0.000156	2.82	44243.09	5838.52	0.13
Angelina River	Downstream	40400	50 YR	55051.00	232.98	252.47		252.50	0.000156	2.93	49661.33	5861.68	0.13
Angelina River	Downstream	40400	100 YR	64110.00	232.98	253.32		253.35	0.000156	3.04	54645.73	5882.90	0.13
Angelina River	Downstream	39350	2 YR	16070.00	232.63	246.54		246.55	0.000039	0.95	36392.61	6606.97	0.05
Angelina River	Downstream	39350	5 YR	27082.00	232.63	248.82		248.82	0.000039	1.08	52332.23	7392.59	0.05
Angelina River	Downstream	39350	10 YR	36162.00	232.63	250.28		250.29	0.000040	1.18	63482.14	7813.96	0.06
Angelina River	Downstream	39350	25 YR	46042.00	232.63	251.49		251.50	0.000042	1.27	72972.85	7874.45	0.06
Angelina River	Downstream	39350	50 YR	55051.00	232.63	252.41		252.42	0.000044	1.36	80273.66	7920.68	0.06
Angelina River	Downstream	39350	100 YR	64110.00	232.63	253.26		253.27	0.000046	1.45	87002.47	7963.04	0.06
Angelina River	Downstream	36950	2 YR	16070.00	231.82	246.32		246.40	0.000242	3.14	12002.61	2574.77	0.17
Angelina River	Downstream	36950	5 YR	27082.00	231.82	248.59		248.69	0.000249	3.64	18532.30	3176.51	0.18
Angelina River	Downstream	36950	10 YR	36162.00	231.82	250.04		250.15	0.000263	4.01	23424.04	4101.11	0.19
Angelina River	Downstream	36950	25 YR	46042.00	231.82	251.25		251.36	0.000256	4.19	28410.27	4137.42	0.19
Angelina River	Downstream	36950	50 YR	55051.00	231.82	252.16		252.28	0.000259	4.38	32216.10	4164.93	0.19
Angelina River	Downstream	36950	100 YR	64110.00	231.82	253.00		253.12	0.000262	4.56	35720.73	4190.10	0.19
Angelina River	Downstream	33750	2 YR	16070.00	230.74	245.01		245.26	0.000744	4.47	5888.26	1452.94	0.23
Angelina River	Downstream	33750	5 YR	27082.00	230.74	247.22		247.52	0.000823	5.29	9682.54	1983.00	0.25
Angelina River	Downstream	33750	10 YR	36162.00	230.74	248.64		248.95	0.000840	5.71	12727.46	2322.47	0.26
Angelina River	Downstream	33750	25 YR	46042.00	230.74	249.85		250.19	0.000870	6.11	15718.74	2613.36	0.27

## HEC-RAS Plan: NP (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Downstream	33750	50 YR	55051.00	230.74	250.77		251.11	0.000870	6.34	18172.41	2676.96	0.27
Angelina River	Downstream	33750	100 YR	64110.00	230.74	251.61		251.96	0.000867	6.53	20438.14	2706.43	0.27
Angelina River	Downstream	32550	2 YR	16070.00	230.34	244.37		244.54	0.000723	4.37	7763.51	1958.97	0.25
Angelina River	Downstream	32550	5 YR	27082.00	230.34	246.72		246.88	0.000588	4.59	12875.54	2393.54	0.24
Angelina River	Downstream	32550	10 YR	36162.00	230.34	248.19		248.35	0.000554	4.82	16580.83	2664.58	0.24
Angelina River	Downstream	32550	25 YR	46042.00	230.34	249.41		249.58	0.000559	5.14	19984.96	2891.28	0.24
Angelina River	Downstream	32550	50 YR	55051.00	230.34	250.34		250.52	0.000572	5.43	22730.18	3016.86	0.25
Angelina River	Downstream	32550	100 YR	64110.00	230.34	251.18		251.38	0.000581	5.67	25300.96	3059.17	0.25
Angelina River	Downstream	30950	2 YR	16070.00	229.81	241.55		242.63	0.002154	8.39	2191.24	604.17	0.49
Angelina River	Downstream	30950	5 YR	27082.00	229.81	243.02		244.94	0.003301	11.49	3355.69	978.04	0.63
Angelina River	Downstream	30950	10 YR	36162.00	229.81	244.22		246.46	0.003583	12.86	4701.03	1280.63	0.66
Angelina River	Downstream	30950	25 YR	46042.00	229.81	245.63		247.80	0.003257	13.24	6770.92	1640.58	0.65
Angelina River	Downstream	30950	50 YR	55051.00	229.81	246.93		248.85	0.002799	13.07	9104.96	1969.06	0.61
Angelina River	Downstream	30950	100 YR	64110.00	229.81	248.14		249.83	0.002402	12.79	11685.26	2277.72	0.57
Angelina River	Downstream	29800	2 YR	16070.00	229.43	241.54		241.64	0.000283	2.66	7412.60	1956.62	0.17
Angelina River	Downstream	29800	5 YR	27082.00	229.43	243.43		243.58	0.000317	3.29	11305.15	2149.99	0.19
Angelina River	Downstream	29800	10 YR	36162.00	229.43	244.83		245.01	0.000317	3.62	14421.97	2293.09	0.20
Angelina River	Downstream	29800	25 YR	46042.00	229.43	246.23		246.42	0.000311	3.89	17718.20	2435.30	0.20
Angelina River	Downstream	29800	50 YR	55051.00	229.43	247.40		247.61	0.000304	4.10	20633.14	2554.48	0.20
Angelina River	Downstream	29800	100 YR	64110.00	229.43	248.48		248.71	0.000299	4.29	23471.55	2665.41	0.20
Angelina River	Downstream	29000	2 YR	16070.00	229.18	240.11	235.84	241.03	0.002940	7.71	2459.61	3741.91	0.44
Angelina River	Downstream	29000	5 YR	27082.00	229.18	242.94		243.14	0.000869	4.99	13831.07	4301.74	0.25
Angelina River	Downstream	29000	10 YR	36162.00	229.18	244.49		244.62	0.000571	4.38	20754.85	4609.43	0.21
Angelina River	Downstream	29000	25 YR	46042.00	229.18	245.97		246.06	0.000430	4.07	27759.37	4901.08	0.18
Angelina River	Downstream	29000	50 YR	55051.00	229.18	247.18		247.26	0.000358	3.91	33868.79	5141.98	0.17
Angelina River	Downstream	29000	100 YR	64110.00	229.18	248.30		248.38	0.000312	3.81	39768.33	5364.34	0.16
Angelina River	Downstream	22700	2 YR	16070.00	227.14	239.46		239.48	0.000095	1.78	17312.94	2471.10	0.09
Angelina River	Downstream	22700	5 YR	27082.00	227.14	242.24		242.28	0.000099	2.11	24515.76	2651.00	0.10
Angelina River	Downstream	22700	10 YR	36162.00	227.14	243.83		243.87	0.000110	2.39	28772.11	2722.29	0.11
Angelina River	Downstream	22700	25 YR	46042.00	227.14	245.33		245.38	0.000119	2.66	32915.20	2789.94	0.11
Angelina River	Downstream	22700	50 YR	55051.00	227.14	246.57		246.63	0.000127	2.87	36405.29	2845.68	0.12
Angelina River	Downstream	22700	100 YR	64110.00	227.14	247.71		247.77	0.000133	3.07	39674.98	2896.92	0.12
Angelina River	Downstream	18600	2 YR	16070.00	225.81	239.05		239.08	0.000161	2.35	13949.21	2078.27	0.12
Angelina River	Downstream	18600	5 YR	27082.00	225.81	241.76		241.82	0.000211	3.11	23653.85	4388.19	0.15
Angelina River	Downstream	18600	10 YR	36162.00	225.81	243.38		243.43	0.000175	3.05	30815.55	4469.05	0.14
Angelina River	Downstream	18600	25 YR	46042.00	225.81	244.90		244.94	0.000157	3.07	37668.64	4545.08	0.13
Angelina River	Downstream	18600	50 YR	55051.00	225.81	246.15		246.19	0.000147	3.12	43376.82	4607.44	0.13
Angelina River	Downstream	18600	100 YR	64110.00	225.81	247.29		247.34	0.000141	3.18	48679.79	4664.64	0.13
Angelina River	Downstream	14400	2 YR	16070.00	224.45	238.97		238.97	0.000028	0.88	32477.96	3773.26	0.05
Angelina River	Downstream	14400	5 YR	27082.00	224.45	241.66		241.67	0.000035	1.14	43022.16	4144.46	0.05
Angelina River	Downstream	14400	10 YR	36162.00	224.45	243.27		243.28	0.000042	1.33	49937.37	4454.09	0.06
Angelina River	Downstream	14400	25 YR	46042.00	224.45	244.78		244.79	0.000048	1.51	56906.43	4745.73	0.06
Angelina River	Downstream	14400	50 YR	55051.00	224.45	246.03		246.04	0.000053	1.66	62960.39	4985.26	0.07
Angelina River	Downstream	14400	100 YR	64110.00	224.45	247.17		247.18	0.000057	1.78	68776.30	5204.99	0.07
Angelina River	Downstream	5700	2 YR	16070.00	221.64	238.75		238.77	0.000095	1.72	18634.76	2562.75	0.08
Angelina River	Downstream	5700	5 YR	27082.00	221.64	241.41		241.43	0.000105	2.05	25973.17	2929.30	0.09
Angelina River	Downstream	5700	10 YR	36162.00	221.64	242.98		243.01	0.000117	2.30	30667.15	3045.57	0.10
Angelina River	Downstream	5700	25 YR	46042.00	221.64	244.46		244.50	0.000127	2.53	35264.88	3155.31	0.10
Angelina River	Downstream	5700	50 YR	55051.00	221.64	245.68		245.72	0.000134	2.72	39172.64	3245.66	0.11
Angelina River	Downstream	5700	100 YR	64110.00	221.64	246.81		246.85	0.000140	2.88	42858.75	3328.64	0.11
Angelina River	Downstream	1000	2 YR	16070.00	220.12	238.00	231.29	238.15	0.000350	3.82	8756.50	1740.94	0.19
Angelina River	Downstream	1000	5 YR	27082.00	220.12	240.64	233.86	240.80	0.000350	4.32	14068.20	2298.38	0.19
Angelina River	Downstream	1000	10 YR	36162.00	220.12	242.18	235.11	242.34	0.000350	4.60	17700.39	2414.89	0.20
Angelina River	Downstream	1000	25 YR	46042.00	220.12	243.64	236.23	243.81	0.000351	4.86	21296.01	2524.95	0.20
Angelina River	Downstream	1000	50 YR	55051.00	220.12	244.84	236.99	245.01	0.000350	5.07	24386.88	2615.86	0.20
Angelina River	Downstream	1000	100 YR	64110.00	220.12	245.94	237.68	246.12	0.000350	5.25	27320.34	2699.31	0.20

HEC-RAS Output  
Proposed Early Median



HEC-RAS Plan: Prop EM

River	Reach	River Sta	Profile	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
Mud Creek	1000	132650	2 YR	1800.00	315.00	316.78		317.18	0.013652	5.05	356.67	199.99	0.67
Mud Creek	1000	132650	5 YR	4469.00	315.00	318.30		319.01	0.011029	6.77	660.12	199.99	0.66
Mud Creek	1000	132650	10 YR	6899.00	315.00	319.42		320.36	0.010102	7.81	883.18	199.99	0.66
Mud Creek	1000	132650	25 YR	9720.00	315.00	320.56		321.74	0.009464	8.75	1111.14	200.00	0.65
Mud Creek	1000	132650	50 YR	12330.00	315.00	321.51		322.90	0.009070	9.46	1302.75	200.00	0.65
Mud Creek	1000	132650	100 YR	15219.00	315.00	322.50		324.10	0.008750	10.15	1499.59	200.00	0.65
Mud Creek	1000	132350.*	2 YR	1800.00	309.12	310.68	310.53	311.20	0.022136	5.75	312.81	222.40	0.86
Mud Creek	1000	132350.*	5 YR	4469.00	309.12	311.81	311.62	312.73	0.020809	7.69	581.03	254.30	0.90
Mud Creek	1000	132350.*	10 YR	6899.00	309.12	312.56	312.39	313.77	0.020687	8.84	780.54	275.65	0.93
Mud Creek	1000	132350.*	25 YR	9720.00	309.12	313.25	313.14	314.79	0.021302	9.94	977.39	295.20	0.96
Mud Creek	1000	132350.*	50 YR	12330.00	309.12	313.80	313.76	315.60	0.021699	10.77	1145.24	310.90	0.99
Mud Creek	1000	132350.*	100 YR	15219.00	309.12	314.37	314.37	316.42	0.021753	11.49	1325.10	326.89	1.01
Mud Creek	1000	132050.*	2 YR	1800.00	303.23	304.90		305.31	0.017328	5.12	351.77	264.74	0.78
Mud Creek	1000	132050.*	5 YR	4469.00	303.23	305.87	305.68	306.63	0.019573	7.01	637.61	327.41	0.89
Mud Creek	1000	132050.*	10 YR	6899.00	303.23	306.48	306.36	307.50	0.020743	8.10	851.69	367.42	0.94
Mud Creek	1000	132050.*	25 YR	9720.00	303.23	307.08	307.00	308.33	0.021192	8.98	1082.20	406.11	0.97
Mud Creek	1000	132050.*	50 YR	12330.00	303.23	307.53	307.51	308.99	0.021745	9.68	1274.07	435.71	1.00
Mud Creek	1000	132050.*	100 YR	15219.00	303.23	308.02	308.02	309.63	0.021470	10.20	1492.43	467.11	1.01
Mud Creek	1000	131750.*	2 YR	1800.00	297.35	298.86	298.78	299.31	0.023252	5.42	332.23	306.26	0.92
Mud Creek	1000	131750.*	5 YR	4469.00	297.35	299.78	299.69	300.49	0.021364	6.75	661.78	411.00	0.94
Mud Creek	1000	131750.*	10 YR	6899.00	297.35	300.35	300.27	301.23	0.020837	7.51	918.09	476.82	0.95
Mud Creek	1000	131750.*	25 YR	9720.00	297.35	300.86	300.82	301.92	0.021166	8.27	1175.46	534.81	0.98
Mud Creek	1000	131750.*	50 YR	12330.00	297.35	301.27	301.25	302.47	0.021241	8.81	1399.62	580.63	1.00
Mud Creek	1000	131750.*	100 YR	15219.00	297.35	301.67	301.67	303.00	0.020983	9.26	1643.26	626.63	1.01
Mud Creek	1000	131450.*	2 YR	1800.00	291.47	293.03	292.85	293.35	0.016974	4.50	400.14	399.10	0.79
Mud Creek	1000	131450.*	5 YR	4469.00	291.47	293.77	293.64	294.33	0.019420	5.99	745.62	534.68	0.89
Mud Creek	1000	131450.*	10 YR	6899.00	291.47	294.23	294.15	294.96	0.020711	6.86	1005.26	617.27	0.95
Mud Creek	1000	131450.*	25 YR	9720.00	291.47	294.66	294.61	295.54	0.021076	7.54	1289.02	696.42	0.98
Mud Creek	1000	131450.*	50 YR	12330.00	291.47	294.98	294.97	296.00	0.021549	8.08	1526.68	756.37	1.00
Mud Creek	1000	131450.*	100 YR	15219.00	291.47	295.32	295.32	296.44	0.021279	8.48	1794.73	818.73	1.01
Mud Creek	1000	131150.*	2 YR	1800.00	285.59	286.91	286.88	287.28	0.024496	4.83	372.43	472.16	0.96
Mud Creek	1000	131150.*	5 YR	4469.00	285.59	287.60	287.56	288.13	0.022031	5.86	762.88	669.37	0.97
Mud Creek	1000	131150.*	10 YR	6899.00	285.59	288.02	287.98	288.66	0.021060	6.43	1073.26	791.84	0.97
Mud Creek	1000	131150.*	25 YR	9720.00	285.59	288.39	288.37	289.16	0.021307	7.04	1380.91	896.88	1.00
Mud Creek	1000	131150.*	50 YR	12330.00	285.59	288.68	288.68	289.54	0.021139	7.45	1654.75	980.95	1.01
Mud Creek	1000	131150.*	100 YR	15219.00	285.59	288.97	288.97	289.91	0.020571	7.78	1957.08	1066.11	1.01
Mud Creek	1000	130850.*	2 YR	1800.00	279.71	280.98	280.87	281.21	0.016791	3.89	462.87	660.87	0.82
Mud Creek	1000	130850.*	5 YR	4469.00	279.71	281.50	281.43	281.91	0.019388	5.16	866.39	901.87	0.93
Mud Creek	1000	130850.*	10 YR	6899.00	279.71	281.80	281.78	282.35	0.020860	5.91	1166.98	1045.92	0.99
Mud Creek	1000	130850.*	25 YR	9720.00	279.71	282.10	282.10	282.75	0.021107	6.47	1502.14	1186.07	1.01
Mud Creek	1000	130850.*	50 YR	12330.00	279.71	282.37	282.37	283.07	0.019898	6.72	1835.37	1310.64	1.00
Mud Creek	1000	130850.*	100 YR	15219.00	279.71	282.62	282.62	283.38	0.019349	7.01	2171.70	1425.38	1.00
Mud Creek	1000	130550.*	2 YR	1800.00	273.82	274.79	274.79	275.05	0.025652	4.11	437.90	856.19	1.01
Mud Creek	1000	130550.*	5 YR	4469.00	273.82	275.24	275.24	275.62	0.022679	4.93	906.72	1231.07	1.01
Mud Creek	1000	130550.*	10 YR	6899.00	273.82	275.52	275.52	275.97	0.021489	5.38	1281.28	1463.11	1.01
Mud Creek	1000	130550.*	25 YR	9720.00	273.82	275.78	275.78	276.29	0.020344	5.75	1691.19	1680.72	1.01
Mud Creek	1000	130550.*	50 YR	12330.00	273.82	275.98	275.98	276.54	0.019754	6.03	2043.82	1847.53	1.01
Mud Creek	1000	130550.*	100 YR	15219.00	273.82	276.17	276.17	276.79	0.019267	6.30	2415.86	2008.56	1.01
Mud Creek	1000	130250	2 YR	1800.00	267.94	269.67		269.68	0.000170	0.51	3561.29	4084.53	0.10
Mud Creek	1000	130250	5 YR	4469.00	267.94	270.79		270.79	0.000061	0.45	9899.27	6275.63	0.06
Mud Creek	1000	130250	10 YR	6899.00	267.94	271.59		271.60	0.000037	0.46	15018.19	6404.81	0.05
Mud Creek	1000	130250	25 YR	9720.00	267.94	272.39		272.39	0.000028	0.49	20175.41	6532.37	0.05
Mud Creek	1000	130250	50 YR	12330.00	267.94	273.10		273.11	0.000023	0.51	24887.54	6646.78	0.05
Mud Creek	1000	130250	100 YR	15219.00	267.94	273.82		273.83	0.000020	0.53	29700.46	6761.65	0.04
Mud Creek	1000	129850	2 YR	1800.00	267.48	269.60		269.60	0.000200	0.48	3787.08	3574.07	0.08
Mud Creek	1000	129850	5 YR	4469.00	267.48	270.76		270.76	0.000091	0.49	10105.23	6329.30	0.06
Mud Creek	1000	129850	10 YR	6899.00	267.48	271.57		271.58	0.000063	0.51	15317.10	6415.18	0.05
Mud Creek	1000	129850	25 YR	9720.00	267.48	272.37		272.38	0.000051	0.54	20492.08	6499.33	0.05
Mud Creek	1000	129850	50 YR	12330.00	267.48	273.09		273.10	0.000043	0.56	25182.97	6574.68	0.05
Mud Creek	1000	129850	100 YR	15219.00	267.48	273.81		273.82	0.000038	0.59	29940.31	6650.22	0.05
Mud Creek	1000	128750	2 YR	1800.00	267.10	269.46		269.46	0.000087	0.39	4662.35	3949.02	0.06
Mud Creek	1000	128750	5 YR	4469.00	267.10	270.68		270.69	0.000049	0.43	10377.27	4935.45	0.05
Mud Creek	1000	128750	10 YR	6899.00	267.10	271.52		271.52	0.000039	0.48	14546.68	5039.95	0.05
Mud Creek	1000	128750	25 YR	9720.00	267.10	272.33		272.33	0.000034	0.53	18665.47	5141.08	0.05
Mud Creek	1000	128750	50 YR	12330.00	267.10	273.05		273.06	0.000031	0.56	22415.91	5231.48	0.05
Mud Creek	1000	128750	100 YR	15219.00	267.10	273.77		273.78	0.000028	0.59	26230.57	5321.84	0.05
Mud Creek	1000	127950	2 YR	1800.00	266.82	269.39		269.39	0.000098	0.43	4144.10	3228.84	0.07
Mud Creek	1000	127950	5 YR	4469.00	266.82	270.64		270.64	0.000062	0.50	9052.85	4235.12	0.06
Mud Creek	1000	127950	10 YR	6899.00	266.82	271.48		271.49	0.000050	0.56	12649.46	4281.57	0.06
Mud Creek	1000	127950	25 YR	9720.00	266.82	272.30		272.30	0.000045	0.62	16146.66	4326.26	0.06
Mud Creek	1000	127950	50 YR	12330.00	266.82	273.02		273.03	0.000041	0.66	19302.48	4366.20	0.05
Mud Creek	1000	127950	100 YR	15219.00	266.82	273.75		273.75	0.000038	0.70	22481.11	4406.06	0.05
Mud Creek	1000	126600	2 YR	2472.00	266.35	269.31		269.32	0.000038	0.34	7223.58	4873.27	0.05
Mud Creek	1000	126600	5 YR	4549.00	266.35	270.60		270.60	0.000017	0.31	14595.33	6123.28	0.04

HEC-RAS Plan: Prop EM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	126600	10 YR	7027.00	266.35	271.45		271.45	0.000014	0.36	19878.83	6297.68	0.03
Mud Creek	1000	126600	25 YR	9915.00	266.35	272.27		272.27	0.000014	0.40	25081.51	6464.82	0.04
Mud Creek	1000	126600	50 YR	12584.00	266.35	273.00		273.00	0.000013	0.43	29847.86	6614.24	0.03
Mud Creek	1000	126600	100 YR	15548.00	266.35	273.72		273.73	0.000012	0.46	34707.82	6763.19	0.03
Mud Creek	1000	124600	2 YR	2472.00	265.65	269.23		269.23	0.000051	0.39	6318.62	3534.40	0.05
Mud Creek	1000	124600	5 YR	4549.00	265.65	270.56		270.56	0.000028	0.39	11762.59	4341.83	0.04
Mud Creek	1000	124600	10 YR	7027.00	265.65	271.41		271.42	0.000027	0.46	15498.42	4405.89	0.04
Mud Creek	1000	124600	25 YR	9915.00	265.65	272.23		272.23	0.000027	0.52	19118.64	4467.09	0.04
Mud Creek	1000	124600	50 YR	12584.00	265.65	272.96		272.96	0.000026	0.57	22402.41	4521.89	0.04
Mud Creek	1000	124600	100 YR	15548.00	265.65	273.69		273.69	0.000026	0.61	25711.83	4576.45	0.04
Mud Creek	1000	123150	2 YR	2472.00	265.14	269.17		269.17	0.000035	0.30	8170.20	4058.93	0.04
Mud Creek	1000	123150	5 YR	4549.00	265.14	270.52		270.52	0.000022	0.31	14481.20	4965.24	0.03
Mud Creek	1000	123150	10 YR	7027.00	265.14	271.38		271.38	0.000023	0.38	18769.90	5072.06	0.03
Mud Creek	1000	123150	25 YR	9915.00	265.14	272.19		272.19	0.000024	0.44	22947.37	5173.98	0.04
Mud Creek	1000	123150	50 YR	12584.00	265.14	272.92		272.93	0.000023	0.48	26766.73	5265.45	0.04
Mud Creek	1000	123150	100 YR	15548.00	265.14	273.65		273.66	0.000023	0.52	30633.74	5356.46	0.04
Mud Creek	1000	121050	2 YR	5358.00	264.41	269.04		269.05	0.000074	0.50	10759.32	4642.97	0.06
Mud Creek	1000	121050	5 YR	9138.00	264.41	270.44		270.45	0.000048	0.50	18422.16	6299.73	0.05
Mud Creek	1000	121050	10 YR	11943.00	264.41	271.31		271.31	0.000037	0.51	23969.41	6494.83	0.04
Mud Creek	1000	121050	25 YR	14964.00	264.41	272.13		272.14	0.000031	0.53	29381.67	6679.70	0.04
Mud Creek	1000	121050	50 YR	17890.00	264.41	272.87		272.87	0.000028	0.55	34362.16	6845.41	0.04
Mud Creek	1000	121050	100 YR	21068.00	264.41	273.60		273.60	0.000025	0.57	39428.75	7009.96	0.04
Mud Creek	1000	119350	2 YR	5358.00	263.81	268.75		268.77	0.000582	1.26	4253.56	1722.95	0.14
Mud Creek	1000	119350	5 YR	9138.00	263.81	270.24		270.26	0.000396	1.27	7202.32	2165.98	0.12
Mud Creek	1000	119350	10 YR	11943.00	263.81	271.15		271.17	0.000303	1.30	9180.71	2188.69	0.11
Mud Creek	1000	119350	25 YR	14964.00	263.81	271.99		272.02	0.000260	1.36	11029.24	2209.71	0.11
Mud Creek	1000	119350	50 YR	17890.00	263.81	272.74		272.77	0.000235	1.42	12686.48	2228.38	0.10
Mud Creek	1000	119350	100 YR	21068.00	263.81	273.47		273.51	0.000218	1.48	14335.92	2246.81	0.10
Mud Creek	1000	117350	2 YR	5358.00	263.11	268.30		268.31	0.000122	0.89	6052.30	2333.71	0.10
Mud Creek	1000	117350	5 YR	9138.00	263.11	269.94		269.95	0.000082	0.87	10490.59	3072.46	0.08
Mud Creek	1000	117350	10 YR	11943.00	263.11	270.93		270.94	0.000060	0.88	13595.21	3188.10	0.07
Mud Creek	1000	117350	25 YR	14964.00	263.11	271.80		271.82	0.000051	0.92	16421.27	3271.23	0.07
Mud Creek	1000	117350	50 YR	17890.00	263.11	272.57		272.58	0.000046	0.96	18956.91	3344.06	0.07
Mud Creek	1000	117350	100 YR	21068.00	263.11	273.32		273.33	0.000043	1.00	21492.30	3415.32	0.07
Mud Creek	1000	114900	2 YR	5358.00	262.26	268.03		268.04	0.000096	0.84	6351.21	2200.31	0.09
Mud Creek	1000	114900	5 YR	9138.00	262.26	269.75		269.77	0.000069	0.85	10703.97	2856.46	0.08
Mud Creek	1000	114900	10 YR	11943.00	262.26	270.79		270.80	0.000054	0.87	13758.51	2993.35	0.07
Mud Creek	1000	114900	25 YR	14964.00	262.26	271.68		271.70	0.000047	0.91	16456.58	3042.52	0.07
Mud Creek	1000	114900	50 YR	17890.00	262.26	272.46		272.47	0.000043	0.96	18836.96	3085.25	0.07
Mud Creek	1000	114900	100 YR	21068.00	262.26	273.22		273.23	0.000041	1.01	21186.21	3126.85	0.07
Mud Creek	1000	113800	2 YR	5358.00	261.87	267.92		267.93	0.000106	0.92	5852.36	1934.74	0.09
Mud Creek	1000	113800	5 YR	9138.00	261.87	269.67		269.68	0.000080	0.94	9728.91	2494.53	0.08
Mud Creek	1000	113800	10 YR	11943.00	261.87	270.72		270.74	0.000063	0.96	12471.33	2675.72	0.08
Mud Creek	1000	113800	25 YR	14964.00	261.87	271.62		271.64	0.000056	1.01	14926.21	2770.38	0.07
Mud Creek	1000	113800	50 YR	17890.00	261.87	272.40		272.42	0.000052	1.06	17121.22	2852.36	0.07
Mud Creek	1000	113800	100 YR	21068.00	261.87	273.16		273.18	0.000049	1.12	19314.90	2932.00	0.07
Mud Creek	1000	112200	2 YR	5358.00	261.31	267.68		267.70	0.000203	1.15	4673.00	1466.62	0.11
Mud Creek	1000	112200	5 YR	9138.00	261.31	269.49		269.51	0.000156	1.19	7695.26	1882.05	0.10
Mud Creek	1000	112200	10 YR	11943.00	261.31	270.57		270.59	0.000128	1.21	9841.47	2025.74	0.10
Mud Creek	1000	112200	25 YR	14964.00	261.31	271.49		271.51	0.000113	1.28	11717.28	2066.99	0.09
Mud Creek	1000	112200	50 YR	17890.00	261.31	272.28		272.31	0.000106	1.35	13360.16	2102.45	0.09
Mud Creek	1000	112200	100 YR	21068.00	261.31	273.04		273.07	0.000102	1.42	14975.15	2136.74	0.09
Mud Creek	1000	110300	2 YR	5358.00	260.65	267.49	262.94	267.49	0.000067	0.69	7745.37	2266.27	0.07
Mud Creek	1000	110300	5 YR	9138.00	260.65	269.33	263.50	269.34	0.000055	0.73	12498.32	2878.83	0.06
Mud Creek	1000	110300	10 YR	11943.00	260.65	270.44	263.82	270.45	0.000047	0.75	15875.57	3124.44	0.06
Mud Creek	1000	110300	25 YR	14964.00	260.65	271.38	264.12	271.39	0.000042	0.80	18812.43	3175.72	0.06
Mud Creek	1000	110300	50 YR	17890.00	260.65	272.17	264.38	272.18	0.000039	0.84	21358.78	3219.52	0.06
Mud Creek	1000	110300	100 YR	21068.00	260.65	272.94	264.63	272.95	0.000038	0.89	23844.02	3261.70	0.06
Mud Creek	1000	110200		Bridge									
Mud Creek	1000	110050	2 YR	5358.00	260.56	267.41		267.42	0.000038	0.60	8956.83	2613.71	0.06
Mud Creek	1000	110050	5 YR	9138.00	260.56	269.26		269.26	0.000031	0.63	14426.78	3317.15	0.05
Mud Creek	1000	110050	10 YR	11943.00	260.56	270.37		270.37	0.000027	0.65	18319.41	3643.98	0.05
Mud Creek	1000	110050	25 YR	14964.00	260.56	271.29		271.30	0.000024	0.69	21739.09	3754.90	0.05
Mud Creek	1000	110050	50 YR	17890.00	260.56	272.08		272.09	0.000023	0.73	24733.66	3849.42	0.05
Mud Creek	1000	110050	100 YR	21068.00	260.56	272.84		272.84	0.000022	0.77	27680.45	3940.21	0.05
Mud Creek	1000	109550	2 YR	5358.00	260.38	267.40		267.40	0.000034	0.57	9338.02	2661.96	0.05
Mud Creek	1000	109550	5 YR	9138.00	260.38	269.24		269.25	0.000029	0.61	14904.14	3363.01	0.05
Mud Creek	1000	109550	10 YR	11943.00	260.38	270.35		270.36	0.000025	0.63	18859.09	3713.68	0.05
Mud Creek	1000	109550	25 YR	14964.00	260.38	271.28		271.29	0.000023	0.67	22373.81	3880.30	0.05
Mud Creek	1000	109550	50 YR	17890.00	260.38	272.07		272.08	0.000021	0.71	25488.21	4022.18	0.05
Mud Creek	1000	109550	100 YR	21068.00	260.38	272.82		272.83	0.000021	0.75	28584.27	4158.43	0.05
Mud Creek	1000	107750	2 YR	5358.00	259.75	267.32		267.33	0.000048	0.65	8189.85	2030.38	0.06
Mud Creek	1000	107750	5 YR	9138.00	259.75	269.18		269.18	0.000047	0.74	12384.91	2493.98	0.06

## HEC-RAS Plan: Prop EM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	107750	10 YR	11943.00	259.75	270.29		270.30	0.000044	0.78	15323.69	2770.09	0.06
Mud Creek	1000	107750	25 YR	14964.00	259.75	271.22		271.23	0.000041	0.84	18002.18	2993.17	0.06
Mud Creek	1000	107750	50 YR	17890.00	259.75	272.01		272.02	0.000040	0.89	20440.44	3182.67	0.06
Mud Creek	1000	107750	100 YR	21068.00	259.75	272.77		272.78	0.000040	0.95	22918.76	3364.37	0.06
Mud Creek	1000	105150	2 YR	5358.00	258.80	267.22		267.23	0.000031	0.68	9170.19	1564.01	0.04
Mud Creek	1000	105150	5 YR	9138.00	258.80	269.06		269.07	0.000041	0.90	12190.38	1720.34	0.05
Mud Creek	1000	105150	10 YR	11943.00	258.80	270.17		270.19	0.000046	1.03	14153.84	1814.76	0.06
Mud Creek	1000	105150	25 YR	14964.00	258.80	271.10		271.12	0.000052	1.17	15865.20	1893.22	0.06
Mud Creek	1000	105150	50 YR	17890.00	258.80	271.88		271.90	0.000058	1.29	17373.63	1959.78	0.07
Mud Creek	1000	105150	100 YR	21068.00	258.80	272.63		272.66	0.000065	1.42	18865.88	2023.46	0.07
Mud Creek	1000	104100	2 YR	5358.00	258.42	267.19		267.20	0.000023	0.77	8472.43	1461.49	0.05
Mud Creek	1000	104100	5 YR	9138.00	258.42	269.02		269.04	0.000030	1.03	11287.68	1616.96	0.06
Mud Creek	1000	104100	10 YR	11943.00	258.42	270.13		270.15	0.000034	1.18	13126.08	1708.64	0.06
Mud Creek	1000	104100	25 YR	14964.00	258.42	271.04		271.07	0.000040	1.34	14719.11	1770.45	0.07
Mud Creek	1000	104100	50 YR	17890.00	258.42	271.82		271.85	0.000044	1.48	16113.86	1822.85	0.08
Mud Creek	1000	104100	100 YR	21068.00	258.42	272.56		272.60	0.000049	1.62	17485.24	1872.95	0.08
Mud Creek	1000	103850	2 YR	5358.00	258.33	267.19		267.20	0.000025	0.80	7696.61	1245.29	0.05
Mud Creek	1000	103850	5 YR	9138.00	258.33	269.01		269.03	0.000033	1.07	10062.12	1345.72	0.06
Mud Creek	1000	103850	10 YR	11943.00	258.33	270.12		270.14	0.000038	1.24	11579.78	1408.12	0.07
Mud Creek	1000	103850	25 YR	14964.00	258.33	271.03		271.06	0.000044	1.42	12894.51	1472.02	0.07
Mud Creek	1000	103850	50 YR	17890.00	258.33	271.80		271.84	0.000050	1.57	14054.25	1526.18	0.08
Mud Creek	1000	103850	100 YR	21068.00	258.33	272.54		272.58	0.000056	1.73	15201.42	1577.92	0.09
Mud Creek	1000	103350	2 YR	7851.00	258.15	267.13	261.56	267.17	0.000100	1.61	6734.78	1299.10	0.10
Mud Creek	1000	103350	5 YR	13212.00	258.15	268.94	262.30	268.99	0.000125	2.08	9247.93	1488.43	0.12
Mud Creek	1000	103350	10 YR	17213.00	258.15	270.03	262.77	270.10	0.000139	2.36	10930.33	1602.08	0.13
Mud Creek	1000	103350	25 YR	21386.00	258.15	270.92	263.20	271.01	0.000154	2.64	12400.55	1673.88	0.14
Mud Creek	1000	103350	50 YR	25409.00	258.15	271.68	263.62	271.78	0.000169	2.88	13694.87	1734.64	0.15
Mud Creek	1000	103350	100 YR	29660.00	258.15	272.41	264.00	272.52	0.000182	3.11	14973.80	1792.65	0.15
Mud Creek	1000	103200		Bridge									
Mud Creek	1000	103100	2 YR	7851.00	258.06	267.03		267.09	0.000317	2.18	4682.96	891.76	0.14
Mud Creek	1000	103100	5 YR	13212.00	258.06	268.77		268.87	0.000403	2.83	6345.75	1013.92	0.17
Mud Creek	1000	103100	10 YR	17213.00	258.06	269.82		269.95	0.000451	3.22	7445.96	1087.23	0.18
Mud Creek	1000	103100	25 YR	21386.00	258.06	270.66		270.83	0.000517	3.64	8402.39	1179.68	0.19
Mud Creek	1000	103100	50 YR	25409.00	258.06	271.37		271.57	0.000577	4.00	9268.70	1264.74	0.21
Mud Creek	1000	103100	100 YR	29660.00	258.06	272.04		272.27	0.000634	4.36	10144.26	1345.25	0.22
Mud Creek	1000	102550	2 YR	7851.00	257.86	266.60		266.75	0.001166	4.29	3603.11	958.64	0.27
Mud Creek	1000	102550	5 YR	13212.00	257.86	268.29		268.47	0.001214	5.00	5406.42	1178.07	0.29
Mud Creek	1000	102550	10 YR	17213.00	257.86	269.32		269.51	0.001213	5.35	6687.39	1311.83	0.29
Mud Creek	1000	102550	25 YR	21386.00	257.86	270.13		270.34	0.001279	5.78	7791.79	1420.96	0.30
Mud Creek	1000	102550	50 YR	25409.00	257.86	270.81		271.04	0.001344	6.16	8791.52	1529.40	0.32
Mud Creek	1000	102550	100 YR	29660.00	257.86	271.46		271.71	0.001391	6.49	9813.84	1632.85	0.32
Mud Creek	1000	101050	2 YR	7851.00	257.31	263.11		263.76	0.004986	7.11	1643.64	682.74	0.59
Mud Creek	1000	101050	5 YR	13212.00	257.31	263.77		264.94	0.007901	9.80	2126.65	784.77	0.76
Mud Creek	1000	101050	10 YR	17213.00	257.31	264.09		265.70	0.010388	11.70	2380.40	833.39	0.88
Mud Creek	1000	101050	25 YR	21386.00	257.31	264.67	264.67	266.42	0.010252	12.44	2896.87	924.47	0.89
Mud Creek	1000	101050	50 YR	25409.00	257.31	265.20	265.20	267.04	0.010017	13.00	3400.68	1005.40	0.90
Mud Creek	1000	101050	100 YR	29660.00	257.31	265.67	265.67	267.62	0.009953	13.58	3899.30	1079.53	0.90
Mud Creek	1000	99150	2 YR	7851.00	256.62	262.71		262.72	0.000200	1.61	13179.22	5187.09	0.14
Mud Creek	1000	99150	5 YR	13212.00	256.62	263.49		263.50	0.000246	1.99	17272.73	5411.11	0.15
Mud Creek	1000	99150	10 YR	17213.00	256.62	263.97		263.98	0.000270	2.21	19908.96	5550.60	0.16
Mud Creek	1000	99150	25 YR	21386.00	256.62	264.41		264.43	0.000292	2.42	22381.56	5678.32	0.17
Mud Creek	1000	99150	50 YR	25409.00	256.62	264.79		264.81	0.000309	2.59	24586.96	5789.86	0.18
Mud Creek	1000	99150	100 YR	29660.00	256.62	265.17		265.19	0.000326	2.76	26770.09	5898.19	0.19
Mud Creek	1000	97950	2 YR	7851.00	256.19	262.56		262.57	0.000244	1.80	12190.53	4963.87	0.15
Mud Creek	1000	97950	5 YR	13212.00	256.19	263.30		263.32	0.000302	2.21	15911.62	5126.14	0.17
Mud Creek	1000	97950	10 YR	17213.00	256.19	263.76		263.78	0.000332	2.45	18305.48	5227.87	0.18
Mud Creek	1000	97950	25 YR	21386.00	256.19	264.19		264.21	0.000359	2.68	20538.85	5321.02	0.19
Mud Creek	1000	97950	50 YR	25409.00	256.19	264.56		264.58	0.000382	2.87	22524.80	5402.51	0.20
Mud Creek	1000	97950	100 YR	29660.00	256.19	264.92		264.95	0.000402	3.06	24484.88	5481.75	0.21
Mud Creek	1000	96975	2 YR	7851.00	255.84	262.50	260.42	262.51	0.000173	1.57	13626.61	5027.12	0.13
Mud Creek	1000	96975	5 YR	13212.00	255.84	263.22	260.64	263.23	0.000233	2.01	17304.43	5185.57	0.15
Mud Creek	1000	96975	10 YR	17213.00	255.84	263.67	260.81	263.69	0.000266	2.26	19676.41	5285.24	0.16
Mud Creek	1000	96975	25 YR	21386.00	255.84	264.09	260.92	264.11	0.000295	2.49	21887.96	5376.51	0.17
Mud Creek	1000	96975	50 YR	25409.00	255.84	264.45	261.02	264.48	0.000320	2.70	23855.16	5456.41	0.18
Mud Creek	1000	96975	100 YR	29660.00	255.84	264.81	261.15	264.83	0.000343	2.89	25796.99	5534.15	0.19
Mud Creek	1000	96950		Bridge									
Mud Creek	1000	96925	2 YR	7851.00	255.82	262.43		262.46	0.000575	2.02	8500.62	4532.55	0.17
Mud Creek	1000	96925	5 YR	13212.00	255.82	263.16		263.19	0.000619	2.33	11847.09	4706.41	0.18
Mud Creek	1000	96925	10 YR	17213.00	255.82	263.61		263.65	0.000639	2.51	14006.52	4815.27	0.19
Mud Creek	1000	96925	25 YR	21386.00	255.82	264.02		264.07	0.000661	2.68	16021.52	4914.67	0.20
Mud Creek	1000	96925	50 YR	25409.00	255.82	264.39		264.43	0.000679	2.83	17817.42	5001.60	0.20
Mud Creek	1000	96925	100 YR	29660.00	255.82	264.74		264.79	0.000696	2.97	19593.89	5086.13	0.21

## HEC-RAS Plan: Prop EM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	95200	2 YR	7851.00	255.19	261.67		261.70	0.000711	2.20	7889.91	4500.09	0.19
Mud Creek	1000	95200	5 YR	13212.00	255.19	262.38		262.42	0.000734	2.49	11179.92	4672.26	0.20
Mud Creek	1000	95200	10 YR	17213.00	255.19	262.83		262.88	0.000744	2.66	13308.70	4780.36	0.20
Mud Creek	1000	95200	25 YR	21386.00	255.19	263.23		263.28	0.000768	2.84	15232.72	4876.00	0.21
Mud Creek	1000	95200	50 YR	25409.00	255.19	263.58		263.63	0.000789	2.99	16943.00	4959.47	0.22
Mud Creek	1000	95200	100 YR	29660.00	255.19	263.92		263.97	0.000809	3.14	18630.61	5040.47	0.22
Mud Creek	1000	93700	2 YR	7851.00	254.65	260.70		260.76	0.001089	2.12	5293.54	4045.22	0.20
Mud Creek	1000	93700	5 YR	13212.00	254.65	261.53		261.60	0.000995	2.35	8767.18	4278.90	0.20
Mud Creek	1000	93700	10 YR	17213.00	254.65	262.02		262.08	0.000976	2.50	10875.18	4414.69	0.20
Mud Creek	1000	93700	25 YR	21386.00	254.65	262.40		262.48	0.001020	2.70	12601.43	4522.85	0.21
Mud Creek	1000	93700	50 YR	25409.00	254.65	262.74		262.82	0.001057	2.86	14128.73	4616.44	0.22
Mud Creek	1000	93700	100 YR	29660.00	254.65	263.06		263.15	0.001093	3.03	15630.42	4706.64	0.22
Mud Creek	1000	91800	2 YR	7851.00	253.96	258.69		258.75	0.001126	1.92	4079.32	1723.86	0.22
Mud Creek	1000	91800	5 YR	13212.00	253.96	259.65		259.73	0.001197	2.24	5890.98	2071.58	0.23
Mud Creek	1000	91800	10 YR	17213.00	253.96	260.19		260.28	0.001183	2.42	7518.09	4545.42	0.24
Mud Creek	1000	91800	25 YR	21386.00	253.96	260.67		260.76	0.001081	2.53	9694.18	4656.56	0.23
Mud Creek	1000	91800	50 YR	25409.00	253.96	261.05		261.15	0.001035	2.65	11477.04	4745.69	0.23
Mud Creek	1000	91800	100 YR	29660.00	253.96	261.40		261.51	0.001004	2.76	13189.89	4829.76	0.23
Mud Creek	1000	90600	2 YR	7851.00	253.52	257.93		257.95	0.000434	1.14	6889.76	3127.58	0.14
Mud Creek	1000	90600	5 YR	13212.00	253.52	258.87		258.89	0.000437	1.30	10153.63	3796.80	0.14
Mud Creek	1000	90600	10 YR	17213.00	253.52	259.42		259.45	0.000440	1.39	12353.66	4187.98	0.14
Mud Creek	1000	90600	25 YR	21386.00	253.52	259.91		259.95	0.000443	1.47	14502.44	4537.61	0.15
Mud Creek	1000	90600	50 YR	25409.00	253.52	260.32		260.36	0.000424	1.55	16400.18	4693.38	0.14
Mud Creek	1000	90600	100 YR	29660.00	253.52	260.70		260.74	0.000413	1.64	18179.86	4802.08	0.15
Mud Creek	1000	89850	2 YR	7851.00	253.25	257.63		257.65	0.000351	1.17	6683.59	3050.82	0.14
Mud Creek	1000	89850	5 YR	13212.00	253.25	258.57		258.60	0.000353	1.34	9862.61	3706.02	0.14
Mud Creek	1000	89850	10 YR	17213.00	253.25	259.12		259.15	0.000355	1.43	12002.70	4088.38	0.15
Mud Creek	1000	89850	25 YR	21386.00	253.25	259.61		259.65	0.000357	1.52	14091.31	4429.84	0.15
Mud Creek	1000	89850	50 YR	25409.00	253.25	260.03		260.07	0.000357	1.59	15994.54	4705.90	0.15
Mud Creek	1000	89850	100 YR	29660.00	253.25	260.41		260.46	0.000340	1.67	17828.50	4787.04	0.15
Mud Creek	1000	88850	2 YR	7851.00	252.89	257.29		257.32	0.000317	1.28	6139.45	2787.73	0.15
Mud Creek	1000	88850	5 YR	13212.00	252.89	258.23		258.26	0.000321	1.46	9027.26	3380.37	0.16
Mud Creek	1000	88850	10 YR	17213.00	252.89	258.78		258.81	0.000324	1.57	10964.41	3725.45	0.16
Mud Creek	1000	88850	25 YR	21386.00	252.89	259.26		259.31	0.000328	1.66	12851.05	4033.26	0.16
Mud Creek	1000	88850	50 YR	25409.00	252.89	259.68		259.72	0.000331	1.74	14577.02	4295.57	0.17
Mud Creek	1000	88850	100 YR	29660.00	252.89	260.07		260.12	0.000329	1.82	16319.37	4514.64	0.17
Mud Creek	1000	87600	2 YR	7851.00	252.43	256.90		256.92	0.000326	1.15	6852.17	3068.19	0.14
Mud Creek	1000	87600	5 YR	13212.00	252.43	257.82		257.85	0.000337	1.32	9993.46	3705.33	0.14
Mud Creek	1000	87600	10 YR	17213.00	252.43	258.36		258.39	0.000345	1.42	12091.16	4075.70	0.15
Mud Creek	1000	87600	25 YR	21386.00	252.43	258.84		258.88	0.000351	1.51	14129.23	4405.83	0.15
Mud Creek	1000	87600	50 YR	25409.00	252.43	259.25		259.29	0.000356	1.59	15993.23	4687.45	0.15
Mud Creek	1000	87600	100 YR	29660.00	252.43	259.65		259.69	0.000360	1.66	17892.41	4957.96	0.15
Mud Creek	1000	85350	2 YR	7851.00	251.62	256.06		256.08	0.000433	1.14	6868.65	3096.75	0.14
Mud Creek	1000	85350	5 YR	13212.00	251.62	256.94		256.97	0.000466	1.34	9873.18	3712.78	0.14
Mud Creek	1000	85350	10 YR	17213.00	251.62	257.45		257.48	0.000485	1.45	11858.39	4068.96	0.15
Mud Creek	1000	85350	25 YR	21386.00	251.62	257.91		257.94	0.000500	1.55	13792.41	4388.25	0.15
Mud Creek	1000	85350	50 YR	25409.00	251.62	258.30		258.34	0.000511	1.63	15570.79	4662.58	0.16
Mud Creek	1000	85350	100 YR	29660.00	251.62	258.68		258.73	0.000517	1.70	17408.18	4930.01	0.16
Mud Creek	1000	83800	2 YR	7851.00	251.05	255.30		255.32	0.000545	1.25	6299.54	2966.18	0.15
Mud Creek	1000	83800	5 YR	13212.00	251.05	256.11		256.14	0.000609	1.48	8928.97	3531.38	0.16
Mud Creek	1000	83800	10 YR	17213.00	251.05	256.58		256.62	0.000644	1.61	10661.02	3858.72	0.17
Mud Creek	1000	83800	25 YR	21386.00	251.05	257.00		257.05	0.000669	1.73	12370.08	4156.52	0.18
Mud Creek	1000	83800	50 YR	25409.00	251.05	257.38		257.43	0.000683	1.82	13972.88	4417.60	0.18
Mud Creek	1000	83800	100 YR	29660.00	251.05	257.75		257.81	0.000683	1.89	15687.73	4680.84	0.18
Mud Creek	1000	82200	2 YR	7851.00	250.47	253.36		253.46	0.003963	2.60	3021.25	2091.64	0.38
Mud Creek	1000	82200	5 YR	13212.00	250.47	254.12		254.24	0.003228	2.74	4820.87	2642.14	0.36
Mud Creek	1000	82200	10 YR	17213.00	250.47	254.60		254.72	0.002847	2.79	6162.92	2987.35	0.34
Mud Creek	1000	82200	25 YR	21386.00	250.47	255.08		255.20	0.002445	2.79	7678.15	3334.43	0.32
Mud Creek	1000	82200	50 YR	25409.00	250.47	255.56		255.67	0.002034	2.71	9361.68	3681.88	0.30
Mud Creek	1000	82200	100 YR	29660.00	250.47	256.08		256.19	0.001637	2.60	11406.57	4064.16	0.27
Mud Creek	1000	80150	2 YR	7851.00	249.62	252.19		252.20	0.000232	0.83	9449.32	4309.54	0.10
Mud Creek	1000	80150	5 YR	13212.00	249.62	252.95		252.96	0.000247	1.04	12721.74	4347.34	0.11
Mud Creek	1000	80150	10 YR	17213.00	249.62	253.47		253.49	0.000244	1.15	15007.28	4373.55	0.11
Mud Creek	1000	80150	25 YR	21386.00	249.62	254.07		254.09	0.000221	1.21	17641.65	4403.56	0.11
Mud Creek	1000	80150	50 YR	25409.00	249.62	254.68		254.70	0.000197	1.25	20329.01	4433.97	0.10
Mud Creek	1000	80150	100 YR	29660.00	249.62	255.33		255.35	0.000174	1.28	23219.17	4466.44	0.10
Mud Creek	1000	78800	2 YR	7851.00	248.93	251.85		251.86	0.000274	0.98	8157.38	4186.07	0.12
Mud Creek	1000	78800	5 YR	13212.00	248.93	252.59		252.61	0.000270	1.20	11325.49	4301.78	0.13
Mud Creek	1000	78800	10 YR	17213.00	248.93	253.13		253.16	0.000252	1.31	13662.12	4385.16	0.13
Mud Creek	1000	78800	25 YR	21386.00	248.93	253.77		253.80	0.000214	1.36	16508.85	4484.66	0.12
Mud Creek	1000	78800	50 YR	25409.00	248.93	254.42		254.45	0.000180	1.38	19449.67	4585.17	0.11
Mud Creek	1000	78800	100 YR	29660.00	248.93	255.10		255.13	0.000153	1.39	22621.85	4691.18	0.11
Mud Creek	1000	77500	2 YR	7851.00	248.27	251.38		251.42	0.000443	1.53	6099.55	3208.98	0.18
Mud Creek	1000	77500	5 YR	13212.00	248.27	252.12		252.17	0.000461	1.89	8484.44	3293.34	0.19

## HEC-RAS Plan: Prop EM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	77500	10 YR	17213.00	248.27	252.68		252.74	0.000424	2.03	10371.38	3358.58	0.19
Mud Creek	1000	77500	25 YR	21386.00	248.27	253.40		253.45	0.000345	2.07	12791.33	3440.45	0.18
Mud Creek	1000	77500	50 YR	25409.00	248.27	254.10		254.16	0.000285	2.09	15248.39	3521.62	0.17
Mud Creek	1000	77500	100 YR	29660.00	248.27	254.83		254.89	0.000241	2.10	17842.04	3605.32	0.16
Mud Creek	1000	76300	2 YR	7851.00	247.66	250.82		250.85	0.000495	1.31	6056.79	3185.29	0.16
Mud Creek	1000	76300	5 YR	13212.00	247.66	251.55		251.59	0.000493	1.61	8427.02	3348.53	0.17
Mud Creek	1000	76300	10 YR	17213.00	247.66	252.19		252.23	0.000409	1.68	10620.58	3492.82	0.16
Mud Creek	1000	76300	25 YR	21386.00	247.66	253.02		253.06	0.000297	1.66	13597.79	3679.61	0.14
Mud Creek	1000	76300	50 YR	25409.00	247.66	253.80		253.84	0.000233	1.65	16544.63	3855.59	0.13
Mud Creek	1000	76300	100 YR	29660.00	247.66	254.58		254.62	0.000192	1.65	19619.44	4031.04	0.12
Mud Creek	1000	74900	2 YR	7851.00	246.95	250.13		250.16	0.000491	1.32	5965.28	3624.34	0.18
Mud Creek	1000	74900	5 YR	13212.00	246.95	250.97		251.01	0.000352	1.47	9085.19	3780.24	0.16
Mud Creek	1000	74900	10 YR	17213.00	246.95	251.77		251.80	0.000236	1.44	12157.27	3927.71	0.14
Mud Creek	1000	74900	25 YR	21386.00	246.95	252.74		252.77	0.000153	1.38	16044.09	4106.70	0.12
Mud Creek	1000	74900	50 YR	25409.00	246.95	253.59		253.62	0.000116	1.36	19594.49	4263.64	0.11
Mud Creek	1000	74900	100 YR	29660.00	246.95	254.41		254.43	0.000095	1.36	23149.95	4415.22	0.10
Mud Creek	1000	72400	2 YR	7851.00	245.67	249.21		249.22	0.000298	0.94	8378.27	4737.64	0.12
Mud Creek	1000	72400	5 YR	13212.00	245.67	250.42		250.43	0.000158	0.88	15011.83	5875.69	0.10
Mud Creek	1000	72400	10 YR	17213.00	245.67	251.45		251.46	0.000088	0.82	21139.84	6060.51	0.08
Mud Creek	1000	72400	25 YR	21386.00	245.67	252.54		252.54	0.000056	0.78	27840.20	6256.35	0.06
Mud Creek	1000	72400	50 YR	25409.00	245.67	253.43		253.44	0.000044	0.78	33521.65	6417.73	0.06
Mud Creek	1000	72400	100 YR	29660.00	245.67	254.28		254.29	0.000037	0.78	39020.23	6570.14	0.05
Mud Creek	1000	71200	2 YR	7851.00	245.06	248.95		248.96	0.000165	0.74	10570.36	5434.02	0.09
Mud Creek	1000	71200	5 YR	13212.00	245.06	250.28		250.29	0.000091	0.70	18994.38	6925.41	0.07
Mud Creek	1000	71200	10 YR	17213.00	245.06	251.37		251.38	0.000051	0.65	26589.87	7023.42	0.06
Mud Creek	1000	71200	25 YR	21386.00	245.06	252.49		252.49	0.000033	0.62	34478.60	7123.79	0.05
Mud Creek	1000	71200	50 YR	25409.00	245.06	253.39		253.40	0.000027	0.63	40976.22	7205.41	0.05
Mud Creek	1000	71200	100 YR	29660.00	245.06	254.25		254.25	0.000023	0.64	47151.71	7282.14	0.04
Mud Creek	1000	69000	2 YR	9468.00	243.94	248.62	245.80	248.63	0.000139	0.88	10733.67	4591.04	0.10
Mud Creek	1000	69000	5 YR	15823.00	243.94	250.08	246.23	250.09	0.000089	0.86	18500.60	5956.74	0.09
Mud Creek	1000	69000	10 YR	20596.00	243.94	251.25	246.50	251.26	0.000052	0.81	25557.63	6056.60	0.07
Mud Creek	1000	69000	25 YR	25573.00	243.94	252.41	246.71	252.42	0.000036	0.79	32589.22	6154.50	0.06
Mud Creek	1000	69000	50 YR	30317.00	243.94	253.33	246.91	253.34	0.000030	0.80	38290.93	6232.75	0.06
Mud Creek	1000	69000	100 YR	35255.00	243.94	254.19	247.09	254.20	0.000027	0.82	43683.59	6305.86	0.05
Mud Creek	1000	68800		Bridge									
Mud Creek	1000	68650	2 YR	9468.00	243.77	248.01		248.04	0.000377	1.19	7947.39	3745.97	0.14
Mud Creek	1000	68650	5 YR	15823.00	243.77	249.76		249.77	0.000168	1.00	15828.04	5286.47	0.10
Mud Creek	1000	68650	10 YR	20596.00	243.77	251.03		251.04	0.000089	0.90	22836.22	5628.14	0.08
Mud Creek	1000	68650	25 YR	25573.00	243.77	252.21		252.23	0.000059	0.87	29614.99	5776.73	0.07
Mud Creek	1000	68650	50 YR	30317.00	243.77	253.14		253.15	0.000048	0.88	35033.55	5892.82	0.06
Mud Creek	1000	68650	100 YR	35255.00	243.77	254.00		254.02	0.000042	0.90	40151.35	6000.39	0.06
Mud Creek	1000	67650	2 YR	9468.00	243.26	247.72		247.73	0.000247	1.00	9499.14	4263.90	0.12
Mud Creek	1000	67650	5 YR	15823.00	243.26	249.63		249.64	0.000102	0.81	19431.65	6098.45	0.08
Mud Creek	1000	67650	10 YR	20596.00	243.26	250.96		250.97	0.000056	0.74	27947.23	6509.90	0.06
Mud Creek	1000	67650	25 YR	25573.00	243.26	252.17		252.18	0.000038	0.72	35879.25	6585.62	0.05
Mud Creek	1000	67650	50 YR	30317.00	243.26	253.11		253.11	0.000032	0.72	42075.36	6644.16	0.05
Mud Creek	1000	67650	100 YR	35255.00	243.26	253.97		253.98	0.000028	0.74	47847.11	6698.23	0.05
Mud Creek	1000	66450	2 YR	9468.00	242.65	247.55		247.56	0.000092	0.74	12824.66	5233.94	0.08
Mud Creek	1000	66450	5 YR	15823.00	242.65	249.56		249.57	0.000041	0.62	25513.01	7382.22	0.06
Mud Creek	1000	66450	10 YR	20596.00	242.65	250.92		250.92	0.000023	0.57	37006.08	8895.97	0.05
Mud Creek	1000	66450	25 YR	25573.00	242.65	252.14		252.15	0.000016	0.55	47935.06	8957.18	0.04
Mud Creek	1000	66450	50 YR	30317.00	242.65	253.09		253.09	0.000014	0.56	56388.61	9004.25	0.04
Mud Creek	1000	66450	100 YR	35255.00	242.65	253.95		253.96	0.000012	0.58	64221.57	9047.64	0.04
Mud Creek	1000	64850	2 YR	9468.00	241.83	247.40		247.41	0.000091	0.80	11782.09	4228.74	0.08
Mud Creek	1000	64850	5 YR	15823.00	241.83	249.49		249.50	0.000047	0.71	22264.34	5813.06	0.06
Mud Creek	1000	64850	10 YR	20596.00	241.83	250.88		250.88	0.000029	0.67	30770.94	6239.39	0.05
Mud Creek	1000	64850	25 YR	25573.00	241.83	252.11		252.12	0.000022	0.67	38518.68	6295.02	0.05
Mud Creek	1000	64850	50 YR	30317.00	241.83	253.06		253.06	0.000019	0.68	44489.16	6337.55	0.05
Mud Creek	1000	64850	100 YR	35255.00	241.83	253.93		253.93	0.000017	0.71	50019.05	6376.70	0.04
Mud Creek	1000	63250	2 YR	9468.00	241.02	247.25		247.25	0.000105	0.71	13385.59	4299.24	0.07
Mud Creek	1000	63250	5 YR	15823.00	241.02	249.41		249.41	0.000060	0.65	24279.41	5790.18	0.06
Mud Creek	1000	63250	10 YR	20596.00	241.02	250.82		250.83	0.000040	0.63	32941.95	6232.84	0.05
Mud Creek	1000	63250	25 YR	25573.00	241.02	252.07		252.08	0.000031	0.63	40764.54	6282.84	0.04
Mud Creek	1000	63250	50 YR	30317.00	241.02	253.02		253.03	0.000028	0.65	46751.08	6320.84	0.04
Mud Creek	1000	63250	100 YR	35255.00	241.02	253.89		253.90	0.000026	0.68	52281.03	6355.74	0.04
Mud Creek	1000	61950	2 YR	9468.00	240.36	247.16		247.16	0.000049	0.67	14140.95	4160.46	0.06
Mud Creek	1000	61950	5 YR	15823.00	240.36	249.35		249.36	0.000031	0.64	24745.42	5503.64	0.05
Mud Creek	1000	61950	10 YR	20596.00	240.36	250.78		250.79	0.000022	0.62	33082.37	5954.85	0.05
Mud Creek	1000	61950	25 YR	25573.00	240.36	252.04		252.05	0.000017	0.63	40631.41	6042.94	0.04
Mud Creek	1000	61950	50 YR	30317.00	240.36	252.99		253.00	0.000015	0.66	46420.18	6109.62	0.04
Mud Creek	1000	61950	100 YR	35255.00	240.36	253.87		253.88	0.000015	0.69	51786.03	6170.80	0.04
Mud Creek	1000	60750	2 YR	9468.00	239.83	247.09		247.10	0.000065	1.28	17437.75	4510.92	0.08
Mud Creek	1000	60750	5 YR	15823.00	239.83	249.30		249.31	0.000052	1.36	28845.13	5794.90	0.08

HEC-RAS Plan: Prop EM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	60750	10 YR	20596.00	239.83	250.74		250.76	0.000043	1.36	37675.84	6267.02	0.07
Mud Creek	1000	60750	25 YR	25573.00	239.83	252.01		252.02	0.000037	1.36	45677.96	6380.90	0.07
Mud Creek	1000	60750	50 YR	30317.00	239.83	252.96		252.98	0.000035	1.40	51811.59	6466.84	0.07
Mud Creek	1000	60750	100 YR	35255.00	239.83	253.84		253.85	0.000035	1.45	57503.93	6545.58	0.07
Mud Creek	1000	58800	2 YR	9468.00	239.18	247.07		247.07	0.000005	0.36	33303.70	5906.95	0.02
Mud Creek	1000	58800	5 YR	15823.00	239.18	249.28		249.28	0.000005	0.44	47326.51	6769.77	0.03
Mud Creek	1000	58800	10 YR	20596.00	239.18	250.72		250.73	0.000005	0.49	57411.50	7082.61	0.03
Mud Creek	1000	58800	25 YR	25573.00	239.18	251.99		251.99	0.000005	0.53	66408.08	7139.54	0.03
Mud Creek	1000	58800	50 YR	30317.00	239.18	252.94		252.95	0.000006	0.57	73238.33	7182.46	0.03
Mud Creek	1000	58800	100 YR	35255.00	239.18	253.82		253.82	0.000006	0.62	79531.17	7221.78	0.03
Mud Creek	1000	57200	2 YR	9468.00	238.64	247.06		247.07	0.000002	0.23	45511.14	6683.53	0.01
Mud Creek	1000	57200	5 YR	15823.00	238.64	249.28		249.28	0.000003	0.29	60808.03	7148.02	0.02
Mud Creek	1000	57200	10 YR	20596.00	238.64	250.72		250.72	0.000003	0.33	71303.59	7346.75	0.02
Mud Creek	1000	57200	25 YR	25573.00	238.64	251.98		251.99	0.000003	0.36	80648.90	7428.98	0.02
Mud Creek	1000	57200	50 YR	30317.00	238.64	252.94		252.94	0.000003	0.39	87761.34	7490.95	0.02
Mud Creek	1000	57200	100 YR	35255.00	238.64	253.81		253.81	0.000004	0.43	94328.24	7547.71	0.02
Mud Creek	1000	55600	2 YR	9468.00	238.10	247.06		247.06	0.000004	0.34	29221.49	3964.67	0.02
Mud Creek	1000	55600	5 YR	15823.00	238.10	249.27		249.27	0.000005	0.44	38179.38	4141.49	0.02
Mud Creek	1000	55600	10 YR	20596.00	238.10	250.71		250.71	0.000005	0.50	44216.54	4205.69	0.03
Mud Creek	1000	55600	25 YR	25573.00	238.10	251.97		251.98	0.000006	0.56	49538.50	4215.80	0.03
Mud Creek	1000	55600	50 YR	30317.00	238.10	252.93		252.93	0.000006	0.61	53556.12	4223.41	0.03
Mud Creek	1000	55600	100 YR	35255.00	238.10	253.80		253.81	0.000007	0.67	57241.82	4230.39	0.03
Mud Creek	1000	53900	2 YR	9468.00	237.53	247.06		247.06	0.000001	0.21	46427.17	6005.53	0.01
Mud Creek	1000	53900	5 YR	15823.00	237.53	249.26		249.27	0.000002	0.28	59941.63	6226.49	0.02
Mud Creek	1000	53900	10 YR	20596.00	237.53	250.71		250.71	0.000002	0.32	69006.23	6321.21	0.02
Mud Creek	1000	53900	25 YR	25573.00	237.53	251.97		251.97	0.000002	0.35	77018.89	6359.12	0.02
Mud Creek	1000	53900	50 YR	30317.00	237.53	252.92		252.92	0.000002	0.39	83085.76	6387.68	0.02
Mud Creek	1000	53900	100 YR	35255.00	237.53	253.79		253.80	0.000003	0.43	88665.63	6413.83	0.02
Mud Creek	1000	52600	2 YR	9468.00	237.09	247.05		247.05	0.000002	0.24	40108.54	4875.70	0.01
Mud Creek	1000	52600	5 YR	15823.00	237.09	249.26		249.26	0.000002	0.32	50973.97	4962.05	0.02
Mud Creek	1000	52600	10 YR	20596.00	237.09	250.70		250.71	0.000003	0.36	58162.42	5004.34	0.02
Mud Creek	1000	52600	25 YR	25573.00	237.09	251.97		251.97	0.000003	0.41	64499.82	5028.45	0.02
Mud Creek	1000	52600	50 YR	30317.00	237.09	252.92		252.92	0.000003	0.45	69292.30	5046.62	0.02
Mud Creek	1000	52600	100 YR	35255.00	237.09	253.79		253.79	0.000004	0.49	73696.01	5063.25	0.02
Mud Creek	1000	51700	2 YR	9468.00	236.78	247.05		247.05	0.000004	0.27	36505.38	4528.78	0.02
Mud Creek	1000	51700	5 YR	15823.00	236.78	249.26		249.26	0.000005	0.35	46688.20	4694.38	0.02
Mud Creek	1000	51700	10 YR	20596.00	236.78	250.70		250.70	0.000006	0.41	53547.16	4848.63	0.02
Mud Creek	1000	51700	25 YR	25573.00	236.78	251.96		251.97	0.000006	0.45	59782.76	5026.69	0.02
Mud Creek	1000	51700	50 YR	30317.00	236.78	252.91		252.92	0.000007	0.50	64625.98	5160.76	0.02
Mud Creek	1000	51700	100 YR	35255.00	236.78	253.78		253.79	0.000008	0.55	69172.48	5283.52	0.02
Mud Creek	1000	49500	2 YR	9468.00	236.04	247.05		247.05	0.000001	0.22	43289.39	4946.60	0.01
Mud Creek	1000	49500	5 YR	15823.00	236.04	249.25		249.25	0.000002	0.30	54290.16	5023.83	0.02
Mud Creek	1000	49500	10 YR	20596.00	236.04	250.69		250.69	0.000002	0.34	61562.72	5074.25	0.02
Mud Creek	1000	49500	25 YR	25573.00	236.04	251.95		251.96	0.000002	0.39	67994.96	5118.42	0.02
Mud Creek	1000	49500	50 YR	30317.00	236.04	252.90		252.91	0.000003	0.43	72873.08	5151.67	0.02
Mud Creek	1000	49500	100 YR	35255.00	236.04	253.77		253.78	0.000003	0.47	77366.75	5182.11	0.02
Mud Creek	1000	47200	2 YR	9468.00	235.27	247.04		247.04	0.000003	0.32	44853.92	6246.92	0.02
Mud Creek	1000	47200	5 YR	15823.00	235.27	249.25		249.25	0.000004	0.41	59042.67	6621.80	0.02
Mud Creek	1000	47200	10 YR	20596.00	235.27	250.69		250.69	0.000004	0.47	68725.21	6787.71	0.02
Mud Creek	1000	47200	25 YR	25573.00	235.27	251.95		251.95	0.000004	0.52	77331.29	6857.09	0.02
Mud Creek	1000	47200	50 YR	30317.00	235.27	252.90		252.90	0.000005	0.57	83864.20	6909.29	0.03
Mud Creek	1000	47200	100 YR	35255.00	235.27	253.76		253.77	0.000005	0.62	89887.89	6957.07	0.03
Mud Creek	1000	46450	2 YR	9468.00	235.02	247.04		247.04	0.000004	0.33	51855.68	8174.46	0.02
Mud Creek	1000	46450	5 YR	15823.00	235.02	249.24		249.24	0.000005	0.42	70801.27	9012.23	0.02
Mud Creek	1000	46450	10 YR	20596.00	235.02	250.68		250.68	0.000005	0.46	84094.75	9340.94	0.02
Mud Creek	1000	46450	25 YR	25573.00	235.02	251.94		251.95	0.000005	0.49	95924.98	9416.62	0.02
Mud Creek	1000	46450	50 YR	30317.00	235.02	252.89		252.89	0.000005	0.53	104887.90	9473.56	0.02
Mud Creek	1000	46450	100 YR	35255.00	235.02	253.76		253.76	0.000006	0.57	113139.60	9525.68	0.03
Mud Creek	1000	44950	2 YR	9468.00	234.51	247.03		247.03	0.000003	0.25	76150.67	12468.40	0.01
Mud Creek	1000	44950	5 YR	15823.00	234.51	249.24		249.24	0.000003	0.30	104969.50	13680.71	0.02
Mud Creek	1000	44950	10 YR	20596.00	234.51	250.68		250.68	0.000003	0.33	125140.50	14194.82	0.02
Mud Creek	1000	44950	25 YR	25573.00	234.51	251.94		251.94	0.000003	0.35	143156.50	14371.41	0.02
Mud Creek	1000	44950	50 YR	30317.00	234.51	252.89		252.89	0.000003	0.37	156853.70	14504.23	0.02
Mud Creek	1000	44950	100 YR	35255.00	234.51	253.76		253.76	0.000004	0.40	169501.40	14625.80	0.02
Angelina River	Upstream	71106	2 YR	12944.00	246.00	252.10		252.14	0.000306	1.66	7852.33	1982.70	0.14
Angelina River	Upstream	71106	5 YR	21707.00	246.00	253.52		253.59	0.000316	2.06	10720.22	2042.96	0.15
Angelina River	Upstream	71106	10 YR	28205.00	246.00	254.45		254.53	0.000315	2.29	12642.55	2082.39	0.16
Angelina River	Upstream	71106	25 YR	35110.00	246.00	255.38		255.47	0.000310	2.48	14590.07	2121.58	0.16
Angelina River	Upstream	71106	50 YR	41349.00	246.00	256.16		256.27	0.000306	2.63	16259.17	2154.60	0.16
Angelina River	Upstream	71106	100 YR	47334.00	246.00	256.88		257.00	0.000301	2.76	17826.52	2185.15	0.16
Angelina River	Upstream	69124	2 YR	12944.00	245.00	251.33		251.40	0.000466	2.24	6596.70	2295.59	0.20
Angelina River	Upstream	69124	5 YR	21707.00	245.00	252.80		252.89	0.000404	2.59	10032.91	2384.58	0.20
Angelina River	Upstream	69124	10 YR	28205.00	245.00	253.76		253.87	0.000373	2.79	12359.74	2442.99	0.20
Angelina River	Upstream	69124	25 YR	35110.00	245.00	254.72		254.84	0.000346	2.95	14734.48	2501.21	0.19

HEC-RAS Plan: Prop EM (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Upstream	69124	50 YR	41349.00	245.00	255.53		255.66	0.000329	3.09	16766.51	2549.96	0.19
Angelina River	Upstream	69124	100 YR	47334.00	245.00	256.27		256.41	0.000313	3.20	18683.67	2595.12	0.19
Angelina River	Upstream	67228	2 YR	12944.00	244.00	250.63		250.68	0.000316	1.78	7272.45	2021.77	0.16
Angelina River	Upstream	67228	5 YR	21707.00	244.00	252.20		252.27	0.000266	2.08	10497.23	2068.91	0.16
Angelina River	Upstream	67228	10 YR	28205.00	244.00	253.21		253.29	0.000248	2.26	12598.84	2099.07	0.16
Angelina River	Upstream	67228	25 YR	35110.00	244.00	254.21		254.30	0.000233	2.42	14709.09	2128.91	0.16
Angelina River	Upstream	67228	50 YR	41349.00	244.00	255.04		255.14	0.000225	2.55	16481.00	2153.66	0.16
Angelina River	Upstream	67228	100 YR	47334.00	244.00	255.80		255.91	0.000217	2.67	18138.33	2176.54	0.16
Angelina River	Upstream	65531	2 YR	12944.00	242.00	250.19		250.22	0.000229	1.27	10198.03	2467.99	0.11
Angelina River	Upstream	65531	5 YR	21707.00	242.00	251.82		251.86	0.000213	1.53	14471.18	2773.85	0.11
Angelina River	Upstream	65531	10 YR	28205.00	242.00	252.85		252.90	0.000206	1.67	17433.51	2967.45	0.11
Angelina River	Upstream	65531	25 YR	35110.00	242.00	253.88		253.92	0.000198	1.80	20561.14	3158.99	0.11
Angelina River	Upstream	65531	50 YR	41349.00	242.00	254.72		254.77	0.000193	1.90	23289.12	3317.04	0.11
Angelina River	Upstream	65531	100 YR	47334.00	242.00	255.50		255.56	0.000187	1.98	25934.00	3463.40	0.11
Angelina River	Upstream	58835	2 YR	12944.00	241.00	247.55		247.61	0.000805	2.02	6403.77	1955.44	0.20
Angelina River	Upstream	58835	5 YR	21707.00	241.00	249.73		249.78	0.000490	1.91	11371.99	2605.83	0.16
Angelina River	Upstream	58835	10 YR	28205.00	241.00	251.11		251.16	0.000336	1.87	15090.14	2714.76	0.14
Angelina River	Upstream	58835	25 YR	35110.00	241.00	252.34		252.40	0.000269	1.91	18445.46	2745.48	0.13
Angelina River	Upstream	58835	50 YR	41349.00	241.00	253.28		253.34	0.000242	1.97	21039.97	2769.01	0.12
Angelina River	Upstream	58835	100 YR	47334.00	241.00	254.14		254.21	0.000224	2.03	23432.69	2790.52	0.12
Angelina River	Upstream	53947	2 YR	12944.00	236.00	247.10		247.10	0.000054	1.19	24655.48	4307.89	0.07
Angelina River	Upstream	53947	5 YR	21707.00	236.00	249.30		249.31	0.000057	1.42	34759.63	4846.10	0.07
Angelina River	Upstream	53947	10 YR	28205.00	236.00	250.74		250.75	0.000055	1.50	41920.71	5029.79	0.07
Angelina River	Upstream	53947	25 YR	35110.00	236.00	252.00		252.01	0.000054	1.58	48283.01	5053.27	0.07
Angelina River	Upstream	53947	50 YR	41349.00	236.00	252.95		252.97	0.000055	1.67	53096.17	5070.95	0.08
Angelina River	Upstream	53947	100 YR	47334.00	236.00	253.82		253.84	0.000055	1.74	57512.59	5087.12	0.08
Angelina River	Upstream	50340	2 YR	12944.00	235.00	247.04		247.04	0.000012	0.50	49409.30	7626.20	0.03
Angelina River	Upstream	50340	5 YR	21707.00	235.00	249.24		249.24	0.000013	0.60	66656.01	8027.90	0.03
Angelina River	Upstream	50340	10 YR	28205.00	235.00	250.68		250.68	0.000013	0.65	78376.40	8227.61	0.03
Angelina River	Upstream	50340	25 YR	35110.00	235.00	251.94		251.95	0.000014	0.71	88824.59	8341.62	0.03
Angelina River	Upstream	50340	50 YR	41349.00	235.00	252.89		252.89	0.000015	0.76	96777.28	8427.36	0.03
Angelina River	Upstream	50340	100 YR	47334.00	235.00	253.76		253.76	0.000015	0.81	104126.40	8505.83	0.04
Angelina River	Downstream	43601	2 YR	15700.00	234.06	246.96		247.01	0.000176	2.60	16788.23	4358.49	0.15
Angelina River	Downstream	43601	5 YR	26403.00	234.06	249.17		249.21	0.000153	2.77	27842.86	5660.47	0.14
Angelina River	Downstream	43601	10 YR	35352.00	234.06	250.61		250.65	0.000136	2.81	36526.70	6180.69	0.13
Angelina River	Downstream	43601	25 YR	45336.00	234.06	251.88		251.92	0.000126	2.87	44369.26	6243.81	0.13
Angelina River	Downstream	43601	50 YR	54335.00	234.06	252.82		252.86	0.000124	2.97	50301.73	6291.14	0.13
Angelina River	Downstream	43601	100 YR	63409.00	234.06	253.69		253.73	0.000123	3.07	55766.17	6334.42	0.13
Angelina River	Downstream	43600	2 YR	15700.00	234.06	246.96	242.30	247.01	0.000176	2.60	16787.43	4358.38	0.15
Angelina River	Downstream	43600	5 YR	26403.00	234.06	249.17	243.51	249.21	0.000153	2.77	27841.99	5660.38	0.14
Angelina River	Downstream	43600	10 YR	35352.00	234.06	250.61	244.23	250.65	0.000136	2.81	36525.85	6180.68	0.13
Angelina River	Downstream	43600	25 YR	45336.00	234.06	251.88	244.84	251.91	0.000126	2.87	44368.50	6243.81	0.13
Angelina River	Downstream	43600	50 YR	54335.00	234.06	252.82	245.31	252.86	0.000124	2.97	50300.96	6291.13	0.13
Angelina River	Downstream	43600	100 YR	63409.00	234.06	253.69	245.72	253.73	0.000123	3.07	55765.40	6334.41	0.13
Angelina River	Downstream	43250		Bridge									
Angelina River	Downstream	42900	2 YR	15700.00	233.82	246.80		246.82	0.000124	1.90	18769.47	3535.15	0.11
Angelina River	Downstream	42900	5 YR	26403.00	233.82	249.04		249.06	0.000128	2.22	27295.01	4104.30	0.11
Angelina River	Downstream	42900	10 YR	35352.00	233.82	250.49		250.52	0.000133	2.43	33510.39	4445.00	0.12
Angelina River	Downstream	42900	25 YR	45336.00	233.82	251.75		251.78	0.000142	2.67	39273.37	4691.01	0.12
Angelina River	Downstream	42900	50 YR	54335.00	233.82	252.69		252.73	0.000152	2.88	43778.83	4874.70	0.13
Angelina River	Downstream	42900	100 YR	63409.00	233.82	253.55		253.59	0.000160	3.06	48048.95	5042.63	0.13
Angelina River	Downstream	40400	2 YR	15700.00	232.98	246.50		246.53	0.000179	2.30	18515.22	4083.30	0.13
Angelina River	Downstream	40400	5 YR	26403.00	232.98	248.75		248.78	0.000164	2.52	28713.64	4993.40	0.13
Angelina River	Downstream	40400	10 YR	35352.00	232.98	250.19		250.22	0.000169	2.76	36402.79	5804.85	0.13
Angelina River	Downstream	40400	25 YR	45336.00	232.98	251.46		251.49	0.000157	2.82	43777.50	5836.53	0.13
Angelina River	Downstream	40400	50 YR	54335.00	232.98	252.40		252.43	0.000156	2.92	49252.37	5859.93	0.13
Angelina River	Downstream	40400	100 YR	63409.00	232.98	253.25		253.29	0.000156	3.03	54270.74	5881.30	0.13
Angelina River	Downstream	39350	2 YR	15700.00	232.63	246.45		246.45	0.000040	0.95	35773.62	6574.56	0.05
Angelina River	Downstream	39350	5 YR	26403.00	232.63	248.70		248.70	0.000039	1.08	51441.13	7350.88	0.05
Angelina River	Downstream	39350	10 YR	35352.00	232.63	250.14		250.15	0.000040	1.17	62415.25	7807.13	0.06
Angelina River	Downstream	39350	25 YR	45336.00	232.63	251.41		251.42	0.000041	1.27	72345.55	7870.47	0.06
Angelina River	Downstream	39350	50 YR	54335.00	232.63	252.34		252.35	0.000044	1.36	79722.17	7917.19	0.06
Angelina River	Downstream	39350	100 YR	63409.00	232.63	253.20		253.21	0.000046	1.44	86495.77	7959.86	0.06
Angelina River	Downstream	36950	2 YR	15700.00	231.82	246.23		246.31	0.000242	3.12	11761.38	2549.83	0.17
Angelina River	Downstream	36950	5 YR	26403.00	231.82	248.47		248.57	0.000248	3.61	18152.04	3144.62	0.18
Angelina River	Downstream	36950	10 YR	35352.00	231.82	249.91		250.01	0.000254	3.93	22940.15	3525.10	0.19
Angelina River	Downstream	36950	25 YR	45336.00	231.82	251.17		251.28	0.000256	4.17	28081.76	4135.04	0.19
Angelina River	Downstream	36950	50 YR	54335.00	231.82	252.10		252.21	0.000259	4.36	31928.98	4162.86	0.19
Angelina River	Downstream	36950	100 YR	63409.00	231.82	252.94		253.06	0.000262	4.54	35456.68	4188.20	0.19
Angelina River	Downstream	33750	2 YR	15700.00	230.74	244.92		245.17	0.000739	4.43	5756.68	1431.04	0.23
Angelina River	Downstream	33750	5 YR	26403.00	230.74	247.10		247.40	0.000821	5.25	9447.90	1954.39	0.25
Angelina River	Downstream	33750	10 YR	35352.00	230.74	248.52		248.84	0.000838	5.67	12466.51	2295.34	0.26
Angelina River	Downstream	33750	25 YR	45336.00	230.74	249.77		250.11	0.000868	6.08	15514.51	2594.54	0.27

## HEC-RAS Plan: Prop EM (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Downstream	33750	50 YR	54335.00	230.74	250.70		251.04	0.000870	6.32	17987.17	2674.54	0.27
Angelina River	Downstream	33750	100 YR	63409.00	230.74	251.55		251.89	0.000867	6.52	20266.91	2704.21	0.27
Angelina River	Downstream	32550	2 YR	15700.00	230.34	244.27		244.44	0.000734	4.37	7567.67	1940.39	0.26
Angelina River	Downstream	32550	5 YR	26403.00	230.34	246.60		246.75	0.000593	4.58	12577.65	2370.40	0.24
Angelina River	Downstream	32550	10 YR	35352.00	230.34	248.07		248.23	0.000555	4.80	16273.92	2643.19	0.24
Angelina River	Downstream	32550	25 YR	45336.00	230.34	249.33		249.50	0.000558	5.12	19758.11	2876.73	0.24
Angelina River	Downstream	32550	50 YR	54335.00	230.34	250.27		250.45	0.000572	5.41	22520.48	3013.38	0.25
Angelina River	Downstream	32550	100 YR	63409.00	230.34	251.12		251.31	0.000581	5.65	25106.18	3055.98	0.25
Angelina River	Downstream	30950	2 YR	15700.00	229.81	241.46		242.52	0.002133	8.29	2139.19	581.88	0.49
Angelina River	Downstream	30950	5 YR	26403.00	229.81	242.94		244.81	0.003250	11.34	3274.28	956.66	0.62
Angelina River	Downstream	30950	10 YR	35352.00	229.81	244.10		246.34	0.003588	12.79	4558.84	1252.10	0.66
Angelina River	Downstream	30950	25 YR	45336.00	229.81	245.53		247.71	0.003287	13.23	6609.33	1615.37	0.65
Angelina River	Downstream	30950	50 YR	54335.00	229.81	246.83		248.77	0.002834	13.09	8908.84	1943.60	0.61
Angelina River	Downstream	30950	100 YR	63409.00	229.81	248.05		249.76	0.002430	12.81	11479.65	2254.67	0.57
Angelina River	Downstream	29800	2 YR	15700.00	229.43	241.43		241.53	0.000287	2.65	7201.22	1945.57	0.18
Angelina River	Downstream	29800	5 YR	26403.00	229.43	243.32		243.47	0.000316	3.26	11072.70	2138.93	0.19
Angelina River	Downstream	29800	10 YR	35352.00	229.43	244.71		244.88	0.000317	3.59	14145.21	2280.75	0.20
Angelina River	Downstream	29800	25 YR	45336.00	229.43	246.14		246.33	0.000311	3.88	17492.55	2425.83	0.20
Angelina River	Downstream	29800	50 YR	54335.00	229.43	247.31		247.51	0.000305	4.09	20404.71	2545.34	0.20
Angelina River	Downstream	29800	100 YR	63409.00	229.43	248.40		248.62	0.000299	4.28	23254.66	2657.09	0.20
Angelina River	Downstream	29000	2 YR	15700.00	229.18	240.00	235.74	240.91	0.002956	7.67	2049.08	3720.12	0.44
Angelina River	Downstream	29000	5 YR	26403.00	229.18	242.81		243.03	0.000906	5.06	13284.20	4276.50	0.26
Angelina River	Downstream	29000	10 YR	35352.00	229.18	244.36		244.49	0.000588	4.42	20159.16	4583.77	0.21
Angelina River	Downstream	29000	25 YR	45336.00	229.18	245.87		245.96	0.000436	4.08	27284.75	4881.87	0.18
Angelina River	Downstream	29000	50 YR	54335.00	229.18	247.09		247.17	0.000362	3.92	33392.91	5123.62	0.17
Angelina River	Downstream	29000	100 YR	63409.00	229.18	248.22		248.30	0.000315	3.82	39318.75	5347.72	0.16
Angelina River	Downstream	22700	2 YR	15700.00	227.14	239.34		239.37	0.000094	1.76	17032.89	2454.61	0.09
Angelina River	Downstream	22700	5 YR	26403.00	227.14	242.12		242.15	0.000098	2.09	24174.04	2645.19	0.10
Angelina River	Downstream	22700	10 YR	35352.00	227.14	243.70		243.73	0.000109	2.37	28411.90	2716.33	0.11
Angelina River	Downstream	22700	25 YR	45336.00	227.14	245.23		245.28	0.000119	2.64	32641.21	2785.52	0.11
Angelina River	Downstream	22700	50 YR	54335.00	227.14	246.48		246.53	0.000126	2.85	36137.45	2841.44	0.12
Angelina River	Downstream	22700	100 YR	63409.00	227.14	247.62		247.69	0.000133	3.05	39428.93	2893.09	0.12
Angelina River	Downstream	18600	2 YR	15700.00	225.81	238.93		238.97	0.000161	2.33	13715.35	2063.87	0.12
Angelina River	Downstream	18600	5 YR	26403.00	225.81	241.63		241.68	0.000215	3.12	23072.08	4381.56	0.15
Angelina River	Downstream	18600	10 YR	35352.00	225.81	243.25		243.29	0.000178	3.05	30214.35	4462.32	0.14
Angelina River	Downstream	18600	25 YR	45336.00	225.81	244.80		244.85	0.000158	3.07	37220.87	4540.15	0.13
Angelina River	Downstream	18600	50 YR	54335.00	225.81	246.05		246.10	0.000147	3.11	42940.66	4602.71	0.13
Angelina River	Downstream	18600	100 YR	63409.00	225.81	247.21		247.25	0.000141	3.17	48282.03	4660.37	0.13
Angelina River	Downstream	14400	2 YR	15700.00	224.45	238.85		238.86	0.000028	0.88	32052.62	3767.62	0.05
Angelina River	Downstream	14400	5 YR	26403.00	224.45	241.53		241.53	0.000035	1.12	42477.82	4119.10	0.05
Angelina River	Downstream	14400	10 YR	35352.00	224.45	243.13		243.14	0.000042	1.32	49341.96	4428.28	0.06
Angelina River	Downstream	14400	25 YR	45336.00	224.45	244.68		244.70	0.000048	1.50	56441.67	4726.85	0.06
Angelina River	Downstream	14400	50 YR	54335.00	224.45	245.93		245.95	0.000052	1.65	62490.15	4967.06	0.07
Angelina River	Downstream	14400	100 YR	63409.00	224.45	247.08		247.10	0.000056	1.77	68333.73	5188.59	0.07
Angelina River	Downstream	5700	2 YR	15700.00	221.64	238.64		238.66	0.000095	1.71	18347.84	2550.41	0.08
Angelina River	Downstream	5700	5 YR	26403.00	221.64	241.28		241.30	0.000104	2.03	25597.15	2919.78	0.09
Angelina River	Downstream	5700	10 YR	35352.00	221.64	242.85		242.88	0.000116	2.28	30268.46	3035.87	0.10
Angelina River	Downstream	5700	25 YR	45336.00	221.64	244.37		244.40	0.000126	2.52	34963.09	3148.22	0.10
Angelina River	Downstream	5700	50 YR	54335.00	221.64	245.59		245.63	0.000133	2.70	38871.85	3238.80	0.11
Angelina River	Downstream	5700	100 YR	63409.00	221.64	246.72		246.76	0.000140	2.87	42580.37	3322.45	0.11
Angelina River	Downstream	1000	2 YR	15700.00	220.12	237.89	231.16	238.04	0.000350	3.80	8562.62	1719.37	0.19
Angelina River	Downstream	1000	5 YR	26403.00	220.12	240.51	233.75	240.67	0.000350	4.30	13778.98	2288.84	0.19
Angelina River	Downstream	1000	10 YR	35352.00	220.12	242.05	235.05	242.21	0.000350	4.58	17390.01	2405.16	0.20
Angelina River	Downstream	1000	25 YR	45336.00	220.12	243.54	236.14	243.71	0.000350	4.84	21062.05	2517.94	0.20
Angelina River	Downstream	1000	50 YR	54335.00	220.12	244.75	236.93	244.92	0.000350	5.05	24148.31	2608.95	0.20
Angelina River	Downstream	1000	100 YR	63409.00	220.12	245.86	237.64	246.04	0.000350	5.24	27098.05	2693.07	0.20

HEC-RAS Output  
Proposed Lowest Early Median



HEC-RAS Plan: Prop LEM

River	Reach	River Sta	Profile	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
Mud Creek	1000	132650	2 YR	617.00	315.00	315.83		316.05	0.019975	3.70	166.75	199.99	0.71
Mud Creek	1000	132650	5 YR	2992.00	315.00	317.51		318.06	0.012136	5.95	502.60	199.99	0.66
Mud Creek	1000	132650	10 YR	5187.00	315.00	318.65		319.43	0.010702	7.11	729.32	199.99	0.66
Mud Creek	1000	132650	25 YR	8048.00	315.00	319.90		320.95	0.009753	8.21	980.84	199.99	0.65
Mud Creek	1000	132650	50 YR	10648.00	315.00	320.91		322.17	0.009269	9.01	1182.44	200.00	0.65
Mud Creek	1000	132650	100 YR	13545.00	315.00	321.94		323.42	0.008891	9.75	1388.64	200.00	0.65
Mud Creek	1000	132350.*	2 YR	617.00	309.12	309.93	309.82	310.18	0.024458	4.03	153.21	201.03	0.81
Mud Creek	1000	132350.*	5 YR	2992.00	309.12	311.24	311.07	311.95	0.021259	6.77	441.76	238.27	0.88
Mud Creek	1000	132350.*	10 YR	5187.00	309.12	312.05	311.87	313.06	0.020793	8.08	642.35	261.05	0.91
Mud Creek	1000	132350.*	25 YR	8048.00	309.12	312.87	312.71	314.21	0.020760	9.29	866.31	284.33	0.94
Mud Creek	1000	132350.*	50 YR	10648.00	309.12	313.45	313.37	315.09	0.021584	10.28	1036.25	300.80	0.98
Mud Creek	1000	132350.*	100 YR	13545.00	309.12	314.03	314.02	315.96	0.021961	11.12	1217.58	317.43	1.00
Mud Creek	1000	132050.*	2 YR	617.00	303.23	304.17		304.36	0.015644	3.50	176.22	217.47	0.69
Mud Creek	1000	132050.*	5 YR	2992.00	303.23	305.39		305.97	0.018474	6.11	490.05	296.72	0.84
Mud Creek	1000	132050.*	10 YR	5187.00	303.23	306.07	305.90	306.91	0.019928	7.36	704.43	340.41	0.90
Mud Creek	1000	132050.*	25 YR	8048.00	303.23	306.73	306.65	307.86	0.021189	8.52	944.23	383.42	0.96
Mud Creek	1000	132050.*	50 YR	10648.00	303.23	307.26	307.19	308.58	0.021206	9.21	1155.89	417.73	0.98
Mud Creek	1000	132050.*	100 YR	13545.00	303.23	307.73	307.73	309.27	0.021852	9.95	1361.86	448.60	1.01
Mud Creek	1000	131750.*	2 YR	617.00	297.35	298.18	298.12	298.44	0.025635	4.08	151.06	229.11	0.89
Mud Creek	1000	131750.*	5 YR	2992.00	297.35	299.32	299.24	299.91	0.022144	6.14	487.60	359.46	0.93
Mud Creek	1000	131750.*	10 YR	5187.00	297.35	299.96	299.88	300.73	0.021194	7.01	740.03	432.16	0.94
Mud Creek	1000	131750.*	25 YR	8048.00	297.35	300.59	300.51	301.53	0.020678	7.80	1031.41	503.18	0.96
Mud Creek	1000	131750.*	50 YR	10648.00	297.35	301.00	300.98	302.13	0.021415	8.51	1251.83	550.85	0.99
Mud Creek	1000	131750.*	100 YR	13545.00	297.35	301.44	301.44	302.70	0.021207	9.02	1501.61	600.31	1.01
Mud Creek	1000	131450.*	2 YR	617.00	291.47	292.42		292.59	0.015199	3.23	190.76	287.33	0.70
Mud Creek	1000	131450.*	5 YR	2992.00	291.47	293.42		293.85	0.018260	5.28	566.74	469.39	0.85
Mud Creek	1000	131450.*	10 YR	5187.00	291.47	293.92	293.81	294.53	0.019818	6.27	826.67	561.76	0.91
Mud Creek	1000	131450.*	25 YR	8048.00	291.47	294.40	294.35	295.21	0.021272	7.21	1116.08	649.33	0.97
Mud Creek	1000	131450.*	50 YR	10648.00	291.47	294.79	294.74	295.71	0.021025	7.71	1381.06	720.23	0.98
Mud Creek	1000	131450.*	100 YR	13545.00	291.47	295.13	295.13	296.19	0.021607	8.28	1635.79	782.35	1.01
Mud Creek	1000	131150.*	2 YR	617.00	285.59	286.38	286.35	286.61	0.027271	3.81	162.10	318.86	0.94
Mud Creek	1000	131150.*	5 YR	2992.00	285.59	287.27	287.23	287.71	0.022991	5.37	556.66	573.72	0.96
Mud Creek	1000	131150.*	10 YR	5187.00	285.59	287.74	287.70	288.30	0.021692	6.05	857.65	709.01	0.97
Mud Creek	1000	131150.*	25 YR	8048.00	285.59	288.19	288.15	288.88	0.020688	6.64	1212.36	840.96	0.97
Mud Creek	1000	131150.*	50 YR	10648.00	285.59	288.49	288.49	289.30	0.021560	7.23	1471.81	925.63	1.01
Mud Creek	1000	131150.*	100 YR	13545.00	285.59	288.81	288.81	289.70	0.020889	7.60	1783.31	1018.04	1.01
Mud Creek	1000	130850.*	2 YR	617.00	279.71	280.54	280.42	280.66	0.014938	2.84	217.30	455.57	0.72
Mud Creek	1000	130850.*	5 YR	2992.00	279.71	281.25	281.15	281.57	0.018148	4.55	657.64	786.47	0.88
Mud Creek	1000	130850.*	10 YR	5187.00	279.71	281.60	281.54	282.05	0.019823	5.40	960.65	949.40	0.95
Mud Creek	1000	130850.*	25 YR	8048.00	279.71	281.92	281.92	282.52	0.021518	6.22	1294.60	1101.39	1.01
Mud Creek	1000	130850.*	50 YR	10648.00	279.71	282.20	282.20	282.87	0.020855	6.59	1615.61	1229.91	1.01
Mud Creek	1000	130850.*	100 YR	13545.00	279.71	282.48	282.48	283.21	0.019652	6.85	1978.53	1360.66	1.00
Mud Creek	1000	130550.*	2 YR	617.00	273.82	274.44	274.44	274.60	0.028750	3.28	188.14	562.33	1.00
Mud Creek	1000	130550.*	5 YR	2992.00	273.82	275.02	275.02	275.34	0.023977	4.55	657.33	1048.47	1.01
Mud Creek	1000	130550.*	10 YR	5187.00	273.82	275.33	275.33	275.73	0.022320	5.09	1019.98	1305.59	1.01
Mud Creek	1000	130550.*	25 YR	8048.00	273.82	275.63	275.63	276.11	0.021057	5.55	1449.14	1555.91	1.01
Mud Creek	1000	130550.*	50 YR	10648.00	273.82	275.85	275.85	276.38	0.020111	5.85	1818.71	1742.89	1.01
Mud Creek	1000	130550.*	100 YR	13545.00	273.82	276.06	276.06	276.65	0.019525	6.15	2202.69	1917.95	1.01
Mud Creek	1000	130250	2 YR	617.00	267.94	269.37		269.37	0.000056	0.25	2428.28	3372.81	0.05
Mud Creek	1000	130250	5 YR	2992.00	267.94	270.60		270.60	0.000041	0.34	8743.90	6246.10	0.05
Mud Creek	1000	130250	10 YR	5187.00	267.94	271.39		271.39	0.000028	0.38	13718.38	6372.25	0.05
Mud Creek	1000	130250	25 YR	8048.00	267.94	272.18		272.18	0.000024	0.43	18796.09	6498.50	0.04
Mud Creek	1000	130250	50 YR	10648.00	267.94	272.87		272.87	0.000021	0.47	23326.63	6609.10	0.04
Mud Creek	1000	130250	100 YR	13545.00	267.94	273.55		273.55	0.000019	0.50	27831.72	6717.28	0.04
Mud Creek	1000	129850	2 YR	617.00	267.48	269.35		269.35	0.000046	0.21	2946.66	3152.64	0.04
Mud Creek	1000	129850	5 YR	2992.00	267.48	270.58		270.58	0.000057	0.37	9005.45	6311.03	0.05
Mud Creek	1000	129850	10 YR	5187.00	267.48	271.37		271.37	0.000046	0.42	14045.45	6394.33	0.05
Mud Creek	1000	129850	25 YR	8048.00	267.48	272.17		272.17	0.000043	0.48	19132.95	6477.34	0.05
Mud Creek	1000	129850	50 YR	10648.00	267.48	272.86		272.86	0.000039	0.52	23644.92	6550.07	0.04
Mud Creek	1000	129850	100 YR	13545.00	267.48	273.53		273.54	0.000037	0.56	28102.58	6621.14	0.04
Mud Creek	1000	128750	2 YR	617.00	267.10	269.32		269.32	0.000014	0.15	4135.92	3719.40	0.02
Mud Creek	1000	128750	5 YR	2992.00	267.10	270.54		270.54	0.000028	0.31	9665.40	4917.39	0.04
Mud Creek	1000	128750	10 YR	5187.00	267.10	271.34		271.34	0.000027	0.38	13625.47	5017.05	0.04
Mud Creek	1000	128750	25 YR	8048.00	267.10	272.13		272.13	0.000028	0.46	17630.64	5115.86	0.04
Mud Creek	1000	128750	50 YR	10648.00	267.10	272.82		272.83	0.000027	0.51	21215.12	5202.71	0.04
Mud Creek	1000	128750	100 YR	13545.00	267.10	273.50		273.50	0.000027	0.56	24770.37	5287.44	0.04
Mud Creek	1000	127950	2 YR	617.00	266.82	269.31		269.31	0.000013	0.16	3908.69	3135.79	0.02
Mud Creek	1000	127950	5 YR	2992.00	266.82	270.51		270.52	0.000034	0.35	8526.60	4228.28	0.04
Mud Creek	1000	127950	10 YR	5187.00	266.82	271.31		271.31	0.000034	0.44	11914.25	4272.12	0.05
Mud Creek	1000	127950	25 YR	8048.00	266.82	272.10		272.10	0.000037	0.54	15300.89	4315.50	0.05
Mud Creek	1000	127950	50 YR	10648.00	266.82	272.80		272.80	0.000036	0.60	18314.27	4353.73	0.05
Mud Creek	1000	127950	100 YR	13545.00	266.82	273.47		273.48	0.000036	0.66	21277.44	4391.01	0.05
Mud Creek	1000	126600	2 YR	2268.00	266.35	269.27		269.28	0.000035	0.32	7031.24	4807.96	0.05
Mud Creek	1000	126600	5 YR	3760.00	266.35	270.49		270.49	0.000013	0.27	13908.20	6100.24	0.03

HEC-RAS Plan: Prop LEM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	126600	10 YR	5254.00	266.35	271.29		271.29	0.000010	0.28	18862.71	6264.52	0.03
Mud Creek	1000	126600	25 YR	8179.00	266.35	272.08		272.08	0.000011	0.35	23854.72	6425.80	0.03
Mud Creek	1000	126600	50 YR	10838.00	266.35	272.77		272.78	0.000011	0.39	28374.02	6568.40	0.03
Mud Creek	1000	126600	100 YR	13807.00	266.35	273.45		273.45	0.000011	0.43	32873.34	6707.35	0.03
Mud Creek	1000	124600	2 YR	2268.00	265.65	269.20		269.20	0.000045	0.37	6212.40	3504.56	0.05
Mud Creek	1000	124600	5 YR	3760.00	265.65	270.45		270.46	0.000022	0.33	11314.87	4334.09	0.04
Mud Creek	1000	124600	10 YR	5254.00	265.65	271.26		271.27	0.000018	0.36	14848.20	4394.81	0.03
Mud Creek	1000	124600	25 YR	8179.00	265.65	272.05		272.05	0.000021	0.45	18306.84	4453.44	0.04
Mud Creek	1000	124600	50 YR	10838.00	265.65	272.74		272.74	0.000023	0.51	21416.69	4505.51	0.04
Mud Creek	1000	124600	100 YR	13807.00	265.65	273.42		273.42	0.000024	0.57	24480.78	4556.23	0.04
Mud Creek	1000	123150	2 YR	2268.00	265.14	269.14		269.14	0.000030	0.28	8078.67	4036.13	0.03
Mud Creek	1000	123150	5 YR	3760.00	265.14	270.43		270.43	0.000017	0.27	14010.52	4953.37	0.03
Mud Creek	1000	123150	10 YR	5254.00	265.14	271.24		271.24	0.000014	0.29	18086.88	5055.19	0.03
Mud Creek	1000	123150	25 YR	8179.00	265.14	272.02		272.02	0.000018	0.37	22048.61	5152.22	0.03
Mud Creek	1000	123150	50 YR	10838.00	265.14	272.71		272.71	0.000020	0.43	25646.36	5238.78	0.03
Mud Creek	1000	123150	100 YR	13807.00	265.14	273.38		273.39	0.000021	0.48	29208.52	5323.10	0.04
Mud Creek	1000	121050	2 YR	5303.00	264.41	269.03		269.03	0.000074	0.50	10676.73	4625.11	0.06
Mud Creek	1000	121050	5 YR	8784.00	264.41	270.35		270.36	0.000049	0.50	17856.70	6279.50	0.05
Mud Creek	1000	121050	10 YR	11369.00	264.41	271.18		271.19	0.000037	0.51	23148.07	6466.32	0.04
Mud Creek	1000	121050	25 YR	14058.00	264.41	271.96		271.97	0.000031	0.52	28255.37	6641.65	0.04
Mud Creek	1000	121050	50 YR	16677.00	264.41	272.66		272.66	0.000027	0.53	32929.23	6798.14	0.04
Mud Creek	1000	121050	100 YR	19518.00	264.41	273.33		273.34	0.000025	0.55	37577.85	6950.30	0.04
Mud Creek	1000	119350	2 YR	5303.00	263.81	268.73		268.75	0.000581	1.26	4223.43	1716.84	0.14
Mud Creek	1000	119350	5 YR	8784.00	263.81	270.15		270.17	0.000402	1.25	7002.67	2163.67	0.12
Mud Creek	1000	119350	10 YR	11369.00	263.81	271.02		271.05	0.000303	1.28	8903.52	2185.52	0.11
Mud Creek	1000	119350	25 YR	14058.00	263.81	271.82		271.85	0.000256	1.32	10661.26	2205.54	0.11
Mud Creek	1000	119350	50 YR	16677.00	263.81	272.53		272.56	0.000230	1.37	12226.28	2223.21	0.10
Mud Creek	1000	119350	100 YR	19518.00	263.81	273.21		273.24	0.000215	1.43	13748.00	2240.25	0.10
Mud Creek	1000	117350	2 YR	5303.00	263.11	268.28		268.29	0.000122	0.88	6014.97	2326.50	0.10
Mud Creek	1000	117350	5 YR	8784.00	263.11	269.85		269.86	0.000081	0.86	10208.41	3030.85	0.08
Mud Creek	1000	117350	10 YR	11369.00	263.11	270.80		270.81	0.000060	0.86	13190.08	3176.01	0.07
Mud Creek	1000	117350	25 YR	14058.00	263.11	271.64		271.65	0.000050	0.89	15886.26	3255.65	0.07
Mud Creek	1000	117350	50 YR	16677.00	263.11	272.37		272.38	0.000045	0.92	18278.70	3324.73	0.07
Mud Creek	1000	117350	100 YR	19518.00	263.11	273.06		273.07	0.000042	0.96	20608.53	3390.65	0.07
Mud Creek	1000	114900	2 YR	5303.00	262.26	268.02		268.03	0.000095	0.84	6319.35	2194.79	0.09
Mud Creek	1000	114900	5 YR	8784.00	262.26	269.66		269.68	0.000068	0.84	10447.23	2822.00	0.08
Mud Creek	1000	114900	10 YR	11369.00	262.26	270.66		270.67	0.000054	0.85	13379.21	2986.37	0.07
Mud Creek	1000	114900	25 YR	14058.00	262.26	271.52		271.53	0.000046	0.88	15966.77	3033.65	0.07
Mud Creek	1000	114900	50 YR	16677.00	262.26	272.26		272.27	0.000042	0.92	18220.32	3074.24	0.07
Mud Creek	1000	114900	100 YR	19518.00	262.26	272.96		272.97	0.000040	0.97	20384.27	3112.71	0.07
Mud Creek	1000	113800	2 YR	5303.00	261.87	267.91		267.92	0.000105	0.91	5826.11	1930.39	0.09
Mud Creek	1000	113800	5 YR	8784.00	261.87	269.58		269.59	0.000078	0.92	9508.12	2466.06	0.08
Mud Creek	1000	113800	10 YR	11369.00	261.87	270.59		270.61	0.000063	0.94	12134.43	2662.47	0.08
Mud Creek	1000	113800	25 YR	14058.00	261.87	271.46		271.48	0.000054	0.98	14485.80	2753.64	0.07
Mud Creek	1000	113800	50 YR	16677.00	261.87	272.21		272.22	0.000050	1.02	16558.00	2831.55	0.07
Mud Creek	1000	113800	100 YR	19518.00	261.87	272.91		272.92	0.000048	1.07	18569.84	2905.20	0.07
Mud Creek	1000	112200	2 YR	5303.00	261.31	267.67		267.69	0.000201	1.14	4656.58	1464.04	0.11
Mud Creek	1000	112200	5 YR	8784.00	261.31	269.40		269.42	0.000153	1.17	7535.74	1862.44	0.10
Mud Creek	1000	112200	10 YR	11369.00	261.31	270.45		270.47	0.000126	1.19	9590.14	2020.15	0.10
Mud Creek	1000	112200	25 YR	14058.00	261.31	271.33		271.36	0.000109	1.24	11397.82	2060.03	0.09
Mud Creek	1000	112200	50 YR	16677.00	261.31	272.08		272.11	0.000102	1.30	12955.43	2093.77	0.09
Mud Creek	1000	112200	100 YR	19518.00	261.31	272.79		272.82	0.000098	1.37	14441.27	2125.47	0.09
Mud Creek	1000	110300	2 YR	5303.00	260.65	267.48	262.93	267.48	0.000066	0.69	7725.74	2263.39	0.07
Mud Creek	1000	110300	5 YR	8784.00	260.65	269.25	263.45	269.26	0.000053	0.72	12265.72	2851.91	0.06
Mud Creek	1000	110300	10 YR	11369.00	260.65	270.32	263.75	270.33	0.000046	0.73	15493.25	3117.71	0.06
Mud Creek	1000	110300	25 YR	14058.00	260.65	271.23	264.03	271.24	0.000040	0.77	18333.81	3167.42	0.06
Mud Creek	1000	110300	50 YR	16677.00	260.65	271.98	264.27	271.99	0.000038	0.81	20752.16	3209.14	0.06
Mud Creek	1000	110300	100 YR	19518.00	260.65	272.69	264.50	272.70	0.000037	0.85	23039.63	3248.11	0.06
Mud Creek	1000	110200		Bridge									
Mud Creek	1000	110050	2 YR	5303.00	260.56	267.41		267.41	0.000038	0.59	8937.14	2610.84	0.06
Mud Creek	1000	110050	5 YR	8784.00	260.56	269.18		269.19	0.000030	0.62	14168.98	3287.38	0.05
Mud Creek	1000	110050	10 YR	11369.00	260.56	270.25		270.25	0.000026	0.64	17887.34	3629.72	0.05
Mud Creek	1000	110050	25 YR	14058.00	260.56	271.15		271.15	0.000023	0.67	21196.62	3737.53	0.05
Mud Creek	1000	110050	50 YR	16677.00	260.56	271.90		271.91	0.000022	0.70	24038.77	3827.69	0.05
Mud Creek	1000	110050	100 YR	19518.00	260.56	272.60		272.61	0.000021	0.74	26744.14	3911.59	0.05
Mud Creek	1000	109550	2 YR	5303.00	260.38	267.39		267.39	0.000034	0.57	9318.70	2659.20	0.05
Mud Creek	1000	109550	5 YR	8784.00	260.38	269.17		269.17	0.000028	0.60	14644.29	3333.56	0.05
Mud Creek	1000	109550	10 YR	11369.00	260.38	270.24		270.24	0.000024	0.62	18420.06	3692.34	0.05
Mud Creek	1000	109550	25 YR	14058.00	260.38	271.14		271.14	0.000022	0.65	21815.69	3854.32	0.05
Mud Creek	1000	109550	50 YR	16677.00	260.38	271.89		271.89	0.000020	0.68	24765.09	3989.69	0.05
Mud Creek	1000	109550	100 YR	19518.00	260.38	272.59		272.59	0.000020	0.72	27599.51	4115.58	0.05
Mud Creek	1000	107750	2 YR	5303.00	259.75	267.32		267.32	0.000048	0.65	8177.53	2028.86	0.06
Mud Creek	1000	107750	5 YR	8784.00	259.75	269.10		269.11	0.000045	0.72	12198.00	2475.18	0.06

HEC-RAS Plan: Prop LEM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	107750	10 YR	11369.00	259.75	270.18		270.18	0.000042	0.76	15001.48	2742.03	0.06
Mud Creek	1000	107750	25 YR	14058.00	259.75	271.08		271.09	0.000039	0.81	17581.20	2959.22	0.06
Mud Creek	1000	107750	50 YR	16677.00	259.75	271.83		271.85	0.000038	0.85	19879.80	3140.11	0.06
Mud Creek	1000	107750	100 YR	19518.00	259.75	272.53		272.55	0.000038	0.91	22134.40	3307.95	0.06
Mud Creek	1000	105150	2 YR	5303.00	258.80	267.22		267.23	0.000031	0.67	9163.36	1563.64	0.04
Mud Creek	1000	105150	5 YR	8784.00	258.80	268.99		269.00	0.000039	0.87	12069.94	1714.38	0.05
Mud Creek	1000	105150	10 YR	11369.00	258.80	270.06		270.08	0.000043	1.00	13951.84	1805.27	0.06
Mud Creek	1000	105150	25 YR	14058.00	258.80	270.96		270.98	0.000048	1.11	15613.81	1881.90	0.06
Mud Creek	1000	105150	50 YR	16677.00	258.80	271.71		271.73	0.000053	1.22	17046.00	1945.51	0.06
Mud Creek	1000	105150	100 YR	19518.00	258.80	272.40		272.43	0.000059	1.34	18412.00	2004.31	0.07
Mud Creek	1000	104100	2 YR	5303.00	258.42	267.19		267.20	0.000023	0.76	8466.90	1461.17	0.05
Mud Creek	1000	104100	5 YR	8784.00	258.42	268.95		268.97	0.000029	0.99	11177.79	1611.17	0.06
Mud Creek	1000	104100	10 YR	11369.00	258.42	270.02		270.04	0.000032	1.14	12940.38	1701.29	0.06
Mud Creek	1000	104100	25 YR	14058.00	258.42	270.91		270.94	0.000036	1.27	14491.39	1761.75	0.07
Mud Creek	1000	104100	50 YR	16677.00	258.42	271.66		271.68	0.000040	1.40	15818.42	1811.88	0.07
Mud Creek	1000	104100	100 YR	19518.00	258.42	272.34		272.37	0.000045	1.53	17075.61	1858.13	0.08
Mud Creek	1000	103850	2 YR	5303.00	258.33	267.18		267.19	0.000024	0.79	7692.09	1245.09	0.05
Mud Creek	1000	103850	5 YR	8784.00	258.33	268.95		268.96	0.000031	1.04	9971.36	1342.01	0.06
Mud Creek	1000	103850	10 YR	11369.00	258.33	270.01		270.03	0.000036	1.19	11427.94	1400.55	0.07
Mud Creek	1000	103850	25 YR	14058.00	258.33	270.90		270.93	0.000041	1.35	12707.22	1463.09	0.07
Mud Creek	1000	103850	50 YR	16677.00	258.33	271.64		271.67	0.000045	1.49	13809.66	1514.92	0.08
Mud Creek	1000	103850	100 YR	19518.00	258.33	272.32		272.36	0.000051	1.64	14859.79	1562.69	0.08
Mud Creek	1000	103350	2 YR	7842.00	258.15	267.13	261.55	267.16	0.000100	1.61	6730.11	1298.72	0.10
Mud Creek	1000	103350	5 YR	12984.00	258.15	268.87	262.27	268.92	0.000124	2.06	9148.69	1481.41	0.12
Mud Creek	1000	103350	10 YR	16800.00	258.15	269.92	262.71	269.99	0.000137	2.34	10759.17	1591.47	0.13
Mud Creek	1000	103350	25 YR	20766.00	258.15	270.80	263.15	270.88	0.000152	2.60	12189.96	1663.79	0.14
Mud Creek	1000	103350	50 YR	24526.00	258.15	271.52	263.54	271.62	0.000166	2.83	13420.29	1721.93	0.15
Mud Creek	1000	103350	100 YR	28366.00	258.15	272.19	263.89	272.30	0.000178	3.04	14590.83	1775.48	0.15
Mud Creek	1000	103200		Bridge									
Mud Creek	1000	103100	2 YR	7842.00	258.06	267.02		267.08	0.000317	2.18	4679.86	891.52	0.14
Mud Creek	1000	103100	5 YR	12984.00	258.06	268.71		268.81	0.000400	2.81	6280.55	1009.41	0.16
Mud Creek	1000	103100	10 YR	16800.00	258.06	269.71		269.84	0.000447	3.18	7334.28	1080.01	0.18
Mud Creek	1000	103100	25 YR	20766.00	258.06	270.55		270.70	0.000507	3.58	8263.37	1165.46	0.19
Mud Creek	1000	103100	50 YR	24526.00	258.06	271.23		271.41	0.000564	3.93	9083.12	1247.01	0.20
Mud Creek	1000	103100	100 YR	28366.00	258.06	271.85		272.06	0.000617	4.25	9879.77	1321.45	0.21
Mud Creek	1000	102550	2 YR	7842.00	257.86	266.60		266.74	0.001166	4.29	3599.90	958.20	0.27
Mud Creek	1000	102550	5 YR	12984.00	257.86	268.23		268.40	0.001213	4.97	5332.65	1169.90	0.29
Mud Creek	1000	102550	10 YR	16800.00	257.86	269.22		269.41	0.001215	5.32	6553.88	1298.53	0.29
Mud Creek	1000	102550	25 YR	20766.00	257.86	270.02		270.23	0.001268	5.72	7631.98	1402.85	0.30
Mud Creek	1000	102550	50 YR	24526.00	257.86	270.67		270.90	0.001331	6.08	8576.79	1506.76	0.31
Mud Creek	1000	102550	100 YR	28366.00	257.86	271.26		271.51	0.001379	6.40	9503.16	1602.11	0.32
Mud Creek	1000	101050	2 YR	7842.00	257.31	263.11		263.76	0.004982	7.10	1642.68	682.53	0.59
Mud Creek	1000	101050	5 YR	12984.00	257.31	263.75		264.89	0.007773	9.70	2109.34	781.35	0.76
Mud Creek	1000	101050	10 YR	16800.00	257.31	264.06		265.63	0.010100	11.50	2359.03	829.40	0.87
Mud Creek	1000	101050	25 YR	20766.00	257.31	264.59	264.59	266.32	0.010305	12.35	2816.83	910.95	0.89
Mud Creek	1000	101050	50 YR	24526.00	257.31	265.09	265.09	266.91	0.010063	12.88	3291.13	988.36	0.90
Mud Creek	1000	101050	100 YR	28366.00	257.31	265.54	265.54	267.45	0.009902	13.38	3760.14	1059.36	0.90
Mud Creek	1000	99150	2 YR	7842.00	256.62	262.71		262.72	0.000200	1.61	13171.62	5186.67	0.14
Mud Creek	1000	99150	5 YR	12984.00	256.62	263.46		263.47	0.000244	1.98	17113.67	5402.58	0.15
Mud Creek	1000	99150	10 YR	16800.00	256.62	263.92		263.94	0.000268	2.19	19651.29	5537.12	0.16
Mud Creek	1000	99150	25 YR	20766.00	256.62	264.35		264.36	0.000289	2.39	22027.75	5660.22	0.17
Mud Creek	1000	99150	50 YR	24526.00	256.62	264.71		264.73	0.000306	2.56	24115.45	5766.19	0.18
Mud Creek	1000	99150	100 YR	28366.00	256.62	265.06		265.08	0.000321	2.71	26117.94	5866.04	0.18
Mud Creek	1000	97950	2 YR	7842.00	256.19	262.56		262.57	0.000244	1.79	12183.56	4963.56	0.15
Mud Creek	1000	97950	5 YR	12984.00	256.19	263.27		263.29	0.000300	2.20	15767.01	5119.93	0.17
Mud Creek	1000	97950	10 YR	16800.00	256.19	263.72		263.74	0.000329	2.43	18072.29	5218.04	0.18
Mud Creek	1000	97950	25 YR	20766.00	256.19	264.13		264.15	0.000355	2.65	20219.67	5307.81	0.19
Mud Creek	1000	97950	50 YR	24526.00	256.19	264.48		264.50	0.000377	2.83	22100.61	5385.21	0.20
Mud Creek	1000	97950	100 YR	28366.00	256.19	264.81		264.84	0.000396	3.00	23899.62	5458.21	0.20
Mud Creek	1000	96975	2 YR	7842.00	255.84	262.50	260.42	262.51	0.000172	1.57	13619.71	5026.81	0.13
Mud Creek	1000	96975	5 YR	12984.00	255.84	263.19	260.63	263.21	0.000231	1.99	17161.14	5179.49	0.15
Mud Creek	1000	96975	10 YR	16800.00	255.84	263.63	260.77	263.65	0.000262	2.24	19445.49	5275.62	0.16
Mud Creek	1000	96975	25 YR	20766.00	255.84	264.03	260.89	264.05	0.000291	2.46	21571.83	5363.56	0.17
Mud Creek	1000	96975	50 YR	24526.00	255.84	264.37	261.04	264.40	0.000315	2.65	23434.86	5439.44	0.18
Mud Creek	1000	96975	100 YR	28366.00	255.84	264.70	261.15	264.73	0.000336	2.83	25216.88	5511.04	0.19
Mud Creek	1000	96950		Bridge									
Mud Creek	1000	96925	2 YR	7842.00	255.82	262.43		262.46	0.000575	2.02	8494.39	4532.22	0.17
Mud Creek	1000	96925	5 YR	12984.00	255.82	263.13		263.16	0.000618	2.32	11716.62	4699.75	0.18
Mud Creek	1000	96925	10 YR	16800.00	255.82	263.57		263.60	0.000637	2.49	13796.32	4804.78	0.19
Mud Creek	1000	96925	25 YR	20766.00	255.82	263.97		264.01	0.000658	2.66	15733.21	4900.57	0.20
Mud Creek	1000	96925	50 YR	24526.00	255.82	264.31		264.35	0.000675	2.80	17433.49	4983.15	0.20
Mud Creek	1000	96925	100 YR	28366.00	255.82	264.63		264.68	0.000691	2.93	19062.66	5061.00	0.20

HEC-RAS Plan: Prop LEM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	95200	2 YR	7842.00	255.19	261.67		261.70	0.000711	2.20	7883.73	4499.76	0.19
Mud Creek	1000	95200	5 YR	12984.00	255.19	262.36		262.39	0.000734	2.48	11050.12	4665.59	0.20
Mud Creek	1000	95200	10 YR	16800.00	255.19	262.79		262.83	0.000742	2.64	13106.86	4770.22	0.20
Mud Creek	1000	95200	25 YR	20766.00	255.19	263.18		263.22	0.000765	2.81	14958.11	4862.47	0.21
Mud Creek	1000	95200	50 YR	24526.00	255.19	263.51		263.56	0.000785	2.96	16577.54	4941.75	0.21
Mud Creek	1000	95200	100 YR	28366.00	255.19	263.82		263.87	0.000804	3.10	18124.21	5016.30	0.22
Mud Creek	1000	93700	2 YR	7842.00	254.65	260.70		260.76	0.001089	2.12	5287.13	4044.77	0.20
Mud Creek	1000	93700	5 YR	12984.00	254.65	261.50		261.56	0.000998	2.34	8633.21	4270.13	0.20
Mud Creek	1000	93700	10 YR	16800.00	254.65	261.98		262.04	0.000972	2.48	10691.38	4403.02	0.20
Mud Creek	1000	93700	25 YR	20766.00	254.65	262.35		262.42	0.001014	2.67	12356.01	4507.63	0.21
Mud Creek	1000	93700	50 YR	24526.00	254.65	262.67		262.75	0.001050	2.83	13802.31	4596.60	0.22
Mud Creek	1000	93700	100 YR	28366.00	254.65	262.96		263.05	0.001084	2.98	15175.26	4679.48	0.22
Mud Creek	1000	91800	2 YR	7842.00	253.96	258.69		258.75	0.001126	1.92	4076.06	1723.17	0.22
Mud Creek	1000	91800	5 YR	12984.00	253.96	259.61		259.69	0.001194	2.23	5819.00	2058.89	0.23
Mud Creek	1000	91800	10 YR	16800.00	253.96	260.14		260.23	0.001194	2.41	7288.40	4533.53	0.24
Mud Creek	1000	91800	25 YR	20766.00	253.96	260.60		260.70	0.001095	2.52	9385.19	4640.94	0.23
Mud Creek	1000	91800	50 YR	24526.00	253.96	260.97		261.07	0.001043	2.62	11103.97	4727.18	0.23
Mud Creek	1000	91800	100 YR	28366.00	253.96	261.30		261.40	0.001012	2.73	12682.83	4805.02	0.23
Mud Creek	1000	90600	2 YR	7842.00	253.52	257.92		257.94	0.000434	1.14	6883.85	3126.24	0.14
Mud Creek	1000	90600	5 YR	12984.00	253.52	258.83		258.86	0.000437	1.30	10023.47	3772.38	0.14
Mud Creek	1000	90600	10 YR	16800.00	253.52	259.37		259.40	0.000440	1.38	12133.67	4150.52	0.14
Mud Creek	1000	90600	25 YR	20766.00	253.52	259.84		259.88	0.000442	1.46	14190.89	4488.61	0.15
Mud Creek	1000	90600	50 YR	24526.00	253.52	260.24		260.27	0.000428	1.53	16003.33	4668.79	0.14
Mud Creek	1000	90600	100 YR	28366.00	253.52	260.59		260.63	0.000415	1.61	17659.71	4770.57	0.15
Mud Creek	1000	89850	2 YR	7842.00	253.25	257.63		257.65	0.000351	1.17	6677.82	3049.51	0.14
Mud Creek	1000	89850	5 YR	12984.00	253.25	258.54		258.57	0.000353	1.33	9735.90	3682.14	0.14
Mud Creek	1000	89850	10 YR	16800.00	253.25	259.07		259.10	0.000354	1.43	11788.81	4051.79	0.15
Mud Creek	1000	89850	25 YR	20766.00	253.25	259.54		259.58	0.000356	1.51	13788.51	4381.98	0.15
Mud Creek	1000	89850	50 YR	24526.00	253.25	259.94		259.98	0.000359	1.57	15587.59	4659.10	0.15
Mud Creek	1000	89850	100 YR	28366.00	253.25	260.30		260.35	0.000343	1.64	17299.19	4763.76	0.15
Mud Creek	1000	88850	2 YR	7842.00	252.89	257.29		257.32	0.000317	1.28	6134.17	2786.54	0.15
Mud Creek	1000	88850	5 YR	12984.00	252.89	258.20		258.23	0.000321	1.46	8912.61	3358.84	0.16
Mud Creek	1000	88850	10 YR	16800.00	252.89	258.72		258.76	0.000324	1.56	10770.97	3692.44	0.16
Mud Creek	1000	88850	25 YR	20766.00	252.89	259.19		259.24	0.000327	1.65	12577.67	3990.13	0.16
Mud Creek	1000	88850	50 YR	24526.00	252.89	259.59		259.64	0.000330	1.73	14204.52	4240.33	0.17
Mud Creek	1000	88850	100 YR	28366.00	252.89	259.96		260.01	0.000332	1.79	15805.96	4472.98	0.17
Mud Creek	1000	87600	2 YR	7842.00	252.43	256.89		256.92	0.000326	1.15	6846.46	3066.91	0.14
Mud Creek	1000	87600	5 YR	12984.00	252.43	257.79		257.82	0.000337	1.32	9869.46	3682.27	0.14
Mud Creek	1000	87600	10 YR	16800.00	252.43	258.31		258.34	0.000344	1.41	11882.00	4040.30	0.15
Mud Creek	1000	87600	25 YR	20766.00	252.43	258.78		258.81	0.000350	1.50	13834.05	4359.57	0.15
Mud Creek	1000	87600	50 YR	24526.00	252.43	259.17		259.21	0.000355	1.57	15590.82	4628.10	0.15
Mud Creek	1000	87600	100 YR	28366.00	252.43	259.53		259.57	0.000359	1.64	17324.01	4878.57	0.15
Mud Creek	1000	85350	2 YR	7842.00	251.62	256.05		256.07	0.000433	1.14	6863.17	3095.52	0.14
Mud Creek	1000	85350	5 YR	12984.00	251.62	256.91		256.93	0.000465	1.33	9754.79	3690.45	0.14
Mud Creek	1000	85350	10 YR	16800.00	251.62	257.40		257.43	0.000483	1.44	11660.05	4034.79	0.15
Mud Creek	1000	85350	25 YR	20766.00	251.62	257.84		257.88	0.000498	1.54	13511.69	4343.36	0.15
Mud Creek	1000	85350	50 YR	24526.00	251.62	258.22		258.26	0.000509	1.62	15185.46	4604.52	0.16
Mud Creek	1000	85350	100 YR	28366.00	251.62	258.57		258.61	0.000515	1.68	16859.07	4851.63	0.16
Mud Creek	1000	83800	2 YR	7842.00	251.05	255.30		255.32	0.000545	1.25	6294.70	2965.04	0.15
Mud Creek	1000	83800	5 YR	12984.00	251.05	256.08		256.11	0.000607	1.47	8825.81	3510.92	0.16
Mud Creek	1000	83800	10 YR	16800.00	251.05	256.53		256.57	0.000641	1.60	10486.75	3827.05	0.17
Mud Creek	1000	83800	25 YR	20766.00	251.05	256.94		256.99	0.000666	1.71	12119.94	4114.28	0.18
Mud Creek	1000	83800	50 YR	24526.00	251.05	257.30		257.35	0.000681	1.80	13622.17	4361.81	0.18
Mud Creek	1000	83800	100 YR	28366.00	251.05	257.64		257.70	0.000682	1.87	15177.41	4604.07	0.18
Mud Creek	1000	82200	2 YR	7842.00	250.47	253.36		253.46	0.003965	2.60	3018.19	2090.58	0.38
Mud Creek	1000	82200	5 YR	12984.00	250.47	254.09		254.21	0.003253	2.74	4744.85	2621.23	0.36
Mud Creek	1000	82200	10 YR	16800.00	250.47	254.55		254.67	0.002885	2.79	6021.02	2952.76	0.34
Mud Creek	1000	82200	25 YR	20766.00	250.47	255.00		255.12	0.002516	2.79	7430.67	3280.25	0.33
Mud Creek	1000	82200	50 YR	24526.00	250.47	255.45		255.56	0.002122	2.73	8973.53	3604.75	0.31
Mud Creek	1000	82200	100 YR	28366.00	250.47	255.94		256.04	0.001722	2.62	10823.47	3958.92	0.28
Mud Creek	1000	80150	2 YR	7842.00	249.62	252.19		252.20	0.000232	0.83	9443.21	4309.47	0.10
Mud Creek	1000	80150	5 YR	12984.00	249.62	252.92		252.93	0.000247	1.03	12594.79	4345.88	0.11
Mud Creek	1000	80150	10 YR	16800.00	249.62	253.41		253.43	0.000246	1.14	14742.17	4370.51	0.11
Mud Creek	1000	80150	25 YR	20766.00	249.62	253.97		253.99	0.000228	1.21	17182.72	4398.35	0.11
Mud Creek	1000	80150	50 YR	24526.00	249.62	254.55		254.57	0.000201	1.24	19747.72	4427.41	0.10
Mud Creek	1000	80150	100 YR	28366.00	249.62	255.17		255.19	0.000176	1.26	22492.98	4458.30	0.10
Mud Creek	1000	78800	2 YR	7842.00	248.93	251.84		251.86	0.000274	0.98	8151.56	4185.85	0.12
Mud Creek	1000	78800	5 YR	12984.00	248.93	252.56		252.59	0.000270	1.20	11201.17	4297.30	0.13
Mud Creek	1000	78800	10 YR	16800.00	248.93	253.06		253.09	0.000257	1.30	13374.86	4375.00	0.13
Mud Creek	1000	78800	25 YR	20766.00	248.93	253.66		253.69	0.000222	1.36	15995.41	4466.88	0.12
Mud Creek	1000	78800	50 YR	24526.00	248.93	254.28		254.31	0.000186	1.37	18815.18	4563.67	0.11
Mud Creek	1000	78800	100 YR	28366.00	248.93	254.94		254.97	0.000156	1.38	21842.83	4665.37	0.11
Mud Creek	1000	77500	2 YR	7842.00	248.27	251.38		251.41	0.000443	1.53	6095.24	3208.83	0.18
Mud Creek	1000	77500	5 YR	12984.00	248.27	252.09		252.14	0.000461	1.88	8390.57	3290.06	0.19

## HEC-RAS Plan: Prop LEM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	77500	10 YR	16800.00	248.27	252.61		252.66	0.000436	2.03	10119.36	3349.94	0.19
Mud Creek	1000	77500	25 YR	20766.00	248.27	253.26		253.32	0.000363	2.08	12340.59	3425.35	0.18
Mud Creek	1000	77500	50 YR	24526.00	248.27	253.95		254.01	0.000296	2.08	14725.85	3504.51	0.17
Mud Creek	1000	77500	100 YR	28366.00	248.27	254.66		254.72	0.000245	2.08	17229.43	3585.73	0.16
Mud Creek	1000	76300	2 YR	7842.00	247.66	250.82		250.85	0.000495	1.31	6052.81	3185.01	0.16
Mud Creek	1000	76300	5 YR	12984.00	247.66	251.52		251.56	0.000494	1.60	8331.36	3342.10	0.17
Mud Creek	1000	76300	10 YR	16800.00	247.66	252.10		252.14	0.000429	1.69	10290.62	3471.50	0.17
Mud Creek	1000	76300	25 YR	20766.00	247.66	252.86		252.91	0.000319	1.68	13027.38	3644.56	0.15
Mud Creek	1000	76300	50 YR	24526.00	247.66	253.64		253.68	0.000243	1.65	15925.64	3819.30	0.13
Mud Creek	1000	76300	100 YR	28366.00	247.66	254.41		254.45	0.000196	1.63	18916.77	3991.62	0.12
Mud Creek	1000	74900	2 YR	7842.00	246.95	250.13		250.16	0.000491	1.32	5960.36	3624.09	0.18
Mud Creek	1000	74900	5 YR	12984.00	246.95	250.94		250.98	0.000354	1.46	8966.98	3774.45	0.16
Mud Creek	1000	74900	10 YR	16800.00	246.95	251.65		251.68	0.000255	1.46	11669.18	3904.65	0.14
Mud Creek	1000	74900	25 YR	20766.00	246.95	252.56		252.59	0.000166	1.40	15308.04	4073.41	0.12
Mud Creek	1000	74900	50 YR	24526.00	246.95	253.42		253.44	0.000122	1.36	18866.41	4231.94	0.11
Mud Creek	1000	74900	100 YR	28366.00	246.95	254.23		254.26	0.000097	1.34	22365.79	4382.24	0.10
Mud Creek	1000	72400	2 YR	7842.00	245.67	249.21		249.22	0.000298	0.94	8371.26	4735.66	0.12
Mud Creek	1000	72400	5 YR	12984.00	245.67	250.38		250.39	0.000161	0.88	14786.75	5868.79	0.10
Mud Creek	1000	72400	10 YR	16800.00	245.67	251.29		251.30	0.000097	0.84	20187.54	6032.16	0.08
Mud Creek	1000	72400	25 YR	20766.00	245.67	252.34		252.35	0.000061	0.79	26596.82	6220.48	0.07
Mud Creek	1000	72400	50 YR	24526.00	245.67	253.25		253.26	0.000046	0.77	32379.36	6385.61	0.06
Mud Creek	1000	72400	100 YR	28366.00	245.67	254.10		254.11	0.000037	0.77	37840.87	6537.75	0.05
Mud Creek	1000	71200	2 YR	7842.00	245.06	248.95		248.96	0.000165	0.74	10562.73	5432.06	0.09
Mud Creek	1000	71200	5 YR	12984.00	245.06	250.24		250.25	0.000092	0.69	18714.31	6921.77	0.07
Mud Creek	1000	71200	10 YR	16800.00	245.06	251.21		251.21	0.000056	0.66	25427.99	7008.52	0.06
Mud Creek	1000	71200	25 YR	20766.00	245.06	252.28		252.29	0.000036	0.63	33029.42	7105.46	0.05
Mud Creek	1000	71200	50 YR	24526.00	245.06	253.21		253.22	0.000028	0.62	39681.30	7189.22	0.05
Mud Creek	1000	71200	100 YR	28366.00	245.06	254.07		254.07	0.000023	0.63	45841.32	7265.93	0.04
Mud Creek	1000	69000	2 YR	9467.00	243.94	248.61	245.80	248.63	0.000139	0.88	10725.97	4589.40	0.10
Mud Creek	1000	69000	5 YR	15670.00	243.94	250.03	246.22	250.05	0.000092	0.86	18231.46	5952.90	0.09
Mud Creek	1000	69000	10 YR	20280.00	243.94	251.08	246.47	251.09	0.000058	0.83	24477.53	6041.43	0.07
Mud Creek	1000	69000	25 YR	25082.00	243.94	252.19	246.69	252.20	0.000040	0.81	31292.15	6136.56	0.06
Mud Creek	1000	69000	50 YR	29634.00	243.94	253.14	246.88	253.15	0.000032	0.80	37152.15	6217.20	0.06
Mud Creek	1000	69000	100 YR	34129.00	243.94	254.01	247.05	254.02	0.000027	0.81	42544.30	6290.48	0.05
Mud Creek	1000	68800		Bridge									
Mud Creek	1000	68650	2 YR	9467.00	243.77	248.01		248.03	0.000379	1.19	7930.54	3742.00	0.14
Mud Creek	1000	68650	5 YR	15670.00	243.77	249.71		249.72	0.000172	1.01	15555.61	5240.78	0.10
Mud Creek	1000	68650	10 YR	20280.00	243.77	250.82		250.84	0.000102	0.94	21711.74	5603.11	0.08
Mud Creek	1000	68650	25 YR	25082.00	243.77	251.99		252.00	0.000066	0.89	28323.36	5748.71	0.07
Mud Creek	1000	68650	50 YR	29634.00	243.77	252.95		252.97	0.000051	0.88	33927.17	5869.30	0.06
Mud Creek	1000	68650	100 YR	34129.00	243.77	253.82		253.84	0.000043	0.89	39073.25	5977.89	0.06
Mud Creek	1000	67650	2 YR	9467.00	243.26	247.71		247.72	0.000249	1.00	9471.38	4257.66	0.12
Mud Creek	1000	67650	5 YR	15670.00	243.26	249.58		249.59	0.000105	0.82	19096.16	6045.58	0.08
Mud Creek	1000	67650	10 YR	20280.00	243.26	250.75		250.76	0.000064	0.76	26580.89	6496.77	0.07
Mud Creek	1000	67650	25 YR	25082.00	243.26	251.94		251.95	0.000042	0.73	34372.16	6571.30	0.06
Mud Creek	1000	67650	50 YR	29634.00	243.26	252.92		252.92	0.000033	0.73	40812.26	6632.27	0.05
Mud Creek	1000	67650	100 YR	34129.00	243.26	253.79		253.80	0.000029	0.74	46637.68	6686.94	0.05
Mud Creek	1000	66450	2 YR	9467.00	242.65	247.54		247.55	0.000092	0.74	12783.56	5225.55	0.08
Mud Creek	1000	66450	5 YR	15670.00	242.65	249.50		249.51	0.000042	0.62	25093.12	7321.22	0.06
Mud Creek	1000	66450	10 YR	20280.00	242.65	250.70		250.71	0.000027	0.59	35087.18	8885.18	0.05
Mud Creek	1000	66450	25 YR	25082.00	242.65	251.91		251.92	0.000018	0.57	45858.25	8945.58	0.04
Mud Creek	1000	66450	50 YR	29634.00	242.65	252.89		252.90	0.000014	0.57	54664.82	8994.67	0.04
Mud Creek	1000	66450	100 YR	34129.00	242.65	253.77		253.78	0.000012	0.57	62583.67	9038.58	0.04
Mud Creek	1000	64850	2 YR	9467.00	241.83	247.39		247.40	0.000092	0.81	11743.54	4221.82	0.09
Mud Creek	1000	64850	5 YR	15670.00	241.83	249.43		249.44	0.000048	0.71	21924.06	5768.47	0.06
Mud Creek	1000	64850	10 YR	20280.00	241.83	250.65		250.66	0.000033	0.69	29389.37	6229.42	0.06
Mud Creek	1000	64850	25 YR	25082.00	241.83	251.88		251.88	0.000024	0.68	37040.30	6284.44	0.05
Mud Creek	1000	64850	50 YR	29634.00	241.83	252.86		252.87	0.000020	0.69	43267.86	6328.88	0.05
Mud Creek	1000	64850	100 YR	34129.00	241.83	253.75		253.75	0.000018	0.70	48863.18	6368.54	0.04
Mud Creek	1000	63250	2 YR	9467.00	241.02	247.24		247.24	0.000106	0.71	13340.56	4292.00	0.07
Mud Creek	1000	63250	5 YR	15670.00	241.02	249.35		249.35	0.000061	0.65	23930.45	5748.42	0.06
Mud Creek	1000	63250	10 YR	20280.00	241.02	250.59		250.60	0.000045	0.64	31518.97	6223.70	0.05
Mud Creek	1000	63250	25 YR	25082.00	241.02	251.83		251.84	0.000034	0.64	39265.53	6273.29	0.04
Mud Creek	1000	63250	50 YR	29634.00	241.02	252.83		252.83	0.000029	0.65	45522.70	6313.06	0.04
Mud Creek	1000	63250	100 YR	34129.00	241.02	253.71		253.72	0.000026	0.67	51126.74	6348.47	0.04
Mud Creek	1000	61950	2 YR	9467.00	240.36	247.15		247.15	0.000049	0.67	14094.14	4153.57	0.06
Mud Creek	1000	61950	5 YR	15670.00	240.36	249.29		249.30	0.000031	0.64	24408.31	5466.02	0.05
Mud Creek	1000	61950	10 YR	20280.00	240.36	250.55		250.56	0.000024	0.64	31697.23	5938.54	0.05
Mud Creek	1000	61950	25 YR	25082.00	240.36	251.80		251.81	0.000018	0.64	39175.64	6026.05	0.04
Mud Creek	1000	61950	50 YR	29634.00	240.36	252.80		252.81	0.000016	0.66	45226.93	6095.94	0.04
Mud Creek	1000	61950	100 YR	34129.00	240.36	253.69		253.69	0.000015	0.68	50664.90	6158.07	0.04
Mud Creek	1000	60750	2 YR	9467.00	239.83	247.08		247.09	0.000066	1.28	17384.52	4504.06	0.08
Mud Creek	1000	60750	5 YR	15670.00	239.83	249.24		249.25	0.000053	1.36	28485.93	5758.84	0.08

HEC-RAS Plan: Prop LEM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	60750	10 YR	20280.00	239.83	250.51		250.52	0.000047	1.40	36192.90	6245.69	0.08
Mud Creek	1000	60750	25 YR	25082.00	239.83	251.77		251.78	0.000039	1.39	44125.72	6358.97	0.07
Mud Creek	1000	60750	50 YR	29634.00	239.83	252.77		252.78	0.000036	1.41	50542.09	6449.14	0.07
Mud Creek	1000	60750	100 YR	34129.00	239.83	253.66		253.67	0.000035	1.44	56314.48	6529.20	0.07
Mud Creek	1000	58800	2 YR	9467.00	239.18	247.06		247.06	0.000005	0.36	33233.34	5902.30	0.02
Mud Creek	1000	58800	5 YR	15670.00	239.18	249.22		249.22	0.000005	0.44	46905.70	6745.49	0.03
Mud Creek	1000	58800	10 YR	20280.00	239.18	250.49		250.49	0.000006	0.49	55726.20	7071.89	0.03
Mud Creek	1000	58800	25 YR	25082.00	239.18	251.75		251.75	0.000006	0.53	64663.76	7128.54	0.03
Mud Creek	1000	58800	50 YR	29634.00	239.18	252.75		252.75	0.000006	0.57	71825.20	7173.60	0.03
Mud Creek	1000	58800	100 YR	34129.00	239.18	253.64		253.64	0.000006	0.61	78220.25	7213.60	0.03
Mud Creek	1000	57200	2 YR	9467.00	238.64	247.05		247.05	0.000002	0.23	45431.40	6681.02	0.01
Mud Creek	1000	57200	5 YR	15670.00	238.64	249.21		249.22	0.000003	0.29	60363.11	7134.94	0.02
Mud Creek	1000	57200	10 YR	20280.00	238.64	250.48		250.48	0.000003	0.33	69554.05	7331.26	0.02
Mud Creek	1000	57200	25 YR	25082.00	238.64	251.74		251.74	0.000003	0.36	78832.93	7413.07	0.02
Mud Creek	1000	57200	50 YR	29634.00	238.64	252.74		252.74	0.000003	0.39	86287.52	7478.15	0.02
Mud Creek	1000	57200	100 YR	34129.00	238.64	253.63		253.63	0.000004	0.42	92959.27	7535.92	0.02
Mud Creek	1000	55600	2 YR	9467.00	238.10	247.05		247.05	0.000004	0.34	29174.07	3963.72	0.02
Mud Creek	1000	55600	5 YR	15670.00	238.10	249.21		249.21	0.000005	0.44	37921.52	4136.50	0.02
Mud Creek	1000	55600	10 YR	20280.00	238.10	250.47		250.48	0.000005	0.50	43212.96	4203.78	0.03
Mud Creek	1000	55600	25 YR	25082.00	238.10	251.73		251.73	0.000006	0.56	48506.27	4213.84	0.03
Mud Creek	1000	55600	50 YR	29634.00	238.10	252.73		252.74	0.000006	0.61	52724.75	4221.84	0.03
Mud Creek	1000	55600	100 YR	34129.00	238.10	253.62		253.62	0.000007	0.66	56475.48	4228.94	0.03
Mud Creek	1000	53900	2 YR	9467.00	237.53	247.04		247.04	0.000001	0.21	46355.24	6004.33	0.01
Mud Creek	1000	53900	5 YR	15670.00	237.53	249.20		249.20	0.000002	0.28	59553.81	6220.26	0.02
Mud Creek	1000	53900	10 YR	20280.00	237.53	250.47		250.47	0.000002	0.32	67497.20	6314.04	0.02
Mud Creek	1000	53900	25 YR	25082.00	237.53	251.73		251.73	0.000002	0.35	75461.45	6351.77	0.02
Mud Creek	1000	53900	50 YR	29634.00	237.53	252.73		252.73	0.000002	0.39	81828.42	6381.77	0.02
Mud Creek	1000	53900	100 YR	34129.00	237.53	253.61		253.62	0.000003	0.42	87504.42	6408.40	0.02
Mud Creek	1000	52600	2 YR	9467.00	237.09	247.04		247.04	0.000002	0.24	40050.07	4875.24	0.01
Mud Creek	1000	52600	5 YR	15670.00	237.09	249.20		249.20	0.000002	0.32	50664.82	4959.62	0.02
Mud Creek	1000	52600	10 YR	20280.00	237.09	250.46		250.47	0.000003	0.37	56967.09	4999.77	0.02
Mud Creek	1000	52600	25 YR	25082.00	237.09	251.72		251.72	0.000003	0.41	63267.75	5023.77	0.02
Mud Creek	1000	52600	50 YR	29634.00	237.09	252.72		252.72	0.000003	0.45	68298.91	5042.86	0.02
Mud Creek	1000	52600	100 YR	34129.00	237.09	253.61		253.61	0.000004	0.48	72780.02	5059.79	0.02
Mud Creek	1000	51700	2 YR	9467.00	236.78	247.04		247.04	0.000004	0.27	36451.00	4527.88	0.02
Mud Creek	1000	51700	5 YR	15670.00	236.78	249.20		249.20	0.000005	0.35	46395.81	4689.71	0.02
Mud Creek	1000	51700	10 YR	20280.00	236.78	250.46		250.46	0.000006	0.41	52391.86	4814.92	0.02
Mud Creek	1000	51700	25 YR	25082.00	236.78	251.72		251.72	0.000006	0.45	58554.33	4992.12	0.02
Mud Creek	1000	51700	50 YR	29634.00	236.78	252.72		252.72	0.000007	0.50	63612.56	5133.00	0.02
Mud Creek	1000	51700	100 YR	34129.00	236.78	253.60		253.61	0.000007	0.54	68219.36	5258.02	0.02
Mud Creek	1000	49500	2 YR	9467.00	236.04	247.03		247.03	0.000001	0.22	43229.91	4946.18	0.01
Mud Creek	1000	49500	5 YR	15670.00	236.04	249.19		249.19	0.000002	0.30	53977.16	5021.65	0.02
Mud Creek	1000	49500	10 YR	20280.00	236.04	250.45		250.46	0.000002	0.34	60349.20	5065.87	0.02
Mud Creek	1000	49500	25 YR	25082.00	236.04	251.71		251.71	0.000003	0.39	66739.99	5109.83	0.02
Mud Creek	1000	49500	50 YR	29634.00	236.04	252.71		252.71	0.000003	0.42	71859.32	5144.78	0.02
Mud Creek	1000	49500	100 YR	34129.00	236.04	253.59		253.60	0.000003	0.46	76431.41	5175.79	0.02
Mud Creek	1000	47200	2 YR	9467.00	235.27	247.03		247.03	0.000003	0.32	44778.63	6244.87	0.02
Mud Creek	1000	47200	5 YR	15670.00	235.27	249.18		249.19	0.000004	0.41	58630.36	6611.20	0.02
Mud Creek	1000	47200	10 YR	20280.00	235.27	250.45		250.45	0.000004	0.47	67100.30	6774.53	0.02
Mud Creek	1000	47200	25 YR	25082.00	235.27	251.70		251.70	0.000004	0.52	75648.91	6843.58	0.02
Mud Creek	1000	47200	50 YR	29634.00	235.27	252.70		252.70	0.000005	0.56	82504.62	6898.46	0.03
Mud Creek	1000	47200	100 YR	34129.00	235.27	253.58		253.59	0.000005	0.61	88633.91	6947.15	0.03
Mud Creek	1000	46450	2 YR	9467.00	235.02	247.03		247.03	0.000004	0.33	51757.04	8169.87	0.02
Mud Creek	1000	46450	5 YR	15670.00	235.02	249.18		249.18	0.000005	0.41	70240.25	8988.55	0.02
Mud Creek	1000	46450	10 YR	20280.00	235.02	250.44		250.44	0.000005	0.46	81856.45	9326.55	0.02
Mud Creek	1000	46450	25 YR	25082.00	235.02	251.70		251.70	0.000005	0.50	93612.88	9401.88	0.02
Mud Creek	1000	46450	50 YR	29634.00	235.02	252.70		252.70	0.000005	0.53	103023.00	9461.74	0.02
Mud Creek	1000	46450	100 YR	34129.00	235.02	253.58		253.58	0.000006	0.57	111422.80	9514.86	0.02
Mud Creek	1000	44950	2 YR	9467.00	234.51	247.02		247.02	0.000003	0.25	75999.84	12461.75	0.01
Mud Creek	1000	44950	5 YR	15670.00	234.51	249.18		249.18	0.000003	0.30	104117.40	13646.41	0.02
Mud Creek	1000	44950	10 YR	20280.00	234.51	250.44		250.44	0.000003	0.33	121736.40	14161.21	0.02
Mud Creek	1000	44950	25 YR	25082.00	234.51	251.69		251.69	0.000003	0.35	139626.20	14336.98	0.02
Mud Creek	1000	44950	50 YR	29634.00	234.51	252.69		252.69	0.000003	0.37	153998.30	14476.64	0.02
Mud Creek	1000	44950	100 YR	34129.00	234.51	253.58		253.58	0.000004	0.39	166867.30	14600.56	0.02
Angelina River	Upstream	71106	2 YR	12944.00	246.00	252.10		252.14	0.000306	1.66	7852.03	1982.69	0.14
Angelina River	Upstream	71106	5 YR	21707.00	246.00	253.52		253.58	0.000316	2.06	10711.80	2042.79	0.15
Angelina River	Upstream	71106	10 YR	28205.00	246.00	254.43		254.51	0.000319	2.30	12587.34	2081.26	0.16
Angelina River	Upstream	71106	25 YR	35110.00	246.00	255.34		255.43	0.000317	2.50	14497.88	2119.74	0.16
Angelina River	Upstream	71106	50 YR	41349.00	246.00	256.11		256.22	0.000312	2.65	16159.93	2152.65	0.16
Angelina River	Upstream	71106	100 YR	47334.00	246.00	256.83		256.95	0.000307	2.78	17715.28	2183.00	0.16
Angelina River	Upstream	69124	2 YR	12944.00	245.00	251.33		251.40	0.000466	2.24	6595.93	2295.57	0.20
Angelina River	Upstream	69124	5 YR	21707.00	245.00	252.79		252.89	0.000406	2.60	10016.76	2384.16	0.20
Angelina River	Upstream	69124	10 YR	28205.00	245.00	253.72		253.83	0.000382	2.81	12262.38	2440.58	0.20
Angelina River	Upstream	69124	25 YR	35110.00	245.00	254.66		254.78	0.000357	2.98	14582.08	2497.51	0.20

HEC-RAS Plan: Prop LEM (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Upstream	69124	50 YR	41349.00	245.00	255.47		255.60	0.000338	3.11	16609.04	2546.22	0.19
Angelina River	Upstream	69124	100 YR	47334.00	245.00	256.21		256.35	0.000322	3.22	18512.58	2591.13	0.19
Angelina River	Upstream	67228	2 YR	12944.00	244.00	250.63		250.68	0.000316	1.78	7271.03	2021.75	0.16
Angelina River	Upstream	67228	5 YR	21707.00	244.00	252.19		252.26	0.000268	2.08	10475.99	2068.61	0.16
Angelina River	Upstream	67228	10 YR	28205.00	244.00	253.16		253.24	0.000256	2.28	12483.00	2097.42	0.16
Angelina River	Upstream	67228	25 YR	35110.00	244.00	254.13		254.22	0.000242	2.45	14540.62	2126.55	0.16
Angelina River	Upstream	67228	50 YR	41349.00	244.00	254.96		255.06	0.000232	2.58	16314.84	2151.35	0.16
Angelina River	Upstream	67228	100 YR	47334.00	244.00	255.72		255.84	0.000224	2.69	17964.03	2174.15	0.16
Angelina River	Upstream	65531	2 YR	12944.00	242.00	250.19		250.22	0.000229	1.27	10195.51	2467.80	0.11
Angelina River	Upstream	65531	5 YR	21707.00	242.00	251.81		251.85	0.000215	1.53	14434.84	2771.40	0.11
Angelina River	Upstream	65531	10 YR	28205.00	242.00	252.79		252.83	0.000213	1.69	17234.12	2954.81	0.11
Angelina River	Upstream	65531	25 YR	35110.00	242.00	253.78		253.83	0.000206	1.82	20267.29	3141.49	0.12
Angelina River	Upstream	65531	50 YR	41349.00	242.00	254.63		254.68	0.000200	1.92	22994.68	3300.35	0.12
Angelina River	Upstream	65531	100 YR	47334.00	242.00	255.41		255.47	0.000193	2.00	25620.17	3446.36	0.11
Angelina River	Upstream	58835	2 YR	12944.00	241.00	247.54		247.60	0.000811	2.03	6386.45	1952.80	0.20
Angelina River	Upstream	58835	5 YR	21707.00	241.00	249.68		249.74	0.000505	1.93	11243.25	2591.04	0.16
Angelina River	Upstream	58835	10 YR	28205.00	241.00	250.92		250.97	0.000378	1.94	14562.91	2709.90	0.15
Angelina River	Upstream	58835	25 YR	35110.00	241.00	252.13		252.19	0.000298	1.97	17874.59	2740.28	0.13
Angelina River	Upstream	58835	50 YR	41349.00	241.00	253.11		253.17	0.000261	2.02	20569.06	2764.75	0.13
Angelina River	Upstream	58835	100 YR	47334.00	241.00	253.98		254.05	0.000238	2.07	22992.51	2786.58	0.13
Angelina River	Upstream	53947	2 YR	12944.00	236.00	247.08		247.09	0.000055	1.19	24605.01	4305.03	0.07
Angelina River	Upstream	53947	5 YR	21707.00	236.00	249.24		249.25	0.000059	1.43	34466.07	4831.31	0.08
Angelina River	Upstream	53947	10 YR	28205.00	236.00	250.51		250.52	0.000060	1.55	40743.13	5025.44	0.08
Angelina River	Upstream	53947	25 YR	35110.00	236.00	251.76		251.77	0.000058	1.63	47068.27	5048.79	0.08
Angelina River	Upstream	53947	50 YR	41349.00	236.00	252.76		252.77	0.000058	1.70	52118.71	5067.36	0.08
Angelina River	Upstream	53947	100 YR	47334.00	236.00	253.65		253.66	0.000058	1.77	56615.46	5083.84	0.08
Angelina River	Upstream	50340	2 YR	12944.00	235.00	247.03		247.03	0.000012	0.50	49317.26	7624.00	0.03
Angelina River	Upstream	50340	5 YR	21707.00	235.00	249.18		249.18	0.000013	0.60	66157.56	8016.57	0.03
Angelina River	Upstream	50340	10 YR	28205.00	235.00	250.44		250.44	0.000014	0.67	76407.71	8205.95	0.03
Angelina River	Upstream	50340	25 YR	35110.00	235.00	251.70		251.70	0.000015	0.73	86779.82	8319.43	0.03
Angelina River	Upstream	50340	50 YR	41349.00	235.00	252.69		252.70	0.000015	0.78	95122.39	8409.59	0.04
Angelina River	Upstream	50340	100 YR	47334.00	235.00	253.58		253.58	0.000016	0.82	102599.60	8489.59	0.04
Angelina River	Downstream	43601	2 YR	15651.00	234.06	246.95		247.00	0.000176	2.60	16735.27	4351.32	0.15
Angelina River	Downstream	43601	5 YR	26053.00	234.06	249.11		249.15	0.000154	2.77	27490.49	5623.62	0.14
Angelina River	Downstream	43601	10 YR	33765.00	234.06	250.37		250.41	0.000140	2.82	35034.76	6168.61	0.14
Angelina River	Downstream	43601	25 YR	43214.00	234.06	251.63		251.67	0.000127	2.85	42834.41	6231.51	0.13
Angelina River	Downstream	43601	50 YR	52369.00	234.06	252.63		252.67	0.000124	2.95	49065.51	6281.31	0.13
Angelina River	Downstream	43601	100 YR	61473.00	234.06	253.51		253.55	0.000123	3.05	54629.05	6325.44	0.13
Angelina River	Downstream	43600	2 YR	15651.00	234.06	246.95	242.29	247.00	0.000176	2.60	16734.47	4351.21	0.15
Angelina River	Downstream	43600	5 YR	26053.00	234.06	249.11	243.48	249.15	0.000154	2.77	27489.63	5623.53	0.14
Angelina River	Downstream	43600	10 YR	33765.00	234.06	250.37	244.12	250.41	0.000140	2.82	35033.91	6168.60	0.14
Angelina River	Downstream	43600	25 YR	43214.00	234.06	251.63	244.74	251.67	0.000127	2.85	42833.64	6231.50	0.13
Angelina River	Downstream	43600	50 YR	52369.00	234.06	252.63	245.24	252.67	0.000124	2.95	49064.75	6281.30	0.13
Angelina River	Downstream	43600	100 YR	61473.00	234.06	253.51	245.64	253.55	0.000123	3.05	54628.28	6325.43	0.13
Angelina River	Downstream	43250		Bridge									
Angelina River	Downstream	42900	2 YR	15651.00	233.82	246.79		246.81	0.000124	1.90	18725.58	3531.98	0.11
Angelina River	Downstream	42900	5 YR	26053.00	233.82	248.97		249.00	0.000128	2.21	27037.68	4088.28	0.11
Angelina River	Downstream	42900	10 YR	33765.00	233.82	250.24		250.27	0.000132	2.40	32435.89	4397.61	0.12
Angelina River	Downstream	42900	25 YR	43214.00	233.82	251.50		251.54	0.000140	2.62	38128.31	4643.17	0.12
Angelina River	Downstream	42900	50 YR	52369.00	233.82	252.50		252.53	0.000150	2.83	42829.20	4836.57	0.13
Angelina River	Downstream	42900	100 YR	61473.00	233.82	253.37		253.41	0.000159	3.03	47150.59	5007.77	0.13
Angelina River	Downstream	40400	2 YR	15651.00	232.98	246.49		246.51	0.000180	2.30	18463.79	4078.20	0.13
Angelina River	Downstream	40400	5 YR	26053.00	232.98	248.69		248.71	0.000164	2.52	28399.54	4967.86	0.13
Angelina River	Downstream	40400	10 YR	33765.00	232.98	249.96		249.99	0.000160	2.66	35052.51	5483.48	0.13
Angelina River	Downstream	40400	25 YR	43214.00	232.98	251.22		251.24	0.000158	2.80	42348.25	5830.40	0.13
Angelina River	Downstream	40400	50 YR	52369.00	232.98	252.20		252.23	0.000156	2.90	48115.84	5855.08	0.13
Angelina River	Downstream	40400	100 YR	61473.00	232.98	253.07		253.11	0.000156	3.01	53226.81	5876.86	0.13
Angelina River	Downstream	39350	2 YR	15651.00	232.63	246.44		246.44	0.000040	0.95	35690.58	6570.21	0.05
Angelina River	Downstream	39350	5 YR	26053.00	232.63	248.64		248.64	0.000039	1.07	50978.02	7329.12	0.05
Angelina River	Downstream	39350	10 YR	33765.00	232.63	249.91		249.91	0.000040	1.16	60588.66	7768.35	0.06
Angelina River	Downstream	39350	25 YR	43214.00	232.63	251.16		251.17	0.000041	1.25	70420.76	7858.23	0.06
Angelina River	Downstream	39350	50 YR	52369.00	232.63	252.15		252.16	0.000043	1.34	78190.07	7907.51	0.06
Angelina River	Downstream	39350	100 YR	61473.00	232.63	253.02		253.03	0.000046	1.42	85085.46	7950.99	0.06
Angelina River	Downstream	36950	2 YR	15651.00	231.82	246.21		246.30	0.000242	3.12	11729.07	2546.46	0.17
Angelina River	Downstream	36950	5 YR	26053.00	231.82	248.41		248.50	0.000248	3.60	17955.06	3127.98	0.18
Angelina River	Downstream	36950	10 YR	33765.00	231.82	249.67		249.78	0.000253	3.87	22126.42	3463.39	0.18
Angelina River	Downstream	36950	25 YR	43214.00	231.82	250.92		251.03	0.000257	4.13	27073.12	4127.72	0.19
Angelina River	Downstream	36950	50 YR	52369.00	231.82	251.90		252.02	0.000258	4.32	31131.34	4157.11	0.19
Angelina River	Downstream	36950	100 YR	61473.00	231.82	252.76		252.88	0.000262	4.51	34721.89	4182.94	0.19
Angelina River	Downstream	33750	2 YR	15651.00	230.74	244.91		245.16	0.000739	4.43	5738.99	1428.07	0.23
Angelina River	Downstream	33750	5 YR	26053.00	230.74	247.04		247.34	0.000820	5.23	9326.84	1939.47	0.25
Angelina River	Downstream	33750	10 YR	33765.00	230.74	248.29		248.61	0.000835	5.60	11948.04	2240.47	0.26
Angelina River	Downstream	33750	25 YR	43214.00	230.74	249.53		249.86	0.000861	6.00	14894.61	2536.55	0.26

## HEC-RAS Plan: Prop LEM (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Downstream	33750	50 YR	52369.00	230.74	250.51		250.85	0.000870	6.28	17472.38	2667.80	0.27
Angelina River	Downstream	33750	100 YR	61473.00	230.74	251.37		251.72	0.000868	6.48	19790.91	2698.04	0.27
Angelina River	Downstream	32550	2 YR	15651.00	230.34	244.26		244.42	0.000736	4.38	7541.04	1937.85	0.26
Angelina River	Downstream	32550	5 YR	26053.00	230.34	246.53		246.69	0.000596	4.57	12423.20	2358.32	0.24
Angelina River	Downstream	32550	10 YR	33765.00	230.34	247.84		247.99	0.000558	4.75	15658.71	2599.77	0.24
Angelina River	Downstream	32550	25 YR	43214.00	230.34	249.09		249.26	0.000555	5.05	19065.44	2831.84	0.24
Angelina River	Downstream	32550	50 YR	52369.00	230.34	250.07		250.25	0.000569	5.35	21937.88	3003.70	0.24
Angelina River	Downstream	32550	100 YR	61473.00	230.34	250.94		251.13	0.000579	5.60	24565.21	3047.12	0.25
Angelina River	Downstream	30950	2 YR	15651.00	229.81	241.45		242.50	0.002132	8.28	2131.58	578.55	0.49
Angelina River	Downstream	30950	5 YR	26053.00	229.81	242.90		244.74	0.003223	11.26	3233.06	945.66	0.62
Angelina River	Downstream	30950	10 YR	33765.00	229.81	243.89		246.09	0.003582	12.62	4292.66	1196.89	0.66
Angelina River	Downstream	30950	25 YR	43214.00	229.81	245.22		247.44	0.003384	13.21	6121.76	1536.79	0.65
Angelina River	Downstream	30950	50 YR	52369.00	229.81	246.55		248.55	0.002932	13.14	8379.34	1873.12	0.62
Angelina River	Downstream	30950	100 YR	61473.00	229.81	247.80		249.55	0.002509	12.87	10916.43	2190.30	0.58
Angelina River	Downstream	29800	2 YR	15651.00	229.43	241.41		241.52	0.000288	2.65	7169.59	1943.91	0.18
Angelina River	Downstream	29800	5 YR	26053.00	229.43	243.27		243.41	0.000316	3.24	10952.85	2133.21	0.19
Angelina River	Downstream	29800	10 YR	33765.00	229.43	244.47		244.64	0.000318	3.54	13600.07	2256.24	0.20
Angelina River	Downstream	29800	25 YR	43214.00	229.43	245.85		246.03	0.000312	3.82	16792.02	2396.20	0.20
Angelina River	Downstream	29800	50 YR	52369.00	229.43	247.06		247.26	0.000306	4.04	19775.52	2520.00	0.20
Angelina River	Downstream	29800	100 YR	61473.00	229.43	248.18		248.39	0.000300	4.24	22653.40	2633.91	0.20
Angelina River	Downstream	29000	2 YR	15651.00	229.18	239.99	235.73	240.90	0.002951	7.66	2043.84	219.94	0.44
Angelina River	Downstream	29000	5 YR	26053.00	229.18	242.74		242.96	0.000926	5.10	13000.26	4263.33	0.26
Angelina River	Downstream	29000	10 YR	33765.00	229.18	244.10		244.24	0.000626	4.50	18981.23	4532.60	0.22
Angelina River	Downstream	29000	25 YR	43214.00	229.18	245.56		245.66	0.000460	4.14	25804.29	4821.45	0.19
Angelina River	Downstream	29000	50 YR	52369.00	229.18	246.83		246.92	0.000375	3.95	32078.41	5072.57	0.17
Angelina River	Downstream	29000	100 YR	61473.00	229.18	247.99		248.06	0.000323	3.83	38071.55	5301.34	0.16
Angelina River	Downstream	22700	2 YR	15651.00	227.14	239.33		239.35	0.000094	1.76	16995.64	2452.41	0.09
Angelina River	Downstream	22700	5 YR	26053.00	227.14	242.05		242.08	0.000097	2.07	23996.43	2642.17	0.10
Angelina River	Downstream	22700	10 YR	33765.00	227.14	243.43		243.47	0.000107	2.32	27695.97	2704.45	0.11
Angelina River	Downstream	22700	25 YR	43214.00	227.14	244.92		244.97	0.000117	2.58	31776.32	2771.51	0.11
Angelina River	Downstream	22700	50 YR	52369.00	227.14	246.21		246.27	0.000124	2.81	35394.26	2829.64	0.12
Angelina River	Downstream	22700	100 YR	61473.00	227.14	247.39		247.45	0.000131	3.01	38743.70	2882.42	0.12
Angelina River	Downstream	18600	2 YR	15651.00	225.81	238.92		238.95	0.000161	2.33	13684.25	2061.95	0.12
Angelina River	Downstream	18600	5 YR	26053.00	225.81	241.56		241.62	0.000217	3.12	22769.21	4378.10	0.15
Angelina River	Downstream	18600	10 YR	33765.00	225.81	242.98		243.02	0.000182	3.06	29016.96	4448.88	0.14
Angelina River	Downstream	18600	25 YR	43214.00	225.81	244.49		244.53	0.000161	3.06	35797.82	4524.45	0.13
Angelina River	Downstream	18600	50 YR	52369.00	225.81	245.79		245.83	0.000149	3.10	41728.80	4589.52	0.13
Angelina River	Downstream	18600	100 YR	61473.00	225.81	246.97		247.01	0.000142	3.16	47173.25	4648.46	0.13
Angelina River	Downstream	14400	2 YR	15651.00	224.45	238.84		238.84	0.000028	0.87	31995.83	3766.87	0.05
Angelina River	Downstream	14400	5 YR	26053.00	224.45	241.46		241.47	0.000035	1.11	42195.50	4105.88	0.05
Angelina River	Downstream	14400	10 YR	33765.00	224.45	242.87		242.87	0.000041	1.28	48164.08	4376.78	0.06
Angelina River	Downstream	14400	25 YR	43214.00	224.45	244.37		244.38	0.000047	1.46	54971.58	4666.59	0.06
Angelina River	Downstream	14400	50 YR	52369.00	224.45	245.67		245.68	0.000052	1.62	61190.25	4916.43	0.07
Angelina River	Downstream	14400	100 YR	61473.00	224.45	246.85		246.86	0.000056	1.75	67105.60	5142.83	0.07
Angelina River	Downstream	5700	2 YR	15651.00	221.64	238.63		238.64	0.000095	1.71	18309.60	2548.76	0.08
Angelina River	Downstream	5700	5 YR	26053.00	221.64	241.21		241.24	0.000104	2.02	25401.69	2914.83	0.09
Angelina River	Downstream	5700	10 YR	33765.00	221.64	242.59		242.61	0.000114	2.24	29476.82	3016.51	0.10
Angelina River	Downstream	5700	25 YR	43214.00	221.64	244.06		244.09	0.000124	2.47	34001.11	3125.53	0.10
Angelina River	Downstream	5700	50 YR	52369.00	221.64	245.33		245.37	0.000132	2.66	38038.03	3219.69	0.11
Angelina River	Downstream	5700	100 YR	61473.00	221.64	246.49		246.53	0.000138	2.84	41806.02	3305.16	0.11
Angelina River	Downstream	1000	2 YR	15651.00	220.12	237.88	231.14	238.02	0.000350	3.80	8536.88	1716.48	0.19
Angelina River	Downstream	1000	5 YR	26053.00	220.12	240.45	233.69	240.60	0.000350	4.29	13628.76	2283.87	0.19
Angelina River	Downstream	1000	10 YR	33765.00	220.12	241.80	234.88	241.96	0.000350	4.53	16774.59	2385.74	0.20
Angelina River	Downstream	1000	25 YR	43214.00	220.12	243.24	235.93	243.41	0.000350	4.79	20306.45	2495.15	0.20
Angelina River	Downstream	1000	50 YR	52369.00	220.12	244.49	236.77	244.67	0.000350	5.01	23487.52	2589.74	0.20
Angelina River	Downstream	1000	100 YR	61473.00	220.12	245.63	237.51	245.81	0.000350	5.20	26480.45	2675.68	0.20

HEC-RAS Output  
Proposed Mature Median



HEC-RAS Plan: Prop MM

River	Reach	River Sta	Profile	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
Mud Creek	1000	132650	2 YR	303.00	315.00	315.41	315.41	315.62	0.049763	3.67	82.61	199.99	1.01
Mud Creek	1000	132650	5 YR	2417.00	315.00	317.18		317.66	0.012574	5.53	436.97	199.99	0.66
Mud Creek	1000	132650	10 YR	4563.00	315.00	318.35		319.07	0.010989	6.82	669.18	199.99	0.66
Mud Creek	1000	132650	25 YR	7303.00	315.00	319.59		320.57	0.009991	7.96	917.52	199.99	0.65
Mud Creek	1000	132650	50 YR	9977.00	315.00	320.65		321.86	0.009411	8.82	1130.89	200.00	0.65
Mud Creek	1000	132650	100 YR	12866.00	315.00	321.70		323.13	0.008997	9.60	1340.64	200.00	0.65
Mud Creek	1000	132350.*	2 YR	303.00	309.12	309.64	309.56	309.79	0.026760	3.17	95.62	192.74	0.79
Mud Creek	1000	132350.*	5 YR	2417.00	309.12	310.99	310.82	311.61	0.021475	6.32	382.69	231.14	0.86
Mud Creek	1000	132350.*	10 YR	4563.00	309.12	311.84	311.66	312.77	0.020791	7.74	589.32	255.23	0.90
Mud Creek	1000	132350.*	25 YR	7303.00	309.12	312.67	312.50	313.93	0.020669	9.00	811.81	278.84	0.93
Mud Creek	1000	132350.*	50 YR	9977.00	309.12	313.31	313.21	314.87	0.021384	10.04	994.08	296.80	0.97
Mud Creek	1000	132350.*	100 YR	12866.00	309.12	313.91	313.87	315.76	0.021709	10.91	1179.27	313.99	0.99
Mud Creek	1000	132050.*	2 YR	303.00	303.23	303.87		303.98	0.014570	2.68	113.03	197.71	0.62
Mud Creek	1000	132050.*	5 YR	2417.00	303.23	305.17		305.67	0.018059	5.68	425.44	282.23	0.82
Mud Creek	1000	132050.*	10 YR	4563.00	303.23	305.89	305.71	306.67	0.019632	7.06	646.40	329.15	0.89
Mud Creek	1000	132050.*	25 YR	7303.00	303.23	306.57	306.46	307.63	0.020939	8.26	884.16	373.11	0.95
Mud Creek	1000	132050.*	50 YR	9977.00	303.23	307.13	307.06	308.40	0.021184	9.05	1102.95	409.42	0.97
Mud Creek	1000	132050.*	100 YR	12866.00	303.23	307.62	307.61	309.11	0.021926	9.82	1310.34	441.08	1.00
Mud Creek	1000	131750.*	2 YR	303.00	297.35	297.90	297.85	298.07	0.028052	3.36	90.22	196.52	0.87
Mud Creek	1000	131750.*	5 YR	2417.00	297.35	299.12	299.03	299.64	0.022478	5.81	415.71	335.89	0.92
Mud Creek	1000	131750.*	10 YR	4563.00	297.35	299.80	299.71	300.52	0.021336	6.79	672.23	413.89	0.94
Mud Creek	1000	131750.*	25 YR	7303.00	297.35	300.44	300.36	301.34	0.020676	7.60	960.34	486.81	0.95
Mud Creek	1000	131750.*	50 YR	9977.00	297.35	300.90	300.87	301.98	0.021250	8.34	1196.56	539.29	0.99
Mud Creek	1000	131750.*	100 YR	12866.00	297.35	301.35	301.34	302.57	0.021158	8.90	1446.43	589.74	1.00
Mud Creek	1000	131450.*	2 YR	303.00	291.47	292.15		292.25	0.014110	2.57	117.70	236.19	0.64
Mud Creek	1000	131450.*	5 YR	2417.00	291.47	293.25		293.63	0.017792	4.95	488.69	437.87	0.83
Mud Creek	1000	131450.*	10 YR	4563.00	291.47	293.79	293.67	294.36	0.019479	6.03	756.36	538.35	0.90
Mud Creek	1000	131450.*	25 YR	7303.00	291.47	294.29	294.22	295.05	0.021004	7.00	1043.22	628.43	0.96
Mud Creek	1000	131450.*	50 YR	9977.00	291.47	294.69	294.65	295.59	0.021036	7.58	1315.48	703.35	0.98
Mud Creek	1000	131450.*	100 YR	12866.00	291.47	295.04	295.04	296.08	0.021754	8.19	1570.31	766.86	1.01
Mud Creek	1000	131150.*	2 YR	303.00	285.59	286.14	286.12	286.30	0.029702	3.24	93.43	249.16	0.93
Mud Creek	1000	131150.*	5 YR	2417.00	285.59	287.11	287.07	287.52	0.023556	5.14	470.53	528.68	0.96
Mud Creek	1000	131150.*	10 YR	4563.00	285.59	287.62	287.58	288.15	0.021986	5.88	775.51	674.79	0.97
Mud Creek	1000	131150.*	25 YR	7303.00	285.59	288.09	288.04	288.74	0.020818	6.49	1124.73	810.36	0.97
Mud Creek	1000	131150.*	50 YR	9977.00	285.59	288.41	288.40	289.20	0.021383	7.09	1406.26	904.99	1.00
Mud Creek	1000	131150.*	100 YR	12866.00	285.59	288.74	288.74	289.61	0.021023	7.52	1711.75	997.56	1.01
Mud Creek	1000	130850.*	2 YR	303.00	279.71	280.33	280.22	280.41	0.013857	2.30	131.60	357.15	0.67
Mud Creek	1000	130850.*	5 YR	2417.00	279.71	281.13	281.03	281.41	0.017543	4.26	567.69	731.15	0.85
Mud Creek	1000	130850.*	10 YR	4563.00	279.71	281.51	281.44	281.93	0.019404	5.19	879.73	908.75	0.93
Mud Creek	1000	130850.*	25 YR	7303.00	279.71	281.84	281.83	282.41	0.021218	6.04	1210.08	1064.97	1.00
Mud Creek	1000	130850.*	50 YR	9977.00	279.71	282.13	282.13	282.79	0.021042	6.51	1533.58	1198.37	1.01
Mud Creek	1000	130850.*	100 YR	12866.00	279.71	282.42	282.42	283.13	0.019788	6.78	1898.79	1333.03	1.00
Mud Creek	1000	130550.*	2 YR	303.00	273.82	274.27	274.27	274.40	0.031470	2.84	106.83	424.86	1.00
Mud Creek	1000	130550.*	5 YR	2417.00	273.82	274.92	274.92	275.21	0.024677	4.36	554.15	962.85	1.01
Mud Creek	1000	130550.*	10 YR	4563.00	273.82	275.25	275.25	275.63	0.022677	4.95	921.02	1240.73	1.01
Mud Creek	1000	130550.*	25 YR	7303.00	273.82	275.56	275.56	276.02	0.021180	5.43	1344.41	1498.68	1.01
Mud Creek	1000	130550.*	50 YR	9977.00	273.82	275.80	275.80	276.32	0.020423	5.79	1722.10	1696.00	1.01
Mud Creek	1000	130550.*	100 YR	12866.00	273.82	276.02	276.02	276.59	0.019424	6.06	2123.46	1883.16	1.01
Mud Creek	1000	130250	2 YR	303.00	267.94	269.32		269.32	0.000016	0.13	2266.58	3258.58	0.03
Mud Creek	1000	130250	5 YR	2417.00	267.94	270.57		270.57	0.000029	0.28	8545.35	6241.01	0.04
Mud Creek	1000	130250	10 YR	4563.00	267.94	271.36		271.36	0.000023	0.34	13537.39	6367.71	0.04
Mud Creek	1000	130250	25 YR	7303.00	267.94	272.15		272.15	0.000021	0.40	18604.98	6493.79	0.04
Mud Creek	1000	130250	50 YR	9977.00	267.94	272.84		272.85	0.000019	0.44	23150.21	6604.83	0.04
Mud Creek	1000	130250	100 YR	12866.00	267.94	273.48		273.49	0.000018	0.48	27416.91	6707.39	0.04
Mud Creek	1000	129850	2 YR	303.00	267.48	269.32		269.32	0.000012	0.11	2839.51	3094.79	0.02
Mud Creek	1000	129850	5 YR	2417.00	267.48	270.56		270.56	0.000039	0.30	8842.16	6308.31	0.04
Mud Creek	1000	129850	10 YR	4563.00	267.48	271.35		271.35	0.000037	0.37	13881.96	6391.65	0.04
Mud Creek	1000	129850	25 YR	7303.00	267.48	272.14		272.14	0.000036	0.44	18955.09	6474.45	0.04
Mud Creek	1000	129850	50 YR	9977.00	267.48	272.83		272.84	0.000035	0.49	23477.84	6547.39	0.04
Mud Creek	1000	129850	100 YR	12866.00	267.48	273.47		273.48	0.000035	0.54	27697.64	6614.72	0.04
Mud Creek	1000	128750	2 YR	303.00	267.10	269.31		269.31	0.000004	0.07	4078.80	3693.63	0.01
Mud Creek	1000	128750	5 YR	2417.00	267.10	270.53		270.53	0.000019	0.25	9605.53	4915.87	0.03
Mud Creek	1000	128750	10 YR	4563.00	267.10	271.32		271.32	0.000021	0.34	13536.54	5014.83	0.04
Mud Creek	1000	128750	25 YR	7303.00	267.10	272.11		272.11	0.000024	0.42	17520.76	5113.18	0.04
Mud Creek	1000	128750	50 YR	9977.00	267.10	272.80		272.80	0.000024	0.48	21102.26	5200.00	0.04
Mud Creek	1000	128750	100 YR	12866.00	267.10	273.44		273.44	0.000025	0.54	24458.19	5280.05	0.04
Mud Creek	1000	127950	2 YR	303.00	266.82	269.31		269.31	0.000003	0.08	3886.42	3126.85	0.01
Mud Creek	1000	127950	5 YR	2417.00	266.82	270.51		270.51	0.000022	0.29	8510.99	4228.07	0.03
Mud Creek	1000	127950	10 YR	4563.00	266.82	271.30		271.30	0.000027	0.39	11861.32	4271.43	0.04
Mud Creek	1000	127950	25 YR	7303.00	266.82	272.08		272.09	0.000031	0.49	15227.02	4314.55	0.05
Mud Creek	1000	127950	50 YR	9977.00	266.82	272.78		272.78	0.000032	0.56	18232.44	4352.70	0.05
Mud Creek	1000	127950	100 YR	12866.00	266.82	273.42		273.42	0.000034	0.63	21025.48	4387.85	0.05
Mud Creek	1000	126600	2 YR	2268.00	266.35	269.27		269.28	0.000035	0.32	7031.24	4807.96	0.05
Mud Creek	1000	126600	5 YR	3760.00	266.35	270.49		270.49	0.000013	0.27	13908.20	6100.24	0.03

## HEC-RAS Plan: Prop MM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	126600	10 YR	4870.00	266.35	271.28		271.28	0.000008	0.26	18807.08	6262.70	0.03
Mud Creek	1000	126600	25 YR	7409.00	266.35	272.06		272.07	0.000009	0.32	23769.24	6423.08	0.03
Mud Creek	1000	126600	50 YR	10143.00	266.35	272.76		272.76	0.000010	0.37	28267.01	6565.06	0.03
Mud Creek	1000	126600	100 YR	13103.00	266.35	273.39		273.40	0.000011	0.41	32498.26	6695.88	0.03
Mud Creek	1000	124600	2 YR	2268.00	265.65	269.20		269.20	0.000045	0.37	6212.40	3504.56	0.05
Mud Creek	1000	124600	5 YR	3760.00	265.65	270.45		270.46	0.000022	0.33	11314.87	4334.09	0.04
Mud Creek	1000	124600	10 YR	4870.00	265.65	271.26		271.26	0.000015	0.33	14824.59	4394.41	0.03
Mud Creek	1000	124600	25 YR	7409.00	265.65	272.04		272.04	0.000018	0.41	18271.51	4452.85	0.04
Mud Creek	1000	124600	50 YR	10143.00	265.65	272.73		272.73	0.000020	0.48	21360.19	4504.57	0.04
Mud Creek	1000	124600	100 YR	13103.00	265.65	273.36		273.37	0.000022	0.55	24236.59	4552.21	0.04
Mud Creek	1000	123150	2 YR	2268.00	265.14	269.14		269.14	0.000030	0.28	8078.67	4036.13	0.03
Mud Creek	1000	123150	5 YR	3760.00	265.14	270.43		270.43	0.000017	0.27	14010.52	4953.37	0.03
Mud Creek	1000	123150	10 YR	4870.00	265.14	271.24		271.24	0.000012	0.27	18755.47	5054.91	0.02
Mud Creek	1000	123150	25 YR	7409.00	265.14	272.01		272.02	0.000015	0.34	22033.20	5151.85	0.03
Mud Creek	1000	123150	50 YR	10143.00	265.14	272.70		272.70	0.000017	0.40	25599.05	5237.65	0.03
Mud Creek	1000	123150	100 YR	13103.00	265.14	273.33		273.34	0.000020	0.46	28935.12	5316.68	0.03
Mud Creek	1000	121050	2 YR	5303.00	264.41	269.03		269.03	0.000074	0.50	10676.73	4625.11	0.06
Mud Creek	1000	121050	5 YR	8784.00	264.41	270.35		270.36	0.000049	0.50	17856.70	6279.50	0.05
Mud Creek	1000	121050	10 YR	11369.00	264.41	271.18		271.19	0.000037	0.51	23148.07	6466.32	0.04
Mud Creek	1000	121050	25 YR	14059.00	264.41	271.96		271.97	0.000031	0.52	28256.18	6641.68	0.04
Mud Creek	1000	121050	50 YR	16607.00	264.41	272.65		272.66	0.000027	0.53	32882.56	6796.60	0.04
Mud Creek	1000	121050	100 YR	19162.00	264.41	273.28		273.29	0.000025	0.55	37231.34	6939.07	0.04
Mud Creek	1000	119350	2 YR	5303.00	263.81	268.73		268.75	0.000581	1.26	4223.43	1716.84	0.14
Mud Creek	1000	119350	5 YR	8784.00	263.81	270.15		270.17	0.000402	1.25	7002.67	2163.67	0.12
Mud Creek	1000	119350	10 YR	11369.00	263.81	271.02		271.05	0.000303	1.28	8903.52	2185.52	0.11
Mud Creek	1000	119350	25 YR	14059.00	263.81	271.82		271.85	0.000256	1.32	10661.46	2205.54	0.11
Mud Creek	1000	119350	50 YR	16607.00	263.81	272.52		272.55	0.000229	1.37	12212.37	2223.05	0.10
Mud Creek	1000	119350	100 YR	19162.00	263.81	273.16		273.19	0.000212	1.41	13639.66	2239.05	0.10
Mud Creek	1000	117350	2 YR	5303.00	263.11	268.28		268.29	0.000122	0.88	6014.97	2326.50	0.10
Mud Creek	1000	117350	5 YR	8784.00	263.11	269.85		269.86	0.000081	0.86	10208.41	3030.85	0.08
Mud Creek	1000	117350	10 YR	11369.00	263.11	270.80		270.81	0.000060	0.86	13190.08	3176.01	0.07
Mud Creek	1000	117350	25 YR	14059.00	263.11	271.64		271.65	0.000050	0.89	15886.46	3255.66	0.07
Mud Creek	1000	117350	50 YR	16607.00	263.11	272.36		272.37	0.000045	0.92	18260.64	3324.22	0.07
Mud Creek	1000	117350	100 YR	19162.00	263.11	273.01		273.03	0.000042	0.95	20450.42	3386.22	0.07
Mud Creek	1000	114900	2 YR	5303.00	262.26	268.02		268.03	0.000095	0.84	6319.35	2194.79	0.09
Mud Creek	1000	114900	5 YR	8784.00	262.26	269.66		269.68	0.000068	0.84	10447.23	2822.00	0.08
Mud Creek	1000	114900	10 YR	11369.00	262.26	270.66		270.67	0.000054	0.85	13379.21	2986.37	0.07
Mud Creek	1000	114900	25 YR	14059.00	262.26	271.52		271.53	0.000046	0.88	15966.95	3033.65	0.07
Mud Creek	1000	114900	50 YR	16607.00	262.26	272.25		272.27	0.000042	0.92	18205.40	3073.97	0.07
Mud Creek	1000	114900	100 YR	19162.00	262.26	272.91		272.93	0.000039	0.96	20243.46	3110.22	0.06
Mud Creek	1000	113800	2 YR	5303.00	261.87	267.91		267.92	0.000105	0.91	5826.11	1930.39	0.09
Mud Creek	1000	113800	5 YR	8784.00	261.87	269.58		269.59	0.000078	0.92	9508.12	2466.06	0.08
Mud Creek	1000	113800	10 YR	11369.00	261.87	270.59		270.61	0.000063	0.94	12134.43	2662.47	0.08
Mud Creek	1000	113800	25 YR	14059.00	261.87	271.46		271.48	0.000054	0.98	14485.97	2753.65	0.07
Mud Creek	1000	113800	50 YR	16607.00	261.87	272.20		272.22	0.000050	1.02	16545.13	2831.08	0.07
Mud Creek	1000	113800	100 YR	19162.00	261.87	272.86		272.88	0.000047	1.06	18440.77	2900.53	0.07
Mud Creek	1000	112200	2 YR	5303.00	261.31	267.67		267.69	0.000201	1.14	4656.58	1464.04	0.11
Mud Creek	1000	112200	5 YR	8784.00	261.31	269.40		269.42	0.000153	1.17	7535.74	1862.44	0.10
Mud Creek	1000	112200	10 YR	11369.00	261.31	270.45		270.47	0.000126	1.19	9590.14	2020.15	0.10
Mud Creek	1000	112200	25 YR	14059.00	261.31	271.33		271.36	0.000109	1.24	11397.88	2060.03	0.09
Mud Creek	1000	112200	50 YR	16607.00	261.31	272.08		272.11	0.000101	1.29	12947.51	2093.60	0.09
Mud Creek	1000	112200	100 YR	19162.00	261.31	272.75		272.77	0.000097	1.35	14351.02	2123.56	0.09
Mud Creek	1000	110300	2 YR	5303.00	260.65	267.48	262.93	267.48	0.000066	0.69	7725.74	2263.39	0.07
Mud Creek	1000	110300	5 YR	8784.00	260.65	269.25	263.45	269.26	0.000053	0.72	12265.72	2851.91	0.06
Mud Creek	1000	110300	10 YR	11369.00	260.65	270.32	263.75	270.33	0.000046	0.73	15493.25	3117.71	0.06
Mud Creek	1000	110300	25 YR	14059.00	260.65	271.23	264.03	271.24	0.000040	0.77	18333.91	3167.42	0.06
Mud Creek	1000	110300	50 YR	16607.00	260.65	271.98	264.26	271.99	0.000037	0.80	20742.17	3208.97	0.05
Mud Creek	1000	110300	100 YR	19162.00	260.65	272.65	264.47	272.66	0.000036	0.84	22906.85	3245.86	0.05
Mud Creek	1000	110200		Bridge									
Mud Creek	1000	110050	2 YR	5303.00	260.56	267.41		267.41	0.000038	0.59	8937.14	2610.84	0.06
Mud Creek	1000	110050	5 YR	8784.00	260.56	269.18		269.19	0.000030	0.62	14168.98	3287.38	0.05
Mud Creek	1000	110050	10 YR	11369.00	260.56	270.25		270.25	0.000026	0.64	17887.34	3629.72	0.05
Mud Creek	1000	110050	25 YR	14059.00	260.56	271.15		271.15	0.000023	0.67	21196.73	3737.53	0.05
Mud Creek	1000	110050	50 YR	16607.00	260.56	271.89		271.90	0.000022	0.70	24029.19	3827.39	0.05
Mud Creek	1000	110050	100 YR	19162.00	260.56	272.56		272.57	0.000021	0.73	26593.94	3906.98	0.05
Mud Creek	1000	109550	2 YR	5303.00	260.38	267.39		267.39	0.000034	0.57	9318.70	2659.20	0.05
Mud Creek	1000	109550	5 YR	8784.00	260.38	269.17		269.17	0.000028	0.60	14644.29	3333.56	0.05
Mud Creek	1000	109550	10 YR	11369.00	260.38	270.24		270.24	0.000024	0.62	18420.06	3692.34	0.05
Mud Creek	1000	109550	25 YR	14059.00	260.38	271.14		271.14	0.000022	0.65	21815.81	3854.33	0.05
Mud Creek	1000	109550	50 YR	16607.00	260.38	271.88		271.89	0.000020	0.68	24755.47	3989.25	0.05
Mud Creek	1000	109550	100 YR	19162.00	260.38	272.55		272.56	0.000020	0.71	27442.27	4108.70	0.05
Mud Creek	1000	107750	2 YR	5303.00	259.75	267.32		267.32	0.000048	0.65	8177.53	2028.86	0.06
Mud Creek	1000	107750	5 YR	8784.00	259.75	269.10		269.11	0.000045	0.72	12198.00	2475.18	0.06

HEC-RAS Plan: Prop MM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	107750	10 YR	11369.00	259.75	270.18		270.18	0.000042	0.76	15001.48	2742.03	0.06
Mud Creek	1000	107750	25 YR	14059.00	259.75	271.08		271.09	0.000039	0.81	17581.20	2959.22	0.06
Mud Creek	1000	107750	50 YR	16607.00	259.75	271.83		271.84	0.000038	0.85	19873.48	3139.63	0.06
Mud Creek	1000	107750	100 YR	19162.00	259.75	272.50		272.51	0.000037	0.90	22011.71	3299.03	0.06
Mud Creek	1000	105150	2 YR	5303.00	258.80	267.22		267.23	0.000031	0.67	9163.36	1563.64	0.04
Mud Creek	1000	105150	5 YR	8784.00	258.80	268.99		269.00	0.000039	0.87	12069.94	1714.38	0.05
Mud Creek	1000	105150	10 YR	11369.00	258.80	270.06		270.08	0.000043	1.00	13951.84	1805.27	0.06
Mud Creek	1000	105150	25 YR	14059.00	258.80	270.96		270.98	0.000048	1.12	15613.81	1881.90	0.06
Mud Creek	1000	105150	50 YR	16607.00	258.80	271.71		271.73	0.000053	1.22	17043.92	1945.42	0.06
Mud Creek	1000	105150	100 YR	19162.00	258.80	272.37		272.39	0.000058	1.32	18343.85	2001.41	0.07
Mud Creek	1000	104100	2 YR	5303.00	258.42	267.19		267.20	0.000023	0.76	8466.90	1461.17	0.05
Mud Creek	1000	104100	5 YR	8784.00	258.42	268.95		268.97	0.000029	0.99	11177.79	1611.17	0.06
Mud Creek	1000	104100	10 YR	11369.00	258.42	270.02		270.04	0.000032	1.14	12940.38	1701.29	0.06
Mud Creek	1000	104100	25 YR	14059.00	258.42	270.91		270.94	0.000036	1.27	14491.39	1761.75	0.07
Mud Creek	1000	104100	50 YR	16607.00	258.42	271.66		271.68	0.000040	1.39	15817.31	1811.84	0.07
Mud Creek	1000	104100	100 YR	19162.00	258.42	272.31		272.34	0.000044	1.51	17015.48	1855.94	0.08
Mud Creek	1000	103850	2 YR	5303.00	258.33	267.18		267.19	0.000024	0.79	7692.09	1245.09	0.05
Mud Creek	1000	103850	5 YR	8784.00	258.33	268.95		268.96	0.000031	1.04	9971.36	1342.01	0.06
Mud Creek	1000	103850	10 YR	11369.00	258.33	270.01		270.03	0.000036	1.19	11427.94	1400.55	0.07
Mud Creek	1000	103850	25 YR	14059.00	258.33	270.90		270.93	0.000041	1.35	12707.22	1463.09	0.07
Mud Creek	1000	103850	50 YR	16607.00	258.33	271.64		271.67	0.000045	1.48	13808.92	1514.88	0.08
Mud Creek	1000	103850	100 YR	19162.00	258.33	272.29		272.33	0.000050	1.61	14810.08	1560.46	0.08
Mud Creek	1000	103350	2 YR	7842.00	258.15	267.13	261.55	267.16	0.000100	1.61	6730.11	1298.72	0.10
Mud Creek	1000	103350	5 YR	12984.00	258.15	268.87	262.27	268.92	0.000124	2.06	9148.69	1481.41	0.12
Mud Creek	1000	103350	10 YR	16800.00	258.15	269.92	262.71	269.99	0.000137	2.34	10759.17	1591.47	0.13
Mud Creek	1000	103350	25 YR	20766.00	258.15	270.80	263.15	270.88	0.000152	2.60	12189.96	1663.79	0.14
Mud Creek	1000	103350	50 YR	24523.00	258.15	271.52	263.54	271.62	0.000166	2.83	13419.24	1721.88	0.15
Mud Creek	1000	103350	100 YR	28175.00	258.15	272.16	263.88	272.27	0.000178	3.03	14534.68	1772.95	0.15
Mud Creek	1000	103200		Bridge									
Mud Creek	1000	103100	2 YR	7842.00	258.06	267.02		267.08	0.000317	2.18	4679.86	891.52	0.14
Mud Creek	1000	103100	5 YR	12984.00	258.06	268.71		268.81	0.000400	2.81	6280.55	1009.41	0.16
Mud Creek	1000	103100	10 YR	16800.00	258.06	269.71		269.84	0.000447	3.18	7334.28	1080.01	0.18
Mud Creek	1000	103100	25 YR	20766.00	258.06	270.55		270.70	0.000507	3.58	8263.37	1165.46	0.19
Mud Creek	1000	103100	50 YR	24523.00	258.06	271.22		271.41	0.000564	3.93	9082.44	1246.94	0.20
Mud Creek	1000	103100	100 YR	28175.00	258.06	271.82		272.03	0.000615	4.24	9841.23	1317.94	0.21
Mud Creek	1000	102550	2 YR	7842.00	257.86	266.60		266.74	0.001166	4.29	3599.90	958.20	0.27
Mud Creek	1000	102550	5 YR	12984.00	257.86	268.23		268.40	0.001213	4.97	5332.65	1169.90	0.29
Mud Creek	1000	102550	10 YR	16800.00	257.86	269.22		269.41	0.001215	5.32	6553.88	1298.53	0.29
Mud Creek	1000	102550	25 YR	20766.00	257.86	270.02		270.23	0.001268	5.72	7631.98	1402.85	0.30
Mud Creek	1000	102550	50 YR	24523.00	257.86	270.67		270.90	0.001331	6.08	8576.01	1506.68	0.31
Mud Creek	1000	102550	100 YR	28175.00	257.86	271.24		271.48	0.001377	6.39	9458.24	1597.62	0.32
Mud Creek	1000	101050	2 YR	7842.00	257.31	263.11		263.76	0.004982	7.10	1642.68	682.53	0.59
Mud Creek	1000	101050	5 YR	12984.00	257.31	263.75		264.89	0.007773	9.70	2109.34	781.35	0.76
Mud Creek	1000	101050	10 YR	16800.00	257.31	264.06		265.63	0.010100	11.50	2359.03	829.40	0.87
Mud Creek	1000	101050	25 YR	20766.00	257.31	264.59	264.59	266.32	0.010305	12.35	2816.83	910.95	0.89
Mud Creek	1000	101050	50 YR	24523.00	257.31	265.09	265.09	266.91	0.010063	12.88	3290.86	988.32	0.90
Mud Creek	1000	101050	100 YR	28175.00	257.31	265.52	265.52	267.42	0.009908	13.36	3737.28	1056.02	0.90
Mud Creek	1000	99150	2 YR	7842.00	256.62	262.71		262.72	0.000200	1.61	13171.62	5186.67	0.14
Mud Creek	1000	99150	5 YR	12984.00	256.62	263.46		263.47	0.000244	1.98	17113.67	5402.58	0.15
Mud Creek	1000	99150	10 YR	16800.00	256.62	263.92		263.94	0.000268	2.19	19651.29	5537.12	0.16
Mud Creek	1000	99150	25 YR	20766.00	256.62	264.35		264.36	0.000289	2.39	22027.75	5660.22	0.17
Mud Creek	1000	99150	50 YR	24523.00	256.62	264.71		264.73	0.000306	2.56	24113.87	5766.11	0.18
Mud Creek	1000	99150	100 YR	28175.00	256.62	265.04		265.06	0.000320	2.70	26020.59	5861.22	0.18
Mud Creek	1000	97950	2 YR	7842.00	256.19	262.56		262.57	0.000244	1.79	12183.56	4963.56	0.15
Mud Creek	1000	97950	5 YR	12984.00	256.19	263.27		263.29	0.000300	2.20	15767.01	5119.93	0.17
Mud Creek	1000	97950	10 YR	16800.00	256.19	263.72		263.74	0.000329	2.43	18072.29	5218.04	0.18
Mud Creek	1000	97950	25 YR	20766.00	256.19	264.13		264.15	0.000355	2.65	20219.67	5307.81	0.19
Mud Creek	1000	97950	50 YR	24523.00	256.19	264.48		264.50	0.000377	2.83	22099.13	5385.15	0.20
Mud Creek	1000	97950	100 YR	28175.00	256.19	264.79		264.82	0.000395	2.99	23812.20	5454.68	0.20
Mud Creek	1000	96975	2 YR	7842.00	255.84	262.50	260.42	262.51	0.000172	1.57	13619.71	5026.81	0.13
Mud Creek	1000	96975	5 YR	12984.00	255.84	263.19	260.63	263.21	0.000231	1.99	17161.14	5179.49	0.15
Mud Creek	1000	96975	10 YR	16800.00	255.84	263.63	260.77	263.65	0.000262	2.24	19445.49	5275.62	0.16
Mud Creek	1000	96975	25 YR	20766.00	255.84	264.03	260.89	264.05	0.000291	2.46	21571.83	5363.56	0.17
Mud Creek	1000	96975	50 YR	24523.00	255.84	264.37	261.03	264.40	0.000315	2.65	23433.53	5439.39	0.18
Mud Creek	1000	96975	100 YR	28175.00	255.84	264.68	261.15	264.71	0.000335	2.82	25130.29	5507.59	0.19
Mud Creek	1000	96950		Bridge									
Mud Creek	1000	96925	2 YR	7842.00	255.82	262.43		262.46	0.000575	2.02	8494.39	4532.22	0.17
Mud Creek	1000	96925	5 YR	12984.00	255.82	263.13		263.16	0.000618	2.32	11716.62	4699.75	0.18
Mud Creek	1000	96925	10 YR	16800.00	255.82	263.57		263.60	0.000637	2.49	13796.32	4804.78	0.19
Mud Creek	1000	96925	25 YR	20766.00	255.82	263.97		264.01	0.000658	2.66	15733.21	4900.57	0.20
Mud Creek	1000	96925	50 YR	24523.00	255.82	264.31		264.35	0.000675	2.80	17432.27	4983.09	0.20
Mud Creek	1000	96925	100 YR	28175.00	255.82	264.62		264.67	0.000691	2.92	18983.46	5057.25	0.20

HEC-RAS Plan: Prop MM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	95200	2 YR	7842.00	255.19	261.67		261.70	0.000711	2.20	7883.73	4499.76	0.19
Mud Creek	1000	95200	5 YR	12984.00	255.19	262.36		262.39	0.000734	2.48	11050.12	4665.59	0.20
Mud Creek	1000	95200	10 YR	16800.00	255.19	262.79		262.83	0.000742	2.64	13106.86	4770.22	0.20
Mud Creek	1000	95200	25 YR	20766.00	255.19	263.18		263.22	0.000765	2.81	14958.11	4862.47	0.21
Mud Creek	1000	95200	50 YR	24523.00	255.19	263.51		263.56	0.000785	2.96	16576.33	4941.69	0.21
Mud Creek	1000	95200	100 YR	28175.00	255.19	263.80		263.86	0.000803	3.09	18048.62	5012.69	0.22
Mud Creek	1000	93700	2 YR	7842.00	254.65	260.70		260.76	0.001089	2.12	5287.13	4044.77	0.20
Mud Creek	1000	93700	5 YR	12984.00	254.65	261.50		261.56	0.000998	2.34	8633.21	4270.13	0.20
Mud Creek	1000	93700	10 YR	16800.00	254.65	261.98		262.04	0.000972	2.48	10691.38	4403.02	0.20
Mud Creek	1000	93700	25 YR	20766.00	254.65	262.35		262.42	0.001014	2.67	12356.01	4507.63	0.21
Mud Creek	1000	93700	50 YR	24523.00	254.65	262.67		262.75	0.001050	2.83	13801.18	4596.53	0.22
Mud Creek	1000	93700	100 YR	28175.00	254.65	262.95		263.04	0.001083	2.97	15107.31	4675.41	0.22
Mud Creek	1000	91800	2 YR	7842.00	253.96	258.69		258.75	0.001126	1.92	4076.06	1723.17	0.22
Mud Creek	1000	91800	5 YR	12984.00	253.96	259.61		259.69	0.001194	2.23	5819.00	2058.89	0.23
Mud Creek	1000	91800	10 YR	16800.00	253.96	260.14		260.23	0.001194	2.41	7288.40	4533.53	0.24
Mud Creek	1000	91800	25 YR	20766.00	253.96	260.60		260.70	0.001095	2.52	9385.05	4640.94	0.23
Mud Creek	1000	91800	50 YR	24523.00	253.96	260.97		261.07	0.001043	2.62	11102.53	4727.10	0.23
Mud Creek	1000	91800	100 YR	28175.00	253.96	261.28		261.39	0.001014	2.72	12606.02	4801.27	0.23
Mud Creek	1000	90600	2 YR	7842.00	253.52	257.92		257.94	0.000434	1.14	6883.85	3126.24	0.14
Mud Creek	1000	90600	5 YR	12984.00	253.52	258.83		258.86	0.000437	1.30	10023.47	3772.38	0.14
Mud Creek	1000	90600	10 YR	16800.00	253.52	259.37		259.40	0.000440	1.38	12133.67	4150.52	0.14
Mud Creek	1000	90600	25 YR	20766.00	253.52	259.84		259.88	0.000442	1.46	14190.75	4488.58	0.15
Mud Creek	1000	90600	50 YR	24523.00	253.52	260.24		260.27	0.000428	1.53	16001.62	4668.69	0.14
Mud Creek	1000	90600	100 YR	28175.00	253.52	260.57		260.61	0.000415	1.61	17579.54	4765.69	0.15
Mud Creek	1000	89850	2 YR	7842.00	253.25	257.63		257.65	0.000351	1.17	6677.82	3049.51	0.14
Mud Creek	1000	89850	5 YR	12984.00	253.25	258.54		258.57	0.000353	1.33	9735.90	3682.14	0.14
Mud Creek	1000	89850	10 YR	16800.00	253.25	259.07		259.10	0.000354	1.43	11788.81	4051.79	0.15
Mud Creek	1000	89850	25 YR	20766.00	253.25	259.54		259.58	0.000356	1.51	13788.38	4381.96	0.15
Mud Creek	1000	89850	50 YR	24523.00	253.25	259.94		259.98	0.000359	1.57	15585.75	4658.82	0.15
Mud Creek	1000	89850	100 YR	28175.00	253.25	260.29		260.33	0.000344	1.64	17216.50	4760.11	0.15
Mud Creek	1000	88850	2 YR	7842.00	252.89	257.29		257.32	0.000317	1.28	6134.17	2786.54	0.15
Mud Creek	1000	88850	5 YR	12984.00	252.89	258.20		258.23	0.000321	1.46	8912.61	3358.84	0.16
Mud Creek	1000	88850	10 YR	16800.00	252.89	258.72		258.76	0.000324	1.56	10770.97	3692.44	0.16
Mud Creek	1000	88850	25 YR	20766.00	252.89	259.19		259.24	0.000327	1.65	12577.54	3990.11	0.16
Mud Creek	1000	88850	50 YR	24523.00	252.89	259.59		259.64	0.000330	1.73	14202.71	4240.06	0.17
Mud Creek	1000	88850	100 YR	28175.00	252.89	259.94		259.99	0.000332	1.79	15726.88	4461.78	0.17
Mud Creek	1000	87600	2 YR	7842.00	252.43	256.89		256.92	0.000326	1.15	6846.46	3066.91	0.14
Mud Creek	1000	87600	5 YR	12984.00	252.43	257.79		257.82	0.000337	1.32	9869.46	3682.27	0.14
Mud Creek	1000	87600	10 YR	16800.00	252.43	258.31		258.34	0.000344	1.41	11882.00	4040.30	0.15
Mud Creek	1000	87600	25 YR	20766.00	252.43	258.78		258.81	0.000350	1.50	13833.92	4359.55	0.15
Mud Creek	1000	87600	50 YR	24523.00	252.43	259.17		259.21	0.000355	1.57	15588.57	4627.77	0.15
Mud Creek	1000	87600	100 YR	28175.00	252.43	259.51		259.56	0.000359	1.63	17238.06	4866.46	0.15
Mud Creek	1000	85350	2 YR	7842.00	251.62	256.05		256.07	0.000433	1.14	6863.17	3095.52	0.14
Mud Creek	1000	85350	5 YR	12984.00	251.62	256.91		256.93	0.000465	1.33	9754.79	3690.45	0.14
Mud Creek	1000	85350	10 YR	16800.00	251.62	257.40		257.43	0.000483	1.44	11660.05	4034.79	0.15
Mud Creek	1000	85350	25 YR	20766.00	251.62	257.84		257.88	0.000499	1.54	13511.29	4343.29	0.15
Mud Creek	1000	85350	50 YR	24523.00	251.62	258.22		258.26	0.000509	1.62	15182.23	4604.03	0.16
Mud Creek	1000	85350	100 YR	28175.00	251.62	258.55		258.60	0.000515	1.68	16774.63	4839.47	0.16
Mud Creek	1000	83800	2 YR	7842.00	251.05	255.30		255.32	0.000545	1.25	6294.70	2965.04	0.15
Mud Creek	1000	83800	5 YR	12984.00	251.05	256.08		256.11	0.000607	1.47	8825.81	3510.92	0.16
Mud Creek	1000	83800	10 YR	16800.00	251.05	256.53		256.57	0.000641	1.60	10486.75	3827.05	0.17
Mud Creek	1000	83800	25 YR	20766.00	251.05	256.94		256.99	0.000666	1.71	12118.94	4114.11	0.18
Mud Creek	1000	83800	50 YR	24523.00	251.05	257.29		257.35	0.000681	1.80	13616.58	4360.91	0.18
Mud Creek	1000	83800	100 YR	28175.00	251.05	257.63		257.68	0.000683	1.87	15095.46	4591.63	0.18
Mud Creek	1000	82200	2 YR	7842.00	250.47	253.36		253.46	0.003965	2.60	3018.19	2090.58	0.38
Mud Creek	1000	82200	5 YR	12984.00	250.47	254.09		254.21	0.003253	2.74	4744.85	2621.23	0.36
Mud Creek	1000	82200	10 YR	16800.00	250.47	254.55		254.67	0.002885	2.79	6021.02	2952.76	0.34
Mud Creek	1000	82200	25 YR	20766.00	250.47	255.00		255.12	0.002528	2.80	7417.26	3277.29	0.33
Mud Creek	1000	82200	50 YR	24523.00	250.47	255.44		255.56	0.002143	2.74	8939.18	3597.84	0.31
Mud Creek	1000	82200	100 YR	28175.00	250.47	255.91		256.01	0.001751	2.63	10700.29	3936.33	0.28
Mud Creek	1000	80150	2 YR	7842.00	249.62	252.19		252.20	0.000232	0.83	9443.21	4309.47	0.10
Mud Creek	1000	80150	5 YR	12984.00	249.62	252.92		252.93	0.000247	1.03	12594.79	4345.88	0.11
Mud Creek	1000	80150	10 YR	16800.00	249.62	253.41		253.43	0.000246	1.14	14742.17	4370.51	0.11
Mud Creek	1000	80150	25 YR	20766.00	249.62	253.95		253.97	0.000231	1.21	17102.73	4397.44	0.11
Mud Creek	1000	80150	50 YR	24523.00	249.62	254.52		254.55	0.000205	1.25	19638.36	4426.17	0.10
Mud Creek	1000	80150	100 YR	28175.00	249.62	255.12		255.15	0.000179	1.26	22300.51	4456.15	0.10
Mud Creek	1000	78800	2 YR	7842.00	248.93	251.84		251.86	0.000274	0.98	8151.56	4185.85	0.12
Mud Creek	1000	78800	5 YR	12984.00	248.93	252.56		252.59	0.000270	1.20	11201.17	4297.30	0.13
Mud Creek	1000	78800	10 YR	16800.00	248.93	253.06		253.09	0.000257	1.30	13374.86	4375.00	0.13
Mud Creek	1000	78800	25 YR	20766.00	248.93	253.63		253.66	0.000227	1.37	15888.45	4463.16	0.12
Mud Creek	1000	78800	50 YR	24523.00	248.93	254.25		254.28	0.000190	1.38	18677.23	4558.98	0.12
Mud Creek	1000	78800	100 YR	28175.00	248.93	254.89		254.92	0.000159	1.38	21624.10	4658.10	0.11
Mud Creek	1000	77500	2 YR	7842.00	248.27	251.38		251.41	0.000443	1.53	6095.24	3208.83	0.18
Mud Creek	1000	77500	5 YR	12984.00	248.27	252.09		252.14	0.000461	1.88	8390.57	3290.06	0.19

HEC-RAS Plan: Prop MM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	77500	10 YR	16800.00	248.27	252.61		252.66	0.000436	2.03	10119.36	3349.94	0.19
Mud Creek	1000	77500	25 YR	20766.00	248.27	253.23		253.29	0.000374	2.10	12225.41	3421.48	0.18
Mud Creek	1000	77500	50 YR	24523.00	248.27	253.91		253.97	0.000304	2.10	14591.12	3500.09	0.17
Mud Creek	1000	77500	100 YR	28175.00	248.27	254.61		254.66	0.000250	2.08	17043.67	3579.76	0.16
Mud Creek	1000	76300	2 YR	7842.00	247.66	250.82		250.85	0.000495	1.31	6052.81	3185.01	0.16
Mud Creek	1000	76300	5 YR	12984.00	247.66	251.52		251.56	0.000494	1.60	8331.36	3342.10	0.17
Mud Creek	1000	76300	10 YR	16800.00	247.66	252.10		252.14	0.000429	1.69	10290.62	3471.50	0.17
Mud Creek	1000	76300	25 YR	20766.00	247.66	252.82		252.86	0.000332	1.70	12851.58	3633.69	0.15
Mud Creek	1000	76300	50 YR	24523.00	247.66	253.59		253.63	0.000252	1.67	15740.00	3808.35	0.13
Mud Creek	1000	76300	100 YR	28175.00	247.66	254.35		254.39	0.000200	1.64	18688.13	3978.71	0.12
Mud Creek	1000	74900	2 YR	7842.00	246.95	250.13		250.16	0.000491	1.32	5960.36	3624.09	0.18
Mud Creek	1000	74900	5 YR	12984.00	246.95	250.94		250.98	0.000354	1.46	8966.98	3774.45	0.16
Mud Creek	1000	74900	10 YR	16800.00	246.95	251.65		251.68	0.000255	1.46	11669.18	3904.65	0.14
Mud Creek	1000	74900	25 YR	20766.00	246.95	252.50		252.53	0.000175	1.42	15048.85	4061.62	0.12
Mud Creek	1000	74900	50 YR	24523.00	246.95	253.36		253.39	0.000127	1.37	18623.47	4221.30	0.11
Mud Creek	1000	74900	100 YR	28175.00	246.95	254.17		254.19	0.000099	1.35	22096.13	4370.84	0.10
Mud Creek	1000	72400	2 YR	7842.00	245.67	249.21		249.22	0.000298	0.94	8371.26	4735.66	0.12
Mud Creek	1000	72400	5 YR	12984.00	245.67	250.38		250.39	0.000161	0.88	14786.75	5868.79	0.10
Mud Creek	1000	72400	10 YR	16800.00	245.67	251.29		251.30	0.000097	0.84	20187.54	6032.16	0.08
Mud Creek	1000	72400	25 YR	20766.00	245.67	252.26		252.27	0.000065	0.81	26118.50	6206.62	0.07
Mud Creek	1000	72400	50 YR	24523.00	245.67	253.19		253.20	0.000048	0.78	31969.13	6374.04	0.06
Mud Creek	1000	72400	100 YR	28175.00	245.67	254.03		254.04	0.000038	0.78	37418.27	6526.11	0.05
Mud Creek	1000	71200	2 YR	7842.00	245.06	248.95		248.96	0.000165	0.74	10562.73	5432.06	0.09
Mud Creek	1000	71200	5 YR	12984.00	245.06	250.24		250.25	0.000092	0.69	18714.31	6921.77	0.07
Mud Creek	1000	71200	10 YR	16800.00	245.06	251.21		251.21	0.000056	0.66	25427.99	7008.52	0.06
Mud Creek	1000	71200	25 YR	20766.00	245.06	252.20		252.21	0.000038	0.64	32460.06	7098.25	0.05
Mud Creek	1000	71200	50 YR	24523.00	245.06	253.15		253.15	0.000029	0.63	39207.49	7183.29	0.05
Mud Creek	1000	71200	100 YR	28175.00	245.06	254.00		254.01	0.000024	0.63	45366.33	7260.04	0.04
Mud Creek	1000	69000	2 YR	9467.00	243.94	248.61	245.80	248.63	0.000139	0.88	10725.97	4589.40	0.10
Mud Creek	1000	69000	5 YR	15670.00	243.94	250.03	246.22	250.05	0.000092	0.86	18231.46	5952.90	0.09
Mud Creek	1000	69000	10 YR	20280.00	243.94	251.08	246.47	251.09	0.000058	0.83	24477.53	6041.43	0.07
Mud Creek	1000	69000	25 YR	25082.00	243.94	252.11	246.69	252.12	0.000042	0.82	30770.15	6129.32	0.06
Mud Creek	1000	69000	50 YR	29635.00	243.94	253.07	246.88	253.09	0.000033	0.81	36725.93	6211.37	0.06
Mud Creek	1000	69000	100 YR	34050.00	243.94	253.94	247.05	253.95	0.000028	0.82	42123.78	6284.80	0.05
Mud Creek	1000	68800		Bridge									
Mud Creek	1000	68650	2 YR	9467.00	243.77	248.01		248.03	0.000379	1.19	7930.54	3742.00	0.14
Mud Creek	1000	68650	5 YR	15670.00	243.77	249.71		249.72	0.000172	1.01	15555.61	5240.78	0.10
Mud Creek	1000	68650	10 YR	20280.00	243.77	250.82		250.84	0.000102	0.94	21711.74	5603.11	0.08
Mud Creek	1000	68650	25 YR	25082.00	243.77	251.89		251.91	0.000070	0.91	27778.58	5736.86	0.07
Mud Creek	1000	68650	50 YR	29635.00	243.77	252.88		252.89	0.000053	0.90	33490.74	5860.00	0.06
Mud Creek	1000	68650	100 YR	34050.00	243.77	253.75		253.77	0.000045	0.90	38651.52	5969.07	0.06
Mud Creek	1000	67650	2 YR	9467.00	243.26	247.71		247.72	0.000249	1.00	9471.38	4257.66	0.12
Mud Creek	1000	67650	5 YR	15670.00	243.26	249.58		249.59	0.000105	0.82	19096.16	6045.58	0.08
Mud Creek	1000	67650	10 YR	20280.00	243.26	250.75		250.76	0.000064	0.76	26580.89	6496.77	0.07
Mud Creek	1000	67650	25 YR	25082.00	243.26	251.84		251.85	0.000045	0.75	33727.93	6565.17	0.06
Mud Creek	1000	67650	50 YR	29635.00	243.26	252.84		252.85	0.000035	0.74	40308.06	6627.51	0.05
Mud Creek	1000	67650	100 YR	34050.00	243.26	253.72		253.73	0.000029	0.74	46159.10	6682.46	0.05
Mud Creek	1000	66450	2 YR	9467.00	242.65	247.54		247.55	0.000092	0.74	12783.56	5225.55	0.08
Mud Creek	1000	66450	5 YR	15670.00	242.65	249.50		249.51	0.000042	0.62	25093.12	7321.22	0.06
Mud Creek	1000	66450	10 YR	20280.00	242.65	250.70		250.71	0.000027	0.59	35087.18	8885.18	0.05
Mud Creek	1000	66450	25 YR	25082.00	242.65	251.81		251.82	0.000019	0.58	44964.02	8940.58	0.04
Mud Creek	1000	66450	50 YR	29635.00	242.65	252.82		252.82	0.000015	0.57	53972.14	8990.82	0.04
Mud Creek	1000	66450	100 YR	34050.00	242.65	253.70		253.70	0.000013	0.58	61931.31	9034.97	0.04
Mud Creek	1000	64850	2 YR	9467.00	241.83	247.39		247.40	0.000092	0.81	11743.54	4221.82	0.09
Mud Creek	1000	64850	5 YR	15670.00	241.83	249.43		249.44	0.000048	0.71	21924.06	5768.47	0.06
Mud Creek	1000	64850	10 YR	20280.00	241.83	250.65		250.66	0.000033	0.69	29389.37	6229.42	0.06
Mud Creek	1000	64850	25 YR	25082.00	241.83	251.77		251.78	0.000025	0.69	36399.11	6279.85	0.05
Mud Creek	1000	64850	50 YR	29635.00	241.83	252.79		252.79	0.000021	0.70	42773.45	6325.36	0.05
Mud Creek	1000	64850	100 YR	34050.00	241.83	253.67		253.68	0.000018	0.71	48399.09	6365.26	0.04
Mud Creek	1000	63250	2 YR	9467.00	241.02	247.24		247.24	0.000106	0.71	13340.56	4292.00	0.07
Mud Creek	1000	63250	5 YR	15670.00	241.02	249.35		249.35	0.000061	0.65	23930.45	5748.42	0.06
Mud Creek	1000	63250	10 YR	20280.00	241.02	250.59		250.60	0.000045	0.64	31518.97	6223.70	0.05
Mud Creek	1000	63250	25 YR	25082.00	241.02	251.73		251.73	0.000035	0.65	38609.18	6269.11	0.05
Mud Creek	1000	63250	50 YR	29635.00	241.02	252.75		252.75	0.000030	0.66	45020.56	6309.88	0.04
Mud Creek	1000	63250	100 YR	34050.00	241.02	253.64		253.65	0.000027	0.67	50658.39	6345.52	0.04
Mud Creek	1000	61950	2 YR	9467.00	240.36	247.15		247.15	0.000049	0.67	14094.14	4153.57	0.06
Mud Creek	1000	61950	5 YR	15670.00	240.36	249.29		249.30	0.000031	0.64	24408.31	5466.02	0.05
Mud Creek	1000	61950	10 YR	20280.00	240.36	250.55		250.56	0.000024	0.64	31697.23	5938.54	0.05
Mud Creek	1000	61950	25 YR	25082.00	240.36	251.69		251.70	0.000019	0.65	38534.60	6018.60	0.05
Mud Creek	1000	61950	50 YR	29635.00	240.36	252.72		252.73	0.000017	0.67	44736.12	6090.30	0.04
Mud Creek	1000	61950	100 YR	34050.00	240.36	253.61		253.62	0.000015	0.68	50206.74	6152.86	0.04
Mud Creek	1000	60750	2 YR	9467.00	239.83	247.08		247.09	0.000066	1.28	17384.52	4504.06	0.08
Mud Creek	1000	60750	5 YR	15670.00	239.83	249.24		249.25	0.000053	1.36	28485.93	5758.84	0.08

HEC-RAS Plan: Prop MM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	60750	10 YR	20280.00	239.83	250.51		250.52	0.000047	1.40	36192.90	6245.69	0.08
Mud Creek	1000	60750	25 YR	25082.00	239.83	251.66		251.67	0.000041	1.41	43437.91	6349.23	0.07
Mud Creek	1000	60750	50 YR	29635.00	239.83	252.69		252.70	0.000038	1.42	50016.02	6441.80	0.07
Mud Creek	1000	60750	100 YR	34050.00	239.83	253.58		253.59	0.000036	1.45	55824.27	6522.44	0.07
Mud Creek	1000	58800	2 YR	9467.00	239.18	247.06		247.06	0.000005	0.36	33233.34	5902.30	0.02
Mud Creek	1000	58800	5 YR	15670.00	239.18	249.22		249.22	0.000005	0.44	46905.70	6745.49	0.03
Mud Creek	1000	58800	10 YR	20280.00	239.18	250.49		250.49	0.000006	0.49	55726.20	7071.89	0.03
Mud Creek	1000	58800	25 YR	25082.00	239.18	251.64		251.64	0.000006	0.54	63886.95	7123.63	0.03
Mud Creek	1000	58800	50 YR	29635.00	239.18	252.66		252.67	0.000006	0.58	71236.02	7169.90	0.03
Mud Creek	1000	58800	100 YR	34050.00	239.18	253.56		253.56	0.000006	0.61	77675.86	7210.21	0.03
Mud Creek	1000	57200	2 YR	9467.00	238.64	247.05		247.05	0.000002	0.23	45431.40	6681.02	0.01
Mud Creek	1000	57200	5 YR	15670.00	238.64	249.21		249.22	0.000003	0.29	60363.11	7134.94	0.02
Mud Creek	1000	57200	10 YR	20280.00	238.64	250.48		250.48	0.000003	0.33	69554.05	7331.26	0.02
Mud Creek	1000	57200	25 YR	25082.00	238.64	251.63		251.63	0.000003	0.36	78023.88	7405.97	0.02
Mud Creek	1000	57200	50 YR	29635.00	238.64	252.66		252.66	0.000004	0.39	85672.36	7472.80	0.02
Mud Creek	1000	57200	100 YR	34050.00	238.64	253.55		253.56	0.000004	0.42	92389.91	7531.00	0.02
Mud Creek	1000	55600	2 YR	9467.00	238.10	247.05		247.05	0.000004	0.34	29174.07	3963.72	0.02
Mud Creek	1000	55600	5 YR	15670.00	238.10	249.21		249.21	0.000005	0.44	37921.52	4136.50	0.02
Mud Creek	1000	55600	10 YR	20280.00	238.10	250.47		250.48	0.000005	0.50	43212.96	4203.78	0.03
Mud Creek	1000	55600	25 YR	25082.00	238.10	251.62		251.62	0.000006	0.56	48045.11	4212.96	0.03
Mud Creek	1000	55600	50 YR	29635.00	238.10	252.65		252.65	0.000006	0.61	52376.46	4221.18	0.03
Mud Creek	1000	55600	100 YR	34050.00	238.10	253.54		253.55	0.000007	0.66	56155.31	4228.33	0.03
Mud Creek	1000	53900	2 YR	9467.00	237.53	247.04		247.04	0.000001	0.21	46355.24	6004.33	0.01
Mud Creek	1000	53900	5 YR	15670.00	237.53	249.20		249.20	0.000002	0.28	59553.81	6220.26	0.02
Mud Creek	1000	53900	10 YR	20280.00	237.53	250.47		250.47	0.000002	0.32	67497.20	6314.04	0.02
Mud Creek	1000	53900	25 YR	25082.00	237.53	251.62		251.62	0.000002	0.36	74765.55	6348.48	0.02
Mud Creek	1000	53900	50 YR	29635.00	237.53	252.64		252.65	0.000003	0.39	81301.31	6379.29	0.02
Mud Creek	1000	53900	100 YR	34050.00	237.53	253.54		253.54	0.000003	0.42	87018.81	6406.12	0.02
Mud Creek	1000	52600	2 YR	9467.00	237.09	247.04		247.04	0.000002	0.24	40050.07	4875.24	0.01
Mud Creek	1000	52600	5 YR	15670.00	237.09	249.20		249.20	0.000002	0.32	50664.82	4959.62	0.02
Mud Creek	1000	52600	10 YR	20280.00	237.09	250.46		250.47	0.000003	0.37	56967.09	4999.77	0.02
Mud Creek	1000	52600	25 YR	25082.00	237.09	251.61		251.61	0.000003	0.41	62716.78	5021.68	0.02
Mud Creek	1000	52600	50 YR	29635.00	237.09	252.64		252.64	0.000003	0.45	67882.00	5041.28	0.02
Mud Creek	1000	52600	100 YR	34050.00	237.09	253.53		253.54	0.000004	0.49	72396.29	5058.35	0.02
Mud Creek	1000	51700	2 YR	9467.00	236.78	247.04		247.04	0.000004	0.27	36451.00	4527.88	0.02
Mud Creek	1000	51700	5 YR	15670.00	236.78	249.20		249.20	0.000005	0.35	46395.81	4689.71	0.02
Mud Creek	1000	51700	10 YR	20280.00	236.78	250.46		250.46	0.000006	0.41	52391.86	4814.92	0.02
Mud Creek	1000	51700	25 YR	25082.00	236.78	251.61		251.61	0.000006	0.46	58007.03	4976.64	0.02
Mud Creek	1000	51700	50 YR	29635.00	236.78	252.63		252.64	0.000007	0.50	63188.14	5121.33	0.02
Mud Creek	1000	51700	100 YR	34050.00	236.78	253.53		253.53	0.000007	0.54	67820.62	5247.32	0.02
Mud Creek	1000	49500	2 YR	9467.00	236.04	247.03		247.03	0.000001	0.22	43229.91	4946.18	0.01
Mud Creek	1000	49500	5 YR	15670.00	236.04	249.19		249.19	0.000002	0.30	53977.16	5021.65	0.02
Mud Creek	1000	49500	10 YR	20280.00	236.04	250.45		250.46	0.000002	0.34	60349.20	5065.87	0.02
Mud Creek	1000	49500	25 YR	25082.00	236.04	251.60		251.60	0.000003	0.39	66177.96	5105.98	0.02
Mud Creek	1000	49500	50 YR	29635.00	236.04	252.63		252.63	0.000003	0.43	71432.70	5141.87	0.02
Mud Creek	1000	49500	100 YR	34050.00	236.04	253.52		253.52	0.000003	0.46	76037.98	5173.13	0.02
Mud Creek	1000	47200	2 YR	9467.00	235.27	247.03		247.03	0.000003	0.32	44778.63	6244.87	0.02
Mud Creek	1000	47200	5 YR	15670.00	235.27	249.18		249.19	0.000004	0.41	58630.36	6611.20	0.02
Mud Creek	1000	47200	10 YR	20280.00	235.27	250.45		250.45	0.000004	0.47	67100.30	6774.53	0.02
Mud Creek	1000	47200	25 YR	25082.00	235.27	251.59		251.59	0.000005	0.52	74894.56	6837.51	0.02
Mud Creek	1000	47200	50 YR	29635.00	235.27	252.62		252.62	0.000005	0.57	81931.34	6893.88	0.03
Mud Creek	1000	47200	100 YR	34050.00	235.27	253.51		253.51	0.000005	0.61	88104.99	6942.96	0.03
Mud Creek	1000	46450	2 YR	9467.00	235.02	247.03		247.03	0.000004	0.33	51757.04	8169.87	0.02
Mud Creek	1000	46450	5 YR	15670.00	235.02	249.18		249.18	0.000005	0.41	70240.25	8988.55	0.02
Mud Creek	1000	46450	10 YR	20280.00	235.02	250.44		250.44	0.000005	0.46	81856.45	9326.55	0.02
Mud Creek	1000	46450	25 YR	25082.00	235.02	251.59		251.59	0.000005	0.50	92575.30	9395.26	0.02
Mud Creek	1000	46450	50 YR	29635.00	235.02	252.61		252.61	0.000006	0.54	102235.70	9456.75	0.02
Mud Creek	1000	46450	100 YR	34050.00	235.02	253.50		253.51	0.000006	0.57	110697.80	9510.29	0.03
Mud Creek	1000	44950	2 YR	9467.00	234.51	247.02		247.02	0.000003	0.25	75999.84	12461.75	0.01
Mud Creek	1000	44950	5 YR	15670.00	234.51	249.18		249.18	0.000003	0.30	104117.40	13646.41	0.02
Mud Creek	1000	44950	10 YR	20280.00	234.51	250.44		250.44	0.000003	0.33	121736.40	14161.21	0.02
Mud Creek	1000	44950	25 YR	25082.00	234.51	251.58		251.58	0.000004	0.36	138041.50	14321.49	0.02
Mud Creek	1000	44950	50 YR	29635.00	234.51	252.61		252.61	0.000004	0.38	152792.00	14464.97	0.02
Mud Creek	1000	44950	100 YR	34050.00	234.51	253.50		253.50	0.000004	0.40	165753.60	14589.88	0.02
Angelina River	Upstream	71106	2 YR	12944.00	246.00	252.10		252.14	0.000306	1.66	7852.03	1982.69	0.14
Angelina River	Upstream	71106	5 YR	21707.00	246.00	253.52		253.58	0.000316	2.06	10711.80	2042.79	0.15
Angelina River	Upstream	71106	10 YR	28205.00	246.00	254.43		254.51	0.000319	2.30	12587.34	2081.26	0.16
Angelina River	Upstream	71106	25 YR	35110.00	246.00	255.32		255.41	0.000319	2.50	14458.55	2118.95	0.16
Angelina River	Upstream	71106	50 YR	41349.00	246.00	256.10		256.20	0.000314	2.66	16120.46	2151.87	0.16
Angelina River	Upstream	71106	100 YR	47334.00	246.00	256.81		256.93	0.000309	2.79	17670.05	2182.12	0.17
Angelina River	Upstream	69124	2 YR	12944.00	245.00	251.33		251.40	0.000466	2.24	6595.93	2295.57	0.20
Angelina River	Upstream	69124	5 YR	21707.00	245.00	252.79		252.89	0.000406	2.60	10016.76	2384.16	0.20
Angelina River	Upstream	69124	10 YR	28205.00	245.00	253.72		253.83	0.000382	2.81	12262.38	2440.58	0.20
Angelina River	Upstream	69124	25 YR	35110.00	245.00	254.64		254.76	0.000361	2.99	14516.51	2495.92	0.20

HEC-RAS Plan: Prop MM (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Upstream	69124	50 YR	41349.00	245.00	255.44		255.57	0.000342	3.12	16546.01	2544.72	0.20
Angelina River	Upstream	69124	100 YR	47334.00	245.00	256.18		256.32	0.000326	3.24	18442.62	2589.49	0.19
Angelina River	Upstream	67228	2 YR	12944.00	244.00	250.63		250.68	0.000316	1.78	7271.03	2021.75	0.16
Angelina River	Upstream	67228	5 YR	21707.00	244.00	252.19		252.26	0.000268	2.08	10475.99	2068.61	0.16
Angelina River	Upstream	67228	10 YR	28205.00	244.00	253.16		253.24	0.000256	2.28	12483.00	2097.42	0.16
Angelina River	Upstream	67228	25 YR	35110.00	244.00	254.10		254.19	0.000246	2.46	14467.43	2125.52	0.16
Angelina River	Upstream	67228	50 YR	41349.00	244.00	254.93		255.03	0.000235	2.59	16247.82	2150.42	0.16
Angelina River	Upstream	67228	100 YR	47334.00	244.00	255.69		255.80	0.000227	2.70	17892.39	2173.16	0.16
Angelina River	Upstream	65531	2 YR	12944.00	242.00	250.19		250.22	0.000229	1.27	10195.51	2467.80	0.11
Angelina River	Upstream	65531	5 YR	21707.00	242.00	251.81		251.85	0.000215	1.53	14434.84	2771.40	0.11
Angelina River	Upstream	65531	10 YR	28205.00	242.00	252.79		252.83	0.000213	1.69	17234.12	2954.81	0.11
Angelina River	Upstream	65531	25 YR	35110.00	242.00	253.74		253.79	0.000210	1.83	20139.27	3133.84	0.12
Angelina River	Upstream	65531	50 YR	41349.00	242.00	254.59		254.65	0.000203	1.93	22875.70	3293.58	0.12
Angelina River	Upstream	65531	100 YR	47334.00	242.00	255.37		255.43	0.000196	2.01	25491.04	3439.32	0.12
Angelina River	Upstream	58835	2 YR	12944.00	241.00	247.54		247.60	0.000811	2.03	6386.45	1952.80	0.20
Angelina River	Upstream	58835	5 YR	21707.00	241.00	249.68		249.74	0.000505	1.93	11243.25	2591.04	0.16
Angelina River	Upstream	58835	10 YR	28205.00	241.00	250.92		250.97	0.000378	1.94	14562.91	2709.90	0.15
Angelina River	Upstream	58835	25 YR	35110.00	241.00	252.04		252.10	0.000313	2.00	17621.76	2737.97	0.14
Angelina River	Upstream	58835	50 YR	41349.00	241.00	253.04		253.10	0.000269	2.04	20371.56	2762.96	0.13
Angelina River	Upstream	58835	100 YR	47334.00	241.00	253.92		253.98	0.000244	2.09	22806.20	2784.91	0.13
Angelina River	Upstream	53947	2 YR	12944.00	236.00	247.08		247.09	0.000055	1.19	24605.01	4305.03	0.07
Angelina River	Upstream	53947	5 YR	21707.00	236.00	249.24		249.25	0.000059	1.43	34466.07	4831.31	0.08
Angelina River	Upstream	53947	10 YR	28205.00	236.00	250.51		250.52	0.000060	1.55	40743.13	5025.44	0.08
Angelina River	Upstream	53947	25 YR	35110.00	236.00	251.66		251.67	0.000061	1.65	46522.71	5046.78	0.08
Angelina River	Upstream	53947	50 YR	41349.00	236.00	252.68		252.69	0.000060	1.72	51705.25	5065.85	0.08
Angelina River	Upstream	53947	100 YR	47334.00	236.00	253.57		253.59	0.000060	1.79	56235.41	5082.45	0.08
Angelina River	Upstream	50340	2 YR	12944.00	235.00	247.03		247.03	0.000012	0.50	49317.26	7624.00	0.03
Angelina River	Upstream	50340	5 YR	21707.00	235.00	249.18		249.18	0.000013	0.60	66157.56	8016.57	0.03
Angelina River	Upstream	50340	10 YR	28205.00	235.00	250.44		250.44	0.000014	0.67	76407.71	8205.95	0.03
Angelina River	Upstream	50340	25 YR	35110.00	235.00	251.59		251.59	0.000015	0.74	85861.30	8309.44	0.03
Angelina River	Upstream	50340	50 YR	41349.00	235.00	252.61		252.61	0.000016	0.78	94422.32	8402.06	0.04
Angelina River	Upstream	50340	100 YR	47334.00	235.00	253.50		253.51	0.000016	0.82	101952.70	8482.70	0.04
Angelina River	Downstream	43601	2 YR	15651.00	234.06	246.95		247.00	0.000176	2.60	16735.27	4351.32	0.15
Angelina River	Downstream	43601	5 YR	26053.00	234.06	249.11		249.15	0.000154	2.77	27490.49	5623.62	0.14
Angelina River	Downstream	43601	10 YR	33765.00	234.06	250.37		250.41	0.000140	2.82	35034.76	6168.61	0.14
Angelina River	Downstream	43601	25 YR	42281.00	234.06	251.52		251.56	0.000127	2.85	42144.20	6225.97	0.13
Angelina River	Downstream	43601	50 YR	51548.00	234.06	252.54		252.58	0.000124	2.94	48542.28	6277.14	0.13
Angelina River	Downstream	43601	100 YR	60660.00	234.06	253.43		253.47	0.000123	3.04	54147.09	6321.63	0.13
Angelina River	Downstream	43600	2 YR	15651.00	234.06	246.95	242.29	247.00	0.000176	2.60	16734.47	4351.21	0.15
Angelina River	Downstream	43600	5 YR	26053.00	234.06	249.11	243.48	249.15	0.000154	2.77	27489.63	5623.53	0.14
Angelina River	Downstream	43600	10 YR	33765.00	234.06	250.37	244.12	250.41	0.000140	2.82	35033.91	6168.60	0.14
Angelina River	Downstream	43600	25 YR	42281.00	234.06	251.52	244.69	251.56	0.000127	2.85	42143.35	6225.96	0.13
Angelina River	Downstream	43600	50 YR	51548.00	234.06	252.54	245.17	252.58	0.000124	2.94	48541.51	6277.13	0.13
Angelina River	Downstream	43600	100 YR	60660.00	234.06	253.43	245.63	253.47	0.000123	3.04	54146.32	6321.62	0.13
Angelina River	Downstream	43250		Bridge									
Angelina River	Downstream	42900	2 YR	15651.00	233.82	246.79		246.81	0.000124	1.90	18725.58	3531.98	0.11
Angelina River	Downstream	42900	5 YR	26053.00	233.82	248.97		249.00	0.000128	2.21	27037.68	4088.28	0.11
Angelina River	Downstream	42900	10 YR	33765.00	233.82	250.24		250.27	0.000132	2.40	32435.89	4397.61	0.12
Angelina River	Downstream	42900	25 YR	42281.00	233.82	251.39		251.42	0.000139	2.60	37616.20	4621.61	0.12
Angelina River	Downstream	42900	50 YR	51548.00	233.82	252.41		252.45	0.000149	2.81	42429.06	4820.41	0.13
Angelina River	Downstream	42900	100 YR	60660.00	233.82	253.30		253.34	0.000158	3.01	46771.46	4992.98	0.13
Angelina River	Downstream	40400	2 YR	15651.00	232.98	246.49		246.51	0.000180	2.30	18463.79	4078.20	0.13
Angelina River	Downstream	40400	5 YR	26053.00	232.98	248.69		248.71	0.000164	2.52	28399.54	4967.86	0.13
Angelina River	Downstream	40400	10 YR	33765.00	232.98	249.96		249.99	0.000160	2.66	35052.51	5483.48	0.13
Angelina River	Downstream	40400	25 YR	42281.00	232.98	251.11		251.13	0.000159	2.79	41704.21	5827.64	0.13
Angelina River	Downstream	40400	50 YR	51548.00	232.98	252.12		252.15	0.000156	2.89	47634.46	5853.03	0.13
Angelina River	Downstream	40400	100 YR	60660.00	232.98	253.00		253.03	0.000156	3.00	52784.43	5874.98	0.13
Angelina River	Downstream	39350	2 YR	15651.00	232.63	246.44		246.44	0.000040	0.95	35690.58	6570.21	0.05
Angelina River	Downstream	39350	5 YR	26053.00	232.63	248.64		248.64	0.000039	1.07	50978.02	7329.12	0.05
Angelina River	Downstream	39350	10 YR	33765.00	232.63	249.91		249.91	0.000040	1.16	60588.66	7768.35	0.06
Angelina River	Downstream	39350	25 YR	42281.00	232.63	251.05		251.06	0.000041	1.24	69553.52	7852.71	0.06
Angelina River	Downstream	39350	50 YR	51548.00	232.63	252.07		252.08	0.000043	1.33	77541.34	7903.41	0.06
Angelina River	Downstream	39350	100 YR	60660.00	232.63	252.94		252.95	0.000046	1.42	84488.09	7947.23	0.06
Angelina River	Downstream	36950	2 YR	15651.00	231.82	246.21		246.30	0.000242	3.12	11729.07	2546.46	0.17
Angelina River	Downstream	36950	5 YR	26053.00	231.82	248.41		248.50	0.000248	3.60	17955.06	3127.98	0.18
Angelina River	Downstream	36950	10 YR	33765.00	231.82	249.67		249.78	0.000253	3.87	22126.42	3463.39	0.18
Angelina River	Downstream	36950	25 YR	42281.00	231.82	250.81		250.92	0.000257	4.12	26618.18	4124.41	0.19
Angelina River	Downstream	36950	50 YR	51548.00	231.82	251.82		251.94	0.000257	4.30	30793.53	4154.67	0.19
Angelina River	Downstream	36950	100 YR	60660.00	231.82	252.69		252.81	0.000261	4.49	34410.69	4180.71	0.19
Angelina River	Downstream	33750	2 YR	15651.00	230.74	244.91		245.16	0.000739	4.43	5738.99	1428.07	0.23
Angelina River	Downstream	33750	5 YR	26053.00	230.74	247.04		247.34	0.000820	5.23	9326.84	1939.47	0.25
Angelina River	Downstream	33750	10 YR	33765.00	230.74	248.29		248.61	0.000835	5.60	11948.04	2240.47	0.26
Angelina River	Downstream	33750	25 YR	42281.00	230.74	249.42		249.75	0.000858	5.96	14618.12	2510.25	0.26

HEC-RAS Plan: Prop MM (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Downstream	33750	50 YR	51548.00	230.74	250.43		250.77	0.000871	6.26	17254.03	2664.93	0.27
Angelina River	Downstream	33750	100 YR	60660.00	230.74	251.30		251.64	0.000868	6.46	19589.57	2695.43	0.27
Angelina River	Downstream	32550	2 YR	15651.00	230.34	244.26		244.42	0.000736	4.38	7541.04	1937.85	0.26
Angelina River	Downstream	32550	5 YR	26053.00	230.34	246.53		246.69	0.000596	4.57	12423.20	2358.32	0.24
Angelina River	Downstream	32550	10 YR	33765.00	230.34	247.84		247.99	0.000558	4.75	15658.71	2599.77	0.24
Angelina River	Downstream	32550	25 YR	42281.00	230.34	248.98		249.15	0.000554	5.02	18754.20	2811.43	0.24
Angelina River	Downstream	32550	50 YR	51548.00	230.34	249.99		250.17	0.000568	5.33	21690.92	2998.45	0.24
Angelina River	Downstream	32550	100 YR	60660.00	230.34	250.87		251.06	0.000578	5.58	24336.60	3043.36	0.25
Angelina River	Downstream	30950	2 YR	15651.00	229.81	241.45		242.50	0.002132	8.28	2131.58	578.55	0.49
Angelina River	Downstream	30950	5 YR	26053.00	229.81	242.90		244.74	0.003223	11.26	3233.06	945.66	0.62
Angelina River	Downstream	30950	10 YR	33765.00	229.81	243.89		246.09	0.003582	12.62	4292.66	1196.89	0.66
Angelina River	Downstream	30950	25 YR	42281.00	229.81	245.09		247.32	0.003424	13.20	5914.71	1502.18	0.66
Angelina River	Downstream	30950	50 YR	51548.00	229.81	246.43		248.46	0.002974	13.16	8161.86	1843.39	0.62
Angelina River	Downstream	30950	100 YR	60660.00	229.81	247.69		249.47	0.002543	12.90	10681.72	2162.91	0.58
Angelina River	Downstream	29800	2 YR	15651.00	229.43	241.41		241.52	0.000288	2.65	7169.59	1943.91	0.18
Angelina River	Downstream	29800	5 YR	26053.00	229.43	243.27		243.41	0.000316	3.24	10952.85	2133.21	0.19
Angelina River	Downstream	29800	10 YR	33765.00	229.43	244.47		244.64	0.000318	3.54	13600.07	2256.24	0.20
Angelina River	Downstream	29800	25 YR	42281.00	229.43	245.72		245.90	0.000313	3.80	16481.29	2382.93	0.20
Angelina River	Downstream	29800	50 YR	51548.00	229.43	246.95		247.16	0.000307	4.03	19511.38	2509.28	0.20
Angelina River	Downstream	29800	100 YR	60660.00	229.43	248.08		248.30	0.000301	4.22	22399.59	2624.06	0.20
Angelina River	Downstream	29000	2 YR	15651.00	229.18	239.99	235.73	240.90	0.002951	7.66	2043.84	219.94	0.44
Angelina River	Downstream	29000	5 YR	26053.00	229.18	242.74		242.96	0.000926	5.10	13000.26	4263.33	0.26
Angelina River	Downstream	29000	10 YR	33765.00	229.18	244.10		244.24	0.000626	4.50	18981.23	4532.60	0.22
Angelina River	Downstream	29000	25 YR	42281.00	229.18	245.43		245.53	0.000472	4.16	25147.69	4794.41	0.19
Angelina River	Downstream	29000	50 YR	51548.00	229.18	246.72		246.81	0.000381	3.96	31525.70	5050.95	0.17
Angelina River	Downstream	29000	100 YR	60660.00	229.18	247.89		247.96	0.000327	3.84	37544.63	5281.63	0.16
Angelina River	Downstream	22700	2 YR	15651.00	227.14	239.33		239.35	0.000094	1.76	16995.64	2452.41	0.09
Angelina River	Downstream	22700	5 YR	26053.00	227.14	242.05		242.08	0.000097	2.07	23996.43	2642.17	0.10
Angelina River	Downstream	22700	10 YR	33765.00	227.14	243.43		243.47	0.000107	2.32	27695.97	2704.45	0.11
Angelina River	Downstream	22700	25 YR	42281.00	227.14	244.78		244.83	0.000116	2.56	31390.40	2765.24	0.11
Angelina River	Downstream	22700	50 YR	51548.00	227.14	246.10		246.15	0.000124	2.79	35080.25	2824.64	0.12
Angelina River	Downstream	22700	100 YR	60660.00	227.14	247.29		247.35	0.000131	2.99	38452.98	2877.87	0.12
Angelina River	Downstream	18600	2 YR	15651.00	225.81	238.92		238.95	0.000161	2.33	13684.25	2061.95	0.12
Angelina River	Downstream	18600	5 YR	26053.00	225.81	241.56		241.62	0.000217	3.12	22769.21	4378.10	0.15
Angelina River	Downstream	18600	10 YR	33765.00	225.81	242.98		243.02	0.000182	3.06	29016.96	4448.88	0.14
Angelina River	Downstream	18600	25 YR	42281.00	225.81	244.35		244.39	0.000162	3.06	35161.86	4517.41	0.13
Angelina River	Downstream	18600	50 YR	51548.00	225.81	245.68		245.72	0.000150	3.10	41216.00	4583.93	0.13
Angelina River	Downstream	18600	100 YR	60660.00	225.81	246.87		246.91	0.000143	3.15	46702.25	4643.39	0.13
Angelina River	Downstream	14400	2 YR	15651.00	224.45	238.84		238.84	0.000028	0.87	31995.83	3766.87	0.05
Angelina River	Downstream	14400	5 YR	26053.00	224.45	241.46		241.47	0.000035	1.11	42195.50	4105.88	0.05
Angelina River	Downstream	14400	10 YR	33765.00	224.45	242.87		242.87	0.000041	1.28	48164.08	4376.78	0.06
Angelina River	Downstream	14400	25 YR	42281.00	224.45	244.23		244.24	0.000046	1.45	54319.15	4639.60	0.06
Angelina River	Downstream	14400	50 YR	51548.00	224.45	245.56		245.57	0.000051	1.60	60643.05	4894.96	0.07
Angelina River	Downstream	14400	100 YR	60660.00	224.45	246.74		246.76	0.000055	1.74	66586.23	5123.35	0.07
Angelina River	Downstream	5700	2 YR	15651.00	221.64	238.63		238.64	0.000095	1.71	18309.60	2548.76	0.08
Angelina River	Downstream	5700	5 YR	26053.00	221.64	241.21		241.24	0.000104	2.02	25401.69	2914.83	0.09
Angelina River	Downstream	5700	10 YR	33765.00	221.64	242.59		242.61	0.000114	2.24	29476.82	3016.51	0.10
Angelina River	Downstream	5700	25 YR	42281.00	221.64	243.92		243.95	0.000123	2.45	33572.58	3115.37	0.10
Angelina River	Downstream	5700	50 YR	51548.00	221.64	245.22		245.26	0.000131	2.65	37685.98	3211.59	0.11
Angelina River	Downstream	5700	100 YR	60660.00	221.64	246.39		246.43	0.000138	2.82	41477.72	3297.80	0.11
Angelina River	Downstream	1000	2 YR	15651.00	220.12	237.88	231.14	238.02	0.000350	3.80	8536.88	1716.48	0.19
Angelina River	Downstream	1000	5 YR	26053.00	220.12	240.45	233.69	240.60	0.000350	4.29	13628.76	2283.87	0.19
Angelina River	Downstream	1000	10 YR	33765.00	220.12	241.80	234.88	241.96	0.000350	4.53	16774.59	2385.74	0.20
Angelina River	Downstream	1000	25 YR	42281.00	220.12	243.11	235.83	243.27	0.000350	4.77	19970.38	2484.94	0.20
Angelina River	Downstream	1000	50 YR	51548.00	220.12	244.39	236.70	244.56	0.000350	4.99	23208.78	2581.59	0.20
Angelina River	Downstream	1000	100 YR	60660.00	220.12	245.53	237.39	245.71	0.000350	5.19	26218.78	2668.28	0.20

HEC-RAS Output  
Proposed Lowest Mature Median



HEC-RAS Plan: Prop LMM

River	Reach	River Sta	Profile	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
Mud Creek	1000	132650	2 YR	1.00	315.00	315.03	315.03	315.03	0.005149	0.19	5.29	199.99	0.21
Mud Creek	1000	132650	5 YR	1176.00	315.00	316.32		316.63	0.015705	4.45	264.43	199.99	0.68
Mud Creek	1000	132650	10 YR	3103.00	315.00	317.58		318.14	0.012024	6.02	515.27	199.99	0.66
Mud Creek	1000	132650	25 YR	5517.00	315.00	318.81		319.62	0.010519	7.25	761.13	199.99	0.65
Mud Creek	1000	132650	50 YR	8307.00	315.00	320.01		321.08	0.009668	8.29	1002.57	199.99	0.65
Mud Creek	1000	132650	100 YR	11160.00	315.00	321.10		322.40	0.009195	9.15	1220.04	200.00	0.65
Mud Creek	1000	132350.*	2 YR	1.00	309.12	309.14	309.14	309.15	0.007621	0.23	4.38	178.82	0.26
Mud Creek	1000	132350.*	5 YR	1176.00	309.12	310.33	310.19	310.71	0.022903	5.00	235.25	212.28	0.84
Mud Creek	1000	132350.*	10 YR	3103.00	309.12	311.29	311.11	312.02	0.021218	6.85	452.94	239.60	0.88
Mud Creek	1000	132350.*	25 YR	5517.00	309.12	312.15	311.97	313.20	0.020775	8.23	669.97	264.03	0.91
Mud Creek	1000	132350.*	50 YR	8307.00	309.12	312.93	312.78	314.30	0.020841	9.40	884.06	286.10	0.94
Mud Creek	1000	132350.*	100 YR	11160.00	309.12	313.56	313.49	315.25	0.021632	10.43	1069.85	303.95	0.98
Mud Creek	1000	132050.*	2 YR	1.00	303.23	303.25	303.25	303.25	0.011755	0.28	3.57	157.72	0.33
Mud Creek	1000	132050.*	5 YR	1176.00	303.23	304.57		304.87	0.016620	4.41	266.48	242.92	0.74
Mud Creek	1000	132050.*	10 YR	3103.00	303.23	305.43		306.03	0.018578	6.18	501.74	299.26	0.84
Mud Creek	1000	132050.*	25 YR	5517.00	303.23	306.15	305.99	307.03	0.020076	7.52	734.12	346.02	0.91
Mud Creek	1000	132050.*	50 YR	8307.00	303.23	306.79	306.69	307.93	0.021198	8.60	966.06	387.10	0.96
Mud Creek	1000	132050.*	100 YR	11160.00	303.23	307.34	307.29	308.70	0.021402	9.36	1191.88	423.28	0.98
Mud Creek	1000	131750.*	2 YR	1.00	297.35	297.37	297.37	297.37	0.019371	0.35	2.83	136.75	0.43
Mud Creek	1000	131750.*	5 YR	1176.00	297.35	298.55	298.47	298.91	0.024060	4.85	242.44	270.78	0.90
Mud Creek	1000	131750.*	10 YR	3103.00	297.35	299.36	299.28	299.96	0.022062	6.19	501.31	363.78	0.93
Mud Creek	1000	131750.*	25 YR	5517.00	297.35	300.04	299.96	300.83	0.021172	7.12	774.48	441.15	0.95
Mud Creek	1000	131750.*	50 YR	8307.00	297.35	300.63	300.56	301.59	0.020738	7.88	1054.60	508.40	0.96
Mud Creek	1000	131750.*	100 YR	11160.00	297.35	301.09	301.07	302.23	0.021358	8.60	1297.62	560.25	1.00
Mud Creek	1000	131450.*	2 YR	1.00	291.47	291.50	291.50	291.50	0.009718	0.31	3.23	117.64	0.33
Mud Creek	1000	131450.*	5 YR	1176.00	291.47	292.76	292.58	293.00	0.016189	3.95	297.96	349.05	0.75
Mud Creek	1000	131450.*	10 YR	3103.00	291.47	293.45		293.89	0.018325	5.34	581.44	475.10	0.85
Mud Creek	1000	131450.*	25 YR	5517.00	291.47	293.99	293.87	294.62	0.019978	6.39	862.80	573.43	0.92
Mud Creek	1000	131450.*	50 YR	8307.00	291.47	294.44	294.39	295.26	0.021268	7.27	1142.98	656.88	0.97
Mud Creek	1000	131450.*	100 YR	11160.00	291.47	294.85	294.82	295.80	0.021183	7.82	1426.26	731.63	0.99
Mud Creek	1000	131150.*	2 YR	1.00	285.59	285.61	285.61	285.62	0.021642	0.44	2.29	97.63	0.50
Mud Creek	1000	131150.*	5 YR	1176.00	285.59	286.67	286.65	286.97	0.025535	4.40	267.41	402.98	0.95
Mud Creek	1000	131150.*	10 YR	3103.00	285.59	287.29	287.26	287.75	0.022954	5.42	572.31	581.53	0.96
Mud Creek	1000	131150.*	25 YR	5517.00	285.59	287.79	287.75	288.38	0.021587	6.13	899.69	725.90	0.97
Mud Creek	1000	131150.*	50 YR	8307.00	285.59	288.23	288.19	288.92	0.020750	6.70	1240.03	850.39	0.98
Mud Creek	1000	131150.*	100 YR	11160.00	285.59	288.55	288.55	289.38	0.021418	7.30	1528.19	943.03	1.01
Mud Creek	1000	130850.*	2 YR	1.00	279.71	279.74		279.74	0.013200	0.41	2.42	83.59	0.43
Mud Creek	1000	130850.*	5 YR	1176.00	279.71	280.78	280.67	280.97	0.015984	3.43	342.96	569.94	0.78
Mud Creek	1000	130850.*	10 YR	3103.00	279.71	281.27	281.18	281.60	0.018267	4.60	674.15	796.21	0.88
Mud Creek	1000	130850.*	25 YR	5517.00	279.71	281.64	281.59	282.11	0.020049	5.51	1001.82	969.42	0.95
Mud Creek	1000	130850.*	50 YR	8307.00	279.71	281.95	281.95	282.56	0.021549	6.27	1325.00	1114.19	1.01
Mud Creek	1000	130850.*	100 YR	11160.00	279.71	282.25	282.25	282.94	0.020718	6.65	1677.64	1253.22	1.01
Mud Creek	1000	130550.*	2 YR	1.00	273.82	273.85	273.85	273.85	0.032225	0.60	1.68	70.71	0.68
Mud Creek	1000	130550.*	5 YR	1176.00	273.82	274.63	274.63	274.85	0.026778	3.75	313.23	724.55	1.01
Mud Creek	1000	130550.*	10 YR	3103.00	273.82	275.04	275.04	275.37	0.023848	4.58	676.89	1063.93	1.01
Mud Creek	1000	130550.*	25 YR	5517.00	273.82	275.37	275.37	275.78	0.022111	5.15	1072.02	1338.44	1.01
Mud Creek	1000	130550.*	50 YR	8307.00	273.82	275.66	275.66	276.14	0.020619	5.55	1495.71	1580.69	1.01
Mud Creek	1000	130550.*	100 YR	11160.00	273.82	275.89	275.89	276.43	0.020150	5.93	1882.55	1773.20	1.01
Mud Creek	1000	130250	2 YR	1.00	267.94	269.30		269.30	0.000000	0.00	2198.68	3209.41	0.00
Mud Creek	1000	130250	5 YR	1176.00	267.94	270.52	270.52	270.52	0.000008	0.14	8230.35	6232.93	0.02
Mud Creek	1000	130250	10 YR	3103.00	267.94	271.32		271.32	0.000011	0.24	13303.34	6361.82	0.03
Mud Creek	1000	130250	25 YR	5517.00	267.94	272.09		272.09	0.000013	0.31	18246.33	6484.95	0.03
Mud Creek	1000	130250	50 YR	8307.00	267.94	272.80		272.80	0.000014	0.37	22841.38	6597.34	0.03
Mud Creek	1000	130250	100 YR	11160.00	267.94	273.44		273.44	0.000014	0.42	27103.30	6699.91	0.04
Mud Creek	1000	129850	2 YR	1.00	267.48	269.30		269.30	0.000000	0.00	2791.82	3068.70	0.00
Mud Creek	1000	129850	5 YR	1176.00	267.48	270.51		270.52	0.000010	0.15	8586.20	6304.05	0.02
Mud Creek	1000	129850	10 YR	3103.00	267.48	271.32		271.32	0.000018	0.26	13685.19	6388.42	0.03
Mud Creek	1000	129850	25 YR	5517.00	267.48	272.09		272.09	0.000022	0.34	18625.65	6469.11	0.03
Mud Creek	1000	129850	50 YR	8307.00	267.48	272.79		272.79	0.000025	0.41	23190.62	6542.78	0.04
Mud Creek	1000	129850	100 YR	11160.00	267.48	273.43		273.43	0.000027	0.47	27403.23	6610.04	0.04
Mud Creek	1000	128750	2 YR	1.00	267.10	269.30		269.30	0.000000	0.00	4045.61	3678.57	0.00
Mud Creek	1000	128750	5 YR	1176.00	267.10	270.51		270.51	0.000005	0.12	9510.89	4913.46	0.02
Mud Creek	1000	128750	10 YR	3103.00	267.10	271.30		271.30	0.000010	0.23	13462.02	5012.97	0.02
Mud Creek	1000	128750	25 YR	5517.00	267.10	272.07		272.07	0.000014	0.32	17327.20	5108.44	0.03
Mud Creek	1000	128750	50 YR	8307.00	267.10	272.77		272.77	0.000017	0.40	20921.91	5195.66	0.03
Mud Creek	1000	128750	100 YR	11160.00	267.10	273.40		273.41	0.000019	0.47	24262.66	5275.42	0.04
Mud Creek	1000	127950	2 YR	1.00	266.82	269.30		269.30	0.000000	0.00	3866.79	3118.94	0.00
Mud Creek	1000	127950	5 YR	1176.00	266.82	270.50		270.50	0.000005	0.14	8482.47	4227.70	0.02
Mud Creek	1000	127950	10 YR	3103.00	266.82	271.29		271.30	0.000013	0.27	11842.95	4271.20	0.03
Mud Creek	1000	127950	25 YR	5517.00	266.82	272.05		272.06	0.000018	0.37	15103.93	4312.98	0.03
Mud Creek	1000	127950	50 YR	8307.00	266.82	272.75		272.75	0.000023	0.47	18111.32	4351.17	0.04
Mud Creek	1000	127950	100 YR	11160.00	266.82	273.38		273.39	0.000026	0.55	20888.25	4386.13	0.04
Mud Creek	1000	126600	2 YR	2268.00	266.35	269.27		269.28	0.000035	0.32	7031.24	4807.96	0.05
Mud Creek	1000	126600	5 YR	3760.00	266.35	270.49		270.49	0.000013	0.27	13908.20	6100.24	0.03

## HEC-RAS Plan: Prop LMM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	126600	10 YR	4870.00	266.35	271.28		271.28	0.000008	0.26	18807.08	6262.70	0.03
Mud Creek	1000	126600	25 YR	6026.00	266.35	272.04		272.04	0.000006	0.26	23630.31	6418.64	0.02
Mud Creek	1000	126600	50 YR	8412.00	266.35	272.73		272.74	0.000007	0.31	28123.21	6560.57	0.03
Mud Creek	1000	126600	100 YR	11338.00	266.35	273.37		273.37	0.000008	0.36	32321.78	6690.47	0.03
Mud Creek	1000	124600	2 YR	2268.00	265.65	269.20		269.20	0.000045	0.37	6212.40	3504.56	0.05
Mud Creek	1000	124600	5 YR	3760.00	265.65	270.45		270.46	0.000022	0.33	11314.87	4334.09	0.04
Mud Creek	1000	124600	10 YR	4870.00	265.65	271.26		271.26	0.000015	0.33	14824.59	4394.41	0.03
Mud Creek	1000	124600	25 YR	6026.00	265.65	272.02		272.03	0.000012	0.33	18212.94	4451.86	0.03
Mud Creek	1000	124600	50 YR	8412.00	265.65	272.71		272.72	0.000014	0.40	21300.81	4503.58	0.03
Mud Creek	1000	124600	100 YR	11338.00	265.65	273.34		273.35	0.000017	0.48	24151.30	4550.80	0.04
Mud Creek	1000	123150	2 YR	2268.00	265.14	269.14		269.14	0.000030	0.28	8078.67	4036.13	0.03
Mud Creek	1000	123150	5 YR	3760.00	265.14	270.43		270.43	0.000017	0.27	14010.52	4953.37	0.03
Mud Creek	1000	123150	10 YR	4870.00	265.14	271.24		271.24	0.000012	0.27	18075.47	5054.91	0.02
Mud Creek	1000	123150	25 YR	6026.00	265.14	272.01		272.01	0.000010	0.28	22005.38	5151.18	0.02
Mud Creek	1000	123150	50 YR	8412.00	265.14	272.70		272.70	0.000012	0.33	25572.52	5237.02	0.03
Mud Creek	1000	123150	100 YR	11338.00	265.14	273.32		273.32	0.000015	0.40	28873.63	5315.23	0.03
Mud Creek	1000	121050	2 YR	5303.00	264.41	269.03		269.03	0.000074	0.50	10676.73	4625.11	0.06
Mud Creek	1000	121050	5 YR	8784.00	264.41	270.35		270.36	0.000049	0.50	17856.70	6279.50	0.05
Mud Creek	1000	121050	10 YR	11369.00	264.41	271.18		271.19	0.000037	0.51	23148.07	6466.32	0.04
Mud Creek	1000	121050	25 YR	14059.00	264.41	271.96		271.97	0.000031	0.52	28256.18	6641.68	0.04
Mud Creek	1000	121050	50 YR	16607.00	264.41	272.65		272.66	0.000027	0.53	32882.56	6796.60	0.04
Mud Creek	1000	121050	100 YR	19074.00	264.41	273.28		273.28	0.000025	0.55	37180.09	6937.41	0.04
Mud Creek	1000	119350	2 YR	5303.00	263.81	268.73		268.75	0.000581	1.26	4223.43	1716.84	0.14
Mud Creek	1000	119350	5 YR	8784.00	263.81	270.15		270.17	0.000402	1.25	7002.67	2163.67	0.12
Mud Creek	1000	119350	10 YR	11369.00	263.81	271.02		271.05	0.000303	1.28	8903.52	2185.52	0.11
Mud Creek	1000	119350	25 YR	14059.00	263.81	271.82		271.85	0.000256	1.32	10661.46	2205.54	0.11
Mud Creek	1000	119350	50 YR	16607.00	263.81	272.52		272.55	0.000229	1.37	12212.37	2223.05	0.10
Mud Creek	1000	119350	100 YR	19074.00	263.81	273.16		273.19	0.000211	1.41	13624.63	2238.88	0.10
Mud Creek	1000	117350	2 YR	5303.00	263.11	268.28		268.29	0.000122	0.88	6014.97	2326.50	0.10
Mud Creek	1000	117350	5 YR	8784.00	263.11	269.85		269.86	0.000081	0.86	10208.41	3030.85	0.08
Mud Creek	1000	117350	10 YR	11369.00	263.11	270.80		270.81	0.000060	0.86	13190.08	3176.01	0.07
Mud Creek	1000	117350	25 YR	14059.00	263.11	271.64		271.65	0.000050	0.89	15886.46	3255.66	0.07
Mud Creek	1000	117350	50 YR	16607.00	263.11	272.36		272.37	0.000045	0.92	18260.64	3324.22	0.07
Mud Creek	1000	117350	100 YR	19074.00	263.11	273.01		273.02	0.000042	0.95	20430.68	3385.66	0.07
Mud Creek	1000	114900	2 YR	5303.00	262.26	268.02		268.03	0.000095	0.84	6319.35	2194.79	0.09
Mud Creek	1000	114900	5 YR	8784.00	262.26	269.66		269.68	0.000068	0.84	10447.23	2822.00	0.08
Mud Creek	1000	114900	10 YR	11369.00	262.26	270.66		270.67	0.000054	0.85	13379.21	2986.37	0.07
Mud Creek	1000	114900	25 YR	14059.00	262.26	271.52		271.53	0.000046	0.88	15966.95	3033.65	0.07
Mud Creek	1000	114900	50 YR	16607.00	262.26	272.25		272.27	0.000042	0.92	18205.40	3073.97	0.07
Mud Creek	1000	114900	100 YR	19074.00	262.26	272.91		272.92	0.000039	0.95	20227.32	3109.93	0.06
Mud Creek	1000	113800	2 YR	5303.00	261.87	267.91		267.92	0.000105	0.91	5826.11	1930.39	0.09
Mud Creek	1000	113800	5 YR	8784.00	261.87	269.58		269.59	0.000078	0.92	9508.12	2466.06	0.08
Mud Creek	1000	113800	10 YR	11369.00	261.87	270.59		270.61	0.000063	0.94	12134.43	2662.47	0.08
Mud Creek	1000	113800	25 YR	14059.00	261.87	271.46		271.48	0.000054	0.98	14485.97	2753.65	0.07
Mud Creek	1000	113800	50 YR	16607.00	261.87	272.20		272.22	0.000050	1.02	16545.13	2831.08	0.07
Mud Creek	1000	113800	100 YR	19074.00	261.87	272.86		272.87	0.000047	1.06	18426.78	2900.02	0.07
Mud Creek	1000	112200	2 YR	5303.00	261.31	267.67		267.69	0.000201	1.14	4656.58	1464.04	0.11
Mud Creek	1000	112200	5 YR	8784.00	261.31	269.40		269.42	0.000153	1.17	7535.74	1862.44	0.10
Mud Creek	1000	112200	10 YR	11369.00	261.31	270.45		270.47	0.000126	1.19	9590.14	2020.15	0.10
Mud Creek	1000	112200	25 YR	14059.00	261.31	271.33		271.36	0.000109	1.24	11397.88	2060.03	0.09
Mud Creek	1000	112200	50 YR	16607.00	261.31	272.08		272.11	0.000101	1.29	12947.51	2093.60	0.09
Mud Creek	1000	112200	100 YR	19074.00	261.31	272.74		272.77	0.000096	1.34	14342.60	2123.38	0.09
Mud Creek	1000	110300	2 YR	5303.00	260.65	267.48	262.93	267.48	0.000066	0.69	7725.74	2263.39	0.07
Mud Creek	1000	110300	5 YR	8784.00	260.65	269.25	263.45	269.26	0.000053	0.72	12265.72	2851.91	0.06
Mud Creek	1000	110300	10 YR	11369.00	260.65	270.32	263.75	270.33	0.000046	0.73	15493.25	3117.71	0.06
Mud Creek	1000	110300	25 YR	14059.00	260.65	271.23	264.03	271.24	0.000040	0.77	18333.91	3167.42	0.06
Mud Creek	1000	110300	50 YR	16607.00	260.65	271.98	264.26	271.99	0.000037	0.80	20742.17	3208.97	0.05
Mud Creek	1000	110300	100 YR	19074.00	260.65	272.65	264.46	272.66	0.000036	0.84	22896.25	3245.68	0.05
Mud Creek	1000	110200		Bridge									
Mud Creek	1000	110050	2 YR	5303.00	260.56	267.41		267.41	0.000038	0.59	8937.14	2610.84	0.06
Mud Creek	1000	110050	5 YR	8784.00	260.56	269.18		269.19	0.000030	0.62	14168.98	3287.38	0.05
Mud Creek	1000	110050	10 YR	11369.00	260.56	270.25		270.25	0.000026	0.64	17887.34	3629.72	0.05
Mud Creek	1000	110050	25 YR	14059.00	260.56	271.15		271.15	0.000023	0.67	21196.73	3737.53	0.05
Mud Creek	1000	110050	50 YR	16607.00	260.56	271.89		271.90	0.000022	0.70	24029.19	3827.39	0.05
Mud Creek	1000	110050	100 YR	19074.00	260.56	272.56		272.56	0.000021	0.73	26584.40	3906.68	0.05
Mud Creek	1000	109550	2 YR	5303.00	260.38	267.39		267.39	0.000034	0.57	9318.70	2659.20	0.05
Mud Creek	1000	109550	5 YR	8784.00	260.38	269.17		269.17	0.000028	0.60	14644.29	3333.56	0.05
Mud Creek	1000	109550	10 YR	11369.00	260.38	270.24		270.24	0.000024	0.62	18420.06	3692.34	0.05
Mud Creek	1000	109550	25 YR	14059.00	260.38	271.14		271.14	0.000022	0.65	21815.81	3854.33	0.05
Mud Creek	1000	109550	50 YR	16607.00	260.38	271.88		271.89	0.000020	0.68	24755.47	3989.25	0.05
Mud Creek	1000	109550	100 YR	19074.00	260.38	272.55		272.55	0.000019	0.71	27432.49	4108.27	0.05
Mud Creek	1000	107750	2 YR	5303.00	259.75	267.32		267.32	0.000048	0.65	8177.53	2028.86	0.06
Mud Creek	1000	107750	5 YR	8784.00	259.75	269.10		269.11	0.000045	0.72	12198.00	2475.18	0.06

HEC-RAS Plan: Prop LMM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	107750	10 YR	11369.00	259.75	270.18		270.18	0.000042	0.76	15001.48	2742.03	0.06
Mud Creek	1000	107750	25 YR	14059.00	259.75	271.08		271.09	0.000039	0.81	17581.20	2959.22	0.06
Mud Creek	1000	107750	50 YR	16607.00	259.75	271.83		271.84	0.000038	0.85	19873.48	3139.63	0.06
Mud Creek	1000	107750	100 YR	19074.00	259.75	272.49		272.51	0.000037	0.89	22005.27	3298.56	0.06
Mud Creek	1000	105150	2 YR	5303.00	258.80	267.22		267.23	0.000031	0.67	9163.36	1563.64	0.04
Mud Creek	1000	105150	5 YR	8784.00	258.80	268.99		269.00	0.000039	0.87	12069.94	1714.38	0.05
Mud Creek	1000	105150	10 YR	11369.00	258.80	270.06		270.08	0.000043	1.00	13951.84	1805.27	0.06
Mud Creek	1000	105150	25 YR	14059.00	258.80	270.96		270.98	0.000048	1.12	15613.81	1881.90	0.06
Mud Creek	1000	105150	50 YR	16607.00	258.80	271.71		271.73	0.000053	1.22	17043.92	1945.42	0.06
Mud Creek	1000	105150	100 YR	19074.00	258.80	272.37		272.39	0.000057	1.31	18342.14	2001.34	0.07
Mud Creek	1000	104100	2 YR	5303.00	258.42	267.19		267.20	0.000023	0.76	8466.90	1461.17	0.05
Mud Creek	1000	104100	5 YR	8784.00	258.42	268.95		268.97	0.000029	0.99	11177.79	1611.17	0.06
Mud Creek	1000	104100	10 YR	11369.00	258.42	270.02		270.04	0.000032	1.14	12940.38	1701.29	0.06
Mud Creek	1000	104100	25 YR	14059.00	258.42	270.91		270.94	0.000036	1.27	14491.39	1761.75	0.07
Mud Creek	1000	104100	50 YR	16607.00	258.42	271.66		271.68	0.000040	1.39	15817.31	1811.84	0.07
Mud Creek	1000	104100	100 YR	19074.00	258.42	272.31		272.34	0.000043	1.50	17014.92	1855.92	0.07
Mud Creek	1000	103850	2 YR	5303.00	258.33	267.18		267.19	0.000024	0.79	7692.09	1245.09	0.05
Mud Creek	1000	103850	5 YR	8784.00	258.33	268.95		268.96	0.000031	1.04	9971.36	1342.01	0.06
Mud Creek	1000	103850	10 YR	11369.00	258.33	270.01		270.03	0.000036	1.19	11427.94	1400.55	0.07
Mud Creek	1000	103850	25 YR	14059.00	258.33	270.90		270.93	0.000041	1.35	12707.22	1463.09	0.07
Mud Creek	1000	103850	50 YR	16607.00	258.33	271.64		271.67	0.000045	1.48	13808.92	1514.88	0.08
Mud Creek	1000	103850	100 YR	19074.00	258.33	272.29		272.33	0.000049	1.60	14809.84	1560.45	0.08
Mud Creek	1000	103350	2 YR	7842.00	258.15	267.13	261.55	267.16	0.000100	1.61	6730.11	1298.72	0.10
Mud Creek	1000	103350	5 YR	12984.00	258.15	268.87	262.27	268.92	0.000124	2.06	9148.69	1481.41	0.12
Mud Creek	1000	103350	10 YR	16800.00	258.15	269.92	262.71	269.99	0.000137	2.34	10759.17	1591.47	0.13
Mud Creek	1000	103350	25 YR	20766.00	258.15	270.80	263.15	270.88	0.000152	2.60	12189.96	1663.79	0.14
Mud Creek	1000	103350	50 YR	24523.00	258.15	271.52	263.54	271.62	0.000166	2.83	13419.24	1721.88	0.15
Mud Creek	1000	103350	100 YR	28173.00	258.15	272.16	263.88	272.27	0.000178	3.03	14534.09	1772.92	0.15
Mud Creek	1000	103200		Bridge									
Mud Creek	1000	103100	2 YR	7842.00	258.06	267.02		267.08	0.000317	2.18	4679.86	891.52	0.14
Mud Creek	1000	103100	5 YR	12984.00	258.06	268.71		268.81	0.000400	2.81	6280.55	1009.41	0.16
Mud Creek	1000	103100	10 YR	16800.00	258.06	269.71		269.84	0.000447	3.18	7334.28	1080.01	0.18
Mud Creek	1000	103100	25 YR	20766.00	258.06	270.55		270.70	0.000507	3.58	8263.37	1165.46	0.19
Mud Creek	1000	103100	50 YR	24523.00	258.06	271.22		271.41	0.000564	3.93	9082.44	1246.94	0.20
Mud Creek	1000	103100	100 YR	28173.00	258.06	271.82		272.03	0.000615	4.24	9840.78	1317.90	0.21
Mud Creek	1000	102550	2 YR	7842.00	257.86	266.60		266.74	0.001166	4.29	3599.90	958.20	0.27
Mud Creek	1000	102550	5 YR	12984.00	257.86	268.23		268.40	0.001213	4.97	5332.65	1169.90	0.29
Mud Creek	1000	102550	10 YR	16800.00	257.86	269.22		269.41	0.001215	5.32	6553.88	1298.53	0.29
Mud Creek	1000	102550	25 YR	20766.00	257.86	270.02		270.23	0.001268	5.72	7631.98	1402.85	0.30
Mud Creek	1000	102550	50 YR	24523.00	257.86	270.67		270.90	0.001331	6.08	8576.01	1506.68	0.31
Mud Creek	1000	102550	100 YR	28173.00	257.86	271.23		271.48	0.001377	6.39	9457.75	1597.57	0.32
Mud Creek	1000	101050	2 YR	7842.00	257.31	263.11		263.76	0.004982	7.10	1642.68	682.53	0.59
Mud Creek	1000	101050	5 YR	12984.00	257.31	263.75		264.89	0.007773	9.70	2109.34	781.35	0.76
Mud Creek	1000	101050	10 YR	16800.00	257.31	264.06		265.63	0.010100	11.50	2359.03	829.40	0.87
Mud Creek	1000	101050	25 YR	20766.00	257.31	264.59	264.59	266.32	0.010305	12.35	2816.83	910.95	0.89
Mud Creek	1000	101050	50 YR	24523.00	257.31	265.09	265.09	266.91	0.010063	12.88	3290.86	988.32	0.90
Mud Creek	1000	101050	100 YR	28173.00	257.31	265.52	265.52	267.42	0.009907	13.36	3737.12	1055.99	0.90
Mud Creek	1000	99150	2 YR	7842.00	256.62	262.71		262.72	0.000200	1.61	13171.62	5186.67	0.14
Mud Creek	1000	99150	5 YR	12984.00	256.62	263.46		263.47	0.000244	1.98	17113.67	5402.58	0.15
Mud Creek	1000	99150	10 YR	16800.00	256.62	263.92		263.94	0.000268	2.19	19651.29	5537.12	0.16
Mud Creek	1000	99150	25 YR	20766.00	256.62	264.35		264.36	0.000289	2.39	22027.75	5660.22	0.17
Mud Creek	1000	99150	50 YR	24523.00	256.62	264.71		264.73	0.000306	2.56	24113.87	5766.11	0.18
Mud Creek	1000	99150	100 YR	28173.00	256.62	265.04		265.06	0.000320	2.70	26019.70	5861.18	0.18
Mud Creek	1000	97950	2 YR	7842.00	256.19	262.56		262.57	0.000244	1.79	12183.56	4963.56	0.15
Mud Creek	1000	97950	5 YR	12984.00	256.19	263.27		263.29	0.000300	2.20	15767.01	5119.93	0.17
Mud Creek	1000	97950	10 YR	16800.00	256.19	263.72		263.74	0.000329	2.43	18072.29	5218.04	0.18
Mud Creek	1000	97950	25 YR	20766.00	256.19	264.13		264.15	0.000355	2.65	20219.67	5307.81	0.19
Mud Creek	1000	97950	50 YR	24523.00	256.19	264.48		264.50	0.000377	2.83	22099.13	5385.15	0.20
Mud Creek	1000	97950	100 YR	28173.00	256.19	264.79		264.82	0.000395	2.99	23811.37	5454.65	0.20
Mud Creek	1000	96975	2 YR	7842.00	255.84	262.50	260.42	262.51	0.000172	1.57	13619.71	5026.81	0.13
Mud Creek	1000	96975	5 YR	12984.00	255.84	263.19	260.63	263.21	0.000231	1.99	17161.14	5179.49	0.15
Mud Creek	1000	96975	10 YR	16800.00	255.84	263.63	260.77	263.65	0.000262	2.24	19445.49	5275.62	0.16
Mud Creek	1000	96975	25 YR	20766.00	255.84	264.03	260.89	264.05	0.000291	2.46	21571.83	5363.56	0.17
Mud Creek	1000	96975	50 YR	24523.00	255.84	264.37	261.03	264.40	0.000315	2.65	23433.53	5439.39	0.18
Mud Creek	1000	96975	100 YR	28173.00	255.84	264.68	261.15	264.71	0.000335	2.82	25129.46	5507.55	0.19
Mud Creek	1000	96950		Bridge									
Mud Creek	1000	96925	2 YR	7842.00	255.82	262.43		262.46	0.000575	2.02	8494.39	4532.22	0.17
Mud Creek	1000	96925	5 YR	12984.00	255.82	263.13		263.16	0.000618	2.32	11716.62	4699.75	0.18
Mud Creek	1000	96925	10 YR	16800.00	255.82	263.57		263.60	0.000637	2.49	13796.32	4804.78	0.19
Mud Creek	1000	96925	25 YR	20766.00	255.82	263.97		264.01	0.000658	2.66	15733.21	4900.57	0.20
Mud Creek	1000	96925	50 YR	24523.00	255.82	264.31		264.35	0.000675	2.80	17432.27	4983.09	0.20
Mud Creek	1000	96925	100 YR	28173.00	255.82	264.62		264.67	0.000691	2.92	18982.68	5057.21	0.20

HEC-RAS Plan: Prop LMM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	95200	2 YR	7842.00	255.19	261.67		261.70	0.000711	2.20	7883.73	4499.76	0.19
Mud Creek	1000	95200	5 YR	12984.00	255.19	262.36		262.39	0.000734	2.48	11050.12	4665.59	0.20
Mud Creek	1000	95200	10 YR	16800.00	255.19	262.79		262.83	0.000742	2.64	13106.86	4770.22	0.20
Mud Creek	1000	95200	25 YR	20766.00	255.19	263.18		263.22	0.000765	2.81	14958.11	4862.47	0.21
Mud Creek	1000	95200	50 YR	24523.00	255.19	263.51		263.56	0.000785	2.96	16576.33	4941.69	0.21
Mud Creek	1000	95200	100 YR	28173.00	255.19	263.80		263.86	0.000803	3.09	18047.85	5012.65	0.22
Mud Creek	1000	93700	2 YR	7842.00	254.65	260.70		260.76	0.001089	2.12	5287.13	4044.77	0.20
Mud Creek	1000	93700	5 YR	12984.00	254.65	261.50		261.56	0.000998	2.34	8633.21	4270.13	0.20
Mud Creek	1000	93700	10 YR	16800.00	254.65	261.98		262.04	0.000972	2.48	10691.38	4403.02	0.20
Mud Creek	1000	93700	25 YR	20766.00	254.65	262.35		262.42	0.001014	2.67	12356.01	4507.63	0.21
Mud Creek	1000	93700	50 YR	24523.00	254.65	262.67		262.75	0.001050	2.83	13801.18	4596.53	0.22
Mud Creek	1000	93700	100 YR	28173.00	254.65	262.95		263.04	0.001083	2.97	15106.60	4675.37	0.22
Mud Creek	1000	91800	2 YR	7842.00	253.96	258.69		258.75	0.001126	1.92	4076.06	1723.17	0.22
Mud Creek	1000	91800	5 YR	12984.00	253.96	259.61		259.69	0.001194	2.23	5819.00	2058.89	0.23
Mud Creek	1000	91800	10 YR	16800.00	253.96	260.14		260.23	0.001194	2.41	7288.40	4533.53	0.24
Mud Creek	1000	91800	25 YR	20766.00	253.96	260.60		260.70	0.001095	2.52	9385.05	4640.94	0.23
Mud Creek	1000	91800	50 YR	24523.00	253.96	260.97		261.07	0.001043	2.62	11102.24	4727.09	0.23
Mud Creek	1000	91800	100 YR	28173.00	253.96	261.28		261.39	0.001014	2.72	12604.12	4801.17	0.23
Mud Creek	1000	90600	2 YR	7842.00	253.52	257.92		257.94	0.000434	1.14	6883.85	3126.24	0.14
Mud Creek	1000	90600	5 YR	12984.00	253.52	258.83		258.86	0.000437	1.30	10023.47	3772.38	0.14
Mud Creek	1000	90600	10 YR	16800.00	253.52	259.37		259.40	0.000440	1.38	12133.67	4150.52	0.14
Mud Creek	1000	90600	25 YR	20766.00	253.52	259.84		259.88	0.000442	1.46	14190.75	4488.58	0.15
Mud Creek	1000	90600	50 YR	24523.00	253.52	260.24		260.27	0.000428	1.53	16000.76	4668.63	0.14
Mud Creek	1000	90600	100 YR	28173.00	253.52	260.57		260.61	0.000416	1.61	17576.48	4765.51	0.15
Mud Creek	1000	89850	2 YR	7842.00	253.25	257.63		257.65	0.000351	1.17	6677.82	3049.51	0.14
Mud Creek	1000	89850	5 YR	12984.00	253.25	258.54		258.57	0.000353	1.33	9735.90	3682.14	0.14
Mud Creek	1000	89850	10 YR	16800.00	253.25	259.07		259.10	0.000354	1.43	11788.81	4051.79	0.15
Mud Creek	1000	89850	25 YR	20766.00	253.25	259.54		259.58	0.000356	1.51	13788.38	4381.96	0.15
Mud Creek	1000	89850	50 YR	24523.00	253.25	259.94		259.98	0.000359	1.57	15584.75	4658.67	0.15
Mud Creek	1000	89850	100 YR	28173.00	253.25	260.29		260.33	0.000344	1.64	17212.72	4759.95	0.15
Mud Creek	1000	88850	2 YR	7842.00	252.89	257.29		257.32	0.000317	1.28	6134.17	2786.54	0.15
Mud Creek	1000	88850	5 YR	12984.00	252.89	258.20		258.23	0.000321	1.46	8912.61	3358.84	0.16
Mud Creek	1000	88850	10 YR	16800.00	252.89	258.72		258.76	0.000324	1.56	10770.97	3692.44	0.16
Mud Creek	1000	88850	25 YR	20766.00	252.89	259.19		259.24	0.000327	1.65	12577.42	3990.09	0.16
Mud Creek	1000	88850	50 YR	24523.00	252.89	259.59		259.64	0.000330	1.73	14201.41	4239.87	0.17
Mud Creek	1000	88850	100 YR	28173.00	252.89	259.94		259.99	0.000332	1.79	15722.39	4461.14	0.17
Mud Creek	1000	87600	2 YR	7842.00	252.43	256.89		256.92	0.000326	1.15	6846.46	3066.91	0.14
Mud Creek	1000	87600	5 YR	12984.00	252.43	257.79		257.82	0.000337	1.32	9869.46	3682.27	0.14
Mud Creek	1000	87600	10 YR	16800.00	252.43	258.31		258.34	0.000344	1.41	11882.00	4040.30	0.15
Mud Creek	1000	87600	25 YR	20766.00	252.43	258.78		258.81	0.000350	1.50	13833.65	4359.50	0.15
Mud Creek	1000	87600	50 YR	24523.00	252.43	259.17		259.21	0.000355	1.57	15586.59	4627.48	0.15
Mud Creek	1000	87600	100 YR	28173.00	252.43	259.51		259.55	0.000359	1.63	17231.52	4865.53	0.15
Mud Creek	1000	85350	2 YR	7842.00	251.62	256.05		256.07	0.000433	1.14	6863.17	3095.52	0.14
Mud Creek	1000	85350	5 YR	12984.00	251.62	256.91		256.93	0.000465	1.33	9754.79	3690.45	0.14
Mud Creek	1000	85350	10 YR	16800.00	251.62	257.40		257.43	0.000483	1.44	11660.05	4034.79	0.15
Mud Creek	1000	85350	25 YR	20766.00	251.62	257.84		257.88	0.000499	1.54	13511.03	4343.25	0.15
Mud Creek	1000	85350	50 YR	24523.00	251.62	258.21		258.25	0.000510	1.62	15178.01	4603.40	0.16
Mud Creek	1000	85350	100 YR	28173.00	251.62	258.55		258.59	0.000516	1.68	16761.64	4837.59	0.16
Mud Creek	1000	83800	2 YR	7842.00	251.05	255.30		255.32	0.000545	1.25	6294.70	2965.04	0.15
Mud Creek	1000	83800	5 YR	12984.00	251.05	256.08		256.11	0.000607	1.47	8825.81	3510.92	0.16
Mud Creek	1000	83800	10 YR	16800.00	251.05	256.53		256.57	0.000641	1.60	10486.75	3827.05	0.17
Mud Creek	1000	83800	25 YR	20766.00	251.05	256.94		256.99	0.000666	1.71	12118.44	4114.02	0.18
Mud Creek	1000	83800	50 YR	24523.00	251.05	257.29		257.34	0.000682	1.80	13607.27	4359.42	0.18
Mud Creek	1000	83800	100 YR	28173.00	251.05	257.62		257.67	0.000686	1.87	15069.27	4587.65	0.18
Mud Creek	1000	82200	2 YR	7842.00	250.47	253.36		253.46	0.003965	2.60	3018.19	2090.58	0.38
Mud Creek	1000	82200	5 YR	12984.00	250.47	254.09		254.21	0.003253	2.74	4744.85	2621.23	0.36
Mud Creek	1000	82200	10 YR	16800.00	250.47	254.55		254.67	0.002885	2.79	6021.02	2952.76	0.34
Mud Creek	1000	82200	25 YR	20766.00	250.47	255.00		255.12	0.002532	2.80	7412.61	3276.26	0.33
Mud Creek	1000	82200	50 YR	24523.00	250.47	255.42		255.54	0.002191	2.77	8865.72	3583.03	0.31
Mud Creek	1000	82200	100 YR	28173.00	250.47	255.87		255.98	0.001817	2.67	10552.51	3909.05	0.29
Mud Creek	1000	80150	2 YR	7842.00	249.62	252.19		252.20	0.000232	0.83	9443.21	4309.47	0.10
Mud Creek	1000	80150	5 YR	12984.00	249.62	252.92		252.93	0.000247	1.03	12594.79	4345.88	0.11
Mud Creek	1000	80150	10 YR	16800.00	249.62	253.41		253.43	0.000246	1.14	14742.17	4370.51	0.11
Mud Creek	1000	80150	25 YR	20766.00	249.62	253.94		253.97	0.000232	1.22	17074.28	4397.11	0.11
Mud Creek	1000	80150	50 YR	24523.00	249.62	254.47		254.49	0.000214	1.26	19386.79	4423.33	0.11
Mud Creek	1000	80150	100 YR	28173.00	249.62	255.05		255.07	0.000188	1.28	21967.67	4452.41	0.10
Mud Creek	1000	78800	2 YR	7842.00	248.93	251.84		251.86	0.000274	0.98	8151.56	4185.85	0.12
Mud Creek	1000	78800	5 YR	12984.00	248.93	252.56		252.59	0.000270	1.20	11201.17	4297.30	0.13
Mud Creek	1000	78800	10 YR	16800.00	248.93	253.06		253.09	0.000257	1.30	13374.86	4375.00	0.13
Mud Creek	1000	78800	25 YR	20766.00	248.93	253.62		253.65	0.000229	1.37	15850.18	4461.83	0.12
Mud Creek	1000	78800	50 YR	24523.00	248.93	254.18		254.21	0.000201	1.41	18356.44	4548.06	0.12
Mud Creek	1000	78800	100 YR	28173.00	248.93	254.80		254.83	0.000169	1.41	21216.00	4644.50	0.11
Mud Creek	1000	77500	2 YR	7842.00	248.27	251.38		251.41	0.000443	1.53	6095.24	3208.83	0.18
Mud Creek	1000	77500	5 YR	12984.00	248.27	252.09		252.14	0.000461	1.88	8390.57	3290.06	0.19

HEC-RAS Plan: Prop LMM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	77500	10 YR	16800.00	248.27	252.61		252.66	0.000436	2.03	10119.36	3349.94	0.19
Mud Creek	1000	77500	25 YR	20766.00	248.27	253.22		253.28	0.000378	2.11	12183.80	3420.08	0.18
Mud Creek	1000	77500	50 YR	24523.00	248.27	253.82		253.88	0.000325	2.14	14272.87	3489.62	0.17
Mud Creek	1000	77500	100 YR	28173.00	248.27	254.50		254.56	0.000268	2.13	16665.45	3567.59	0.16
Mud Creek	1000	76300	2 YR	7842.00	247.66	250.82		250.85	0.000495	1.31	6052.81	3185.01	0.16
Mud Creek	1000	76300	5 YR	12984.00	247.66	251.52		251.56	0.000494	1.60	8331.36	3342.10	0.17
Mud Creek	1000	76300	10 YR	16800.00	247.66	252.10		252.14	0.000429	1.69	10290.62	3471.50	0.17
Mud Creek	1000	76300	25 YR	20766.00	247.66	252.80		252.84	0.000337	1.71	12787.41	3629.72	0.15
Mud Creek	1000	76300	50 YR	24523.00	247.66	253.48		253.52	0.000275	1.71	15294.04	3781.91	0.14
Mud Creek	1000	76300	100 YR	28173.00	247.66	254.22		254.27	0.000217	1.68	18187.73	3950.31	0.13
Mud Creek	1000	74900	2 YR	7842.00	246.95	250.13		250.16	0.000491	1.32	5960.36	3624.09	0.18
Mud Creek	1000	74900	5 YR	12984.00	246.95	250.94		250.98	0.000354	1.46	8966.98	3774.45	0.16
Mud Creek	1000	74900	10 YR	16800.00	246.95	251.65		251.68	0.000255	1.46	11669.18	3904.65	0.14
Mud Creek	1000	74900	25 YR	20766.00	246.95	252.47		252.50	0.000179	1.43	14952.97	4057.25	0.13
Mud Creek	1000	74900	50 YR	24523.00	246.95	253.22		253.25	0.000140	1.42	18029.76	4195.20	0.11
Mud Creek	1000	74900	100 YR	28173.00	246.95	254.02		254.05	0.000108	1.38	21475.02	4344.48	0.10
Mud Creek	1000	72400	2 YR	7842.00	245.67	249.21		249.22	0.000298	0.94	8371.26	4735.66	0.12
Mud Creek	1000	72400	5 YR	12984.00	245.67	250.38		250.39	0.000161	0.88	14786.75	5868.79	0.10
Mud Creek	1000	72400	10 YR	16800.00	245.67	251.29		251.30	0.000097	0.84	20187.54	6032.16	0.08
Mud Creek	1000	72400	25 YR	20766.00	245.67	252.23		252.24	0.000066	0.81	25939.58	6201.43	0.07
Mud Creek	1000	72400	50 YR	24523.00	245.67	253.03		253.04	0.000053	0.81	30953.50	6345.29	0.06
Mud Creek	1000	72400	100 YR	28173.00	245.67	253.88		253.89	0.000042	0.80	36409.79	6498.23	0.06
Mud Creek	1000	71200	2 YR	7842.00	245.06	248.95		248.96	0.000165	0.74	10562.73	5432.06	0.09
Mud Creek	1000	71200	5 YR	12984.00	245.06	250.24		250.25	0.000092	0.69	18714.31	6921.77	0.07
Mud Creek	1000	71200	10 YR	16800.00	245.06	251.21		251.21	0.000056	0.66	25427.99	7008.52	0.06
Mud Creek	1000	71200	25 YR	20766.00	245.06	252.17		252.18	0.000039	0.65	32246.41	7095.54	0.05
Mud Creek	1000	71200	50 YR	24523.00	245.06	252.98		252.99	0.000032	0.65	38029.43	7168.51	0.05
Mud Creek	1000	71200	100 YR	28173.00	245.06	253.84		253.85	0.000026	0.64	44221.44	7245.84	0.05
Mud Creek	1000	69000	2 YR	9467.00	243.94	248.61	245.80	248.63	0.000139	0.88	10725.97	4589.40	0.10
Mud Creek	1000	69000	5 YR	15670.00	243.94	250.03	246.22	250.05	0.000092	0.86	18231.46	5952.90	0.09
Mud Creek	1000	69000	10 YR	20280.00	243.94	251.08	246.47	251.09	0.000058	0.83	24477.53	6041.43	0.07
Mud Creek	1000	69000	25 YR	25082.00	243.94	252.08	246.69	252.09	0.000043	0.82	30573.60	6126.60	0.06
Mud Creek	1000	69000	50 YR	29635.00	243.94	252.90	246.88	252.91	0.000036	0.84	35662.63	6196.80	0.06
Mud Creek	1000	69000	100 YR	34050.00	243.94	253.78	247.05	253.79	0.000030	0.84	41101.29	6270.96	0.06
Mud Creek	1000	68800		Bridge									
Mud Creek	1000	68650	2 YR	9467.00	243.77	248.01		248.03	0.000379	1.19	7930.54	3742.00	0.14
Mud Creek	1000	68650	5 YR	15670.00	243.77	249.71		249.72	0.000172	1.01	15555.61	5240.78	0.10
Mud Creek	1000	68650	10 YR	20280.00	243.77	250.82		250.84	0.000102	0.94	21711.74	5603.11	0.08
Mud Creek	1000	68650	25 YR	25082.00	243.77	251.86		251.87	0.000072	0.92	27572.59	5732.37	0.07
Mud Creek	1000	68650	50 YR	29635.00	243.77	252.69		252.71	0.000059	0.93	32395.70	5836.59	0.07
Mud Creek	1000	68650	100 YR	34050.00	243.77	253.58		253.59	0.000049	0.92	37608.64	5947.19	0.06
Mud Creek	1000	67650	2 YR	9467.00	243.26	247.71		247.72	0.000249	1.00	9471.38	4257.66	0.12
Mud Creek	1000	67650	5 YR	15670.00	243.26	249.58		249.59	0.000105	0.82	19096.16	6045.58	0.08
Mud Creek	1000	67650	10 YR	20280.00	243.26	250.75		250.76	0.000064	0.76	26580.89	6496.77	0.07
Mud Creek	1000	67650	25 YR	25082.00	243.26	251.81		251.81	0.000046	0.75	33483.64	6562.84	0.06
Mud Creek	1000	67650	50 YR	29635.00	243.26	252.65		252.66	0.000038	0.76	39038.13	6615.53	0.05
Mud Creek	1000	67650	100 YR	34050.00	243.26	253.54		253.55	0.000032	0.76	44969.95	6671.33	0.05
Mud Creek	1000	66450	2 YR	9467.00	242.65	247.54		247.55	0.000092	0.74	12783.56	5225.55	0.08
Mud Creek	1000	66450	5 YR	15670.00	242.65	249.50		249.51	0.000042	0.62	25093.12	7321.22	0.06
Mud Creek	1000	66450	10 YR	20280.00	242.65	250.70		250.71	0.000027	0.59	35087.18	8885.18	0.05
Mud Creek	1000	66450	25 YR	25082.00	242.65	251.77		251.78	0.000020	0.58	44624.37	8938.68	0.04
Mud Creek	1000	66450	50 YR	29635.00	242.65	252.62		252.63	0.000017	0.59	52224.20	8981.09	0.04
Mud Creek	1000	66450	100 YR	34050.00	242.65	253.52		253.52	0.000014	0.59	60306.30	9025.98	0.04
Mud Creek	1000	64850	2 YR	9467.00	241.83	247.39		247.40	0.000092	0.81	11743.54	4221.82	0.09
Mud Creek	1000	64850	5 YR	15670.00	241.83	249.43		249.44	0.000048	0.71	21924.06	5768.47	0.06
Mud Creek	1000	64850	10 YR	20280.00	241.83	250.65		250.66	0.000033	0.69	29389.37	6229.42	0.06
Mud Creek	1000	64850	25 YR	25082.00	241.83	251.74		251.74	0.000026	0.69	36155.27	6278.10	0.05
Mud Creek	1000	64850	50 YR	29635.00	241.83	252.59		252.60	0.000023	0.72	41524.34	6316.47	0.05
Mud Creek	1000	64850	100 YR	34050.00	241.83	253.49		253.50	0.000020	0.72	47240.54	6357.06	0.05
Mud Creek	1000	63250	2 YR	9467.00	241.02	247.24		247.24	0.000106	0.71	13340.56	4292.00	0.07
Mud Creek	1000	63250	5 YR	15670.00	241.02	249.35		249.35	0.000061	0.65	23930.45	5748.42	0.06
Mud Creek	1000	63250	10 YR	20280.00	241.02	250.59		250.60	0.000045	0.64	31518.97	6223.70	0.05
Mud Creek	1000	63250	25 YR	25082.00	241.02	251.69		251.69	0.000036	0.65	38359.26	6267.51	0.05
Mud Creek	1000	63250	50 YR	29635.00	241.02	252.55		252.55	0.000033	0.68	43749.79	6301.82	0.05
Mud Creek	1000	63250	100 YR	34050.00	241.02	253.45		253.46	0.000029	0.69	49485.65	6338.12	0.04
Mud Creek	1000	61950	2 YR	9467.00	240.36	247.15		247.15	0.000049	0.67	14094.14	4153.57	0.06
Mud Creek	1000	61950	5 YR	15670.00	240.36	249.29		249.30	0.000031	0.64	24408.31	5466.02	0.05
Mud Creek	1000	61950	10 YR	20280.00	240.36	250.55		250.56	0.000024	0.64	31697.23	5938.54	0.05
Mud Creek	1000	61950	25 YR	25082.00	240.36	251.65		251.66	0.000020	0.66	38290.46	6015.76	0.05
Mud Creek	1000	61950	50 YR	29635.00	240.36	252.51		252.52	0.000018	0.68	43493.43	6076.00	0.04
Mud Creek	1000	61950	100 YR	34050.00	240.36	253.43		253.43	0.000016	0.70	49057.78	6139.77	0.04
Mud Creek	1000	60750	2 YR	9467.00	239.83	247.08		247.09	0.000066	1.28	17384.52	4504.06	0.08
Mud Creek	1000	60750	5 YR	15670.00	239.83	249.24		249.25	0.000053	1.36	28485.93	5758.84	0.08

HEC-RAS Plan: Prop LMM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	60750	10 YR	20280.00	239.83	250.51		250.52	0.000047	1.40	36192.90	6245.69	0.08
Mud Creek	1000	60750	25 YR	25082.00	239.83	251.62		251.63	0.000042	1.42	43175.83	6345.51	0.07
Mud Creek	1000	60750	50 YR	29635.00	239.83	252.48		252.49	0.000041	1.47	48683.21	6423.15	0.07
Mud Creek	1000	60750	100 YR	34050.00	239.83	253.39		253.41	0.000038	1.48	54592.27	6505.42	0.07
Mud Creek	1000	58800	2 YR	9467.00	239.18	247.06		247.06	0.000005	0.36	33233.34	5902.30	0.02
Mud Creek	1000	58800	5 YR	15670.00	239.18	249.22		249.22	0.000005	0.44	46905.70	6745.49	0.03
Mud Creek	1000	58800	10 YR	20280.00	239.18	250.49		250.49	0.000006	0.49	55726.20	7071.89	0.03
Mud Creek	1000	58800	25 YR	25082.00	239.18	251.59		251.60	0.000006	0.54	63590.80	7121.76	0.03
Mud Creek	1000	58800	50 YR	29635.00	239.18	252.46		252.46	0.000006	0.59	69741.01	7160.51	0.03
Mud Creek	1000	58800	100 YR	34050.00	239.18	253.37		253.37	0.000006	0.62	76303.97	7201.64	0.03
Mud Creek	1000	57200	2 YR	9467.00	238.64	247.05		247.05	0.000002	0.23	45431.40	6681.02	0.01
Mud Creek	1000	57200	5 YR	15670.00	238.64	249.21		249.22	0.000003	0.29	60363.11	7134.94	0.02
Mud Creek	1000	57200	10 YR	20280.00	238.64	250.48		250.48	0.000003	0.33	69554.05	7331.26	0.02
Mud Creek	1000	57200	25 YR	25082.00	238.64	251.59		251.59	0.000003	0.37	77715.42	7403.26	0.02
Mud Creek	1000	57200	50 YR	29635.00	238.64	252.45		252.45	0.000004	0.40	84111.84	7459.21	0.02
Mud Creek	1000	57200	100 YR	34050.00	238.64	253.36		253.37	0.000004	0.43	90954.89	7518.61	0.02
Mud Creek	1000	55600	2 YR	9467.00	238.10	247.05		247.05	0.000004	0.34	29174.07	3963.72	0.02
Mud Creek	1000	55600	5 YR	15670.00	238.10	249.21		249.21	0.000005	0.44	37921.52	4136.50	0.02
Mud Creek	1000	55600	10 YR	20280.00	238.10	250.47		250.48	0.000005	0.50	43212.96	4203.78	0.03
Mud Creek	1000	55600	25 YR	25082.00	238.10	251.58		251.58	0.000006	0.57	47869.17	4212.63	0.03
Mud Creek	1000	55600	50 YR	29635.00	238.10	252.44		252.44	0.000007	0.62	51492.09	4219.50	0.03
Mud Creek	1000	55600	100 YR	34050.00	238.10	253.35		253.36	0.000007	0.67	55347.04	4226.80	0.03
Mud Creek	1000	53900	2 YR	9467.00	237.53	247.04		247.04	0.000001	0.21	46355.24	6004.33	0.01
Mud Creek	1000	53900	5 YR	15670.00	237.53	249.20		249.20	0.000002	0.28	59553.81	6220.26	0.02
Mud Creek	1000	53900	10 YR	20280.00	237.53	250.47		250.47	0.000002	0.32	67497.20	6314.04	0.02
Mud Creek	1000	53900	25 YR	25082.00	237.53	251.57		251.58	0.000002	0.36	74500.16	6347.23	0.02
Mud Creek	1000	53900	50 YR	29635.00	237.53	252.43		252.44	0.000003	0.40	79963.45	6373.00	0.02
Mud Creek	1000	53900	100 YR	34050.00	237.53	253.35		253.35	0.000003	0.43	85793.00	6400.38	0.02
Mud Creek	1000	52600	2 YR	9467.00	237.09	247.04		247.04	0.000002	0.24	40050.07	4875.24	0.01
Mud Creek	1000	52600	5 YR	15670.00	237.09	249.20		249.20	0.000002	0.32	50664.82	4959.62	0.02
Mud Creek	1000	52600	10 YR	20280.00	237.09	250.46		250.47	0.000003	0.37	56967.09	4999.77	0.02
Mud Creek	1000	52600	25 YR	25082.00	237.09	251.57		251.57	0.000003	0.41	62506.62	5020.88	0.02
Mud Creek	1000	52600	50 YR	29635.00	237.09	252.43		252.43	0.000003	0.46	66823.49	5037.27	0.02
Mud Creek	1000	52600	100 YR	34050.00	237.09	253.34		253.34	0.000004	0.49	71427.28	5054.69	0.02
Mud Creek	1000	51700	2 YR	9467.00	236.78	247.04		247.04	0.000004	0.27	36451.00	4527.88	0.02
Mud Creek	1000	51700	5 YR	15670.00	236.78	249.20		249.20	0.000005	0.35	46395.81	4689.71	0.02
Mud Creek	1000	51700	10 YR	20280.00	236.78	250.46		250.46	0.000006	0.41	52391.86	4814.92	0.02
Mud Creek	1000	51700	25 YR	25082.00	236.78	251.57		251.57	0.000007	0.46	57798.63	4970.73	0.02
Mud Creek	1000	51700	50 YR	29635.00	236.78	252.42		252.43	0.000007	0.51	62114.18	5091.67	0.02
Mud Creek	1000	51700	100 YR	34050.00	236.78	253.34		253.34	0.000008	0.55	66816.45	5220.26	0.02
Mud Creek	1000	49500	2 YR	9467.00	236.04	247.03		247.03	0.000001	0.22	43229.91	4946.18	0.01
Mud Creek	1000	49500	5 YR	15670.00	236.04	249.19		249.19	0.000002	0.30	53977.16	5021.65	0.02
Mud Creek	1000	49500	10 YR	20280.00	236.04	250.45		250.46	0.000002	0.34	60349.20	5065.87	0.02
Mud Creek	1000	49500	25 YR	25082.00	236.04	251.56		251.56	0.000003	0.39	65963.66	5104.51	0.02
Mud Creek	1000	49500	50 YR	29635.00	236.04	252.41		252.42	0.000003	0.43	70349.80	5134.50	0.02
Mud Creek	1000	49500	100 YR	34050.00	236.04	253.33		253.33	0.000003	0.47	75044.04	5166.40	0.02
Mud Creek	1000	47200	2 YR	9467.00	235.27	247.03		247.03	0.000003	0.32	44778.63	6244.87	0.02
Mud Creek	1000	47200	5 YR	15670.00	235.27	249.18		249.19	0.000004	0.41	58630.36	6611.20	0.02
Mud Creek	1000	47200	10 YR	20280.00	235.27	250.45		250.45	0.000004	0.47	67100.30	6774.53	0.02
Mud Creek	1000	47200	25 YR	25082.00	235.27	251.55		251.55	0.000005	0.53	74606.97	6835.20	0.02
Mud Creek	1000	47200	50 YR	29635.00	235.27	252.40		252.41	0.000005	0.58	80476.29	6882.27	0.03
Mud Creek	1000	47200	100 YR	34050.00	235.27	253.32		253.32	0.000005	0.62	86768.08	6932.36	0.03
Mud Creek	1000	46450	2 YR	9467.00	235.02	247.03		247.03	0.000004	0.33	51757.04	8169.87	0.02
Mud Creek	1000	46450	5 YR	15670.00	235.02	249.18		249.18	0.000005	0.41	70240.25	8988.55	0.02
Mud Creek	1000	46450	10 YR	20280.00	235.02	250.44		250.44	0.000005	0.46	81856.45	9326.55	0.02
Mud Creek	1000	46450	25 YR	25082.00	235.02	251.55		251.55	0.000005	0.51	92179.67	9392.73	0.02
Mud Creek	1000	46450	50 YR	29635.00	235.02	252.40		252.40	0.000006	0.55	100237.10	9444.06	0.03
Mud Creek	1000	46450	100 YR	34050.00	235.02	253.31		253.31	0.000006	0.58	108864.20	9498.71	0.03
Mud Creek	1000	44950	2 YR	9467.00	234.51	247.02		247.02	0.000003	0.25	75999.84	12461.75	0.01
Mud Creek	1000	44950	5 YR	15670.00	234.51	249.18		249.18	0.000003	0.30	104117.40	13646.41	0.02
Mud Creek	1000	44950	10 YR	20280.00	234.51	250.44		250.44	0.000003	0.33	121736.40	14161.21	0.02
Mud Creek	1000	44950	25 YR	25082.00	234.51	251.54		251.54	0.000004	0.36	137437.40	14315.58	0.02
Mud Creek	1000	44950	50 YR	29635.00	234.51	252.40		252.40	0.000004	0.39	149730.70	14435.31	0.02
Mud Creek	1000	44950	100 YR	34050.00	234.51	253.31		253.31	0.000004	0.40	162936.90	14562.83	0.02
Angelina River	Upstream	71106	2 YR	12944.00	246.00	252.10		252.14	0.000306	1.66	7852.03	1982.69	0.14
Angelina River	Upstream	71106	5 YR	21707.00	246.00	253.52		253.58	0.000316	2.06	10711.80	2042.79	0.15
Angelina River	Upstream	71106	10 YR	28205.00	246.00	254.43		254.51	0.000319	2.30	12587.34	2081.26	0.16
Angelina River	Upstream	71106	25 YR	35110.00	246.00	255.31		255.41	0.000320	2.50	14444.59	2118.68	0.16
Angelina River	Upstream	71106	50 YR	41349.00	246.00	256.05		256.16	0.000320	2.67	16026.59	2150.03	0.17
Angelina River	Upstream	71106	100 YR	47334.00	246.00	256.76		256.88	0.000315	2.80	17562.09	2180.03	0.17
Angelina River	Upstream	69124	2 YR	12944.00	245.00	251.33		251.40	0.000466	2.24	6595.93	2295.57	0.20
Angelina River	Upstream	69124	5 YR	21707.00	245.00	252.79		252.89	0.000406	2.60	10016.76	2384.16	0.20
Angelina River	Upstream	69124	10 YR	28205.00	245.00	253.72		253.83	0.000382	2.81	12262.38	2440.58	0.20
Angelina River	Upstream	69124	25 YR	35110.00	245.00	254.63		254.75	0.000363	3.00	14493.17	2495.35	0.20

HEC-RAS Plan: Prop LMM (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Upstream	69124	50 YR	41349.00	245.00	255.38		255.52	0.000351	3.15	16395.18	2541.12	0.20
Angelina River	Upstream	69124	100 YR	47334.00	245.00	256.11		256.26	0.000334	3.26	18274.58	2585.55	0.20
Angelina River	Upstream	67228	2 YR	12944.00	244.00	250.63		250.68	0.000316	1.78	7271.03	2021.75	0.16
Angelina River	Upstream	67228	5 YR	21707.00	244.00	252.19		252.26	0.000268	2.08	10475.99	2068.61	0.16
Angelina River	Upstream	67228	10 YR	28205.00	244.00	253.16		253.24	0.000256	2.28	12483.00	2097.42	0.16
Angelina River	Upstream	67228	25 YR	35110.00	244.00	254.09		254.18	0.000248	2.46	14441.29	2125.15	0.16
Angelina River	Upstream	67228	50 YR	41349.00	244.00	254.86		254.96	0.000243	2.61	16086.47	2148.17	0.16
Angelina River	Upstream	67228	100 YR	47334.00	244.00	255.61		255.73	0.000234	2.73	17719.16	2170.78	0.16
Angelina River	Upstream	65531	2 YR	12944.00	242.00	250.19		250.22	0.000229	1.27	10195.51	2467.80	0.11
Angelina River	Upstream	65531	5 YR	21707.00	242.00	251.81		251.85	0.000215	1.53	14434.84	2771.40	0.11
Angelina River	Upstream	65531	10 YR	28205.00	242.00	252.79		252.83	0.000213	1.69	17234.12	2954.81	0.11
Angelina River	Upstream	65531	25 YR	35110.00	242.00	253.73		253.78	0.000212	1.84	20093.44	3131.09	0.12
Angelina River	Upstream	65531	50 YR	41349.00	242.00	254.51		254.56	0.000210	1.95	22588.70	3277.19	0.12
Angelina River	Upstream	65531	100 YR	47334.00	242.00	255.28		255.34	0.000203	2.03	25178.31	3422.22	0.12
Angelina River	Upstream	58835	2 YR	12944.00	241.00	247.54		247.60	0.000811	2.03	6386.45	1952.80	0.20
Angelina River	Upstream	58835	5 YR	21707.00	241.00	249.68		249.74	0.000505	1.93	11243.25	2591.04	0.16
Angelina River	Upstream	58835	10 YR	28205.00	241.00	250.92		250.97	0.000378	1.94	14562.91	2709.90	0.15
Angelina River	Upstream	58835	25 YR	35110.00	241.00	252.00		252.07	0.000318	2.01	17526.03	2737.10	0.14
Angelina River	Upstream	58835	50 YR	41349.00	241.00	252.86		252.93	0.000292	2.09	19875.37	2758.47	0.14
Angelina River	Upstream	58835	100 YR	47334.00	241.00	253.75		253.82	0.000261	2.13	22340.90	2780.73	0.13
Angelina River	Upstream	53947	2 YR	12944.00	236.00	247.08		247.09	0.000055	1.19	24605.08	4305.04	0.07
Angelina River	Upstream	53947	5 YR	21707.00	236.00	249.24		249.25	0.000059	1.43	34466.07	4831.31	0.08
Angelina River	Upstream	53947	10 YR	28205.00	236.00	250.51		250.52	0.000060	1.55	40743.13	5025.44	0.08
Angelina River	Upstream	53947	25 YR	35110.00	236.00	251.61		251.62	0.000062	1.66	46314.81	5046.02	0.08
Angelina River	Upstream	53947	50 YR	41349.00	236.00	252.47		252.49	0.000064	1.76	50656.25	5061.99	0.08
Angelina River	Upstream	53947	100 YR	47334.00	236.00	253.38		253.40	0.000063	1.82	55274.09	5078.93	0.08
Angelina River	Upstream	50340	2 YR	12944.00	235.00	247.03		247.03	0.000012	0.50	49317.50	7624.01	0.03
Angelina River	Upstream	50340	5 YR	21707.00	235.00	249.18		249.18	0.000013	0.60	66157.56	8016.57	0.03
Angelina River	Upstream	50340	10 YR	28205.00	235.00	250.44		250.44	0.000014	0.67	76407.71	8205.95	0.03
Angelina River	Upstream	50340	25 YR	35110.00	235.00	251.54		251.55	0.000016	0.74	85511.18	8305.63	0.03
Angelina River	Upstream	50340	50 YR	41349.00	235.00	252.40		252.40	0.000017	0.80	92645.89	8382.93	0.04
Angelina River	Upstream	50340	100 YR	47334.00	235.00	253.31		253.31	0.000017	0.84	100316.60	8465.25	0.04
Angelina River	Downstream	43601	2 YR	15651.00	234.06	246.95		247.00	0.000176	2.60	16735.27	4351.32	0.15
Angelina River	Downstream	43601	5 YR	26053.00	234.06	249.11		249.15	0.000154	2.77	27490.49	5623.62	0.14
Angelina River	Downstream	43601	10 YR	33765.00	234.06	250.37		250.41	0.000140	2.82	35034.76	6168.61	0.14
Angelina River	Downstream	43601	25 YR	41929.00	234.06	251.48		251.52	0.000128	2.84	41881.00	6223.85	0.13
Angelina River	Downstream	43601	50 YR	49499.00	234.06	252.33		252.37	0.000124	2.92	47213.57	6266.55	0.13
Angelina River	Downstream	43601	100 YR	58622.00	234.06	253.24		253.28	0.000124	3.02	52927.41	6311.97	0.13
Angelina River	Downstream	43600	2 YR	15651.00	234.06	246.95	242.29	247.00	0.000176	2.60	16734.47	4351.21	0.15
Angelina River	Downstream	43600	5 YR	26053.00	234.06	249.11	243.48	249.15	0.000154	2.77	27489.63	5623.53	0.14
Angelina River	Downstream	43600	10 YR	33765.00	234.06	250.37	244.12	250.41	0.000140	2.82	35033.91	6168.60	0.14
Angelina River	Downstream	43600	25 YR	41929.00	234.06	251.48	244.67	251.52	0.000128	2.84	41880.14	6223.85	0.13
Angelina River	Downstream	43600	50 YR	49499.00	234.06	252.33	245.03	252.37	0.000124	2.92	47212.80	6266.54	0.13
Angelina River	Downstream	43600	100 YR	58622.00	234.06	253.24	245.52	253.28	0.000124	3.02	52926.64	6311.97	0.13
Angelina River	Downstream	43250		Bridge									
Angelina River	Downstream	42900	2 YR	15651.00	233.82	246.79		246.81	0.000124	1.90	18725.58	3531.98	0.11
Angelina River	Downstream	42900	5 YR	26053.00	233.82	248.97		249.00	0.000128	2.21	27037.68	4088.28	0.11
Angelina River	Downstream	42900	10 YR	33765.00	233.82	250.24		250.27	0.000132	2.40	32435.89	4397.61	0.12
Angelina River	Downstream	42900	25 YR	41929.00	233.82	251.35		251.38	0.000139	2.59	37421.46	4613.39	0.12
Angelina River	Downstream	42900	50 YR	49499.00	233.82	252.20		252.24	0.000147	2.77	41417.54	4779.31	0.12
Angelina River	Downstream	42900	100 YR	58622.00	233.82	253.11		253.15	0.000156	2.97	45815.86	4955.52	0.13
Angelina River	Downstream	40400	2 YR	15651.00	232.98	246.49		246.51	0.000180	2.30	18463.79	4078.20	0.13
Angelina River	Downstream	40400	5 YR	26053.00	232.98	248.69		248.71	0.000164	2.52	28399.54	4967.86	0.13
Angelina River	Downstream	40400	10 YR	33765.00	232.98	249.96		249.99	0.000160	2.66	35052.51	5483.48	0.13
Angelina River	Downstream	40400	25 YR	41929.00	232.98	251.06		251.09	0.000159	2.79	41458.45	5826.59	0.13
Angelina River	Downstream	40400	50 YR	49499.00	232.98	251.91		251.94	0.000156	2.86	46410.65	5847.80	0.13
Angelina River	Downstream	40400	100 YR	58622.00	232.98	252.81		252.84	0.000156	2.98	51664.41	5870.21	0.13
Angelina River	Downstream	39350	2 YR	15651.00	232.63	246.44		246.44	0.000040	0.95	35690.58	6570.21	0.05
Angelina River	Downstream	39350	5 YR	26053.00	232.63	248.64		248.64	0.000039	1.07	50978.02	7329.12	0.05
Angelina River	Downstream	39350	10 YR	33765.00	232.63	249.91		249.91	0.000040	1.16	60588.66	7768.35	0.06
Angelina River	Downstream	39350	25 YR	41929.00	232.63	251.01		251.02	0.000041	1.23	69222.62	7850.60	0.06
Angelina River	Downstream	39350	50 YR	49499.00	232.63	251.86		251.87	0.000043	1.31	75892.55	7892.97	0.06
Angelina River	Downstream	39350	100 YR	58622.00	232.63	252.75		252.76	0.000045	1.40	82976.09	7937.72	0.06
Angelina River	Downstream	36950	2 YR	15651.00	231.82	246.21		246.30	0.000242	3.12	11729.07	2546.46	0.17
Angelina River	Downstream	36950	5 YR	26053.00	231.82	248.41		248.50	0.000248	3.60	17955.06	3127.98	0.18
Angelina River	Downstream	36950	10 YR	33765.00	231.82	249.67		249.78	0.000253	3.87	22126.42	3463.39	0.18
Angelina River	Downstream	36950	25 YR	41929.00	231.82	250.77		250.88	0.000257	4.11	26444.51	4123.15	0.19
Angelina River	Downstream	36950	50 YR	49499.00	231.82	251.62		251.73	0.000257	4.26	29934.60	4148.46	0.19
Angelina River	Downstream	36950	100 YR	58622.00	231.82	252.50		252.62	0.000260	4.45	33623.19	4175.05	0.19
Angelina River	Downstream	33750	2 YR	15651.00	230.74	244.91		245.16	0.000739	4.43	5738.99	1428.07	0.23
Angelina River	Downstream	33750	5 YR	26053.00	230.74	247.04		247.34	0.000820	5.23	9326.84	1939.47	0.25
Angelina River	Downstream	33750	10 YR	33765.00	230.74	248.29		248.61	0.000835	5.60	11948.04	2240.47	0.26
Angelina River	Downstream	33750	25 YR	41929.00	230.74	249.38		249.71	0.000856	5.95	14513.03	2500.18	0.26

HEC-RAS Plan: Prop LMM (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Downstream	33750	50 YR	49499.00	230.74	250.22		250.56	0.000872	6.21	16696.28	2657.59	0.27
Angelina River	Downstream	33750	100 YR	58622.00	230.74	251.11		251.45	0.000869	6.42	19080.45	2688.81	0.27
Angelina River	Downstream	32550	2 YR	15651.00	230.34	244.26		244.42	0.000736	4.38	7541.04	1937.85	0.26
Angelina River	Downstream	32550	5 YR	26053.00	230.34	246.53		246.69	0.000596	4.57	12423.20	2358.32	0.24
Angelina River	Downstream	32550	10 YR	33765.00	230.34	247.84		247.99	0.000558	4.75	15658.71	2599.77	0.24
Angelina River	Downstream	32550	25 YR	41929.00	230.34	248.94		249.10	0.000554	5.01	18635.49	2803.61	0.24
Angelina River	Downstream	32550	50 YR	49499.00	230.34	249.78		249.96	0.000564	5.26	21067.20	2959.72	0.24
Angelina River	Downstream	32550	100 YR	58622.00	230.34	250.68		250.87	0.000576	5.53	23758.88	3033.86	0.25
Angelina River	Downstream	30950	2 YR	15651.00	229.81	241.45		242.50	0.002132	8.28	2131.58	578.55	0.49
Angelina River	Downstream	30950	5 YR	26053.00	229.81	242.90		244.74	0.003223	11.26	3233.06	945.66	0.62
Angelina River	Downstream	30950	10 YR	33765.00	229.81	243.89		246.09	0.003582	12.62	4292.66	1196.89	0.66
Angelina River	Downstream	30950	25 YR	41929.00	229.81	245.04		247.27	0.003438	13.19	5838.19	1489.19	0.66
Angelina River	Downstream	30950	50 YR	49499.00	229.81	246.14		248.22	0.003080	13.21	7629.16	1768.47	0.63
Angelina River	Downstream	30950	100 YR	58622.00	229.81	247.41		249.25	0.002635	12.97	10094.91	2092.87	0.59
Angelina River	Downstream	29800	2 YR	15651.00	229.43	241.41		241.52	0.000288	2.65	7169.59	1943.91	0.18
Angelina River	Downstream	29800	5 YR	26053.00	229.43	243.27		243.41	0.000316	3.24	10952.85	2133.21	0.19
Angelina River	Downstream	29800	10 YR	33765.00	229.43	244.47		244.64	0.000318	3.54	13600.07	2256.24	0.20
Angelina River	Downstream	29800	25 YR	41929.00	229.43	245.67		245.85	0.000313	3.79	16364.00	2377.91	0.20
Angelina River	Downstream	29800	50 YR	49499.00	229.43	246.69		246.89	0.000308	3.98	18848.11	2482.18	0.20
Angelina River	Downstream	29800	100 YR	58622.00	229.43	247.83		248.05	0.000302	4.18	21756.28	2598.94	0.20
Angelina River	Downstream	29000	2 YR	15651.00	229.18	239.99	235.73	240.90	0.002951	7.66	2043.84	219.94	0.44
Angelina River	Downstream	29000	5 YR	26053.00	229.18	242.74		242.96	0.000926	5.10	13000.26	4263.33	0.26
Angelina River	Downstream	29000	10 YR	33765.00	229.18	244.10		244.24	0.000626	4.50	18981.23	4532.60	0.22
Angelina River	Downstream	29000	25 YR	41929.00	229.18	245.37		245.48	0.000477	4.17	24899.00	4784.13	0.19
Angelina River	Downstream	29000	50 YR	49499.00	229.18	246.45		246.53	0.000398	3.99	30136.28	4996.18	0.18
Angelina River	Downstream	29000	100 YR	58622.00	229.18	247.63		247.71	0.000338	3.86	36207.10	5231.24	0.17
Angelina River	Downstream	22700	2 YR	15651.00	227.14	239.33		239.35	0.000094	1.76	16995.64	2452.41	0.09
Angelina River	Downstream	22700	5 YR	26053.00	227.14	242.05		242.08	0.000097	2.07	23996.43	2642.17	0.10
Angelina River	Downstream	22700	10 YR	33765.00	227.14	243.43		243.47	0.000107	2.32	27695.97	2704.45	0.11
Angelina River	Downstream	22700	25 YR	41929.00	227.14	244.73		244.77	0.000115	2.55	31243.88	2762.85	0.11
Angelina River	Downstream	22700	50 YR	49499.00	227.14	245.82		245.87	0.000122	2.74	34286.70	2811.97	0.12
Angelina River	Downstream	22700	100 YR	58622.00	227.14	247.03		247.09	0.000129	2.95	37710.91	2866.25	0.12
Angelina River	Downstream	18600	2 YR	15651.00	225.81	238.92		238.95	0.000161	2.33	13684.25	2061.95	0.12
Angelina River	Downstream	18600	5 YR	26053.00	225.81	241.56		241.62	0.000217	3.12	22769.21	4378.10	0.15
Angelina River	Downstream	18600	10 YR	33765.00	225.81	242.98		243.02	0.000182	3.06	29016.96	4448.88	0.14
Angelina River	Downstream	18600	25 YR	41929.00	225.81	244.29		244.34	0.000163	3.06	34920.19	4514.74	0.13
Angelina River	Downstream	18600	50 YR	49499.00	225.81	245.40		245.44	0.000152	3.09	39918.29	4569.76	0.13
Angelina River	Downstream	18600	100 YR	58622.00	225.81	246.61		246.65	0.000144	3.14	45497.46	4630.40	0.13
Angelina River	Downstream	14400	2 YR	15651.00	224.45	238.84		238.84	0.000028	0.87	31995.83	3766.87	0.05
Angelina River	Downstream	14400	5 YR	26053.00	224.45	241.46		241.47	0.000035	1.11	42195.50	4105.88	0.05
Angelina River	Downstream	14400	10 YR	33765.00	224.45	242.87		242.87	0.000041	1.28	48164.08	4376.78	0.06
Angelina River	Downstream	14400	25 YR	41929.00	224.45	244.18		244.19	0.000046	1.44	54072.00	4629.33	0.06
Angelina River	Downstream	14400	50 YR	49499.00	224.45	245.28		245.29	0.000050	1.57	59266.28	4840.51	0.07
Angelina River	Downstream	14400	100 YR	58622.00	224.45	246.49		246.50	0.000054	1.71	65263.79	5073.42	0.07
Angelina River	Downstream	5700	2 YR	15651.00	221.64	238.63		238.64	0.000095	1.71	18309.60	2548.76	0.08
Angelina River	Downstream	5700	5 YR	26053.00	221.64	241.21		241.24	0.000104	2.02	25401.69	2914.83	0.09
Angelina River	Downstream	5700	10 YR	33765.00	221.64	242.59		242.61	0.000114	2.24	29476.82	3016.51	0.10
Angelina River	Downstream	5700	25 YR	41929.00	221.64	243.87		243.90	0.000123	2.44	33409.96	3111.50	0.10
Angelina River	Downstream	5700	50 YR	49499.00	221.64	244.95		244.98	0.000130	2.61	36797.43	3191.05	0.10
Angelina River	Downstream	5700	100 YR	58622.00	221.64	246.13		246.17	0.000137	2.79	40638.87	3278.92	0.11
Angelina River	Downstream	1000	2 YR	15651.00	220.12	237.88	231.14	238.02	0.000350	3.80	8536.88	1716.48	0.19
Angelina River	Downstream	1000	5 YR	26053.00	220.12	240.45	233.69	240.60	0.000350	4.29	13628.76	2283.87	0.19
Angelina River	Downstream	1000	10 YR	33765.00	220.12	241.80	234.88	241.96	0.000350	4.53	16774.59	2385.74	0.20
Angelina River	Downstream	1000	25 YR	41929.00	220.12	243.06	235.82	243.22	0.000350	4.76	19842.89	2481.06	0.20
Angelina River	Downstream	1000	50 YR	49499.00	220.12	244.11	236.54	244.28	0.000350	4.94	22505.86	2560.92	0.20
Angelina River	Downstream	1000	100 YR	58622.00	220.12	245.28	237.28	245.46	0.000350	5.15	25548.90	2649.23	0.20

HEC-RAS Output  
300' Wide Spillway  
Proposed Normal Pool



River	Reach	River Sta	Profile	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
Mud Creek	1000	132650	2 YR	3016.00	315.00	317.53		317.77	0.005325	3.98	758.03	299.99	0.44
Mud Creek	1000	132650	5 YR	6510.00	315.00	319.25		319.66	0.004447	5.11	1275.19	299.99	0.44
Mud Creek	1000	132650	10 YR	9551.00	315.00	320.49		321.01	0.004123	5.80	1647.25	300.00	0.44
Mud Creek	1000	132650	25 YR	13254.00	315.00	321.84		322.49	0.003859	6.46	2052.13	300.00	0.44
Mud Creek	1000	132650	50 YR	16532.00	315.00	322.93		323.68	0.003703	6.95	2379.02	300.00	0.43
Mud Creek	1000	132650	100 YR	20124.00	315.00	324.02		324.87	0.025572	7.36	2733.83	1400.14	0.93
Mud Creek	1000	132350.*	2 YR	3016.00	309.12	310.84	310.66	311.41	0.020918	6.06	497.72	314.28	0.85
Mud Creek	1000	132350.*	5 YR	6510.00	309.12	311.85	311.64	312.80	0.019898	7.83	830.93	343.02	0.89
Mud Creek	1000	132350.*	10 YR	9551.00	309.12	312.52	312.34	313.76	0.020037	8.95	1066.95	362.01	0.92
Mud Creek	1000	132350.*	25 YR	13254.00	309.12	313.20	313.06	314.77	0.020353	10.04	1320.55	381.35	0.95
Mud Creek	1000	132350.*	50 YR	16532.00	309.12	313.73	313.65	315.55	0.020682	10.84	1524.49	396.22	0.97
Mud Creek	1000	132350.*	100 YR	20124.00	309.12	314.23	314.23	316.34	0.021170	11.64	1728.24	410.54	1.00
Mud Creek	1000	132050.*	2 YR	3016.00	303.23	305.05		305.56	0.018104	5.71	528.42	349.41	0.82
Mud Creek	1000	132050.*	5 YR	6510.00	303.23	305.95	305.78	306.82	0.019863	7.50	867.85	407.62	0.91
Mud Creek	1000	132050.*	10 YR	9551.00	303.23	306.55	306.43	307.67	0.020363	8.49	1124.89	446.69	0.94
Mud Creek	1000	132050.*	25 YR	13254.00	303.23	307.15	307.10	308.53	0.020888	9.43	1405.55	485.77	0.98
Mud Creek	1000	132050.*	50 YR	16532.00	303.23	307.61	307.61	309.20	0.021245	10.11	1635.67	515.61	1.00
Mud Creek	1000	132050.*	100 YR	20124.00	303.23	308.11	308.11	309.85	0.020685	10.58	1901.25	548.03	1.00
Mud Creek	1000	131750.*	2 YR	3016.00	297.35	299.08	298.99	299.62	0.021637	5.89	511.64	394.20	0.91
Mud Creek	1000	131750.*	5 YR	6510.00	297.35	299.97	299.87	300.77	0.020364	7.18	906.19	495.32	0.94
Mud Creek	1000	131750.*	10 YR	9551.00	297.35	300.52	300.44	301.51	0.020450	7.99	1194.77	557.79	0.96
Mud Creek	1000	131750.*	25 YR	13254.00	297.35	301.06	301.02	302.25	0.020641	8.76	1512.55	619.33	0.99
Mud Creek	1000	131750.*	50 YR	16532.00	297.35	301.46	301.46	302.81	0.020850	9.33	1771.95	665.36	1.01
Mud Creek	1000	131750.*	100 YR	20124.00	297.35	301.89	301.89	303.36	0.020252	9.72	2069.46	714.52	1.01
Mud Creek	1000	131450.*	2 YR	3016.00	291.47	293.25	293.09	293.67	0.018025	5.19	581.06	489.21	0.84
Mud Creek	1000	131450.*	5 YR	6510.00	291.47	293.97	293.87	294.66	0.020189	6.64	980.55	621.06	0.93
Mud Creek	1000	131450.*	10 YR	9551.00	291.47	294.44	294.38	295.29	0.020733	7.41	1288.98	706.21	0.97
Mud Creek	1000	131450.*	25 YR	13254.00	291.47	294.89	294.88	295.92	0.021263	8.14	1627.89	789.26	1.00
Mud Creek	1000	131450.*	50 YR	16532.00	291.47	295.26	295.26	296.40	0.020922	8.57	1930.07	856.54	1.01
Mud Creek	1000	131450.*	100 YR	20124.00	291.47	295.62	295.62	296.86	0.020477	8.94	2251.91	922.82	1.01
Mud Creek	1000	131150.*	2 YR	3016.00	285.59	287.18	287.13	287.62	0.022765	5.33	565.34	585.12	0.96
Mud Creek	1000	131150.*	5 YR	6510.00	285.59	287.86	287.82	288.48	0.020906	6.30	1033.90	782.63	0.97
Mud Creek	1000	131150.*	10 YR	9551.00	285.59	288.27	288.24	289.02	0.020891	6.94	1376.34	899.98	0.99
Mud Creek	1000	131150.*	25 YR	13254.00	285.59	288.67	288.67	289.55	0.020885	7.54	1758.03	1014.90	1.01
Mud Creek	1000	131150.*	50 YR	16532.00	285.59	288.98	288.98	289.95	0.020302	7.89	2095.84	1106.70	1.01
Mud Creek	1000	131150.*	100 YR	20124.00	285.59	289.29	289.29	290.34	0.019775	8.21	2451.67	1195.81	1.01
Mud Creek	1000	130850.*	2 YR	3016.00	279.71	281.21	281.11	281.53	0.017996	4.54	664.72	793.23	0.87
Mud Creek	1000	130850.*	5 YR	6510.00	279.71	281.71	281.68	282.23	0.020520	5.79	1125.28	1029.12	0.97
Mud Creek	1000	130850.*	10 YR	9551.00	279.71	282.04	282.04	282.68	0.021135	6.44	1482.82	1180.16	1.01
Mud Creek	1000	130850.*	25 YR	13254.00	279.71	282.40	282.40	283.12	0.019711	6.81	1945.44	1350.77	1.00
Mud Creek	1000	130850.*	50 YR	16532.00	279.71	282.67	282.67	283.46	0.019139	7.12	2321.19	1474.89	1.00
Mud Creek	1000	130850.*	100 YR	20124.00	279.71	282.93	282.93	283.78	0.018639	7.41	2716.46	1595.06	1.00
Mud Creek	1000	130550.*	2 YR	3016.00	273.82	275.01	275.01	275.33	0.023934	4.56	661.91	1052.75	1.01
Mud Creek	1000	130550.*	5 YR	6510.00	273.82	275.46	275.46	275.90	0.021545	5.31	1225.70	1431.52	1.01
Mud Creek	1000	130550.*	10 YR	9551.00	273.82	275.75	275.75	276.26	0.020459	5.73	1665.75	1668.44	1.01
Mud Creek	1000	130550.*	25 YR	13254.00	273.82	276.03	276.03	276.61	0.019687	6.13	2160.58	1899.89	1.01
Mud Creek	1000	130550.*	50 YR	16532.00	273.82	276.23	276.23	276.87	0.019149	6.42	2576.61	2074.60	1.01
Mud Creek	1000	130550.*	100 YR	20124.00	273.82	276.44	276.44	277.13	0.018510	6.65	3024.21	2247.44	1.01
Mud Creek	1000	130250	2 YR	3016.00	267.94	270.05		270.05	0.000218	0.57	5307.45	6157.44	0.11
Mud Creek	1000	130250	5 YR	6510.00	267.94	271.11		271.12	0.000069	0.55	11955.49	6327.83	0.07
Mud Creek	1000	130250	10 YR	9551.00	267.94	271.93		271.94	0.000046	0.56	17209.19	6459.31	0.06
Mud Creek	1000	130250	25 YR	13254.00	267.94	272.76		272.76	0.000036	0.60	22571.73	6590.80	0.06
Mud Creek	1000	130250	50 YR	16532.00	267.94	273.48		273.48	0.000031	0.62	27384.58	6706.62	0.05
Mud Creek	1000	130250	100 YR	20124.00	267.94	274.23		274.24	0.000026	0.64	32472.67	6826.93	0.05
Mud Creek	1000	129850	2 YR	3016.00	267.48	269.95		269.96	0.000247	0.58	5155.70	4170.17	0.09
Mud Creek	1000	129850	5 YR	6510.00	267.48	271.08		271.08	0.000113	0.60	12139.91	6362.97	0.07
Mud Creek	1000	129850	10 YR	9551.00	267.48	271.91		271.91	0.000080	0.62	17476.54	6450.43	0.06
Mud Creek	1000	129850	25 YR	13254.00	267.48	272.74		272.74	0.000067	0.67	22841.54	6537.18	0.06
Mud Creek	1000	129850	50 YR	16532.00	267.48	273.46		273.47	0.000058	0.69	27620.94	6613.50	0.06
Mud Creek	1000	129850	100 YR	20124.00	267.48	274.22		274.22	0.000050	0.71	32637.76	6692.67	0.05
Mud Creek	1000	128750	2 YR	3016.00	267.10	269.76		269.77	0.000128	0.51	5931.64	4454.25	0.08
Mud Creek	1000	128750	5 YR	6510.00	267.10	270.98		270.99	0.000067	0.55	11853.46	4972.70	0.06
Mud Creek	1000	128750	10 YR	9551.00	267.10	271.84		271.84	0.000053	0.60	16155.97	5079.70	0.06
Mud Creek	1000	128750	25 YR	13254.00	267.10	272.67		272.68	0.000048	0.66	20439.32	5184.03	0.06
Mud Creek	1000	128750	50 YR	16532.00	267.10	273.41		273.41	0.000043	0.70	24277.96	5275.78	0.06
Mud Creek	1000	128750	100 YR	20124.00	267.10	274.17		274.17	0.000039	0.73	28321.08	5370.72	0.05
Mud Creek	1000	127950	2 YR	3016.00	266.82	269.65		269.65	0.000165	0.60	5022.46	3554.60	0.09
Mud Creek	1000	127950	5 YR	6510.00	266.82	270.92		270.92	0.000089	0.65	10239.67	4250.50	0.07
Mud Creek	1000	127950	10 YR	9551.00	266.82	271.79		271.79	0.000070	0.70	13953.28	4298.29	0.07
Mud Creek	1000	127950	25 YR	13254.00	266.82	272.63		272.63	0.000064	0.77	17577.53	4344.41	0.07
Mud Creek	1000	127950	50 YR	16532.00	266.82	273.36		273.37	0.000058	0.82	20798.84	4385.01	0.06
Mud Creek	1000	127950	100 YR	20124.00	266.82	274.13		274.14	0.000053	0.86	24159.26	4426.95	0.06
Mud Creek	1000	126600	2 YR	3132.00	266.35	269.55		269.55	0.000041	0.37	8421.65	5261.91	0.05
Mud Creek	1000	126600	5 YR	6678.00	266.35	270.86		270.87	0.000025	0.41	16204.93	6176.94	0.04

HEC-RAS Plan: Prop 300 NP (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	126600	10 YR	9790.00	266.35	271.74		271.75	0.000021	0.46	21718.10	6357.27	0.04
Mud Creek	1000	126600	25 YR	13600.00	266.35	272.59		272.59	0.000020	0.51	27146.25	6529.97	0.04
Mud Creek	1000	126600	50 YR	16969.00	266.35	273.33		273.33	0.000018	0.54	32048.96	6682.11	0.04
Mud Creek	1000	126600	100 YR	20669.00	266.35	274.09		274.10	0.000017	0.58	37228.80	6839.18	0.04
Mud Creek	1000	124600	2 YR	3132.00	265.65	269.45		269.46	0.000059	0.44	7145.56	3758.57	0.06
Mud Creek	1000	124600	5 YR	6678.00	265.65	270.79		270.80	0.000046	0.52	12790.92	4359.56	0.05
Mud Creek	1000	124600	10 YR	9790.00	265.65	271.68		271.69	0.000042	0.59	16694.34	4426.20	0.05
Mud Creek	1000	124600	25 YR	13600.00	265.65	272.53		272.53	0.000041	0.67	20454.55	4489.47	0.05
Mud Creek	1000	124600	50 YR	16969.00	265.65	273.27		273.28	0.000039	0.72	23821.24	4545.36	0.05
Mud Creek	1000	124600	100 YR	20669.00	265.65	274.04		274.05	0.000037	0.77	27337.88	4603.02	0.05
Mud Creek	1000	123150	2 YR	3132.00	265.14	269.38		269.38	0.000042	0.35	9068.51	4276.25	0.04
Mud Creek	1000	123150	5 YR	6678.00	265.14	270.73		270.74	0.000038	0.43	15537.74	4991.76	0.04
Mud Creek	1000	123150	10 YR	9790.00	265.14	271.63		271.63	0.000036	0.49	20049.61	5103.50	0.04
Mud Creek	1000	123150	25 YR	13600.00	265.14	272.47		272.48	0.000037	0.56	24397.32	5208.90	0.04
Mud Creek	1000	123150	50 YR	16969.00	265.14	273.22		273.22	0.000035	0.61	28327.49	5302.37	0.05
Mud Creek	1000	123150	100 YR	20669.00	265.14	273.99		274.00	0.000034	0.65	32454.07	5398.78	0.05
Mud Creek	1000	121050	2 YR	5938.00	264.41	269.26		269.26	0.000072	0.50	11761.73	4854.44	0.06
Mud Creek	1000	121050	5 YR	9896.00	264.41	270.64		270.65	0.000046	0.51	19684.36	6344.65	0.05
Mud Creek	1000	121050	10 YR	13039.00	264.41	271.55		271.56	0.000036	0.53	25543.38	6549.13	0.04
Mud Creek	1000	121050	25 YR	16333.00	264.41	272.40		272.41	0.000031	0.55	31189.62	6740.32	0.04
Mud Creek	1000	121050	50 YR	19479.00	264.41	273.15		273.16	0.000028	0.57	36331.13	6909.82	0.04
Mud Creek	1000	121050	100 YR	23101.00	264.41	273.93		273.94	0.000025	0.59	41755.71	7084.26	0.04
Mud Creek	1000	119350	2 YR	5938.00	263.81	268.97		268.99	0.000568	1.28	4638.42	1799.21	0.14
Mud Creek	1000	119350	5 YR	9896.00	263.81	270.45		270.47	0.000380	1.29	7649.62	2171.13	0.12
Mud Creek	1000	119350	10 YR	13039.00	263.81	271.39		271.42	0.000300	1.35	9711.05	2194.74	0.11
Mud Creek	1000	119350	25 YR	16333.00	263.81	272.26		272.29	0.000261	1.41	11622.08	2216.40	0.11
Mud Creek	1000	119350	50 YR	19479.00	263.81	273.02		273.05	0.000237	1.47	13319.45	2235.47	0.10
Mud Creek	1000	119350	100 YR	23101.00	263.81	273.80		273.84	0.000223	1.55	15069.55	2254.95	0.10
Mud Creek	1000	117350	2 YR	5938.00	263.11	268.53		268.54	0.000119	0.90	6602.54	2437.48	0.10
Mud Creek	1000	117350	5 YR	9896.00	263.11	270.16		270.17	0.000079	0.89	11167.53	3114.92	0.08
Mud Creek	1000	117350	10 YR	13039.00	263.11	271.17		271.18	0.000060	0.91	14376.78	3211.31	0.07
Mud Creek	1000	117350	25 YR	16333.00	263.11	272.07		272.08	0.000052	0.95	17299.07	3296.62	0.07
Mud Creek	1000	117350	50 YR	19479.00	263.11	272.85		272.87	0.000047	0.99	19903.35	3370.84	0.07
Mud Creek	1000	117350	100 YR	23101.00	263.11	273.64		273.66	0.000045	1.05	22599.66	3445.99	0.07
Mud Creek	1000	114900	2 YR	5938.00	262.26	268.27		268.28	0.000095	0.86	6878.49	2289.83	0.09
Mud Creek	1000	114900	5 YR	9896.00	262.26	269.98		269.99	0.000070	0.87	11344.40	2940.67	0.08
Mud Creek	1000	114900	10 YR	13039.00	262.26	271.03		271.05	0.000054	0.90	14491.41	3006.78	0.07
Mud Creek	1000	114900	25 YR	16333.00	262.26	271.95		271.96	0.000048	0.95	17266.59	3057.13	0.07
Mud Creek	1000	114900	50 YR	19479.00	262.26	272.74		272.75	0.000045	1.00	19701.28	3100.62	0.07
Mud Creek	1000	114900	100 YR	23101.00	262.26	273.53		273.55	0.000043	1.05	22187.43	3144.41	0.07
Mud Creek	1000	113800	2 YR	5938.00	261.87	268.15		268.17	0.000107	0.94	6315.70	2009.87	0.09
Mud Creek	1000	113800	5 YR	9896.00	261.87	269.89		269.90	0.000081	0.96	10285.76	2564.92	0.08
Mud Creek	1000	113800	10 YR	13039.00	261.87	270.96		270.98	0.000064	1.00	13126.14	2701.30	0.08
Mud Creek	1000	113800	25 YR	16333.00	261.87	271.89		271.90	0.000057	1.05	15661.53	2798.11	0.08
Mud Creek	1000	113800	50 YR	19479.00	261.87	272.68		272.70	0.000053	1.11	17917.40	2881.52	0.08
Mud Creek	1000	113800	100 YR	23101.00	261.87	273.48		273.50	0.000051	1.17	20249.58	2965.29	0.08
Mud Creek	1000	112200	2 YR	5938.00	261.31	267.92		267.94	0.000206	1.18	5020.32	1520.15	0.11
Mud Creek	1000	112200	5 YR	9896.00	261.31	269.70		269.73	0.000159	1.22	8109.17	1932.01	0.10
Mud Creek	1000	112200	10 YR	13039.00	261.31	270.81		270.84	0.000130	1.26	10330.97	2036.59	0.10
Mud Creek	1000	112200	25 YR	16333.00	261.31	271.75		271.78	0.000117	1.34	12255.93	2078.69	0.10
Mud Creek	1000	112200	50 YR	19479.00	261.31	272.55		272.58	0.000110	1.41	13935.64	2114.74	0.09
Mud Creek	1000	112200	100 YR	23101.00	261.31	273.35		273.38	0.000107	1.50	15641.41	2150.73	0.10
Mud Creek	1000	110300	2 YR	5938.00	260.65	267.71	263.04	267.72	0.000069	0.72	8270.55	2341.84	0.07
Mud Creek	1000	110300	5 YR	9896.00	260.65	269.55	263.59	269.56	0.000056	0.75	13119.70	2949.52	0.06
Mud Creek	1000	110300	10 YR	13039.00	260.65	270.68	263.94	270.69	0.000048	0.78	16623.64	3137.58	0.06
Mud Creek	1000	110300	25 YR	16333.00	260.65	271.63	264.25	271.64	0.000043	0.83	19629.10	3189.83	0.06
Mud Creek	1000	110300	50 YR	19479.00	260.65	272.44	264.51	272.45	0.000041	0.88	22228.24	3234.34	0.06
Mud Creek	1000	110300	100 YR	23101.00	260.65	273.25	264.78	273.26	0.000040	0.94	24846.17	3278.55	0.06
Mud Creek	1000	110200		Bridge									
Mud Creek	1000	110050	2 YR	5938.00	260.56	267.64		267.64	0.000040	0.62	9549.23	2698.76	0.06
Mud Creek	1000	110050	5 YR	9896.00	260.56	269.47		269.47	0.000032	0.65	15126.48	3396.64	0.05
Mud Creek	1000	110050	10 YR	13039.00	260.56	270.60		270.61	0.000028	0.68	19169.14	3671.85	0.05
Mud Creek	1000	110050	25 YR	16333.00	260.56	271.54		271.55	0.000025	0.72	22675.79	3784.72	0.05
Mud Creek	1000	110050	50 YR	19479.00	260.56	272.34		272.35	0.000024	0.77	25740.03	3880.66	0.05
Mud Creek	1000	110050	100 YR	23101.00	260.56	273.13		273.14	0.000024	0.81	28847.60	3975.59	0.05
Mud Creek	1000	109550	2 YR	5938.00	260.38	267.62		267.62	0.000036	0.60	9939.29	2746.32	0.06
Mud Creek	1000	109550	5 YR	9896.00	260.38	269.45		269.46	0.000030	0.63	15611.57	3441.89	0.05
Mud Creek	1000	109550	10 YR	13039.00	260.38	270.59		270.59	0.000026	0.66	19725.26	3755.43	0.05
Mud Creek	1000	109550	25 YR	16333.00	260.38	271.53		271.54	0.000024	0.71	23341.73	3924.94	0.05
Mud Creek	1000	109550	50 YR	19479.00	260.38	272.33		272.34	0.000022	0.75	26539.73	4068.96	0.05
Mud Creek	1000	109550	100 YR	23101.00	260.38	273.12		273.13	0.000022	0.79	29815.94	4211.40	0.05
Mud Creek	1000	107750	2 YR	5938.00	259.75	267.54		267.55	0.000051	0.69	8639.15	2084.96	0.06
Mud Creek	1000	107750	5 YR	9896.00	259.75	269.38		269.39	0.000049	0.77	12900.93	2545.18	0.06

HEC-RAS Plan: Prop 300 NP (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	107750	10 YR	13039.00	259.75	270.52		270.53	0.000045	0.82	15965.55	2825.15	0.06
Mud Creek	1000	107750	25 YR	16333.00	259.75	271.47		271.48	0.000043	0.88	18742.69	3051.97	0.06
Mud Creek	1000	107750	50 YR	19479.00	259.75	272.27		272.28	0.000042	0.94	21265.58	3244.30	0.06
Mud Creek	1000	107750	100 YR	23101.00	259.75	273.06		273.07	0.000043	1.00	23906.22	3434.09	0.06
Mud Creek	1000	105150	2 YR	5938.00	258.80	267.43		267.44	0.000035	0.73	9499.52	1581.81	0.05
Mud Creek	1000	105150	5 YR	9896.00	258.80	269.26		269.27	0.000044	0.95	12530.23	1737.05	0.05
Mud Creek	1000	105150	10 YR	13039.00	258.80	270.39		270.41	0.000051	1.10	14555.65	1833.48	0.06
Mud Creek	1000	105150	25 YR	16333.00	258.80	271.33		271.35	0.000058	1.25	16311.96	1913.17	0.06
Mud Creek	1000	105150	50 YR	19479.00	258.80	272.13		272.15	0.000064	1.37	17858.55	1980.70	0.07
Mud Creek	1000	105150	100 YR	23101.00	258.80	272.91		272.94	0.000072	1.51	19431.16	2047.07	0.07
Mud Creek	1000	104100	2 YR	5938.00	258.42	267.40		267.41	0.000026	0.83	8775.25	1479.00	0.05
Mud Creek	1000	104100	5 YR	9896.00	258.42	269.22		269.23	0.000033	1.09	11601.33	1633.36	0.06
Mud Creek	1000	104100	10 YR	13039.00	258.42	270.34		270.36	0.000038	1.26	13495.63	1723.17	0.07
Mud Creek	1000	104100	25 YR	16333.00	258.42	271.27		271.30	0.000044	1.43	15126.32	1785.91	0.07
Mud Creek	1000	104100	50 YR	19479.00	258.42	272.06		272.09	0.000049	1.57	16553.05	1839.04	0.08
Mud Creek	1000	104100	100 YR	23101.00	258.42	272.83		272.87	0.000055	1.73	17993.43	1891.17	0.08
Mud Creek	1000	103850	2 YR	5938.00	258.33	267.39		267.40	0.000027	0.86	7953.19	1256.58	0.05
Mud Creek	1000	103850	5 YR	9896.00	258.33	269.21		269.22	0.000036	1.14	10321.49	1356.28	0.07
Mud Creek	1000	103850	10 YR	13039.00	258.33	270.33		270.35	0.000042	1.32	11882.53	1423.09	0.07
Mud Creek	1000	103850	25 YR	16333.00	258.33	271.26		271.29	0.000049	1.51	13230.68	1487.92	0.08
Mud Creek	1000	103850	50 YR	19479.00	258.33	272.04		272.08	0.000055	1.67	14419.05	1542.82	0.08
Mud Creek	1000	103850	100 YR	23101.00	258.33	272.81		272.86	0.000062	1.85	15625.66	1596.63	0.09
Mud Creek	1000	103350	2 YR	8372.00	258.15	267.34	261.65	267.37	0.000103	1.66	7000.31	1320.39	0.11
Mud Creek	1000	103350	5 YR	13871.00	258.15	269.13	262.39	269.18	0.000127	2.13	9532.31	1508.36	0.12
Mud Creek	1000	103350	10 YR	18042.00	258.15	270.24	262.87	270.31	0.000141	2.41	11272.07	1619.05	0.13
Mud Creek	1000	103350	25 YR	22505.00	258.15	271.15	263.33	271.24	0.000158	2.70	12778.08	1691.83	0.14
Mud Creek	1000	103350	50 YR	26741.00	258.15	271.92	263.75	272.02	0.000173	2.95	14103.95	1753.41	0.15
Mud Creek	1000	103350	100 YR	31326.00	258.15	272.67	264.14	272.79	0.000188	3.20	15449.47	1813.76	0.16
Mud Creek	1000	103200		Bridge									
Mud Creek	1000	103100	2 YR	8372.00	258.06	267.22		267.29	0.000326	2.25	4859.99	905.55	0.14
Mud Creek	1000	103100	5 YR	13871.00	258.06	268.95		269.06	0.000412	2.90	6532.30	1026.72	0.17
Mud Creek	1000	103100	10 YR	18042.00	258.06	270.02		270.15	0.000459	3.29	7668.96	1102.56	0.18
Mud Creek	1000	103100	25 YR	22505.00	258.06	270.87		271.04	0.000533	3.74	8653.28	1204.93	0.20
Mud Creek	1000	103100	50 YR	26741.00	258.06	271.59		271.79	0.000595	4.12	9546.34	1290.81	0.21
Mud Creek	1000	103100	100 YR	31326.00	258.06	272.29		272.52	0.000655	4.49	10473.79	1374.33	0.22
Mud Creek	1000	102550	2 YR	8372.00	257.86	266.79		266.94	0.001174	4.37	3786.98	983.26	0.27
Mud Creek	1000	102550	5 YR	13871.00	257.86	268.47		268.65	0.001216	5.06	5618.77	1201.28	0.29
Mud Creek	1000	102550	10 YR	18042.00	257.86	269.52		269.72	0.001207	5.41	6956.00	1338.19	0.29
Mud Creek	1000	102550	25 YR	22505.00	257.86	270.33		270.55	0.001296	5.89	8082.26	1453.30	0.31
Mud Creek	1000	102550	50 YR	26741.00	257.86	271.02		271.26	0.001361	6.27	9114.21	1562.79	0.32
Mud Creek	1000	102550	100 YR	31326.00	257.86	271.69		271.95	0.001409	6.62	10199.71	1670.23	0.33
Mud Creek	1000	101050	2 YR	8372.00	257.31	263.19		263.89	0.005267	7.39	1698.49	695.08	0.61
Mud Creek	1000	101050	5 YR	13871.00	257.31	263.83		265.07	0.008277	10.11	2175.05	794.28	0.78
Mud Creek	1000	101050	10 YR	18042.00	257.31	264.13		265.86	0.011000	12.10	2419.32	840.60	0.91
Mud Creek	1000	101050	25 YR	22505.00	257.31	264.82	264.82	266.60	0.010247	12.63	3029.42	946.43	0.90
Mud Creek	1000	101050	50 YR	26741.00	257.31	265.36	265.36	267.22	0.009957	13.17	3564.16	1030.29	0.90
Mud Creek	1000	101050	100 YR	31326.00	257.31	265.85	265.85	267.83	0.009935	13.80	4090.88	1106.70	0.91
Mud Creek	1000	99150	2 YR	8372.00	256.62	262.80		262.81	0.000205	1.65	13622.08	5211.79	0.14
Mud Creek	1000	99150	5 YR	13871.00	256.62	263.57		263.58	0.000250	2.03	17729.36	5435.53	0.16
Mud Creek	1000	99150	10 YR	18042.00	256.62	264.06		264.08	0.000275	2.25	20418.34	5577.15	0.17
Mud Creek	1000	99150	25 YR	22505.00	256.62	264.52		264.54	0.000297	2.47	23010.63	5710.35	0.17
Mud Creek	1000	99150	50 YR	26741.00	256.62	264.91		264.94	0.000315	2.65	25286.12	5824.77	0.18
Mud Creek	1000	99150	100 YR	31326.00	256.62	265.31		265.33	0.000332	2.82	27593.87	5938.55	0.19
Mud Creek	1000	97950	2 YR	8372.00	256.19	262.64		262.65	0.000251	1.84	12594.05	4981.72	0.15
Mud Creek	1000	97950	5 YR	13871.00	256.19	263.38		263.40	0.000307	2.25	16327.21	5143.94	0.17
Mud Creek	1000	97950	10 YR	18042.00	256.19	263.85		263.87	0.000338	2.50	18766.29	5247.22	0.18
Mud Creek	1000	97950	25 YR	22505.00	256.19	264.29		264.32	0.000366	2.73	21105.84	5344.41	0.19
Mud Creek	1000	97950	50 YR	26741.00	256.19	264.67		264.70	0.000388	2.93	23153.29	5428.04	0.20
Mud Creek	1000	97950	100 YR	31326.00	256.19	265.05		265.08	0.000410	3.13	25223.61	5511.31	0.21
Mud Creek	1000	96975	2 YR	8372.00	255.84	262.58	260.43	262.59	0.000179	1.62	14025.26	5044.53	0.13
Mud Creek	1000	96975	5 YR	13871.00	255.84	263.30	260.67	263.31	0.000239	2.05	17716.26	5203.01	0.15
Mud Creek	1000	96975	10 YR	18042.00	255.84	263.76	260.81	263.78	0.000272	2.31	20132.71	5304.20	0.17
Mud Creek	1000	96975	25 YR	22505.00	255.84	264.19	260.96	264.21	0.000302	2.55	22449.47	5399.44	0.18
Mud Creek	1000	96975	50 YR	26741.00	255.84	264.57	261.08	264.59	0.000327	2.76	24477.86	5481.46	0.19
Mud Creek	1000	96975	100 YR	31326.00	255.84	264.94	261.24	264.97	0.000351	2.96	26529.01	5563.18	0.19
Mud Creek	1000	96950		Bridge									
Mud Creek	1000	96925	2 YR	8372.00	255.82	262.51		262.54	0.000580	2.05	8864.35	4551.77	0.17
Mud Creek	1000	96925	5 YR	13871.00	255.82	263.24		263.27	0.000622	2.36	12221.85	4725.48	0.19
Mud Creek	1000	96925	10 YR	18042.00	255.82	263.70		263.73	0.000644	2.54	14421.96	4835.93	0.19
Mud Creek	1000	96925	25 YR	22505.00	255.82	264.13		264.17	0.000666	2.72	16533.66	4939.62	0.20
Mud Creek	1000	96925	50 YR	26741.00	255.82	264.50		264.55	0.000684	2.87	18386.78	5028.85	0.20
Mud Creek	1000	96925	100 YR	31326.00	255.82	264.87		264.92	0.000702	3.02	20264.79	5117.69	0.21

HEC-RAS Plan: Prop 300 NP (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	95200	2 YR	8372.00	255.19	261.74		261.78	0.000715	2.23	8240.42	4518.75	0.19
Mud Creek	1000	95200	5 YR	13871.00	255.19	262.46		262.50	0.000734	2.51	11556.70	4691.58	0.20
Mud Creek	1000	95200	10 YR	18042.00	255.19	262.92		262.96	0.000749	2.69	13706.77	4800.31	0.21
Mud Creek	1000	95200	25 YR	22505.00	255.19	263.33		263.38	0.000774	2.88	15720.65	4899.96	0.21
Mud Creek	1000	95200	50 YR	26741.00	255.19	263.69		263.74	0.000796	3.04	17484.90	4985.62	0.22
Mud Creek	1000	95200	100 YR	31326.00	255.19	264.05		264.10	0.000816	3.20	19270.44	5070.85	0.22
Mud Creek	1000	93700	2 YR	8372.00	254.65	260.79		260.85	0.001079	2.15	5669.79	4071.18	0.20
Mud Creek	1000	93700	5 YR	13871.00	254.65	261.63		261.69	0.000981	2.37	9167.59	4305.03	0.20
Mud Creek	1000	93700	10 YR	18042.00	254.65	262.10		262.17	0.000984	2.54	11235.15	4437.46	0.21
Mud Creek	1000	93700	25 YR	22505.00	254.65	262.50		262.58	0.001031	2.74	13037.09	4549.74	0.21
Mud Creek	1000	93700	50 YR	26741.00	254.65	262.84		262.93	0.001068	2.92	14613.07	4645.72	0.22
Mud Creek	1000	93700	100 YR	31326.00	254.65	263.18		263.27	0.001104	3.08	16205.89	4740.75	0.22
Mud Creek	1000	91800	2 YR	8372.00	253.96	258.80		258.86	0.001134	1.96	4268.59	1763.40	0.22
Mud Creek	1000	91800	5 YR	13871.00	253.96	259.75		259.83	0.001204	2.28	6096.69	2107.44	0.24
Mud Creek	1000	91800	10 YR	18042.00	253.96	260.29		260.38	0.001161	2.45	7970.35	4568.74	0.24
Mud Creek	1000	91800	25 YR	22505.00	253.96	260.78		260.88	0.001062	2.56	10227.76	4683.41	0.23
Mud Creek	1000	91800	50 YR	26741.00	253.96	261.16		261.26	0.001024	2.68	12026.49	4772.82	0.23
Mud Creek	1000	91800	100 YR	31326.00	253.96	261.54		261.65	0.000995	2.80	13830.89	4860.85	0.23
Mud Creek	1000	90600	2 YR	8372.00	253.52	258.03		258.05	0.000434	1.16	7228.75	3203.60	0.14
Mud Creek	1000	90600	5 YR	13871.00	253.52	258.97		258.99	0.000438	1.32	10525.55	3865.71	0.14
Mud Creek	1000	90600	10 YR	18042.00	253.52	259.52		259.55	0.000440	1.41	12790.85	4261.44	0.14
Mud Creek	1000	90600	25 YR	22505.00	253.52	260.03		260.07	0.000441	1.49	15055.20	4609.52	0.15
Mud Creek	1000	90600	50 YR	26741.00	253.52	260.44		260.48	0.000419	1.58	16976.42	4728.85	0.14
Mud Creek	1000	90600	100 YR	31326.00	253.52	260.83		260.88	0.000411	1.67	18835.70	4841.53	0.15
Mud Creek	1000	89850	2 YR	8372.00	253.25	257.74		257.76	0.000351	1.19	7014.09	3125.34	0.14
Mud Creek	1000	89850	5 YR	13871.00	253.25	258.67		258.70	0.000353	1.36	10223.94	3773.30	0.15
Mud Creek	1000	89850	10 YR	18042.00	253.25	259.22		259.26	0.000355	1.45	12427.74	4160.14	0.15
Mud Creek	1000	89850	25 YR	22505.00	253.25	259.73		259.77	0.000357	1.54	14632.15	4514.05	0.15
Mud Creek	1000	89850	50 YR	26741.00	253.25	260.16		260.20	0.000350	1.61	16594.53	4732.60	0.15
Mud Creek	1000	89850	100 YR	31326.00	253.25	260.55		260.60	0.000337	1.70	18492.43	4816.07	0.15
Mud Creek	1000	88850	2 YR	8372.00	252.89	257.40		257.43	0.000317	1.30	6440.56	2855.28	0.15
Mud Creek	1000	88850	5 YR	13871.00	252.89	258.33		258.36	0.000322	1.48	9353.78	3440.96	0.16
Mud Creek	1000	88850	10 YR	18042.00	252.89	258.88		258.92	0.000325	1.59	11348.58	3790.16	0.16
Mud Creek	1000	88850	25 YR	22505.00	252.89	259.38		259.43	0.000329	1.69	13339.45	4109.18	0.17
Mud Creek	1000	88850	50 YR	26741.00	252.89	259.81		259.85	0.000331	1.77	15137.21	4377.33	0.17
Mud Creek	1000	88850	100 YR	31326.00	252.89	260.21		260.27	0.000322	1.85	16969.03	4544.04	0.17
Mud Creek	1000	87600	2 YR	8372.00	252.43	257.00		257.02	0.000327	1.17	7181.12	3140.98	0.14
Mud Creek	1000	87600	5 YR	13871.00	252.43	257.92		257.95	0.000339	1.34	10345.92	3770.10	0.14
Mud Creek	1000	87600	10 YR	18042.00	252.43	258.46		258.50	0.000346	1.44	12506.49	4145.11	0.15
Mud Creek	1000	87600	25 YR	22505.00	252.43	258.96		259.00	0.000353	1.54	14656.83	4487.34	0.15
Mud Creek	1000	87600	50 YR	26741.00	252.43	259.38		259.42	0.000357	1.61	16600.71	4775.64	0.15
Mud Creek	1000	87600	100 YR	31326.00	252.43	259.80		259.84	0.000360	1.68	18633.14	5059.55	0.15
Mud Creek	1000	85350	2 YR	8372.00	251.62	256.16		256.18	0.000437	1.17	7184.93	3167.25	0.14
Mud Creek	1000	85350	5 YR	13871.00	251.62	257.03		257.06	0.000470	1.36	10205.65	3774.77	0.15
Mud Creek	1000	85350	10 YR	18042.00	251.62	257.54		257.58	0.000488	1.47	12252.39	4136.01	0.15
Mud Creek	1000	85350	25 YR	22505.00	251.62	258.02		258.06	0.000504	1.57	14295.09	4467.50	0.16
Mud Creek	1000	85350	50 YR	26741.00	251.62	258.42		258.47	0.000513	1.65	16162.54	4750.35	0.16
Mud Creek	1000	85350	100 YR	31326.00	251.62	258.83		258.88	0.000517	1.73	18146.29	5033.44	0.16
Mud Creek	1000	83800	2 YR	8372.00	251.05	255.39		255.42	0.000553	1.27	6577.45	3030.91	0.15
Mud Creek	1000	83800	5 YR	13871.00	251.05	256.19		256.22	0.000618	1.51	9209.28	3586.38	0.17
Mud Creek	1000	83800	10 YR	18042.00	251.05	256.66		256.71	0.000650	1.64	11007.77	3920.97	0.17
Mud Creek	1000	83800	25 YR	22505.00	251.05	257.11		257.16	0.000673	1.76	12821.38	4231.66	0.18
Mud Creek	1000	83800	50 YR	26741.00	251.05	257.50		257.55	0.000681	1.84	14533.98	4505.43	0.18
Mud Creek	1000	83800	100 YR	31326.00	251.05	257.91		257.96	0.000675	1.91	16419.16	4788.72	0.18
Mud Creek	1000	82200	2 YR	8372.00	250.47	253.44		253.55	0.003872	2.62	3198.32	2152.06	0.38
Mud Creek	1000	82200	5 YR	13871.00	250.47	254.20		254.32	0.003161	2.75	5039.96	2701.51	0.36
Mud Creek	1000	82200	10 YR	18042.00	250.47	254.69		254.81	0.002765	2.80	6454.00	3057.08	0.34
Mud Creek	1000	82200	25 YR	22505.00	250.47	255.22		255.34	0.002304	2.76	8156.94	3436.82	0.32
Mud Creek	1000	82200	50 YR	26741.00	250.47	255.75		255.85	0.001853	2.65	10073.96	3819.38	0.29
Mud Creek	1000	82200	100 YR	31326.00	250.47	256.34		256.44	0.001438	2.51	12476.35	4250.47	0.26
Mud Creek	1000	80150	2 YR	8372.00	249.62	252.27		252.28	0.000234	0.85	9798.47	4313.59	0.10
Mud Creek	1000	80150	5 YR	13871.00	249.62	253.03		253.05	0.000247	1.06	13102.43	4351.71	0.11
Mud Creek	1000	80150	10 YR	18042.00	249.62	253.60		253.62	0.000238	1.16	15560.45	4379.87	0.11
Mud Creek	1000	80150	25 YR	22505.00	249.62	254.27		254.29	0.000209	1.21	18524.83	4413.58	0.10
Mud Creek	1000	80150	50 YR	26741.00	249.62	254.94		254.97	0.000182	1.24	21492.05	4447.06	0.10
Mud Creek	1000	80150	100 YR	31326.00	249.62	255.66		255.68	0.000158	1.27	24697.80	4482.96	0.10
Mud Creek	1000	78800	2 YR	8372.00	248.93	251.93		251.94	0.000274	1.01	8490.33	4198.38	0.12
Mud Creek	1000	78800	5 YR	13871.00	248.93	252.68		252.70	0.000268	1.22	11708.72	4315.56	0.13
Mud Creek	1000	78800	10 YR	18042.00	248.93	253.27		253.29	0.000241	1.32	14268.08	4406.53	0.12
Mud Creek	1000	78800	25 YR	22505.00	248.93	253.99		254.02	0.000197	1.35	17502.13	4518.86	0.12
Mud Creek	1000	78800	50 YR	26741.00	248.93	254.70		254.73	0.000163	1.36	20760.07	4629.26	0.11
Mud Creek	1000	78800	100 YR	31326.00	248.93	255.46		255.49	0.000137	1.38	24283.13	4745.75	0.10
Mud Creek	1000	77500	2 YR	8372.00	248.27	251.46		251.49	0.000447	1.57	6346.77	3217.83	0.18
Mud Creek	1000	77500	5 YR	13871.00	248.27	252.21		252.26	0.000457	1.92	8789.92	3303.99	0.19

## HEC-RAS Plan: Prop 300 NP (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	77500	10 YR	18042.00	248.27	252.84		252.90	0.000400	2.03	10906.53	3376.86	0.19
Mud Creek	1000	77500	25 YR	22505.00	248.27	253.65		253.70	0.000313	2.05	13659.80	3469.35	0.17
Mud Creek	1000	77500	50 YR	26741.00	248.27	254.42		254.47	0.000255	2.06	16363.03	3557.83	0.16
Mud Creek	1000	77500	100 YR	31326.00	248.27	255.21		255.27	0.000215	2.07	19218.15	3648.95	0.15
Mud Creek	1000	76300	2 YR	8372.00	247.66	250.90		250.92	0.000500	1.35	6286.74	3201.49	0.17
Mud Creek	1000	76300	5 YR	13871.00	247.66	251.65		251.70	0.000478	1.62	8781.07	3372.24	0.17
Mud Creek	1000	76300	10 YR	18042.00	247.66	252.39		252.43	0.000369	1.66	11317.96	3537.46	0.16
Mud Creek	1000	76300	25 YR	22505.00	247.66	253.31		253.35	0.000261	1.63	14687.00	3745.62	0.14
Mud Creek	1000	76300	50 YR	26741.00	247.66	254.15		254.19	0.000204	1.62	17910.77	3934.51	0.12
Mud Creek	1000	76300	100 YR	31326.00	247.66	254.99		255.03	0.000169	1.62	21287.25	4123.08	0.12
Mud Creek	1000	74900	2 YR	8372.00	246.95	250.21		250.24	0.000479	1.34	6247.94	3638.74	0.18
Mud Creek	1000	74900	5 YR	13871.00	246.95	251.11		251.15	0.000323	1.46	9617.75	3806.21	0.16
Mud Creek	1000	74900	10 YR	18042.00	246.95	252.02		252.05	0.000202	1.40	13149.46	3974.17	0.13
Mud Creek	1000	74900	25 YR	22505.00	246.95	253.07		253.10	0.000131	1.34	17416.83	4168.08	0.11
Mud Creek	1000	74900	50 YR	26741.00	246.95	253.97		253.99	0.000101	1.33	21224.62	4333.80	0.10
Mud Creek	1000	74900	100 YR	31326.00	246.95	254.84		254.86	0.000084	1.33	25070.57	4494.98	0.09
Mud Creek	1000	72400	2 YR	8372.00	245.67	249.30		249.31	0.000296	0.95	8808.81	4857.84	0.12
Mud Creek	1000	72400	5 YR	13871.00	245.67	250.63		250.64	0.000134	0.85	16260.47	5913.82	0.09
Mud Creek	1000	72400	10 YR	18042.00	245.67	251.75		251.76	0.000074	0.79	22982.72	6115.00	0.07
Mud Creek	1000	72400	25 YR	22505.00	245.67	252.90		252.91	0.000048	0.76	30111.49	6321.36	0.06
Mud Creek	1000	72400	50 YR	26741.00	245.67	253.83		253.84	0.000039	0.76	36102.01	6489.70	0.05
Mud Creek	1000	72400	100 YR	31326.00	245.67	254.73		254.73	0.000033	0.77	41973.99	6650.57	0.05
Mud Creek	1000	71200	2 YR	8372.00	245.06	249.04		249.05	0.000166	0.76	11060.82	5558.65	0.09
Mud Creek	1000	71200	5 YR	13871.00	245.06	250.52		250.52	0.000076	0.67	20616.49	6946.46	0.07
Mud Creek	1000	71200	10 YR	18042.00	245.06	251.69		251.69	0.000043	0.63	28806.40	7051.77	0.05
Mud Creek	1000	71200	25 YR	22505.00	245.06	252.85		252.86	0.000029	0.61	37104.58	7156.89	0.05
Mud Creek	1000	71200	50 YR	26741.00	245.06	253.80		253.80	0.000024	0.62	43898.13	7241.82	0.04
Mud Creek	1000	71200	100 YR	31326.00	245.06	254.70		254.70	0.000021	0.63	50441.11	7322.68	0.04
Mud Creek	1000	69000	2 YR	9929.00	243.94	248.71	245.84	248.72	0.000138	0.89	11146.62	4678.52	0.10
Mud Creek	1000	69000	5 YR	16451.00	243.94	250.35	246.26	250.36	0.000073	0.82	20103.10	5979.56	0.08
Mud Creek	1000	69000	10 YR	21327.00	243.94	251.59	246.53	251.60	0.000043	0.78	27582.95	6084.96	0.06
Mud Creek	1000	69000	25 YR	26528.00	243.94	252.78	246.77	252.79	0.000031	0.77	34924.94	6186.67	0.06
Mud Creek	1000	69000	50 YR	31496.00	243.94	253.74	246.96	253.75	0.000026	0.78	40868.64	6267.80	0.05
Mud Creek	1000	69000	100 YR	36754.00	243.94	254.64	247.16	254.65	0.000024	0.80	46572.99	6344.69	0.05
Mud Creek	1000	68800		Bridge									
Mud Creek	1000	68650	2 YR	9929.00	243.77	248.12		248.14	0.000362	1.19	8364.32	3842.98	0.14
Mud Creek	1000	68650	5 YR	16451.00	243.77	250.07		250.09	0.000136	0.94	17537.17	5509.19	0.09
Mud Creek	1000	68650	10 YR	21327.00	243.77	251.39		251.40	0.000072	0.86	24885.43	5673.47	0.07
Mud Creek	1000	68650	25 YR	26528.00	243.77	252.61		252.62	0.000050	0.84	31918.14	5826.36	0.06
Mud Creek	1000	68650	50 YR	31496.00	243.77	253.57		253.58	0.000042	0.85	37561.18	5946.19	0.06
Mud Creek	1000	68650	100 YR	36754.00	243.77	254.47		254.48	0.000037	0.87	42979.61	6059.03	0.06
Mud Creek	1000	67650	2 YR	9929.00	243.26	247.84		247.85	0.000235	0.99	10033.85	4382.26	0.12
Mud Creek	1000	67650	5 YR	16451.00	243.26	249.97		249.98	0.000084	0.76	21552.47	6422.64	0.07
Mud Creek	1000	67650	10 YR	21327.00	243.26	251.33		251.34	0.000045	0.70	30396.03	6533.37	0.06
Mud Creek	1000	67650	25 YR	26528.00	243.26	252.57		252.58	0.000032	0.69	38543.98	6610.86	0.05
Mud Creek	1000	67650	50 YR	31496.00	243.26	253.54		253.55	0.000027	0.71	44951.11	6671.16	0.05
Mud Creek	1000	67650	100 YR	36754.00	243.26	254.44		254.45	0.000025	0.73	51022.41	6727.80	0.05
Mud Creek	1000	66450	2 YR	9929.00	242.65	247.68		247.69	0.000087	0.73	13522.49	5374.45	0.08
Mud Creek	1000	66450	5 YR	16451.00	242.65	249.91		249.92	0.000034	0.58	28171.24	7757.27	0.05
Mud Creek	1000	66450	10 YR	21327.00	242.65	251.30		251.31	0.000019	0.54	40416.32	8915.11	0.04
Mud Creek	1000	66450	25 YR	26528.00	242.65	252.55		252.56	0.000014	0.53	51592.70	8977.58	0.04
Mud Creek	1000	66450	50 YR	31496.00	242.65	253.52		253.52	0.000012	0.55	60309.20	9025.99	0.04
Mud Creek	1000	66450	100 YR	36754.00	242.65	254.43		254.43	0.000011	0.56	68528.50	9071.41	0.03
Mud Creek	1000	64850	2 YR	9929.00	241.83	247.54		247.55	0.000088	0.80	12369.84	4332.93	0.08
Mud Creek	1000	64850	5 YR	16451.00	241.83	249.85		249.86	0.000039	0.67	24422.47	6088.28	0.06
Mud Creek	1000	64850	10 YR	21327.00	241.83	251.27		251.27	0.000024	0.64	33210.10	6256.96	0.05
Mud Creek	1000	64850	25 YR	26528.00	241.83	252.52		252.53	0.000019	0.65	41116.73	6313.56	0.04
Mud Creek	1000	64850	50 YR	31496.00	241.83	253.49		253.50	0.000017	0.67	47269.64	6357.27	0.04
Mud Creek	1000	64850	100 YR	36754.00	241.83	254.40		254.41	0.000016	0.70	53072.23	6398.21	0.04
Mud Creek	1000	63250	2 YR	9929.00	241.02	247.39		247.40	0.000103	0.71	14002.70	4397.23	0.07
Mud Creek	1000	63250	5 YR	16451.00	241.02	249.78		249.79	0.000052	0.62	26500.75	6049.25	0.05
Mud Creek	1000	63250	10 YR	21327.00	241.02	251.22		251.23	0.000034	0.60	35433.57	6248.81	0.04
Mud Creek	1000	63250	25 YR	26528.00	241.02	252.49		252.49	0.000027	0.61	43389.93	6299.54	0.04
Mud Creek	1000	63250	50 YR	31496.00	241.02	253.46		253.47	0.000025	0.64	49549.29	6338.53	0.04
Mud Creek	1000	63250	100 YR	36754.00	241.02	254.37		254.38	0.000023	0.67	55345.12	6375.00	0.04
Mud Creek	1000	61950	2 YR	9929.00	240.36	247.30		247.31	0.000048	0.67	14744.97	4248.39	0.06
Mud Creek	1000	61950	5 YR	16451.00	240.36	249.74		249.74	0.000026	0.61	26896.52	5737.87	0.05
Mud Creek	1000	61950	10 YR	21327.00	240.36	251.19		251.19	0.000018	0.60	35499.81	5983.20	0.04
Mud Creek	1000	61950	25 YR	26528.00	240.36	252.46		252.47	0.000015	0.62	43180.43	6072.39	0.04
Mud Creek	1000	61950	50 YR	31496.00	240.36	253.44		253.45	0.000014	0.65	49144.91	6140.76	0.04
Mud Creek	1000	61950	100 YR	36754.00	240.36	254.35		254.36	0.000013	0.68	54779.15	6204.66	0.04
Mud Creek	1000	60750	2 YR	9929.00	239.83	247.23		247.24	0.000066	1.30	18093.25	4594.42	0.08
Mud Creek	1000	60750	5 YR	16451.00	239.83	249.69		249.70	0.000046	1.32	31141.35	6020.34	0.07

HEC-RAS Plan: Prop 300 NP (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	60750	10 YR	21327.00	239.83	251.16		251.16	0.000038	1.30	40254.73	6303.95	0.07
Mud Creek	1000	60750	25 YR	26528.00	239.83	252.43		252.44	0.000033	1.32	48393.00	6419.08	0.07
Mud Creek	1000	60750	50 YR	31496.00	239.83	253.41		253.42	0.000032	1.37	54715.57	6507.13	0.07
Mud Creek	1000	60750	100 YR	36754.00	239.83	254.33		254.34	0.000032	1.43	60697.07	6589.34	0.07
Mud Creek	1000	58800	2 YR	9929.00	239.18	247.21		247.21	0.000005	0.37	34155.33	5962.91	0.02
Mud Creek	1000	58800	5 YR	16451.00	239.18	249.67		249.67	0.000005	0.44	49996.58	6921.88	0.02
Mud Creek	1000	58800	10 YR	21327.00	239.18	251.14		251.14	0.000005	0.48	60331.20	7101.13	0.03
Mud Creek	1000	58800	25 YR	26528.00	239.18	252.42		252.42	0.000005	0.53	69449.31	7158.68	0.03
Mud Creek	1000	58800	50 YR	31496.00	239.18	253.39		253.40	0.000005	0.57	76466.06	7202.65	0.03
Mud Creek	1000	58800	100 YR	36754.00	239.18	254.30		254.31	0.000006	0.62	83055.49	7243.71	0.03
Mud Creek	1000	57200	2 YR	9929.00	238.64	247.21		247.21	0.000002	0.23	46471.52	6713.64	0.01
Mud Creek	1000	57200	5 YR	16451.00	238.64	249.67		249.67	0.000003	0.29	63614.26	7230.00	0.02
Mud Creek	1000	57200	10 YR	21327.00	238.64	251.13		251.13	0.000003	0.32	74336.10	7373.53	0.02
Mud Creek	1000	57200	25 YR	26528.00	238.64	252.41		252.41	0.000003	0.36	83817.11	7456.65	0.02
Mud Creek	1000	57200	50 YR	31496.00	238.64	253.39		253.39	0.000003	0.40	91131.59	7520.14	0.02
Mud Creek	1000	57200	100 YR	36754.00	238.64	254.30		254.30	0.000004	0.43	98015.73	7579.40	0.02
Mud Creek	1000	55600	2 YR	9929.00	238.10	247.20		247.20	0.000004	0.35	29789.83	3976.13	0.02
Mud Creek	1000	55600	5 YR	16451.00	238.10	249.66		249.66	0.000005	0.44	39803.32	4172.74	0.02
Mud Creek	1000	55600	10 YR	21327.00	238.10	251.12		251.13	0.000005	0.50	45951.45	4208.98	0.03
Mud Creek	1000	55600	25 YR	26528.00	238.10	252.40		252.41	0.000005	0.56	51334.81	4219.20	0.03
Mud Creek	1000	55600	50 YR	31496.00	238.10	253.38		253.38	0.000006	0.62	55454.29	4227.01	0.03
Mud Creek	1000	55600	100 YR	36754.00	238.10	254.29		254.29	0.000007	0.68	59305.95	4234.29	0.03
Mud Creek	1000	53900	2 YR	9929.00	237.53	247.20		247.20	0.000002	0.22	47287.20	6019.83	0.01
Mud Creek	1000	53900	5 YR	16451.00	237.53	249.66		249.66	0.000002	0.28	62382.92	6265.58	0.01
Mud Creek	1000	53900	10 YR	21327.00	237.53	251.12		251.12	0.000002	0.32	71616.91	6333.58	0.02
Mud Creek	1000	53900	25 YR	26528.00	237.53	252.40		252.40	0.000002	0.36	79731.35	6371.90	0.02
Mud Creek	1000	53900	50 YR	31496.00	237.53	253.37		253.37	0.000002	0.39	85959.82	6401.16	0.02
Mud Creek	1000	53900	100 YR	36754.00	237.53	254.28		254.29	0.000003	0.43	91798.59	6428.47	0.02
Mud Creek	1000	52600	2 YR	9929.00	237.09	247.20		247.20	0.000002	0.25	40805.89	4881.29	0.01
Mud Creek	1000	52600	5 YR	16451.00	237.09	249.65		249.65	0.000002	0.32	52916.92	4977.34	0.02
Mud Creek	1000	52600	10 YR	21327.00	237.09	251.12		251.12	0.000003	0.36	60229.43	5012.22	0.02
Mud Creek	1000	52600	25 YR	26528.00	237.09	252.39		252.40	0.000003	0.41	66644.72	5036.59	0.02
Mud Creek	1000	52600	50 YR	31496.00	237.09	253.37		253.37	0.000003	0.45	71562.96	5055.20	0.02
Mud Creek	1000	52600	100 YR	36754.00	237.09	254.28		254.28	0.000004	0.50	76169.09	5072.56	0.02
Mud Creek	1000	51700	2 YR	9929.00	236.78	247.19		247.19	0.000004	0.28	37153.02	4539.49	0.02
Mud Creek	1000	51700	5 YR	16451.00	236.78	249.65		249.65	0.000005	0.35	48529.83	4723.71	0.02
Mud Creek	1000	51700	10 YR	21327.00	236.78	251.11		251.11	0.000005	0.41	55560.97	4906.84	0.02
Mud Creek	1000	51700	25 YR	26528.00	236.78	252.39		252.39	0.000006	0.46	61938.61	5086.81	0.02
Mud Creek	1000	51700	50 YR	31496.00	236.78	253.36		253.37	0.000007	0.50	66960.91	5224.17	0.02
Mud Creek	1000	51700	100 YR	36754.00	236.78	254.27		254.28	0.000007	0.55	71768.16	5352.34	0.02
Mud Creek	1000	49500	2 YR	9929.00	236.04	247.19		247.19	0.000002	0.23	43995.32	4951.59	0.01
Mud Creek	1000	49500	5 YR	16451.00	236.04	249.64		249.65	0.000002	0.30	56258.80	5037.53	0.02
Mud Creek	1000	49500	10 YR	21327.00	236.04	251.11		251.11	0.000002	0.34	63662.04	5088.71	0.02
Mud Creek	1000	49500	25 YR	26528.00	236.04	252.38		252.38	0.000002	0.39	70181.53	5133.35	0.02
Mud Creek	1000	49500	50 YR	31496.00	236.04	253.35		253.36	0.000003	0.43	75194.38	5167.42	0.02
Mud Creek	1000	49500	100 YR	36754.00	236.04	254.26		254.27	0.000003	0.47	79901.41	5199.20	0.02
Mud Creek	1000	47200	2 YR	9929.00	235.27	247.18		247.18	0.000003	0.33	45745.37	6271.13	0.02
Mud Creek	1000	47200	5 YR	16451.00	235.27	249.64		249.64	0.000003	0.41	61648.71	6688.37	0.02
Mud Creek	1000	47200	10 YR	21327.00	235.27	251.10		251.10	0.000004	0.47	71536.30	6810.45	0.02
Mud Creek	1000	47200	25 YR	26528.00	235.27	252.37		252.38	0.000004	0.52	80263.23	6880.56	0.02
Mud Creek	1000	47200	50 YR	31496.00	235.27	253.35		253.35	0.000005	0.57	86980.20	6934.05	0.03
Mud Creek	1000	47200	100 YR	36754.00	235.27	254.25		254.26	0.000005	0.62	93293.48	6983.94	0.03
Mud Creek	1000	46450	2 YR	9929.00	235.02	247.18		247.18	0.000004	0.34	53023.03	8228.54	0.02
Mud Creek	1000	46450	5 YR	16451.00	235.02	249.63		249.64	0.000004	0.41	74361.15	9161.11	0.02
Mud Creek	1000	46450	10 YR	21327.00	235.02	251.10		251.10	0.000005	0.45	87963.91	9365.76	0.02
Mud Creek	1000	46450	25 YR	26528.00	235.02	252.37		252.37	0.000005	0.49	99951.66	9442.25	0.02
Mud Creek	1000	46450	50 YR	31496.00	235.02	253.34		253.35	0.000005	0.53	109160.50	9500.58	0.02
Mud Creek	1000	46450	100 YR	36754.00	235.02	254.25		254.25	0.000006	0.57	117802.50	9555.00	0.02
Mud Creek	1000	44950	2 YR	9929.00	234.51	247.18		247.18	0.000003	0.26	77929.20	12546.61	0.01
Mud Creek	1000	44950	5 YR	16451.00	234.51	249.63		249.63	0.000003	0.30	110375.90	13896.36	0.01
Mud Creek	1000	44950	10 YR	21327.00	234.51	251.09		251.09	0.000003	0.32	131029.60	14252.78	0.02
Mud Creek	1000	44950	25 YR	26528.00	234.51	252.37		252.37	0.000003	0.35	149310.70	14431.24	0.02
Mud Creek	1000	44950	50 YR	31496.00	234.51	253.34		253.34	0.000003	0.37	163404.20	14567.32	0.02
Mud Creek	1000	44950	100 YR	36754.00	234.51	254.24		254.25	0.000003	0.40	176670.50	14694.26	0.02
Angelina River	Upstream	71106	2 YR	12944.00	246.00	252.10		252.14	0.000305	1.66	7856.20	1982.78	0.14
Angelina River	Upstream	71106	5 YR	21707.00	246.00	253.55		253.62	0.000310	2.05	10780.68	2044.22	0.15
Angelina River	Upstream	71106	10 YR	28205.00	246.00	254.51		254.59	0.000306	2.27	12759.42	2084.76	0.16
Angelina River	Upstream	71106	25 YR	35110.00	246.00	255.47		255.56	0.000298	2.45	14782.79	2125.42	0.16
Angelina River	Upstream	71106	50 YR	41349.00	246.00	256.28		256.38	0.000291	2.59	16519.93	2159.71	0.16
Angelina River	Upstream	71106	100 YR	47334.00	246.00	257.04		257.15	0.000284	2.71	18167.33	2191.74	0.16
Angelina River	Upstream	69124	2 YR	12944.00	245.00	251.33		251.41	0.000464	2.24	6605.95	2295.83	0.20
Angelina River	Upstream	69124	5 YR	21707.00	245.00	252.85		252.94	0.000391	2.57	10148.03	2387.50	0.20
Angelina River	Upstream	69124	10 YR	28205.00	245.00	253.85		253.95	0.000356	2.74	12562.81	2448.02	0.19
Angelina River	Upstream	69124	25 YR	35110.00	245.00	254.85		254.96	0.000325	2.89	15047.87	2508.79	0.19

HEC-RAS Plan: Prop 300 NP (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Upstream	69124	50 YR	41349.00	245.00	255.69		255.81	0.000306	3.02	17173.85	2559.63	0.19
Angelina River	Upstream	69124	100 YR	47334.00	245.00	256.47		256.60	0.000289	3.12	19200.28	2607.16	0.18
Angelina River	Upstream	67228	2 YR	12944.00	244.00	250.64		250.69	0.000313	1.78	7289.17	2022.02	0.16
Angelina River	Upstream	67228	5 YR	21707.00	244.00	252.28		252.34	0.000254	2.05	10646.85	2071.08	0.16
Angelina River	Upstream	67228	10 YR	28205.00	244.00	253.33		253.40	0.000234	2.22	12836.21	2102.45	0.16
Angelina River	Upstream	67228	25 YR	35110.00	244.00	254.37		254.46	0.000217	2.37	15049.32	2133.69	0.15
Angelina River	Upstream	67228	50 YR	41349.00	244.00	255.23		255.33	0.000207	2.49	16904.02	2159.52	0.15
Angelina River	Upstream	67228	100 YR	47334.00	244.00	256.04		256.15	0.000198	2.59	18656.67	2183.65	0.15
Angelina River	Upstream	65531	2 YR	12944.00	242.00	250.20		250.23	0.000226	1.27	10228.02	2470.27	0.11
Angelina River	Upstream	65531	5 YR	21707.00	242.00	251.91		251.95	0.000202	1.50	14725.54	2791.00	0.11
Angelina River	Upstream	65531	10 YR	28205.00	242.00	252.99		253.03	0.000193	1.64	17839.24	2992.99	0.11
Angelina River	Upstream	65531	25 YR	35110.00	242.00	254.06		254.11	0.000183	1.75	21151.29	3193.84	0.11
Angelina River	Upstream	65531	50 YR	41349.00	242.00	254.94		254.99	0.000176	1.85	24035.81	3359.01	0.11
Angelina River	Upstream	65531	100 YR	47334.00	242.00	255.76		255.82	0.000169	1.92	26864.92	3513.46	0.11
Angelina River	Upstream	58835	2 YR	12944.00	241.00	247.66		247.71	0.000739	1.96	6612.03	1986.99	0.19
Angelina River	Upstream	58835	5 YR	21707.00	241.00	250.05		250.10	0.000402	1.78	12218.10	2688.18	0.15
Angelina River	Upstream	58835	10 YR	28205.00	241.00	251.46		251.51	0.000275	1.76	16033.00	2723.43	0.13
Angelina River	Upstream	58835	25 YR	35110.00	241.00	252.71		252.76	0.000226	1.81	19464.46	2754.74	0.12
Angelina River	Upstream	58835	50 YR	41349.00	241.00	253.68		253.73	0.000205	1.88	22141.37	2778.93	0.12
Angelina River	Upstream	58835	100 YR	47334.00	241.00	254.58		254.63	0.000190	1.94	24651.02	2801.42	0.11
Angelina River	Upstream	53947	2 YR	12944.00	236.00	247.23		247.24	0.000051	1.16	25250.10	4341.41	0.07
Angelina River	Upstream	53947	5 YR	21707.00	236.00	249.69		249.69	0.000050	1.34	36632.19	4939.41	0.07
Angelina River	Upstream	53947	10 YR	28205.00	236.00	251.15		251.15	0.000047	1.42	43960.07	5037.33	0.07
Angelina River	Upstream	53947	25 YR	35110.00	236.00	252.42		252.43	0.000047	1.50	50402.00	5061.06	0.07
Angelina River	Upstream	53947	50 YR	41349.00	236.00	253.40		253.41	0.000048	1.59	55340.44	5079.18	0.07
Angelina River	Upstream	53947	100 YR	47334.00	236.00	254.30		254.32	0.000048	1.66	59957.77	5096.06	0.07
Angelina River	Upstream	50340	2 YR	12944.00	235.00	247.18		247.18	0.000011	0.48	50488.44	7651.96	0.03
Angelina River	Upstream	50340	5 YR	21707.00	235.00	249.63		249.64	0.000011	0.57	69809.16	8099.18	0.03
Angelina River	Upstream	50340	10 YR	28205.00	235.00	251.09		251.10	0.000012	0.62	81783.58	8264.96	0.03
Angelina River	Upstream	50340	25 YR	35110.00	235.00	252.37		252.37	0.000012	0.68	92390.87	8380.18	0.03
Angelina River	Upstream	50340	50 YR	41349.00	235.00	253.34		253.34	0.000013	0.73	100577.60	8468.03	0.03
Angelina River	Upstream	50340	100 YR	47334.00	235.00	254.25		254.25	0.000013	0.77	108299.60	8549.96	0.03
Angelina River	Downstream	43601	2 YR	16285.00	234.06	247.11		247.15	0.000174	2.61	17414.36	4442.44	0.14
Angelina River	Downstream	43601	5 YR	28674.00	234.06	249.56		249.61	0.000150	2.80	30112.75	5892.32	0.14
Angelina River	Downstream	43601	10 YR	38331.00	234.06	251.03		251.07	0.000131	2.82	39100.02	6201.47	0.13
Angelina River	Downstream	43601	25 YR	49236.00	234.06	252.30		252.34	0.000124	2.91	47040.71	6265.17	0.13
Angelina River	Downstream	43601	50 YR	58970.00	234.06	253.27		253.31	0.000124	3.02	53136.63	6313.63	0.13
Angelina River	Downstream	43601	100 YR	68793.00	234.06	254.18		254.22	0.000123	3.13	58862.98	6358.82	0.13
Angelina River	Downstream	43600	2 YR	16285.00	234.06	247.11	242.39	247.15	0.000174	2.61	17413.55	4442.33	0.14
Angelina River	Downstream	43600	5 YR	28674.00	234.06	249.56	243.73	249.61	0.000150	2.80	30111.85	5892.23	0.14
Angelina River	Downstream	43600	10 YR	38331.00	234.06	251.03	244.43	251.07	0.000131	2.82	39099.16	6201.47	0.13
Angelina River	Downstream	43600	25 YR	49236.00	234.06	252.30	245.01	252.34	0.000124	2.91	47039.94	6265.16	0.13
Angelina River	Downstream	43600	50 YR	58970.00	234.06	253.27	245.54	253.31	0.000124	3.02	53135.86	6313.62	0.13
Angelina River	Downstream	43600	100 YR	68793.00	234.06	254.18	245.95	254.22	0.000123	3.13	58862.20	6358.81	0.13
Angelina River	Downstream	43250		Bridge									
Angelina River	Downstream	42900	2 YR	16285.00	233.82	246.95		246.97	0.000124	1.92	19285.36	3572.16	0.11
Angelina River	Downstream	42900	5 YR	28674.00	233.82	249.43		249.46	0.000129	2.28	28936.44	4205.05	0.11
Angelina River	Downstream	42900	10 YR	38331.00	233.82	250.90		250.93	0.000135	2.50	35379.28	4526.25	0.12
Angelina River	Downstream	42900	25 YR	49236.00	233.82	252.17		252.21	0.000146	2.76	41286.42	4773.96	0.12
Angelina River	Downstream	42900	50 YR	58970.00	233.82	253.14		253.18	0.000157	2.98	45979.37	4961.95	0.13
Angelina River	Downstream	42900	100 YR	68793.00	233.82	254.04		254.08	0.000165	3.16	50521.25	5137.34	0.13
Angelina River	Downstream	40400	2 YR	16285.00	232.98	246.65		246.67	0.000178	2.32	19119.92	4142.85	0.13
Angelina River	Downstream	40400	5 YR	28674.00	232.98	249.15		249.17	0.000163	2.56	30724.80	5153.94	0.13
Angelina River	Downstream	40400	10 YR	38331.00	232.98	250.62		250.64	0.000162	2.76	38852.88	5815.40	0.13
Angelina River	Downstream	40400	25 YR	49236.00	232.98	251.88		251.91	0.000156	2.86	46251.30	5847.11	0.13
Angelina River	Downstream	40400	50 YR	58970.00	232.98	252.84		252.87	0.000156	2.98	51856.55	5871.03	0.13
Angelina River	Downstream	40400	100 YR	68793.00	232.98	253.73		253.77	0.000156	3.09	57112.80	5893.37	0.13
Angelina River	Downstream	39350	2 YR	16285.00	232.63	246.60		246.60	0.000039	0.95	36746.86	6625.44	0.05
Angelina River	Downstream	39350	5 YR	28674.00	232.63	249.09		249.10	0.000039	1.10	54382.87	7487.68	0.05
Angelina River	Downstream	39350	10 YR	38331.00	232.63	250.56		250.57	0.000040	1.20	65715.72	7828.24	0.06
Angelina River	Downstream	39350	25 YR	49236.00	232.63	251.83		251.84	0.000042	1.30	75677.83	7891.61	0.06
Angelina River	Downstream	39350	50 YR	58970.00	232.63	252.79		252.80	0.000045	1.40	83235.44	7939.35	0.06
Angelina River	Downstream	39350	100 YR	68793.00	232.63	253.68		253.69	0.000047	1.49	90338.30	7983.96	0.06
Angelina River	Downstream	36950	2 YR	16285.00	231.82	246.37		246.46	0.000242	3.15	12141.01	2588.98	0.17
Angelina River	Downstream	36950	5 YR	28674.00	231.82	248.86		248.96	0.000250	3.69	19413.36	3249.18	0.18
Angelina River	Downstream	36950	10 YR	38331.00	231.82	250.32		250.43	0.000260	4.05	24601.12	4109.71	0.19
Angelina River	Downstream	36950	25 YR	49236.00	231.82	251.59		251.70	0.000256	4.25	29822.70	4147.65	0.19
Angelina River	Downstream	36950	50 YR	58970.00	231.82	252.53		252.65	0.000261	4.46	33758.20	4176.02	0.19
Angelina River	Downstream	36950	100 YR	68793.00	231.82	253.42		253.54	0.000264	4.64	37459.93	4202.53	0.20
Angelina River	Downstream	33750	2 YR	16285.00	230.74	245.06		245.32	0.000747	4.49	5963.56	1465.32	0.23
Angelina River	Downstream	33750	5 YR	28674.00	230.74	247.49		247.80	0.000826	5.37	10230.83	2048.28	0.25
Angelina River	Downstream	33750	10 YR	38331.00	230.74	248.93		249.25	0.000846	5.80	13413.75	2392.33	0.26
Angelina River	Downstream	33750	25 YR	49236.00	230.74	250.19		250.53	0.000873	6.21	16623.38	2656.63	0.27

## HEC-RAS Plan: Prop 300 NP (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Downstream	33750	50 YR	58970.00	230.74	251.14		251.48	0.000869	6.43	19167.61	2689.94	0.27
Angelina River	Downstream	33750	100 YR	68793.00	230.74	252.03		252.38	0.000864	6.62	21569.21	2721.01	0.27
Angelina River	Downstream	32550	2 YR	16285.00	230.34	244.43		244.59	0.000718	4.37	7874.11	1969.39	0.25
Angelina River	Downstream	32550	5 YR	28674.00	230.34	247.01		247.16	0.000579	4.63	13564.17	2446.19	0.24
Angelina River	Downstream	32550	10 YR	38331.00	230.34	248.48		248.64	0.000552	4.89	17379.54	2719.47	0.24
Angelina River	Downstream	32550	25 YR	49236.00	230.34	249.75		249.93	0.000564	5.25	20986.07	2954.65	0.24
Angelina River	Downstream	32550	50 YR	58970.00	230.34	250.71		250.90	0.000577	5.54	23857.70	3035.49	0.25
Angelina River	Downstream	32550	100 YR	68793.00	230.34	251.60		251.80	0.000584	5.78	26589.70	3080.16	0.25
Angelina River	Downstream	30950	2 YR	16285.00	229.81	241.60		242.69	0.002171	8.45	2218.26	615.43	0.50
Angelina River	Downstream	30950	5 YR	28674.00	229.81	243.22		245.22	0.003409	11.82	3553.05	1028.02	0.64
Angelina River	Downstream	30950	10 YR	38331.00	229.81	244.52		246.78	0.003550	13.03	5103.10	1358.03	0.66
Angelina River	Downstream	30950	25 YR	49236.00	229.81	246.10		248.19	0.003094	13.21	7562.37	1758.85	0.63
Angelina River	Downstream	30950	50 YR	58970.00	229.81	247.46		249.28	0.002620	12.96	10191.59	2104.57	0.59
Angelina River	Downstream	30950	100 YR	68793.00	229.81	248.73		250.32	0.002231	12.63	13078.05	2428.07	0.55
Angelina River	Downstream	29800	2 YR	16285.00	229.43	241.59		241.70	0.000282	2.67	7519.40	1962.18	0.17
Angelina River	Downstream	29800	5 YR	28674.00	229.43	243.68		243.84	0.000318	3.36	11846.80	2175.53	0.19
Angelina River	Downstream	29800	10 YR	38331.00	229.43	245.15		245.33	0.000316	3.68	15157.95	2325.60	0.20
Angelina River	Downstream	29800	25 YR	49236.00	229.43	246.65		246.85	0.000308	3.97	18763.02	2478.68	0.20
Angelina River	Downstream	29800	50 YR	58970.00	229.43	247.87		248.09	0.000302	4.19	21863.72	2603.15	0.20
Angelina River	Downstream	29800	100 YR	68793.00	229.43	249.02		249.25	0.000296	4.38	24908.83	2719.85	0.20
Angelina River	Downstream	29000	2 YR	16285.00	229.18	240.18	235.91	241.09	0.002904	7.70	2713.23	3755.31	0.44
Angelina River	Downstream	29000	5 YR	28674.00	229.18	243.23		243.41	0.000795	4.85	15086.14	4359.13	0.24
Angelina River	Downstream	29000	10 YR	38331.00	229.18	244.83		244.95	0.000531	4.29	22332.05	4676.69	0.20
Angelina River	Downstream	29000	25 YR	49236.00	229.18	246.41		246.50	0.000400	4.00	29957.63	4989.10	0.18
Angelina River	Downstream	29000	50 YR	58970.00	229.18	247.68		247.75	0.000336	3.86	36430.30	5239.68	0.17
Angelina River	Downstream	29000	100 YR	68793.00	229.18	248.85		248.93	0.000294	3.78	42742.75	5473.03	0.16
Angelina River	Downstream	22700	2 YR	16285.00	227.14	239.52		239.54	0.000095	1.78	17474.59	2480.57	0.09
Angelina River	Downstream	22700	5 YR	28674.00	227.14	242.54		242.57	0.000101	2.16	25296.27	2664.22	0.10
Angelina River	Downstream	22700	10 YR	38331.00	227.14	244.18		244.22	0.000112	2.45	29719.79	2737.91	0.11
Angelina River	Downstream	22700	25 YR	49236.00	227.14	245.79		245.84	0.000122	2.73	34184.31	2810.33	0.12
Angelina River	Downstream	22700	50 YR	58970.00	227.14	247.07		247.13	0.000130	2.96	37834.46	2868.19	0.12
Angelina River	Downstream	22700	100 YR	68793.00	227.14	248.27		248.33	0.000136	3.16	41292.00	2921.93	0.13
Angelina River	Downstream	18600	2 YR	16285.00	225.81	239.11		239.15	0.000161	2.36	14084.15	2086.53	0.12
Angelina River	Downstream	18600	5 YR	28674.00	225.81	242.06		242.11	0.000202	3.09	24976.13	4403.23	0.14
Angelina River	Downstream	18600	10 YR	38331.00	225.81	243.73		243.78	0.000170	3.05	32393.35	4486.67	0.14
Angelina River	Downstream	18600	25 YR	49236.00	225.81	245.36		245.40	0.000153	3.09	39750.76	4567.92	0.13
Angelina River	Downstream	18600	50 YR	58970.00	225.81	246.65		246.69	0.000144	3.14	45697.39	4632.56	0.13
Angelina River	Downstream	18600	100 YR	68793.00	225.81	247.85		247.90	0.000138	3.21	51289.01	4692.52	0.13
Angelina River	Downstream	14400	2 YR	16285.00	224.45	239.03		239.03	0.000028	0.89	32722.41	3776.50	0.05
Angelina River	Downstream	14400	5 YR	28674.00	224.45	241.96		241.97	0.000037	1.17	44268.84	4201.97	0.05
Angelina River	Downstream	14400	10 YR	38331.00	224.45	243.62		243.63	0.000044	1.38	51512.32	4521.64	0.06
Angelina River	Downstream	14400	25 YR	49236.00	224.45	245.24		245.25	0.000050	1.57	59089.37	4833.47	0.07
Angelina River	Downstream	14400	50 YR	58970.00	224.45	246.53		246.54	0.000055	1.71	65482.35	5081.71	0.07
Angelina River	Downstream	14400	100 YR	68793.00	224.45	247.73		247.74	0.000058	1.84	71703.66	5312.15	0.07
Angelina River	Downstream	5700	2 YR	16285.00	221.64	238.82		238.83	0.000095	1.73	18800.05	2569.84	0.08
Angelina River	Downstream	5700	5 YR	28674.00	221.64	241.70		241.72	0.000107	2.10	26829.67	2950.86	0.09
Angelina River	Downstream	5700	10 YR	38331.00	221.64	243.32		243.35	0.000119	2.35	31717.08	3070.98	0.10
Angelina River	Downstream	5700	25 YR	49236.00	221.64	244.91		244.95	0.000129	2.60	36683.00	3188.39	0.10
Angelina River	Downstream	5700	50 YR	58970.00	221.64	246.18		246.22	0.000137	2.79	40777.23	3282.04	0.11
Angelina River	Downstream	5700	100 YR	68793.00	221.64	247.35		247.40	0.000143	2.96	44692.58	3369.16	0.11
Angelina River	Downstream	1000	2 YR	16285.00	220.12	238.07	231.37	238.22	0.000350	3.83	8868.81	1753.32	0.19
Angelina River	Downstream	1000	5 YR	28674.00	220.12	240.92	234.12	241.08	0.000351	4.38	14725.33	2319.89	0.19
Angelina River	Downstream	1000	10 YR	38331.00	220.12	242.52	235.40	242.68	0.000350	4.66	18518.92	2440.38	0.20
Angelina River	Downstream	1000	25 YR	49236.00	220.12	244.08	236.50	244.25	0.000350	4.94	22415.60	2558.25	0.20
Angelina River	Downstream	1000	50 YR	58970.00	220.12	245.32	237.26	245.50	0.000351	5.15	25658.15	2652.34	0.20
Angelina River	Downstream	1000	100 YR	68793.00	220.12	246.48	238.04	246.67	0.000350	5.35	28787.33	2740.08	0.20

HEC-RAS Output  
300' Wide Spillway  
Proposed Mature Median



HEC-RAS Plan: Prop 300 MM

River	Reach	River Sta	Profile	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
Mud Creek	1000	132650	2 YR	417.00	315.00	315.56		315.66	0.014874	2.47	169.05	299.99	0.58
Mud Creek	1000	132650	5 YR	3177.00	315.00	317.62		317.87	0.005249	4.04	785.59	299.99	0.44
Mud Creek	1000	132650	10 YR	5966.00	315.00	319.02		319.40	0.004491	4.95	1205.84	299.99	0.43
Mud Creek	1000	132650	25 YR	9346.00	315.00	320.41		320.93	0.004139	5.76	1623.63	300.00	0.44
Mud Creek	1000	132650	50 YR	12985.00	315.00	321.75		322.38	0.003879	6.42	2023.60	300.00	0.44
Mud Creek	1000	132650	100 YR	16636.00	315.00	322.96		323.72	0.003697	6.96	2389.29	300.00	0.43
Mud Creek	1000	132350.*	2 YR	417.00	309.12	309.61	309.54	309.76	0.026570	3.10	134.65	279.62	0.79
Mud Creek	1000	132350.*	5 YR	3177.00	309.12	310.89	310.71	311.48	0.020859	6.17	514.94	315.83	0.85
Mud Creek	1000	132350.*	10 YR	5966.00	309.12	311.72	311.50	312.61	0.019870	7.60	785.41	339.24	0.88
Mud Creek	1000	132350.*	25 YR	9346.00	309.12	312.48	312.29	313.70	0.019987	8.88	1052.66	360.88	0.92
Mud Creek	1000	132350.*	50 YR	12985.00	309.12	313.16	313.01	314.70	0.020351	9.97	1302.64	380.01	0.95
Mud Creek	1000	132350.*	100 YR	16636.00	309.12	313.74	313.67	315.58	0.020693	10.87	1530.65	396.66	0.98
Mud Creek	1000	132050.*	2 YR	417.00	303.23	303.85		303.96	0.014633	2.69	155.13	271.32	0.63
Mud Creek	1000	132050.*	5 YR	3177.00	303.23	305.10		305.63	0.018181	5.81	546.68	352.78	0.82
Mud Creek	1000	132050.*	10 YR	5966.00	303.23	305.82	305.66	306.65	0.019787	7.29	818.05	399.61	0.90
Mud Creek	1000	132050.*	25 YR	9346.00	303.23	306.51	306.39	307.62	0.020381	8.44	1107.56	444.16	0.94
Mud Creek	1000	132050.*	50 YR	12985.00	303.23	307.11	307.05	308.47	0.020823	9.36	1386.82	483.26	0.97
Mud Creek	1000	132050.*	100 YR	16636.00	303.23	307.62	307.62	309.22	0.021252	10.13	1642.80	516.51	1.00
Mud Creek	1000	131750.*	2 YR	417.00	297.35	297.89	297.84	298.07	0.027648	3.41	122.36	258.17	0.87
Mud Creek	1000	131750.*	5 YR	3177.00	297.35	299.13	299.04	299.69	0.021595	5.98	531.35	399.86	0.91
Mud Creek	1000	131750.*	10 YR	5966.00	297.35	299.86	299.75	300.62	0.020315	7.00	851.73	482.63	0.93
Mud Creek	1000	131750.*	25 YR	9346.00	297.35	300.49	300.40	301.46	0.020380	7.94	1177.55	554.26	0.96
Mud Creek	1000	131750.*	50 YR	12985.00	297.35	301.02	300.98	302.20	0.020668	8.72	1488.98	614.98	0.99
Mud Creek	1000	131750.*	100 YR	16636.00	297.35	301.47	301.47	302.83	0.020830	9.34	1780.71	666.86	1.01
Mud Creek	1000	131450.*	2 YR	417.00	291.47	292.15		292.27	0.014195	2.71	153.96	287.79	0.65
Mud Creek	1000	131450.*	5 YR	3177.00	291.47	293.30	293.13	293.73	0.018155	5.28	601.94	496.97	0.85
Mud Creek	1000	131450.*	10 YR	5966.00	291.47	293.88	293.77	294.53	0.020073	6.48	921.29	603.33	0.92
Mud Creek	1000	131450.*	25 YR	9346.00	291.47	294.41	294.35	295.25	0.020774	7.37	1267.30	700.56	0.97
Mud Creek	1000	131450.*	50 YR	12985.00	291.47	294.86	294.85	295.88	0.021172	8.09	1605.90	784.13	1.00
Mud Creek	1000	131450.*	100 YR	16636.00	291.47	295.27	295.27	296.41	0.020902	8.58	1939.78	858.61	1.01
Mud Creek	1000	131150.*	2 YR	417.00	285.59	286.17	286.15	286.35	0.029187	3.43	121.54	294.10	0.94
Mud Creek	1000	131150.*	5 YR	3177.00	285.59	287.21	287.17	287.67	0.022670	5.40	588.45	596.40	0.96
Mud Creek	1000	131150.*	10 YR	5966.00	285.59	287.78	287.73	288.36	0.020923	6.16	968.47	758.15	0.96
Mud Creek	1000	131150.*	25 YR	9346.00	285.59	288.25	288.22	288.98	0.020806	6.89	1356.31	893.54	0.99
Mud Creek	1000	131150.*	50 YR	12985.00	285.59	288.64	288.64	289.51	0.020956	7.51	1729.13	1006.66	1.01
Mud Creek	1000	131150.*	100 YR	16636.00	285.59	288.99	288.99	289.96	0.020288	7.90	2106.22	1109.40	1.01
Mud Creek	1000	130850.*	2 YR	417.00	279.71	280.38	280.26	280.48	0.013965	2.49	167.43	406.27	0.68
Mud Creek	1000	130850.*	5 YR	3177.00	279.71	281.24	281.15	281.57	0.018118	4.61	689.32	807.57	0.88
Mud Creek	1000	130850.*	10 YR	5966.00	279.71	281.65	281.61	282.14	0.020383	5.65	1056.78	997.57	0.97
Mud Creek	1000	130850.*	25 YR	9346.00	279.71	282.02	282.02	282.65	0.021200	6.41	1467.25	1170.01	1.01
Mud Creek	1000	130850.*	50 YR	12985.00	279.71	282.38	282.38	283.09	0.019767	6.79	1913.74	1339.77	1.00
Mud Creek	1000	130850.*	100 YR	16636.00	279.71	282.68	282.68	283.47	0.019122	7.13	2332.91	1478.59	1.00
Mud Creek	1000	130550.*	2 YR	417.00	273.82	274.33	274.33	274.47	0.031100	3.06	136.45	480.90	1.01
Mud Creek	1000	130550.*	5 YR	3177.00	273.82	275.04	275.04	275.37	0.023786	4.61	689.83	1074.65	1.01
Mud Creek	1000	130550.*	10 YR	5966.00	273.82	275.41	275.41	275.83	0.021573	5.20	1147.52	1385.20	1.01
Mud Creek	1000	130550.*	25 YR	9346.00	273.82	275.73	275.73	276.24	0.020422	5.70	1639.99	1655.51	1.01
Mud Creek	1000	130550.*	50 YR	12985.00	273.82	276.01	276.01	276.59	0.019732	6.11	2125.82	1884.56	1.01
Mud Creek	1000	130550.*	100 YR	16636.00	273.82	276.24	276.24	276.88	0.019119	6.42	2590.30	2080.10	1.01
Mud Creek	1000	130250	2 YR	417.00	267.94	269.34		269.34	0.000029	0.18	2315.77	3293.75	0.04
Mud Creek	1000	130250	5 YR	3177.00	267.94	270.61		270.61	0.000045	0.36	8813.48	6247.88	0.05
Mud Creek	1000	130250	10 YR	5966.00	267.94	271.44		271.44	0.000035	0.43	14016.67	6379.74	0.05
Mud Creek	1000	130250	25 YR	9346.00	267.94	272.23		272.24	0.000031	0.50	19158.87	6507.42	0.05
Mud Creek	1000	130250	50 YR	12985.00	267.94	272.94		272.95	0.000030	0.56	23803.45	6620.64	0.05
Mud Creek	1000	130250	100 YR	16636.00	267.94	273.59		273.60	0.000028	0.61	28134.67	6724.49	0.05
Mud Creek	1000	129850	2 YR	417.00	267.48	269.33		269.33	0.000022	0.15	2872.18	3112.55	0.03
Mud Creek	1000	129850	5 YR	3177.00	267.48	270.59		270.59	0.000063	0.39	9063.23	6311.99	0.05
Mud Creek	1000	129850	10 YR	5966.00	267.48	271.42		271.42	0.000058	0.47	14322.45	6398.88	0.05
Mud Creek	1000	129850	25 YR	9346.00	267.48	272.22		272.22	0.000055	0.55	19471.31	6482.82	0.05
Mud Creek	1000	129850	50 YR	12985.00	267.48	272.93		272.93	0.000055	0.62	24086.92	6557.15	0.05
Mud Creek	1000	129850	100 YR	16636.00	267.48	273.57		273.58	0.000054	0.68	28367.97	6625.35	0.05
Mud Creek	1000	128750	2 YR	417.00	267.10	269.31		269.31	0.000007	0.10	4097.08	3701.90	0.02
Mud Creek	1000	128750	5 YR	3177.00	267.10	270.54		270.55	0.000031	0.33	9686.56	4917.93	0.04
Mud Creek	1000	128750	10 YR	5966.00	267.10	271.37		271.37	0.000034	0.44	13792.58	5021.21	0.05
Mud Creek	1000	128750	25 YR	9346.00	267.10	272.17		272.17	0.000037	0.53	17841.04	5121.00	0.05
Mud Creek	1000	128750	50 YR	12985.00	267.10	272.87		272.88	0.000039	0.62	21487.43	5209.25	0.05
Mud Creek	1000	128750	100 YR	16636.00	267.10	273.52		273.53	0.000040	0.68	24893.52	5290.35	0.05
Mud Creek	1000	127950	2 YR	417.00	266.82	269.31		269.31	0.000006	0.11	3894.35	3130.04	0.02
Mud Creek	1000	127950	5 YR	3177.00	266.82	270.52		270.52	0.000038	0.38	8531.89	4228.35	0.05
Mud Creek	1000	127950	10 YR	5966.00	266.82	271.34		271.34	0.000044	0.51	12026.52	4273.56	0.05
Mud Creek	1000	127950	25 YR	9346.00	266.82	272.13		272.14	0.000048	0.62	15442.89	4317.31	0.06
Mud Creek	1000	127950	50 YR	12985.00	266.82	272.84		272.84	0.000052	0.72	18491.56	4355.97	0.06
Mud Creek	1000	127950	100 YR	16636.00	266.82	273.48		273.49	0.000054	0.80	21321.94	4391.56	0.06
Mud Creek	1000	126600	2 YR	2268.00	266.35	269.27		269.28	0.000035	0.32	7031.24	4807.96	0.05
Mud Creek	1000	126600	5 YR	3760.00	266.35	270.49		270.49	0.000013	0.27	13908.20	6100.24	0.03

HEC-RAS Plan: Prop 300 MM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	126600	10 YR	6058.00	266.35	271.31		271.31	0.000012	0.32	18988.93	6268.65	0.03
Mud Creek	1000	126600	25 YR	9514.00	266.35	272.10		272.11	0.000014	0.40	24019.51	6431.06	0.04
Mud Creek	1000	126600	50 YR	13254.00	266.35	272.80		272.81	0.000016	0.47	28574.57	6574.66	0.04
Mud Creek	1000	126600	100 YR	17009.00	266.35	273.45		273.45	0.000017	0.53	32864.75	6707.09	0.04
Mud Creek	1000	124600	2 YR	2268.00	265.65	269.20		269.20	0.000045	0.37	6212.40	3504.56	0.05
Mud Creek	1000	124600	5 YR	3760.00	265.65	270.45		270.46	0.000022	0.33	11314.87	4334.09	0.04
Mud Creek	1000	124600	10 YR	6058.00	265.65	271.28		271.28	0.000023	0.41	14901.18	4395.71	0.04
Mud Creek	1000	124600	25 YR	9514.00	265.65	272.06		272.07	0.000029	0.52	18375.08	4454.59	0.04
Mud Creek	1000	124600	50 YR	13254.00	265.65	272.76		272.76	0.000034	0.62	21485.18	4506.65	0.05
Mud Creek	1000	124600	100 YR	17009.00	265.65	273.40		273.40	0.000037	0.71	24393.20	4554.79	0.05
Mud Creek	1000	123150	2 YR	2268.00	265.14	269.14		269.14	0.000030	0.28	8078.67	4036.13	0.03
Mud Creek	1000	123150	5 YR	3760.00	265.14	270.43		270.43	0.000017	0.27	14010.52	4953.37	0.03
Mud Creek	1000	123150	10 YR	6058.00	265.14	271.25		271.25	0.000019	0.34	18111.41	5055.80	0.03
Mud Creek	1000	123150	25 YR	9514.00	265.14	272.02		272.03	0.000025	0.43	22078.02	5152.94	0.04
Mud Creek	1000	123150	50 YR	13254.00	265.14	272.71		272.72	0.000030	0.52	25649.56	5238.86	0.04
Mud Creek	1000	123150	100 YR	17009.00	265.14	273.35		273.35	0.000033	0.60	29014.64	5318.55	0.04
Mud Creek	1000	121050	2 YR	5303.00	264.41	269.03		269.03	0.000074	0.50	10676.73	4625.11	0.06
Mud Creek	1000	121050	5 YR	8784.00	264.41	270.35		270.36	0.000049	0.50	17856.70	6279.50	0.05
Mud Creek	1000	121050	10 YR	11369.00	264.41	271.18		271.19	0.000037	0.51	23148.07	6466.32	0.04
Mud Creek	1000	121050	25 YR	14059.00	264.41	271.96		271.97	0.000031	0.52	28256.18	6641.68	0.04
Mud Creek	1000	121050	50 YR	16607.00	264.41	272.65		272.66	0.000027	0.53	32882.56	6796.60	0.04
Mud Creek	1000	121050	100 YR	19222.00	264.41	273.29		273.29	0.000025	0.55	37265.86	6940.19	0.04
Mud Creek	1000	119350	2 YR	5303.00	263.81	268.73		268.75	0.000581	1.26	4223.43	1716.84	0.14
Mud Creek	1000	119350	5 YR	8784.00	263.81	270.15		270.17	0.000402	1.25	7002.67	2163.67	0.12
Mud Creek	1000	119350	10 YR	11369.00	263.81	271.02		271.05	0.000303	1.28	8903.52	2185.52	0.11
Mud Creek	1000	119350	25 YR	14059.00	263.81	271.82		271.85	0.000256	1.32	10661.46	2205.54	0.11
Mud Creek	1000	119350	50 YR	16607.00	263.81	272.52		272.55	0.000229	1.37	12212.37	2223.05	0.10
Mud Creek	1000	119350	100 YR	19222.00	263.81	273.17		273.20	0.000213	1.42	13649.71	2239.16	0.10
Mud Creek	1000	117350	2 YR	5303.00	263.11	268.28		268.29	0.000122	0.88	6014.97	2326.50	0.10
Mud Creek	1000	117350	5 YR	8784.00	263.11	269.85		269.86	0.000081	0.86	10208.41	3030.85	0.08
Mud Creek	1000	117350	10 YR	11369.00	263.11	270.80		270.81	0.000060	0.86	13190.08	3176.01	0.07
Mud Creek	1000	117350	25 YR	14059.00	263.11	271.64		271.65	0.000050	0.89	15886.46	3255.66	0.07
Mud Creek	1000	117350	50 YR	16607.00	263.11	272.36		272.37	0.000045	0.92	18260.64	3324.22	0.07
Mud Creek	1000	117350	100 YR	19222.00	263.11	273.02		273.03	0.000042	0.96	20463.64	3386.59	0.07
Mud Creek	1000	114900	2 YR	5303.00	262.26	268.02		268.03	0.000095	0.84	6319.35	2194.79	0.09
Mud Creek	1000	114900	5 YR	8784.00	262.26	269.66		269.68	0.000068	0.84	10447.23	2822.00	0.08
Mud Creek	1000	114900	10 YR	11369.00	262.26	270.66		270.67	0.000054	0.85	13379.21	2986.37	0.07
Mud Creek	1000	114900	25 YR	14059.00	262.26	271.52		271.53	0.000046	0.88	15966.95	3033.65	0.07
Mud Creek	1000	114900	50 YR	16607.00	262.26	272.25		272.27	0.000042	0.92	18205.40	3073.97	0.07
Mud Creek	1000	114900	100 YR	19222.00	262.26	272.92		272.93	0.000040	0.96	20254.18	3110.41	0.06
Mud Creek	1000	113800	2 YR	5303.00	261.87	267.91		267.92	0.000105	0.91	5826.11	1930.39	0.09
Mud Creek	1000	113800	5 YR	8784.00	261.87	269.58		269.59	0.000078	0.92	9508.12	2466.06	0.08
Mud Creek	1000	113800	10 YR	11369.00	261.87	270.59		270.61	0.000063	0.94	12134.43	2662.47	0.08
Mud Creek	1000	113800	25 YR	14059.00	261.87	271.46		271.48	0.000054	0.98	14485.97	2753.65	0.07
Mud Creek	1000	113800	50 YR	16607.00	261.87	272.20		272.22	0.000050	1.02	16545.13	2831.08	0.07
Mud Creek	1000	113800	100 YR	19222.00	261.87	272.87		272.88	0.000047	1.06	18450.06	2900.87	0.07
Mud Creek	1000	112200	2 YR	5303.00	261.31	267.67		267.69	0.000201	1.14	4656.58	1464.04	0.11
Mud Creek	1000	112200	5 YR	8784.00	261.31	269.40		269.42	0.000153	1.17	7535.74	1862.44	0.10
Mud Creek	1000	112200	10 YR	11369.00	261.31	270.45		270.47	0.000126	1.19	9590.14	2020.15	0.10
Mud Creek	1000	112200	25 YR	14059.00	261.31	271.33		271.36	0.000109	1.24	11397.88	2060.03	0.09
Mud Creek	1000	112200	50 YR	16607.00	261.31	272.08		272.11	0.000101	1.29	12947.51	2093.60	0.09
Mud Creek	1000	112200	100 YR	19222.00	261.31	272.75		272.78	0.000097	1.35	14356.66	2123.68	0.09
Mud Creek	1000	110300	2 YR	5303.00	260.65	267.48	262.93	267.48	0.000066	0.69	7725.74	2263.39	0.07
Mud Creek	1000	110300	5 YR	8784.00	260.65	269.25	263.45	269.26	0.000053	0.72	12265.72	2851.91	0.06
Mud Creek	1000	110300	10 YR	11369.00	260.65	270.32	263.75	270.33	0.000046	0.73	15493.25	3117.71	0.06
Mud Creek	1000	110300	25 YR	14059.00	260.65	271.23	264.03	271.24	0.000040	0.77	18333.91	3167.42	0.06
Mud Creek	1000	110300	50 YR	16607.00	260.65	271.98	264.26	271.99	0.000037	0.80	20742.17	3208.97	0.05
Mud Creek	1000	110300	100 YR	19222.00	260.65	272.65	264.48	272.67	0.000036	0.84	22913.88	3245.98	0.05
Mud Creek	1000	110200		Bridge									
Mud Creek	1000	110050	2 YR	5303.00	260.56	267.41		267.41	0.000038	0.59	8937.14	2610.84	0.06
Mud Creek	1000	110050	5 YR	8784.00	260.56	269.18		269.19	0.000030	0.62	14168.99	3287.38	0.05
Mud Creek	1000	110050	10 YR	11369.00	260.56	270.25		270.25	0.000026	0.64	17887.34	3629.72	0.05
Mud Creek	1000	110050	25 YR	14059.00	260.56	271.15		271.15	0.000023	0.67	21196.73	3737.53	0.05
Mud Creek	1000	110050	50 YR	16607.00	260.56	271.89		271.90	0.000022	0.70	24029.19	3827.39	0.05
Mud Creek	1000	110050	100 YR	19222.00	260.56	272.56		272.57	0.000021	0.73	26600.26	3907.17	0.05
Mud Creek	1000	109550	2 YR	5303.00	260.38	267.39		267.39	0.000034	0.57	9318.70	2659.20	0.05
Mud Creek	1000	109550	5 YR	8784.00	260.38	269.17		269.17	0.000028	0.60	14644.29	3333.56	0.05
Mud Creek	1000	109550	10 YR	11369.00	260.38	270.24		270.24	0.000024	0.62	18420.06	3692.34	0.05
Mud Creek	1000	109550	25 YR	14059.00	260.38	271.14		271.14	0.000022	0.65	21815.81	3854.33	0.05
Mud Creek	1000	109550	50 YR	16607.00	260.38	271.88		271.89	0.000020	0.68	24755.47	3989.25	0.05
Mud Creek	1000	109550	100 YR	19222.00	260.38	272.55		272.56	0.000020	0.71	27448.66	4108.98	0.05
Mud Creek	1000	107750	2 YR	5303.00	259.75	267.32		267.32	0.000048	0.65	8177.53	2028.86	0.06
Mud Creek	1000	107750	5 YR	8784.00	259.75	269.10		269.11	0.000045	0.72	12198.00	2475.18	0.06

HEC-RAS Plan: Prop 300 MM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	107750	10 YR	11369.00	259.75	270.18		270.18	0.000042	0.76	15001.48	2742.03	0.06
Mud Creek	1000	107750	25 YR	14059.00	259.75	271.08		271.09	0.000039	0.81	17581.20	2959.22	0.06
Mud Creek	1000	107750	50 YR	16607.00	259.75	271.83		271.84	0.000038	0.85	19873.48	3139.63	0.06
Mud Creek	1000	107750	100 YR	19222.00	259.75	272.50		272.51	0.000037	0.90	22015.84	3299.33	0.06
Mud Creek	1000	105150	2 YR	5303.00	258.80	267.22		267.23	0.000031	0.67	9163.36	1563.64	0.04
Mud Creek	1000	105150	5 YR	8784.00	258.80	268.99		269.00	0.000039	0.87	12069.94	1714.38	0.05
Mud Creek	1000	105150	10 YR	11369.00	258.80	270.06		270.08	0.000043	1.00	13951.84	1805.27	0.06
Mud Creek	1000	105150	25 YR	14059.00	258.80	270.96		270.98	0.000048	1.12	15613.81	1881.90	0.06
Mud Creek	1000	105150	50 YR	16607.00	258.80	271.71		271.73	0.000053	1.22	17043.92	1945.42	0.06
Mud Creek	1000	105150	100 YR	19222.00	258.80	272.37		272.39	0.000058	1.32	18344.83	2001.46	0.07
Mud Creek	1000	104100	2 YR	5303.00	258.42	267.19		267.20	0.000023	0.76	8466.90	1461.17	0.05
Mud Creek	1000	104100	5 YR	8784.00	258.42	268.95		268.97	0.000029	0.99	11177.79	1611.17	0.06
Mud Creek	1000	104100	10 YR	11369.00	258.42	270.02		270.04	0.000032	1.14	12940.38	1701.29	0.06
Mud Creek	1000	104100	25 YR	14059.00	258.42	270.91		270.94	0.000036	1.27	14491.39	1761.75	0.07
Mud Creek	1000	104100	50 YR	16607.00	258.42	271.66		271.68	0.000040	1.39	15817.31	1811.84	0.07
Mud Creek	1000	104100	100 YR	19222.00	258.42	272.31		272.34	0.000044	1.52	17015.71	1855.95	0.08
Mud Creek	1000	103850	2 YR	5303.00	258.33	267.18		267.19	0.000024	0.79	7692.09	1245.09	0.05
Mud Creek	1000	103850	5 YR	8784.00	258.33	268.95		268.96	0.000031	1.04	9971.36	1342.01	0.06
Mud Creek	1000	103850	10 YR	11369.00	258.33	270.01		270.03	0.000036	1.19	11427.94	1400.55	0.07
Mud Creek	1000	103850	25 YR	14059.00	258.33	270.90		270.93	0.000041	1.35	12707.22	1463.09	0.07
Mud Creek	1000	103850	50 YR	16607.00	258.33	271.64		271.67	0.000045	1.48	13808.92	1514.88	0.08
Mud Creek	1000	103850	100 YR	19222.00	258.33	272.29		272.33	0.000050	1.61	14810.08	1560.46	0.08
Mud Creek	1000	103350	2 YR	7842.00	258.15	267.13	261.55	267.16	0.000100	1.61	6730.11	1298.72	0.10
Mud Creek	1000	103350	5 YR	12984.00	258.15	268.87	262.27	268.92	0.000124	2.06	9148.69	1481.41	0.12
Mud Creek	1000	103350	10 YR	16800.00	258.15	269.92	262.71	269.99	0.000137	2.34	10759.17	1591.47	0.13
Mud Creek	1000	103350	25 YR	20766.00	258.15	270.80	263.15	270.88	0.000152	2.60	12189.96	1663.79	0.14
Mud Creek	1000	103350	50 YR	24523.00	258.15	271.52	263.54	271.62	0.000166	2.83	13419.24	1721.88	0.15
Mud Creek	1000	103350	100 YR	28176.00	258.15	272.16	263.88	272.27	0.000178	3.03	14534.90	1772.96	0.15
Mud Creek	1000	103200		Bridge									
Mud Creek	1000	103100	2 YR	7842.00	258.06	267.02		267.08	0.000317	2.18	4679.86	891.52	0.14
Mud Creek	1000	103100	5 YR	12984.00	258.06	268.71		268.81	0.000400	2.81	6280.55	1009.41	0.16
Mud Creek	1000	103100	10 YR	16800.00	258.06	269.71		269.84	0.000447	3.18	7334.28	1080.01	0.18
Mud Creek	1000	103100	25 YR	20766.00	258.06	270.55		270.70	0.000507	3.58	8263.37	1165.46	0.19
Mud Creek	1000	103100	50 YR	24523.00	258.06	271.22		271.41	0.000564	3.93	9082.44	1246.94	0.20
Mud Creek	1000	103100	100 YR	28176.00	258.06	271.82		272.03	0.000615	4.24	9841.39	1317.96	0.21
Mud Creek	1000	102550	2 YR	7842.00	257.86	266.60		266.74	0.001166	4.29	3599.90	958.20	0.27
Mud Creek	1000	102550	5 YR	12984.00	257.86	268.23		268.40	0.001213	4.97	5332.65	1169.90	0.29
Mud Creek	1000	102550	10 YR	16800.00	257.86	269.22		269.41	0.001215	5.32	6553.88	1298.53	0.29
Mud Creek	1000	102550	25 YR	20766.00	257.86	270.02		270.23	0.001268	5.72	7631.98	1402.85	0.30
Mud Creek	1000	102550	50 YR	24523.00	257.86	270.67		270.90	0.001331	6.08	8576.01	1506.68	0.31
Mud Creek	1000	102550	100 YR	28176.00	257.86	271.24		271.48	0.001377	6.39	9458.44	1597.64	0.32
Mud Creek	1000	101050	2 YR	7842.00	257.31	263.11		263.76	0.004982	7.10	1642.68	682.53	0.59
Mud Creek	1000	101050	5 YR	12984.00	257.31	263.75		264.89	0.007773	9.70	2109.34	781.35	0.76
Mud Creek	1000	101050	10 YR	16800.00	257.31	264.06		265.63	0.010100	11.50	2359.03	829.40	0.87
Mud Creek	1000	101050	25 YR	20766.00	257.31	264.59	264.59	266.32	0.010305	12.35	2816.83	910.95	0.89
Mud Creek	1000	101050	50 YR	24523.00	257.31	265.09	265.09	266.91	0.010063	12.88	3290.86	988.32	0.90
Mud Creek	1000	101050	100 YR	28176.00	257.31	265.52	265.52	267.42	0.009907	13.36	3737.47	1056.04	0.90
Mud Creek	1000	99150	2 YR	7842.00	256.62	262.71		262.72	0.000200	1.61	13171.62	5186.67	0.14
Mud Creek	1000	99150	5 YR	12984.00	256.62	263.46		263.47	0.000244	1.98	17113.67	5402.58	0.15
Mud Creek	1000	99150	10 YR	16800.00	256.62	263.92		263.94	0.000268	2.19	19651.29	5537.12	0.16
Mud Creek	1000	99150	25 YR	20766.00	256.62	264.35		264.36	0.000289	2.39	22027.75	5660.22	0.17
Mud Creek	1000	99150	50 YR	24523.00	256.62	264.71		264.73	0.000306	2.56	24113.87	5766.11	0.18
Mud Creek	1000	99150	100 YR	28176.00	256.62	265.04		265.06	0.000320	2.70	26021.13	5861.25	0.18
Mud Creek	1000	97950	2 YR	7842.00	256.19	262.56		262.57	0.000244	1.79	12183.56	4963.56	0.15
Mud Creek	1000	97950	5 YR	12984.00	256.19	263.27		263.29	0.000300	2.20	15767.01	5119.93	0.17
Mud Creek	1000	97950	10 YR	16800.00	256.19	263.72		263.74	0.000329	2.43	18072.29	5218.04	0.18
Mud Creek	1000	97950	25 YR	20766.00	256.19	264.13		264.15	0.000355	2.65	20219.67	5307.81	0.19
Mud Creek	1000	97950	50 YR	24523.00	256.19	264.48		264.50	0.000377	2.83	22099.13	5385.15	0.20
Mud Creek	1000	97950	100 YR	28176.00	256.19	264.79		264.82	0.000395	2.99	23812.70	5454.70	0.20
Mud Creek	1000	96975	2 YR	7842.00	255.84	262.50	260.42	262.51	0.000172	1.57	13619.71	5026.81	0.13
Mud Creek	1000	96975	5 YR	12984.00	255.84	263.19	260.63	263.21	0.000231	1.99	17161.14	5179.49	0.15
Mud Creek	1000	96975	10 YR	16800.00	255.84	263.63	260.77	263.65	0.000262	2.24	19445.49	5275.62	0.16
Mud Creek	1000	96975	25 YR	20766.00	255.84	264.03	260.89	264.05	0.000291	2.46	21571.83	5363.56	0.17
Mud Creek	1000	96975	50 YR	24523.00	255.84	264.37	261.03	264.40	0.000315	2.65	23433.53	5439.39	0.18
Mud Creek	1000	96975	100 YR	28176.00	255.84	264.68	261.15	264.71	0.000335	2.82	25130.80	5507.61	0.19
Mud Creek	1000	96950		Bridge									
Mud Creek	1000	96925	2 YR	7842.00	255.82	262.43		262.46	0.000575	2.02	8494.39	4532.22	0.17
Mud Creek	1000	96925	5 YR	12984.00	255.82	263.13		263.16	0.000618	2.32	11716.62	4699.75	0.18
Mud Creek	1000	96925	10 YR	16800.00	255.82	263.57		263.60	0.000637	2.49	13796.32	4804.78	0.19
Mud Creek	1000	96925	25 YR	20766.00	255.82	263.97		264.01	0.000658	2.66	15733.21	4900.57	0.20
Mud Creek	1000	96925	50 YR	24523.00	255.82	264.31		264.35	0.000675	2.80	17432.27	4983.09	0.20
Mud Creek	1000	96925	100 YR	28176.00	255.82	264.62		264.67	0.000691	2.92	18983.92	5057.27	0.20

HEC-RAS Plan: Prop 300 MM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	95200	2 YR	7842.00	255.19	261.67		261.70	0.000711	2.20	7883.73	4499.76	0.19
Mud Creek	1000	95200	5 YR	12984.00	255.19	262.36		262.39	0.000734	2.48	11050.12	4665.59	0.20
Mud Creek	1000	95200	10 YR	16800.00	255.19	262.79		262.83	0.000742	2.64	13106.86	4770.22	0.20
Mud Creek	1000	95200	25 YR	20766.00	255.19	263.18		263.22	0.000765	2.81	14958.11	4862.47	0.21
Mud Creek	1000	95200	50 YR	24523.00	255.19	263.51		263.56	0.000785	2.96	16576.33	4941.69	0.21
Mud Creek	1000	95200	100 YR	28176.00	255.19	263.80		263.86	0.000803	3.09	18049.08	5012.71	0.22
Mud Creek	1000	93700	2 YR	7842.00	254.65	260.70		260.76	0.001089	2.12	5287.13	4044.77	0.20
Mud Creek	1000	93700	5 YR	12984.00	254.65	261.50		261.56	0.000998	2.34	8633.21	4270.13	0.20
Mud Creek	1000	93700	10 YR	16800.00	254.65	261.98		262.04	0.000972	2.48	10691.38	4403.02	0.20
Mud Creek	1000	93700	25 YR	20766.00	254.65	262.35		262.42	0.001014	2.67	12356.01	4507.63	0.21
Mud Creek	1000	93700	50 YR	24523.00	254.65	262.67		262.75	0.001050	2.83	13801.32	4596.54	0.22
Mud Creek	1000	93700	100 YR	28176.00	254.65	262.95		263.04	0.001083	2.97	15107.74	4675.44	0.22
Mud Creek	1000	91800	2 YR	7842.00	253.96	258.69		258.75	0.001126	1.92	4076.06	1723.17	0.22
Mud Creek	1000	91800	5 YR	12984.00	253.96	259.61		259.69	0.001194	2.23	5819.00	2058.89	0.23
Mud Creek	1000	91800	10 YR	16800.00	253.96	260.14		260.23	0.001194	2.41	7288.40	4533.53	0.24
Mud Creek	1000	91800	25 YR	20766.00	253.96	260.60		260.70	0.001095	2.52	9385.19	4640.94	0.23
Mud Creek	1000	91800	50 YR	24523.00	253.96	260.97		261.07	0.001043	2.62	11103.25	4727.14	0.23
Mud Creek	1000	91800	100 YR	28176.00	253.96	261.28		261.39	0.001013	2.72	12609.25	4801.42	0.23
Mud Creek	1000	90600	2 YR	7842.00	253.52	257.92		257.94	0.000434	1.14	6883.85	3126.24	0.14
Mud Creek	1000	90600	5 YR	12984.00	253.52	258.83		258.86	0.000437	1.30	10023.47	3772.38	0.14
Mud Creek	1000	90600	10 YR	16800.00	253.52	259.37		259.40	0.000440	1.38	12133.67	4150.52	0.14
Mud Creek	1000	90600	25 YR	20766.00	253.52	259.84		259.88	0.000442	1.46	14191.03	4488.63	0.15
Mud Creek	1000	90600	50 YR	24523.00	253.52	260.24		260.27	0.000428	1.53	16003.19	4668.78	0.14
Mud Creek	1000	90600	100 YR	28176.00	253.52	260.57		260.61	0.000415	1.61	17585.93	4766.08	0.14
Mud Creek	1000	89850	2 YR	7842.00	253.25	257.63		257.65	0.000351	1.17	6677.82	3049.51	0.14
Mud Creek	1000	89850	5 YR	12984.00	253.25	258.54		258.57	0.000353	1.33	9735.90	3682.14	0.14
Mud Creek	1000	89850	10 YR	16800.00	253.25	259.07		259.10	0.000354	1.43	11788.81	4051.79	0.15
Mud Creek	1000	89850	25 YR	20766.00	253.25	259.54		259.58	0.000356	1.51	13788.78	4382.03	0.15
Mud Creek	1000	89850	50 YR	24523.00	253.25	259.94		259.98	0.000358	1.57	15587.88	4659.14	0.15
Mud Creek	1000	89850	100 YR	28176.00	253.25	260.29		260.33	0.000344	1.64	17224.78	4760.48	0.15
Mud Creek	1000	88850	2 YR	7842.00	252.89	257.29		257.32	0.000317	1.28	6134.17	2786.54	0.15
Mud Creek	1000	88850	5 YR	12984.00	252.89	258.20		258.23	0.000321	1.46	8912.61	3358.84	0.16
Mud Creek	1000	88850	10 YR	16800.00	252.89	258.72		258.76	0.000324	1.56	10770.97	3692.44	0.16
Mud Creek	1000	88850	25 YR	20766.00	252.89	259.19		259.24	0.000327	1.65	12577.91	3990.16	0.16
Mud Creek	1000	88850	50 YR	24523.00	252.89	259.59		259.64	0.000330	1.73	14205.29	4240.45	0.17
Mud Creek	1000	88850	100 YR	28176.00	252.89	259.94		259.99	0.000331	1.79	15737.23	4463.24	0.17
Mud Creek	1000	87600	2 YR	7842.00	252.43	256.89		256.92	0.000326	1.15	6846.46	3066.91	0.14
Mud Creek	1000	87600	5 YR	12984.00	252.43	257.79		257.82	0.000337	1.32	9869.46	3682.27	0.14
Mud Creek	1000	87600	10 YR	16800.00	252.43	258.31		258.34	0.000344	1.41	11882.00	4040.30	0.15
Mud Creek	1000	87600	25 YR	20766.00	252.43	258.78		258.81	0.000350	1.50	13834.45	4359.63	0.15
Mud Creek	1000	87600	50 YR	24523.00	252.43	259.17		259.21	0.000355	1.57	15592.66	4628.38	0.15
Mud Creek	1000	87600	100 YR	28176.00	252.43	259.52		259.56	0.000358	1.63	17253.51	4868.64	0.15
Mud Creek	1000	85350	2 YR	7842.00	251.62	256.05		256.07	0.000433	1.14	6863.17	3095.52	0.14
Mud Creek	1000	85350	5 YR	12984.00	251.62	256.91		256.93	0.000465	1.33	9754.79	3690.45	0.14
Mud Creek	1000	85350	10 YR	16800.00	251.62	257.40		257.43	0.000483	1.44	11659.93	4034.77	0.15
Mud Creek	1000	85350	25 YR	20766.00	251.62	257.84		257.88	0.000498	1.54	13512.62	4343.51	0.15
Mud Creek	1000	85350	50 YR	24523.00	251.62	258.22		258.26	0.000509	1.61	15191.22	4605.40	0.16
Mud Creek	1000	85350	100 YR	28176.00	251.62	258.56		258.60	0.000513	1.68	16806.99	4844.13	0.16
Mud Creek	1000	83800	2 YR	7842.00	251.05	255.30		255.32	0.000545	1.25	6294.70	2965.04	0.15
Mud Creek	1000	83800	5 YR	12984.00	251.05	256.08		256.11	0.000607	1.47	8825.81	3510.92	0.16
Mud Creek	1000	83800	10 YR	16800.00	251.05	256.53		256.57	0.000641	1.60	10486.63	3827.03	0.17
Mud Creek	1000	83800	25 YR	20766.00	251.05	256.94		256.99	0.000666	1.71	12121.95	4114.62	0.18
Mud Creek	1000	83800	50 YR	24523.00	251.05	257.30		257.35	0.000678	1.80	13636.68	4364.13	0.18
Mud Creek	1000	83800	100 YR	28176.00	251.05	257.64		257.69	0.000675	1.86	15162.94	4601.88	0.18
Mud Creek	1000	82200	2 YR	7842.00	250.47	253.36		253.46	0.003965	2.60	3018.19	2090.58	0.38
Mud Creek	1000	82200	5 YR	12984.00	250.47	254.09		254.21	0.003253	2.74	4744.85	2621.23	0.36
Mud Creek	1000	82200	10 YR	16800.00	250.47	254.55		254.67	0.002885	2.79	6021.74	2952.94	0.34
Mud Creek	1000	82200	25 YR	20766.00	250.47	255.01		255.13	0.002495	2.79	7453.36	3285.26	0.33
Mud Creek	1000	82200	50 YR	24523.00	250.47	255.48		255.59	0.002051	2.70	9088.69	3627.80	0.30
Mud Creek	1000	82200	100 YR	28176.00	250.47	256.00		256.10	0.001605	2.55	11055.83	4001.19	0.27
Mud Creek	1000	80150	2 YR	7842.00	249.62	252.19		252.20	0.000232	0.83	9443.21	4309.47	0.10
Mud Creek	1000	80150	5 YR	12984.00	249.62	252.92		252.93	0.000247	1.03	12594.79	4345.88	0.11
Mud Creek	1000	80150	10 YR	16800.00	249.62	253.41		253.43	0.000245	1.14	14758.58	4370.70	0.11
Mud Creek	1000	80150	25 YR	20766.00	249.62	254.00		254.02	0.000222	1.20	17310.46	4399.80	0.11
Mud Creek	1000	80150	50 YR	24523.00	249.62	254.63		254.65	0.000190	1.22	20095.18	4431.33	0.10
Mud Creek	1000	80150	100 YR	28176.00	249.62	255.29		255.31	0.000160	1.22	23050.25	4464.55	0.09
Mud Creek	1000	78800	2 YR	7842.00	248.93	251.84		251.86	0.000274	0.98	8151.56	4185.85	0.12
Mud Creek	1000	78800	5 YR	12984.00	248.93	252.56		252.59	0.000270	1.20	11201.17	4297.30	0.13
Mud Creek	1000	78800	10 YR	16800.00	248.93	253.07		253.10	0.000255	1.30	13398.30	4375.83	0.13
Mud Creek	1000	78800	25 YR	20766.00	248.93	253.70		253.72	0.000215	1.34	16164.83	4472.75	0.12
Mud Creek	1000	78800	50 YR	24523.00	248.93	254.38		254.40	0.000173	1.34	19250.70	4574.44	0.11
Mud Creek	1000	78800	100 YR	28176.00	248.93	255.09		255.11	0.000140	1.33	22530.97	4688.18	0.10
Mud Creek	1000	77500	2 YR	7842.00	248.27	251.38		251.41	0.000443	1.53	6095.24	3208.83	0.18
Mud Creek	1000	77500	5 YR	12984.00	248.27	252.09		252.14	0.000461	1.88	8390.57	3290.06	0.19

HEC-RAS Plan: Prop 300 MM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	77500	10 YR	16800.00	248.27	252.62		252.67	0.000432	2.03	10147.89	3350.92	0.19
Mud Creek	1000	77500	25 YR	20766.00	248.27	253.32		253.37	0.000347	2.05	12520.75	3431.39	0.18
Mud Creek	1000	77500	50 YR	24523.00	248.27	254.07		254.13	0.000271	2.03	15146.07	3518.27	0.16
Mud Creek	1000	77500	100 YR	28176.00	248.27	254.84		254.89	0.000217	1.99	17866.41	3606.10	0.15
Mud Creek	1000	76300	2 YR	7842.00	247.66	250.82		250.85	0.000495	1.31	6052.81	3185.01	0.16
Mud Creek	1000	76300	5 YR	12984.00	247.66	251.52		251.56	0.000494	1.60	8331.36	3342.10	0.17
Mud Creek	1000	76300	10 YR	16800.00	247.66	252.11		252.15	0.000422	1.69	10342.08	3474.83	0.16
Mud Creek	1000	76300	25 YR	20766.00	247.66	252.94		252.98	0.000300	1.65	13297.27	3661.19	0.14
Mud Creek	1000	76300	50 YR	24523.00	247.66	253.79		253.83	0.000219	1.60	16496.75	3852.80	0.13
Mud Creek	1000	76300	100 YR	28176.00	247.66	254.62		254.65	0.000170	1.56	19756.61	4038.69	0.11
Mud Creek	1000	74900	2 YR	7842.00	246.95	250.13		250.16	0.000491	1.32	5960.36	3624.09	0.18
Mud Creek	1000	74900	5 YR	12984.00	246.95	250.94		250.98	0.000354	1.46	8966.98	3774.45	0.16
Mud Creek	1000	74900	10 YR	16800.00	246.95	251.67		251.70	0.000249	1.45	11764.92	3909.18	0.14
Mud Creek	1000	74900	25 YR	20766.00	246.95	252.65		252.68	0.000154	1.37	15697.48	4091.06	0.12
Mud Creek	1000	74900	50 YR	24523.00	246.95	253.59		253.62	0.000108	1.31	19602.63	4264.00	0.10
Mud Creek	1000	74900	100 YR	28176.00	246.95	254.46		254.49	0.000083	1.28	23395.80	4425.51	0.09
Mud Creek	1000	72400	2 YR	7842.00	245.67	249.21		249.22	0.000298	0.94	8371.26	4735.66	0.12
Mud Creek	1000	72400	5 YR	12984.00	245.67	250.38		250.39	0.000161	0.88	14786.75	5868.79	0.10
Mud Creek	1000	72400	10 YR	16800.00	245.67	251.33		251.34	0.000094	0.83	20403.40	6038.60	0.08
Mud Creek	1000	72400	25 YR	20766.00	245.67	252.45		252.46	0.000056	0.77	27303.02	6240.88	0.06
Mud Creek	1000	72400	50 YR	24523.00	245.67	253.45		253.45	0.000041	0.75	33607.94	6420.15	0.06
Mud Creek	1000	72400	100 YR	28176.00	245.67	254.35		254.36	0.000032	0.74	39496.00	6583.16	0.05
Mud Creek	1000	71200	2 YR	7842.00	245.06	248.95		248.96	0.000165	0.74	10562.73	5432.06	0.09
Mud Creek	1000	71200	5 YR	12984.00	245.06	250.24		250.25	0.000092	0.69	18714.31	6921.77	0.07
Mud Creek	1000	71200	10 YR	16800.00	245.06	251.24		251.25	0.000054	0.66	25699.05	7012.00	0.06
Mud Creek	1000	71200	25 YR	20766.00	245.06	252.40		252.41	0.000033	0.62	33865.75	7116.05	0.05
Mud Creek	1000	71200	50 YR	24523.00	245.06	253.41		253.42	0.000025	0.60	41094.31	7206.89	0.04
Mud Creek	1000	71200	100 YR	28176.00	245.06	254.32		254.33	0.000020	0.60	47710.11	7289.04	0.04
Mud Creek	1000	69000	2 YR	9467.00	243.94	248.61	245.80	248.63	0.000139	0.88	10725.97	4589.40	0.10
Mud Creek	1000	69000	5 YR	15670.00	243.94	250.03	246.22	250.05	0.000092	0.86	18231.46	5952.90	0.09
Mud Creek	1000	69000	10 YR	20280.00	243.94	251.12	246.47	251.13	0.000056	0.82	24737.84	6045.09	0.07
Mud Creek	1000	69000	25 YR	25082.00	243.94	252.32	246.69	252.33	0.000037	0.79	32055.38	6147.12	0.06
Mud Creek	1000	69000	50 YR	29635.00	243.94	253.35	246.88	253.36	0.000028	0.78	38418.96	6234.49	0.05
Mud Creek	1000	69000	100 YR	34049.00	243.94	254.27	247.05	254.28	0.000024	0.78	44208.47	6312.93	0.05
Mud Creek	1000	68800		Bridge									
Mud Creek	1000	68650	2 YR	9467.00	243.77	248.01		248.03	0.000379	1.19	7930.54	3742.00	0.14
Mud Creek	1000	68650	5 YR	15670.00	243.77	249.71		249.72	0.000172	1.01	15555.61	5240.78	0.10
Mud Creek	1000	68650	10 YR	20280.00	243.77	250.88		250.89	0.000098	0.92	21997.03	5609.47	0.08
Mud Creek	1000	68650	25 YR	25082.00	243.77	252.13		252.14	0.000060	0.87	29113.56	5765.87	0.07
Mud Creek	1000	68650	50 YR	29635.00	243.77	253.17		253.18	0.000045	0.85	35216.86	5896.70	0.06
Mud Creek	1000	68650	100 YR	34049.00	243.77	254.10		254.12	0.000038	0.85	40762.60	6013.11	0.06
Mud Creek	1000	67650	2 YR	9467.00	243.26	247.71		247.72	0.000249	1.00	9471.38	4257.66	0.12
Mud Creek	1000	67650	5 YR	15670.00	243.26	249.58		249.59	0.000105	0.82	19096.16	6045.58	0.08
Mud Creek	1000	67650	10 YR	20280.00	243.26	250.80		250.81	0.000061	0.75	26933.00	6500.16	0.07
Mud Creek	1000	67650	25 YR	25082.00	243.26	252.08		252.09	0.000038	0.71	35302.49	6580.14	0.05
Mud Creek	1000	67650	50 YR	29635.00	243.26	253.14		253.15	0.000030	0.70	42296.61	6646.24	0.05
Mud Creek	1000	67650	100 YR	34049.00	243.26	254.08		254.08	0.000025	0.71	48552.68	6704.81	0.05
Mud Creek	1000	66450	2 YR	9467.00	242.65	247.54		247.55	0.000092	0.74	12783.56	5225.55	0.08
Mud Creek	1000	66450	5 YR	15670.00	242.65	249.50		249.51	0.000042	0.62	25093.12	7321.22	0.06
Mud Creek	1000	66450	10 YR	20280.00	242.65	250.76		250.76	0.000026	0.58	35585.91	8887.98	0.05
Mud Creek	1000	66450	25 YR	25082.00	242.65	252.06		252.06	0.000016	0.55	47146.77	8952.78	0.04
Mud Creek	1000	66450	50 YR	29635.00	242.65	253.12		253.12	0.000013	0.55	56700.38	9005.98	0.04
Mud Creek	1000	66450	100 YR	34049.00	242.65	254.06		254.06	0.000011	0.55	65193.78	9053.01	0.03
Mud Creek	1000	64850	2 YR	9467.00	241.83	247.39		247.40	0.000092	0.81	11743.54	4221.82	0.09
Mud Creek	1000	64850	5 YR	15670.00	241.83	249.43		249.44	0.000048	0.71	21924.06	5768.47	0.06
Mud Creek	1000	64850	10 YR	20280.00	241.83	250.71		250.72	0.000032	0.68	29751.51	6232.03	0.05
Mud Creek	1000	64850	25 YR	25082.00	241.83	252.02		252.03	0.000022	0.66	37962.89	6291.04	0.05
Mud Creek	1000	64850	50 YR	29635.00	241.83	253.09		253.10	0.000018	0.67	44719.34	6339.19	0.04
Mud Creek	1000	64850	100 YR	34049.00	241.83	254.04		254.04	0.000015	0.68	50722.23	6381.66	0.04
Mud Creek	1000	63250	2 YR	9467.00	241.02	247.24		247.24	0.000106	0.71	13340.56	4292.00	0.07
Mud Creek	1000	63250	5 YR	15670.00	241.02	249.35		249.35	0.000061	0.65	23930.45	5748.42	0.06
Mud Creek	1000	63250	10 YR	20280.00	241.02	250.65		250.66	0.000044	0.64	31895.78	6226.13	0.05
Mud Creek	1000	63250	25 YR	25082.00	241.02	251.98		251.99	0.000031	0.62	40207.70	6279.30	0.04
Mud Creek	1000	63250	50 YR	29635.00	241.02	253.06		253.07	0.000026	0.63	46994.35	6322.38	0.04
Mud Creek	1000	63250	100 YR	34049.00	241.02	254.01		254.01	0.000023	0.65	53004.77	6360.29	0.04
Mud Creek	1000	61950	2 YR	9467.00	240.36	247.15		247.15	0.000049	0.67	14094.14	4153.57	0.06
Mud Creek	1000	61950	5 YR	15670.00	240.36	249.29		249.30	0.000031	0.64	24408.31	5466.02	0.05
Mud Creek	1000	61950	10 YR	20280.00	240.36	250.61		250.62	0.000023	0.63	32066.26	5942.89	0.05
Mud Creek	1000	61950	25 YR	25082.00	240.36	251.95		251.96	0.000017	0.63	40095.04	6036.72	0.04
Mud Creek	1000	61950	50 YR	29635.00	240.36	253.03		253.04	0.000014	0.64	46665.14	6112.43	0.04
Mud Creek	1000	61950	100 YR	34049.00	240.36	253.99		253.99	0.000013	0.65	52505.59	6178.95	0.04
Mud Creek	1000	60750	2 YR	9467.00	239.83	247.08		247.09	0.000066	1.28	17384.52	4504.06	0.08
Mud Creek	1000	60750	5 YR	15670.00	239.83	249.24		249.25	0.000053	1.36	28485.93	5758.84	0.08

HEC-RAS Plan: Prop 300 MM (Continued)

River	Reach	River Sta	Profile	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
Mud Creek	1000	60750	10 YR	20280.00	239.83	250.57		250.58	0.000045	1.38	36590.49	6251.41	0.07
Mud Creek	1000	60750	25 YR	25082.00	239.83	251.92		251.93	0.000037	1.35	45111.17	6372.90	0.07
Mud Creek	1000	60750	50 YR	29635.00	239.83	253.01		253.02	0.000033	1.36	52082.44	6470.60	0.07
Mud Creek	1000	60750	100 YR	34049.00	239.83	253.96		253.97	0.000031	1.38	58287.41	6556.34	0.06
Mud Creek	1000	58800	2 YR	9467.00	239.18	247.06		247.06	0.000005	0.36	33233.34	5902.30	0.02
Mud Creek	1000	58800	5 YR	15670.00	239.18	249.22		249.22	0.000005	0.44	46905.70	6745.49	0.03
Mud Creek	1000	58800	10 YR	20280.00	239.18	250.55		250.55	0.000005	0.49	56179.62	7074.77	0.03
Mud Creek	1000	58800	25 YR	25082.00	239.18	251.90		251.90	0.000005	0.52	65775.20	7135.55	0.03
Mud Creek	1000	58800	50 YR	29635.00	239.18	252.99		252.99	0.000005	0.56	73547.65	7184.40	0.03
Mud Creek	1000	58800	100 YR	34049.00	239.18	253.94		253.94	0.000006	0.59	80411.08	7227.26	0.03
Mud Creek	1000	57200	2 YR	9467.00	238.64	247.05		247.05	0.000002	0.23	45431.40	6681.02	0.01
Mud Creek	1000	57200	5 YR	15670.00	238.64	249.21		249.22	0.000003	0.29	60363.11	7134.94	0.02
Mud Creek	1000	57200	10 YR	20280.00	238.64	250.55		250.55	0.000003	0.33	70025.04	7335.43	0.02
Mud Creek	1000	57200	25 YR	25082.00	238.64	251.90		251.90	0.000003	0.36	79990.88	7423.22	0.02
Mud Creek	1000	57200	50 YR	29635.00	238.64	252.98		252.98	0.000003	0.38	88086.47	7493.77	0.02
Mud Creek	1000	57200	100 YR	34049.00	238.64	253.93		253.94	0.000003	0.41	95252.62	7555.67	0.02
Mud Creek	1000	55600	2 YR	9467.00	238.10	247.05		247.05	0.000004	0.34	29174.07	3963.72	0.02
Mud Creek	1000	55600	5 YR	15670.00	238.10	249.21		249.21	0.000005	0.44	37921.52	4136.50	0.02
Mud Creek	1000	55600	10 YR	20280.00	238.10	250.54		250.54	0.000005	0.50	43483.61	4204.29	0.03
Mud Creek	1000	55600	25 YR	25082.00	238.10	251.89		251.89	0.000006	0.55	49165.68	4215.09	0.03
Mud Creek	1000	55600	50 YR	29635.00	238.10	252.97		252.98	0.000006	0.60	53741.92	4223.77	0.03
Mud Creek	1000	55600	100 YR	34049.00	238.10	253.92		253.93	0.000006	0.64	57764.42	4231.38	0.03
Mud Creek	1000	53900	2 YR	9467.00	237.53	247.04		247.04	0.000001	0.21	46355.24	6004.33	0.01
Mud Creek	1000	53900	5 YR	15670.00	237.53	249.20		249.20	0.000002	0.28	59553.81	6220.26	0.02
Mud Creek	1000	53900	10 YR	20280.00	237.53	250.53		250.53	0.000002	0.32	67904.32	6315.97	0.02
Mud Creek	1000	53900	25 YR	25082.00	237.53	251.88		251.88	0.000002	0.35	76456.91	6356.47	0.02
Mud Creek	1000	53900	50 YR	29635.00	237.53	252.97		252.97	0.000002	0.38	83368.25	6389.00	0.02
Mud Creek	1000	53900	100 YR	34049.00	237.53	253.92		253.92	0.000002	0.41	89460.82	6417.55	0.02
Mud Creek	1000	52600	2 YR	9467.00	237.09	247.04		247.04	0.000002	0.24	40050.07	4875.24	0.01
Mud Creek	1000	52600	5 YR	15670.00	237.09	249.20		249.20	0.000002	0.32	50664.82	4959.62	0.02
Mud Creek	1000	52600	10 YR	20280.00	237.09	250.53		250.53	0.000003	0.36	57289.77	5001.01	0.02
Mud Creek	1000	52600	25 YR	25082.00	237.09	251.88		251.88	0.000003	0.40	64055.79	5026.77	0.02
Mud Creek	1000	52600	50 YR	29635.00	237.09	252.96		252.97	0.000003	0.44	69516.71	5047.47	0.02
Mud Creek	1000	52600	100 YR	34049.00	237.09	253.91		253.92	0.000003	0.47	74326.13	5065.62	0.02
Mud Creek	1000	51700	2 YR	9467.00	236.78	247.04		247.04	0.000004	0.27	36451.00	4527.88	0.02
Mud Creek	1000	51700	5 YR	15670.00	236.78	249.20		249.20	0.000005	0.35	46395.81	4689.71	0.02
Mud Creek	1000	51700	10 YR	20280.00	236.78	250.53		250.53	0.000006	0.41	52703.23	4824.03	0.02
Mud Creek	1000	51700	25 YR	25082.00	236.78	251.87		251.88	0.000006	0.45	59339.74	5014.25	0.02
Mud Creek	1000	51700	50 YR	29635.00	236.78	252.96		252.96	0.000006	0.49	64856.93	5167.07	0.02
Mud Creek	1000	51700	100 YR	34049.00	236.78	253.91		253.91	0.000007	0.53	69833.54	5301.13	0.02
Mud Creek	1000	49500	2 YR	9467.00	236.04	247.03		247.03	0.000001	0.22	43229.91	4946.18	0.01
Mud Creek	1000	49500	5 YR	15670.00	236.04	249.19		249.19	0.000002	0.30	53977.16	5021.65	0.02
Mud Creek	1000	49500	10 YR	20280.00	236.04	250.52		250.52	0.000002	0.34	60677.18	5068.13	0.02
Mud Creek	1000	49500	25 YR	25082.00	236.04	251.87		251.87	0.000002	0.38	67544.14	5115.34	0.02
Mud Creek	1000	49500	50 YR	29635.00	236.04	252.95		252.95	0.000003	0.42	73105.79	5153.25	0.02
Mud Creek	1000	49500	100 YR	34049.00	236.04	253.90		253.90	0.000003	0.45	78018.82	5186.51	0.02
Mud Creek	1000	47200	2 YR	9467.00	235.27	247.03		247.03	0.000003	0.32	44778.63	6244.87	0.02
Mud Creek	1000	47200	5 YR	15670.00	235.27	249.18		249.19	0.000004	0.41	58630.36	6611.20	0.02
Mud Creek	1000	47200	10 YR	20280.00	235.27	250.51		250.51	0.000004	0.47	67539.84	6778.09	0.02
Mud Creek	1000	47200	25 YR	25082.00	235.27	251.86		251.86	0.000004	0.51	76728.20	6852.25	0.02
Mud Creek	1000	47200	50 YR	29635.00	235.27	252.94		252.95	0.000004	0.55	84179.70	6911.80	0.02
Mud Creek	1000	47200	100 YR	34049.00	235.27	253.89		253.90	0.000005	0.59	90769.64	6964.04	0.03
Mud Creek	1000	46450	2 YR	9467.00	235.02	247.03		247.03	0.000004	0.33	51757.04	8169.87	0.02
Mud Creek	1000	46450	5 YR	15670.00	235.02	249.18		249.18	0.000005	0.41	70240.25	8988.55	0.02
Mud Creek	1000	46450	10 YR	20280.00	235.02	250.51		250.51	0.000005	0.46	82462.26	9330.45	0.02
Mud Creek	1000	46450	25 YR	25082.00	235.02	251.86		251.86	0.000005	0.49	95097.02	9411.35	0.02
Mud Creek	1000	46450	50 YR	29635.00	235.02	252.94		252.94	0.000005	0.52	105322.30	9476.31	0.02
Mud Creek	1000	46450	100 YR	34049.00	235.02	253.89		253.89	0.000005	0.55	114350.10	9533.30	0.02
Mud Creek	1000	44950	2 YR	9467.00	234.51	247.02		247.02	0.000003	0.25	75999.84	12461.75	0.01
Mud Creek	1000	44950	5 YR	15670.00	234.51	249.18		249.18	0.000003	0.30	104117.40	13646.41	0.02
Mud Creek	1000	44950	10 YR	20280.00	234.51	250.50		250.50	0.000003	0.33	122658.00	14170.31	0.02
Mud Creek	1000	44950	25 YR	25082.00	234.51	251.85		251.85	0.000003	0.35	141893.90	14359.10	0.02
Mud Creek	1000	44950	50 YR	29635.00	234.51	252.93		252.93	0.000003	0.36	157523.30	14510.69	0.02
Mud Creek	1000	44950	100 YR	34049.00	234.51	253.88		253.88	0.000003	0.38	171368.70	14643.66	0.02
Angelina River	Upstream	71106	2 YR	12944.00	246.00	252.10		252.14	0.000306	1.66	7852.03	1982.69	0.14
Angelina River	Upstream	71106	5 YR	21707.00	246.00	253.52		253.58	0.000316	2.06	10711.80	2042.79	0.15
Angelina River	Upstream	71106	10 YR	28205.00	246.00	254.43		254.51	0.000318	2.29	12601.54	2081.55	0.16
Angelina River	Upstream	71106	25 YR	35110.00	246.00	255.36		255.46	0.000313	2.49	14555.40	2120.89	0.16
Angelina River	Upstream	71106	50 YR	41349.00	246.00	256.17		256.28	0.000305	2.63	16283.90	2155.08	0.16
Angelina River	Upstream	71106	100 YR	47334.00	246.00	256.92		257.04	0.000296	2.75	17910.31	2186.78	0.16
Angelina River	Upstream	69124	2 YR	12944.00	245.00	251.33		251.40	0.000466	2.24	6595.93	2295.57	0.20
Angelina River	Upstream	69124	5 YR	21707.00	245.00	252.79		252.89	0.000406	2.60	10016.76	2384.16	0.20
Angelina River	Upstream	69124	10 YR	28205.00	245.00	253.73		253.84	0.000379	2.80	12287.48	2441.20	0.20
Angelina River	Upstream	69124	25 YR	35110.00	245.00	254.70		254.82	0.000350	2.96	14677.36	2499.82	0.19

HEC-RAS Plan: Prop 300 MM (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Upstream	69124	50 YR	41349.00	245.00	255.54		255.67	0.000326	3.08	16805.47	2550.89	0.19
Angelina River	Upstream	69124	100 YR	47334.00	245.00	256.32		256.46	0.000307	3.18	18811.73	2598.11	0.19
Angelina River	Upstream	67228	2 YR	12944.00	244.00	250.63		250.68	0.000316	1.78	7271.03	2021.75	0.16
Angelina River	Upstream	67228	5 YR	21707.00	244.00	252.19		252.26	0.000268	2.08	10475.99	2068.61	0.16
Angelina River	Upstream	67228	10 YR	28205.00	244.00	253.17		253.25	0.000254	2.28	12512.99	2097.84	0.16
Angelina River	Upstream	67228	25 YR	35110.00	244.00	254.18		254.27	0.000237	2.43	14646.18	2128.03	0.16
Angelina River	Upstream	67228	50 YR	41349.00	244.00	255.06		255.16	0.000223	2.55	16521.88	2154.22	0.16
Angelina River	Upstream	67228	100 YR	47334.00	244.00	255.86		255.97	0.000212	2.65	18267.87	2178.32	0.16
Angelina River	Upstream	65531	2 YR	12944.00	242.00	250.19		250.22	0.000229	1.27	10195.51	2467.80	0.11
Angelina River	Upstream	65531	5 YR	21707.00	242.00	251.81		251.85	0.000215	1.53	14434.84	2771.40	0.11
Angelina River	Upstream	65531	10 YR	28205.00	242.00	252.80		252.85	0.000212	1.69	17285.82	2958.09	0.11
Angelina River	Upstream	65531	25 YR	35110.00	242.00	253.84		253.89	0.000201	1.81	20451.54	3152.48	0.11
Angelina River	Upstream	65531	50 YR	41349.00	242.00	254.74		254.79	0.000191	1.89	23361.44	3321.13	0.11
Angelina River	Upstream	65531	100 YR	47334.00	242.00	255.57		255.62	0.000182	1.96	26167.00	3475.99	0.11
Angelina River	Upstream	58835	2 YR	12944.00	241.00	247.54		247.60	0.000811	2.03	6386.45	1952.80	0.20
Angelina River	Upstream	58835	5 YR	21707.00	241.00	249.68		249.74	0.000505	1.93	11243.25	2591.04	0.16
Angelina River	Upstream	58835	10 YR	28205.00	241.00	250.97		251.03	0.000367	1.92	14704.32	2711.20	0.14
Angelina River	Upstream	58835	25 YR	35110.00	241.00	252.26		252.32	0.000279	1.93	18240.43	2743.61	0.13
Angelina River	Upstream	58835	50 YR	41349.00	241.00	253.32		253.38	0.000238	1.96	21152.13	2770.02	0.12
Angelina River	Upstream	58835	100 YR	47334.00	241.00	254.25		254.32	0.000214	2.01	23749.01	2793.36	0.12
Angelina River	Upstream	53947	2 YR	12944.00	236.00	247.08		247.09	0.000055	1.19	24605.01	4305.03	0.07
Angelina River	Upstream	53947	5 YR	21707.00	236.00	249.24		249.25	0.000059	1.43	34466.07	4831.31	0.08
Angelina River	Upstream	53947	10 YR	28205.00	236.00	250.57		250.58	0.000059	1.54	41062.09	5026.62	0.08
Angelina River	Upstream	53947	25 YR	35110.00	236.00	251.92		251.93	0.000055	1.60	47849.28	5051.67	0.08
Angelina River	Upstream	53947	50 YR	41349.00	236.00	253.00		253.01	0.000054	1.66	53327.31	5071.80	0.08
Angelina River	Upstream	53947	100 YR	47334.00	236.00	253.95		253.96	0.000053	1.72	58152.50	5089.46	0.08
Angelina River	Upstream	50340	2 YR	12944.00	235.00	247.03		247.03	0.000012	0.50	49317.26	7624.00	0.03
Angelina River	Upstream	50340	5 YR	21707.00	235.00	249.18		249.18	0.000013	0.60	66157.56	8016.57	0.03
Angelina River	Upstream	50340	10 YR	28205.00	235.00	250.51		250.51	0.000014	0.67	76941.06	8211.83	0.03
Angelina River	Upstream	50340	25 YR	35110.00	235.00	251.86		251.86	0.000014	0.72	88094.58	8333.70	0.03
Angelina River	Upstream	50340	50 YR	41349.00	235.00	252.94		252.94	0.000014	0.76	97168.68	8431.56	0.03
Angelina River	Upstream	50340	100 YR	47334.00	235.00	253.89		253.89	0.000015	0.80	105215.70	8517.40	0.03
Angelina River	Downstream	43601	2 YR	15651.00	234.06	246.95		247.00	0.000176	2.60	16735.27	4351.32	0.15
Angelina River	Downstream	43601	5 YR	26053.00	234.06	249.11		249.15	0.000154	2.77	27490.49	5623.62	0.14
Angelina River	Downstream	43601	10 YR	34133.00	234.06	250.44		250.48	0.000138	2.81	35440.55	6171.90	0.14
Angelina River	Downstream	43601	25 YR	44571.00	234.06	251.79		251.83	0.000126	2.87	43821.54	6239.42	0.13
Angelina River	Downstream	43601	50 YR	54805.00	234.06	252.87		252.91	0.000124	2.98	50593.90	6293.46	0.13
Angelina River	Downstream	43601	100 YR	64803.00	234.06	253.82		253.86	0.000123	3.09	56576.94	6340.82	0.13
Angelina River	Downstream	43600	2 YR	15651.00	234.06	246.95	242.29	247.00	0.000176	2.60	16734.47	4351.21	0.15
Angelina River	Downstream	43600	5 YR	26053.00	234.06	249.11	243.48	249.15	0.000154	2.77	27489.63	5623.53	0.14
Angelina River	Downstream	43600	10 YR	34133.00	234.06	250.44	244.14	250.48	0.000138	2.81	35439.70	6171.89	0.14
Angelina River	Downstream	43600	25 YR	44571.00	234.06	251.79	244.80	251.83	0.000126	2.87	43820.78	6239.42	0.13
Angelina River	Downstream	43600	50 YR	54805.00	234.06	252.87	245.31	252.91	0.000124	2.98	50593.13	6293.45	0.13
Angelina River	Downstream	43600	100 YR	64803.00	234.06	253.82	245.79	253.86	0.000123	3.09	56576.17	6340.81	0.13
Angelina River	Downstream	43250		Bridge									
Angelina River	Downstream	42900	2 YR	15651.00	233.82	246.79		246.81	0.000124	1.90	18725.58	3531.98	0.11
Angelina River	Downstream	42900	5 YR	26053.00	233.82	248.97		249.00	0.000128	2.21	27037.68	4088.28	0.11
Angelina River	Downstream	42900	10 YR	34133.00	233.82	250.31		250.34	0.000132	2.40	32729.43	4410.61	0.12
Angelina River	Downstream	42900	25 YR	44571.00	233.82	251.66		251.69	0.000141	2.65	38863.75	4673.95	0.12
Angelina River	Downstream	42900	50 YR	54805.00	233.82	252.74		252.78	0.000152	2.89	44004.19	4883.71	0.13
Angelina River	Downstream	42900	100 YR	64803.00	233.82	253.68		253.72	0.000162	3.09	48692.56	5067.45	0.13
Angelina River	Downstream	40400	2 YR	15651.00	232.98	246.49		246.51	0.000180	2.30	18463.79	4078.20	0.13
Angelina River	Downstream	40400	5 YR	26053.00	232.98	248.69		248.71	0.000164	2.52	28399.54	4967.86	0.13
Angelina River	Downstream	40400	10 YR	34133.00	232.98	250.02		250.04	0.000172	2.76	35363.41	5800.38	0.13
Angelina River	Downstream	40400	25 YR	44571.00	232.98	251.37		251.40	0.000157	2.81	43267.92	5834.34	0.13
Angelina River	Downstream	40400	50 YR	54805.00	232.98	252.44		252.47	0.000156	2.93	49520.91	5861.08	0.13
Angelina River	Downstream	40400	100 YR	64803.00	232.98	253.38		253.41	0.000156	3.05	55014.89	5884.46	0.13
Angelina River	Downstream	39350	2 YR	15651.00	232.63	246.44		246.44	0.000040	0.95	35690.58	6570.21	0.05
Angelina River	Downstream	39350	5 YR	26053.00	232.63	248.64		248.64	0.000039	1.07	50978.02	7329.12	0.05
Angelina River	Downstream	39350	10 YR	34133.00	232.63	249.96		249.97	0.000040	1.16	61016.39	7787.32	0.06
Angelina River	Downstream	39350	25 YR	44571.00	232.63	251.32		251.33	0.000041	1.26	71659.17	7866.11	0.06
Angelina River	Downstream	39350	50 YR	54805.00	232.63	252.39		252.40	0.000044	1.36	80084.29	7919.48	0.06
Angelina River	Downstream	39350	100 YR	64803.00	232.63	253.32		253.33	0.000047	1.45	87501.48	7966.17	0.06
Angelina River	Downstream	36950	2 YR	15651.00	231.82	246.21		246.30	0.000242	3.12	11729.07	2546.46	0.17
Angelina River	Downstream	36950	5 YR	26053.00	231.82	248.41		248.50	0.000248	3.60	17955.06	3127.98	0.18
Angelina River	Downstream	36950	10 YR	34133.00	231.82	249.73		249.83	0.000253	3.89	22315.73	3477.85	0.18
Angelina River	Downstream	36950	25 YR	44571.00	231.82	251.08		251.19	0.000256	4.16	27722.23	4132.43	0.19
Angelina River	Downstream	36950	50 YR	54805.00	231.82	252.14		252.26	0.000259	4.37	32117.48	4164.22	0.19
Angelina River	Downstream	36950	100 YR	64803.00	231.82	253.07		253.19	0.000263	4.57	35980.82	4191.96	0.19
Angelina River	Downstream	33750	2 YR	15651.00	230.74	244.91		245.16	0.000739	4.43	5738.99	1428.07	0.23
Angelina River	Downstream	33750	5 YR	26053.00	230.74	247.04		247.34	0.000820	5.23	9326.84	1939.47	0.25
Angelina River	Downstream	33750	10 YR	34133.00	230.74	248.35		248.66	0.000836	5.62	12069.07	2253.40	0.26
Angelina River	Downstream	33750	25 YR	44571.00	230.74	249.68		250.02	0.000865	6.05	15292.43	2573.91	0.27

HEC-RAS Plan: Prop 300 MM (Continued)

River	Reach	River Sta	Profile	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
Angelina River	Downstream	33750	50 YR	54805.00	230.74	250.75		251.09	0.000870	6.33	18108.74	2676.13	0.27
Angelina River	Downstream	33750	100 YR	64803.00	230.74	251.67		252.02	0.000866	6.55	20606.95	2708.61	0.27
Angelina River	Downstream	32550	2 YR	15651.00	230.34	244.26		244.42	0.000736	4.38	7541.04	1937.85	0.26
Angelina River	Downstream	32550	5 YR	26053.00	230.34	246.53		246.69	0.000596	4.57	12423.20	2358.32	0.24
Angelina River	Downstream	32550	10 YR	34133.00	230.34	247.89		248.05	0.000557	4.77	15803.00	2610.02	0.24
Angelina River	Downstream	32550	25 YR	44571.00	230.34	249.25		249.42	0.000557	5.09	19510.74	2860.78	0.24
Angelina River	Downstream	32550	50 YR	54805.00	230.34	250.31		250.50	0.000572	5.42	22658.06	3015.66	0.25
Angelina River	Downstream	32550	100 YR	64803.00	230.34	251.25		251.44	0.000582	5.69	25493.05	3062.30	0.25
Angelina River	Downstream	30950	2 YR	15651.00	229.81	241.45		242.50	0.002132	8.28	2131.58	578.55	0.49
Angelina River	Downstream	30950	5 YR	26053.00	229.81	242.90		244.74	0.003223	11.26	3233.06	945.66	0.62
Angelina River	Downstream	30950	10 YR	34133.00	229.81	243.94		246.15	0.003585	12.66	4352.92	1209.61	0.66
Angelina River	Downstream	30950	25 YR	44571.00	229.81	245.42		247.62	0.003323	13.23	6430.68	1587.03	0.65
Angelina River	Downstream	30950	50 YR	54805.00	229.81	246.89		248.83	0.002815	13.09	9031.05	1959.50	0.61
Angelina River	Downstream	30950	100 YR	64803.00	229.81	248.23		249.91	0.002375	12.76	11889.52	2300.38	0.57
Angelina River	Downstream	29800	2 YR	15651.00	229.43	241.41		241.52	0.000288	2.65	7169.59	1943.91	0.18
Angelina River	Downstream	29800	5 YR	26053.00	229.43	243.27		243.41	0.000316	3.24	10952.85	2133.21	0.19
Angelina River	Downstream	29800	10 YR	34133.00	229.43	244.53		244.70	0.000318	3.56	13726.82	2261.96	0.20
Angelina River	Downstream	29800	25 YR	44571.00	229.43	246.03		246.22	0.000311	3.86	17240.66	2415.22	0.20
Angelina River	Downstream	29800	50 YR	54805.00	229.43	247.36		247.57	0.000305	4.10	20548.61	2551.10	0.20
Angelina River	Downstream	29800	100 YR	64803.00	229.43	248.56		248.79	0.000299	4.30	23685.69	2673.59	0.20
Angelina River	Downstream	29000	2 YR	15651.00	229.18	239.99	235.73	240.90	0.002951	7.66	2043.84	219.94	0.44
Angelina River	Downstream	29000	5 YR	26053.00	229.18	242.74		242.96	0.000926	5.10	13000.26	4263.33	0.26
Angelina River	Downstream	29000	10 YR	34133.00	229.18	244.16		244.30	0.000617	4.48	19255.68	4544.57	0.22
Angelina River	Downstream	29000	25 YR	44571.00	229.18	245.76		245.86	0.000445	4.10	26753.02	4860.26	0.19
Angelina River	Downstream	29000	50 YR	54805.00	229.18	247.15		247.23	0.000360	3.91	33692.45	5135.18	0.17
Angelina River	Downstream	29000	100 YR	64803.00	229.18	248.39		248.46	0.000309	3.81	40211.91	5380.69	0.16
Angelina River	Downstream	22700	2 YR	15651.00	227.14	239.33		239.35	0.000094	1.76	16995.64	2452.41	0.09
Angelina River	Downstream	22700	5 YR	26053.00	227.14	242.05		242.08	0.000097	2.07	23996.43	2642.17	0.10
Angelina River	Downstream	22700	10 YR	34133.00	227.14	243.49		243.53	0.000107	2.33	27863.22	2707.23	0.11
Angelina River	Downstream	22700	25 YR	44571.00	227.14	245.12		245.17	0.000118	2.62	32331.39	2780.51	0.11
Angelina River	Downstream	22700	50 YR	54805.00	227.14	246.54		246.59	0.000126	2.86	36304.71	2844.08	0.12
Angelina River	Downstream	22700	100 YR	64803.00	227.14	247.79		247.86	0.000134	3.08	39917.32	2900.68	0.12
Angelina River	Downstream	18600	2 YR	15651.00	225.81	238.92		238.95	0.000161	2.33	13684.25	2061.95	0.12
Angelina River	Downstream	18600	5 YR	26053.00	225.81	241.56		241.62	0.000217	3.12	22769.21	4378.10	0.15
Angelina River	Downstream	18600	10 YR	34133.00	225.81	243.04		243.09	0.000181	3.06	29296.94	4452.03	0.14
Angelina River	Downstream	18600	25 YR	44571.00	225.81	244.69		244.73	0.000159	3.07	36711.52	4534.53	0.13
Angelina River	Downstream	18600	50 YR	54805.00	225.81	246.11		246.16	0.000147	3.12	43211.28	4605.65	0.13
Angelina River	Downstream	18600	100 YR	64803.00	225.81	247.38		247.42	0.000140	3.18	49071.44	4668.83	0.13
Angelina River	Downstream	14400	2 YR	15651.00	224.45	238.84		238.84	0.000028	0.87	31995.83	3766.87	0.05
Angelina River	Downstream	14400	5 YR	26053.00	224.45	241.46		241.47	0.000035	1.11	42195.50	4105.88	0.05
Angelina River	Downstream	14400	10 YR	34133.00	224.45	242.93		242.94	0.000041	1.29	48438.54	4388.83	0.06
Angelina River	Downstream	14400	25 YR	44571.00	224.45	244.57		244.58	0.000048	1.49	55913.90	4705.30	0.06
Angelina River	Downstream	14400	50 YR	54805.00	224.45	245.99		246.00	0.000053	1.65	62781.22	4978.33	0.07
Angelina River	Downstream	14400	100 YR	64803.00	224.45	247.25		247.27	0.000057	1.79	69212.91	5221.11	0.07
Angelina River	Downstream	5700	2 YR	15651.00	221.64	238.63		238.64	0.000095	1.71	18309.60	2548.76	0.08
Angelina River	Downstream	5700	5 YR	26053.00	221.64	241.21		241.24	0.000104	2.02	25401.69	2914.83	0.09
Angelina River	Downstream	5700	10 YR	34133.00	221.64	242.65		242.68	0.000114	2.25	29661.62	3021.04	0.10
Angelina River	Downstream	5700	25 YR	44571.00	221.64	244.26		244.29	0.000125	2.50	34618.34	3140.11	0.10
Angelina River	Downstream	5700	50 YR	54805.00	221.64	245.65		245.69	0.000134	2.71	39056.95	3243.02	0.11
Angelina River	Downstream	5700	100 YR	64803.00	221.64	246.89		246.93	0.000141	2.90	43133.12	3334.74	0.11
Angelina River	Downstream	1000	2 YR	15651.00	220.12	237.88	231.14	238.02	0.000350	3.80	8536.88	1716.48	0.19
Angelina River	Downstream	1000	5 YR	26053.00	220.12	240.45	233.69	240.60	0.000350	4.29	13628.76	2283.87	0.19
Angelina River	Downstream	1000	10 YR	34133.00	220.12	241.86	234.92	242.02	0.000350	4.54	16918.16	2390.28	0.20
Angelina River	Downstream	1000	25 YR	44571.00	220.12	243.44	236.01	243.60	0.000350	4.82	20791.09	2509.79	0.20
Angelina River	Downstream	1000	50 YR	54805.00	220.12	244.80	236.94	244.98	0.000350	5.06	24292.33	2613.12	0.20
Angelina River	Downstream	1000	100 YR	64803.00	220.12	246.02	237.76	246.21	0.000350	5.27	27539.54	2705.44	0.20

## **APPENDIX 2**

### **TWDB COMMENTS ON DRAFT REPORT AND ANRA RESPONSES**





# TEXAS WATER DEVELOPMENT BOARD



F. G. Rod Pittman *Chairman*  
William W. Meadows *Member*  
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J. Kevin Ward  
*Executive Administrator*

Jack Hunt *Vice Chairman*  
Thomas Went Labatt III *Member*  
James F. Herring *Member*

August 29, 2005

Mr. Kenneth Reneau  
General Manager  
Angelina & Neches River Authority  
P. O. Box 387  
Lufkin, TX 75902

Re: Regional Water Facility Planning Grant Contract Between the Angelina and Neches River Authority (ANRA) and the Texas Water Development Board (Board), TWDB Contract No. 2001-483-385, Phase II, Draft Final Report Comments

Dear Mr. Reneau:

Staff members of the Board have completed a review of the draft report under TWDB Contract No. 2001-483-385. As stated in the above-referenced contract, the CONTRACTOR(S) must consider incorporating comments from the EXECUTIVE ADMINISTRATOR shown in Attachment 1 and other commentors on the draft final report into a final report. The CONTRACTOR(S) must include a copy of the EXECUTIVE ADMINISTRATOR's comments in the final report.

The Board looks forward to receiving one (1) electronic copy, one (1) unbound single-sided camera-ready original, and nine (9) bound double-sided copies of the final report on this study.

Please contact Mr. Bill Roberts, the Board's designated Contract Manager, at (512) 936-0853 if you have any questions regarding this matter.

Sincerely,

William F. Mullican, III  
Deputy Executive Administrator  
Office of Planning

Attachment 1 – Review Comments

c: Bill Roberts, TWDB

RECEIVED

### Our Mission

To provide leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas.

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A Member of the Texas Geographic Information Council (TGIC)





ATTACHMENT 1

TEXAS WATER DEVELOPMENT BOARD  
Review Comments of the Draft Final Report entitled  
"Lake Eastex Planning Studies"  
Contract No. 2001-483-385  
Phase II

Page 1-1 Include documentation of the public coordination meetings held in Jacksonville

Multiple locations: Clarify that the terms *existing conditions* means conditions "without" the reservoir and *proposed conditions* means conditions "with" the reservoir.

Page 3-1: Consider providing additional details of the operation scenario such as time-series input, period of simulation, source of input data, time steps duration. Consider including release rules and/or assumptions, if releases are anticipated to vary by month of year

Page 3-1, Section 3 2: Consider including the volumetric difference between the initial capacity (before sedimentation) and the mature capacity (50 years of sedimentation)

Page 3-2, 2<sup>nd</sup> paragraph, first sentence: Consider clarifying whether historical time series or daily flows were used in the analyses

Chapter 4: Consider locating both the existing USGS gaging stations and the analysis locations noted in Tables 4 5 to 4 8 on the maps (Figs 4.1 and 4 2).

Page 4-5, Table 4 5: Consider explaining how the discharges in Table 4 5 compare to the observed discharges recorded at the USGS Mud Creek SH79 gage

Page 4-5, 1<sup>st</sup> paragraph: Consider including the flow rate for probable maximum flood (PMF) in the text

Page 4-2: Consider providing a one paragraph description for both HEC-1 and HEC-RAS respectively

Page 4-8, Table 4 8: Consider explaining why the 2-year surface water elevation might be lower than the longer time intervals

Page 4-10: Consider clarifying whether steady-state or historical time-series data were used. Time-series output is indicated in Chapter 4, but Appendix 1 indicates steady-state output for the model runs. Consider clarifying the contradiction

Page 5-4, #9 and #10: Consider providing references or justification to support these statements

Page 5-4, #12 and #13: Impacts to roughly 70% of affected area (7,773 of 10,694 acres) was not addressed by this report. While the lake will likely have negligible impact on the 10% of the 100-year floodplain (per Figure 4.9), consider reporting that 6,348 acres of hydric and 1,425 acres of non-hydric soils are located within the 2-year flood plain (Table 5.2) and that these areas are directly affected by intra-annual variation of flows.



ANRA Response to  
Texas Water Development Board  
Review Comments of the Draft Final Report Entitled  
Lake Columbia Downstream Impacts Analysis  
Contract No. 2001-483-385  
Phase II  
September 2005

Comment: Page 1-1: Include documentation of the public coordination meetings held in Jacksonville.

Response: Documentation added in Section 1, 1.1.

Comment: Multiple locations: Clarify that the terms “existing conditions” means conditions “without” the reservoir and “proposed conditions” means conditions “with” the reservoir.

Response: Clarification added in several locations in Sections 4 and 5.

Comment: Page 3-1: Consider providing additional details of the operation scenario such as time-series input, period of simulation, source of input data, time steps duration. Consider including release rules and/or assumptions, if releases are anticipated to vary by month of the year.

Response: Section 3.0 revised to provide the operation scenario details.

Comment: Page 3-1, Section 3.2: consider including the volumetric difference between the initial capacity (before sedimentation) and the mature capacity (50 years of sedimentation).

Response: Section 3.2 revised to include the mature sedimentation assumption.

Comment: Page 3-2, 2<sup>nd</sup> paragraph, first sentence: consider clarifying whether historical time series or daily flows were used in the analyses.

Response: Section 3.3 revised to indicate that daily historical runoff data were used for the analysis.

Comment: Chapter 4: Consider locating both the existing USGS gaging stations and the analysis locations noted in Tables 4.5 to 4.8 on the maps (Figs 4.1 and 4.2).

Response: The USGS location was added to Figure 4.1. Figure 4.2 does not include the area where the gage is located. The cross sections noted in the tables were highlighted with bold lines and labels on each map.

Comment: Page 4-5, Table 4.5: Consider explaining how the discharges in Table 4.5 compare to the observed discharges recorded at USGS Mud Creek SH79 gage.

Response: The USGS gage records began in 1940 and continued to 1979. The gage was inactive until 2002, but has been active since then. A frequency analysis of the gage information shows discharges lower than the data developed for the study. The hydrology was calibrated to the April 1966 storm at that gage and a comparison of the hydrographs was provided in the Lake Eastex Planning Studies Report (Freese and Nichols, Inc. 2003). These values were then used in HEC-1 to obtain a full estimated hydrograph, which a frequency analysis cannot provide. The parameters which were used in the analysis were reasonable and calibration to the frequency of the gage records would result in the use of some parameters which are not consistent with standard values. The gage information was also influenced by the construction of the Tyler Lakes.



Comment: Page 4-5, 1<sup>st</sup> paragraph: Consider including the flow rate for the probable maximum flood (PMF) in the text.

Response: The discharges at the dam were included in Section 4.3.2.

Comment: Page 4-2: Consider providing a one paragraph description for both HEC-1 and HEC-RAS, respectively.

Response: Brief descriptions were added to Sections 4.3 (HEC-1) and 4.4 (HEC-RAS).

Comment: Page 4-8, Table 4.8: Consider explaining why the 2-year surface water elevation might be lower than the longer time intervals.

Response: The 2-year flood is defined in hydrologic terms as the flood that is expected to occur, on average, once every two years. This two year time period is called the “recurrence interval.” Floods that are expected to occur, on average, less frequently than the 2-year flood are larger magnitude events. Examples of the concept that greater runoff is associated with less frequent (longer recurrence interval) events is illustrated in Tables 4.7 and 4.8 of the report. Thus, of the six flood recurrence intervals evaluated in the current study, the 2-year flood has the smallest discharge which results in the lowest water surface elevation.

Comment: Page 4-10: Consider clarifying whether steady-state or historical time series data were used. Time-series output is indicated in Chapter 4, but appendix 1 indicates steady-state output for the model runs. Consider clarifying the contradiction.

Response: The operating scenarios which are described in the text were used to get a starting water surface elevation. This elevation was then used as a starting water surface elevation for the HEC-1 program which modeled the dam, and the output was a peak discharge, which was input into the HEC-RAS program. The steady state function of HEC-RAS was used and has been noted as such in Section 4.5.

Comment: Page 5-4, #9 and #10: Consider providing references or justification to support these statements.

Response: References cited in the literature discussion in Section 2-2 of the report have been added to conclusion #9. Conclusion #10 is our logically deduced opinion given the literature supported conclusion #9.

Comment: Page 5-4, #12 and #13: Impacts to roughly 70% of affected area (7,773 of 10,694 acres) was not addressed by this report. While the lake will likely have negligible impact on the 10% of the 100-year floodplain (per Figure 4.9), consider reporting that 6,348 acres of hydric and 1,425 acres of non-hydric soils are located within the 2-year floodplain (Table 5.2) and that these areas are directly affected by intra-annual variation of flows.

Response: This study considered the effects of the dam on all of the Mud Creek 100-year floodplain downstream from the proposed dam site. As noted in conclusion #13, using mapped hydric soils as an indicator, wetlands are expected to occur at the edge of the 100-year floodplain. This is well beyond the area influenced by intra-annual, or less than 1-year flows. Given this observation, wetland hydrology is expected to persist within the existing intra-annual flow variation area, whether it is due to stream hydrology or another hydrologic mode such as direct precipitation, or surface runoff or seepage from adjacent areas.



## **APPENDIX 3**

**SATELLITE PHOTO IMAGES OF DOWNSTREAM STUDY  
AREA (CD-ROM ON BACK COVER)**

