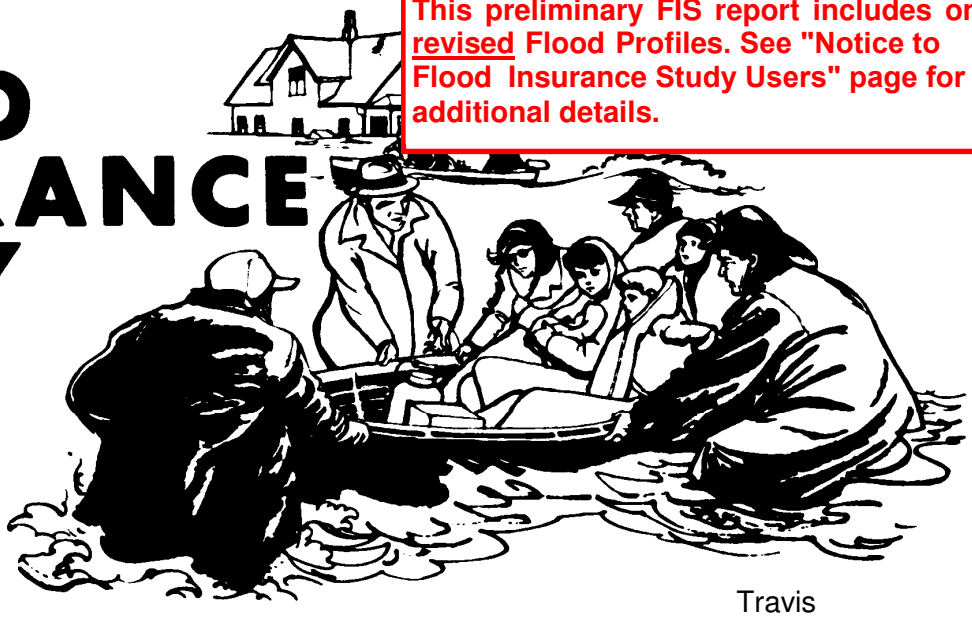
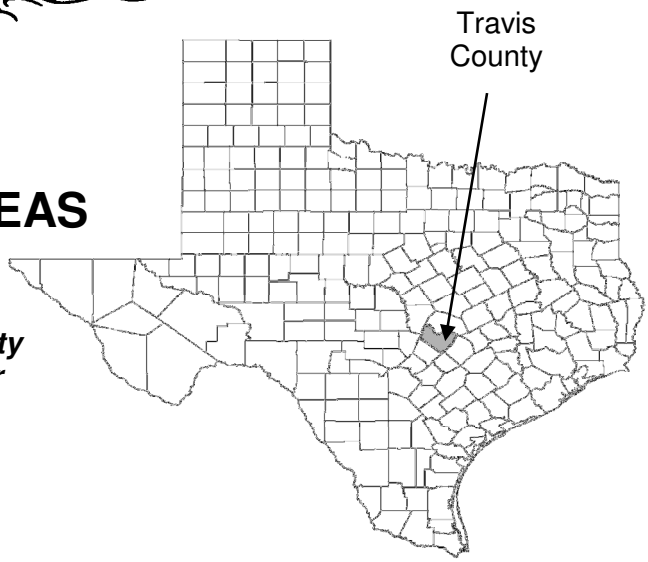
Notice

This preliminary FIS report includes only revised Flood Profiles. See "Notice to Flood Insurance Study Users" page for additional details.

FLOOD INSURANCE STUDY



TRAVIS COUNTY, TEXAS
AND INCORPORATED AREAS
VOLUME 1 OF 7



Community Name	*Community Number*
TRAVIS COUNTY (UNINCORPORATED AREAS)	481026
AUSTIN, CITY OF	480624
BEE CAVE, VILLAGE OF	481610
BRIAR CLIFF, VILLAGE OF	481649
*CEDAR PARK, CITY OF	481282
CREEDMOOR, CITY OF	481697
*ELGIN, CITY OF	480023
JONESTOWN, CITY OF	481597
LAGO VISTA, CITY OF	481588
LAKEWAY, CITY OF	481303
LEANDER, CITY OF	481536
MANOR, CITY OF	481027
MUSTANG RIDGE, CITY OF	481687
PFLUGERVILLE, CITY OF	481028
POINT VENTURE, VILLAGE OF	481691
ROLLINGWOOD, CITY OF	481029
ROUND ROCK, CITY OF	481048
SAN LEANNA, VILLAGE OF	481305
SUNSET VALLEY, CITY OF	481127
THE HILLS, VILLAGE OF	480063
VOLENTE, VILLAGE OF	481696
WEBBERVILLE, VILLAGE OF	480062
WEST LAKE HILLS, CITY OF	481030

* No Special Flood Hazard Areas Identified

REVISED PRELIMINARY: 2/23/2015

Revised: To be determined

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER

48453CV001C

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Countywide FIS Effective Date: June 16, 1993

First Revised Countywide FIS Date: June 5, 1997

Second Revised Countywide FIS Date: January 19, 2000

Third Revised Countywide FIS Date: April 15, 2002

Fourth Revised Countywide FIS Date: September 26, 2008

Fifth Revised Countywide FIS Date: August 18, 2014 to incorporate previously issued Letters of Map Revision and perform additional analysis of an approximately 1 mile stretch of new detailed study along Elm Creek.

Sixth Revised Countywide FIS Date: To be determined

This preliminary FIS report does not include unrevised Floodway Data Tables or unrevised Flood Profiles. These Floodway Data Tables and Flood Profiles will appear in the final FIS report.

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EXHIBITS (continued)

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EXHIBITS (continued)

FLOOD INSURANCE STUDY
TRAVIS COUNTY, TEXAS AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Travis County, including the Cities of Austin, Cedar Park, Creedmoor, Elgin, Jonestown, Lago Vista, Lakeway, Leander, Manor, Mustang Ridge, Pflugerville, Rollingwood, Round Rock, Sunset Valley, West Lake Hills; the Villages of Bee Cave, Briarcliff, Point Venture, San Leanna, The Hills, Volente, Webberville; and the unincorporated areas of Travis County (referred to collectively herein as Travis County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

Please note that the Cities of Cedar Park, Leander and Round Rock, Austin, and Pflugerville are geographically located in Travis and Williamson Counties; the City of Elgin is geographically located in Travis and Bastrop Counties; and the City of Mustang Ridge is geographically located in Travis and Caldwell Counties. See these separately published FIS reports and Flood Insurance Rate Maps (FIRMs) for county-wide map dates and flood hazard information outside of Travis County.

Please note that on the effective date of this study, the Cities of Cedar Park and Elgin have no mapped Special Flood Hazard Areas (SFHA). This does not preclude future determinations of SFHAs that could be necessitated by changed conditions affecting the community or the availability of new scientific or technical data about flood hazards.

In some States or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence, and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS report are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The single-community FIS reports were incorporated into a countywide FIS report, effective June 16, 1993. The communities and their respective community FIS report data are listed below:

Travis County

The hydrologic and hydraulic analyses for the FIS dated June 1978 were prepared by URS/Forrest and Cotton, Inc., Consulting Engineers, for FEMA, under Contract No. H-

3972. In the revision of the FIS dated October 1, 1981, and the FIRM dated April 1, 1982 the hydrologic and hydraulic analyses were prepared by the U.S. Army Corps of Engineers (USACE), Fort Worth District (Reference 1).

City of Austin

The hydrologic and hydraulic analyses for the FIS dated June 1978 were prepared by URS/Forrest and Cotton, Inc., Consulting Engineers, for the Federal Emergency Management Agency (FEMA), under Contract No. H-3972. In the FIS revision dated March 2, 1981, and the FIRM dated September 2, 1981, the hydrologic and hydraulic analyses were prepared by the USACE, Fort Worth District (Reference 2).

City of Jonestown

The hydrologic and hydraulic analyses for the FIS dated March 16, 1988 were prepared by URS/Forrest and Cotton, Inc., Consulting Engineers during the preparation of the FIS for the unincorporated areas of Travis County and the City of Austin, dated June 1978 (Reference 3).

City of Lago Vista

The hydrologic and hydraulic analyses for the FIS dated December 18, 1986 were prepared by URS/Forrest and Cotton, Inc., Consulting Engineers during the preparation of the FIS for the unincorporated areas of Travis County and the City of Austin, dated June 1978 (Reference 4).

City of Lakeway

The hydrologic and hydraulic analyses for the FIS dated March 1980 and the FIRM dated November 5, 1980, were prepared by URS/Forrest and Cotton, Inc., Consulting Engineers under Contract No. H-3972. This work was completed in November 1977 (Reference 5).

City of Pflugerville

The hydrologic and hydraulic analyses for the FIS dated November 1977, and the FIRM dated May I, 1978, were prepared by URS/Forrest and Cotton, Inc., Consulting Engineers, for FEMA, under Contract No. H-3972. This work was completed in April 1977 (Reference 6).

City of Rollingwood

Hydrologic and hydraulic analyses for the FIS dated March 1978, and the FIRM dated September 29, 1978, were prepared by URS/Forrest and Cotton, Inc., Consulting Engineers, for FEMA, under Contract No. H-3972. Work was completed in June 1977 (Reference 7).

Village of San Leanna

Hydrologic and hydraulic analyses for the FIS dated March 1980, and the FIRM dated September 5, 1980, prepared by URS/Forrest and Cotton, Inc., Consulting Engineers,

for FEMA, under Contract No. H-3972. This work was completed in August 1977 (Reference 8).

City of Sunset Valley

The hydrologic and hydraulic analyses for the FIS dated August 1978, and the FIRM dated March I, 1979, prepared by URS/Forrest and Cotton, Inc., Consulting Engineers, for FEMA, under Contract No. H-3972. This work was completed in October 1977 (Reference 9).

City of West Lake Hills

The hydrologic and hydraulic analyses for the August 1, 1984 FIS were prepared by URS/Forrest and Cotton, Inc., Consulting Engineers under Contract No. H-3972. That work was completed in April 1977. An updated version was prepared by Dewberry & Davis, under agreement with FEMA. This work was completed in April 1983 (Reference 10).

Countywide FIS Report Major Revisions

Four major revisions were made to the original countywide FIS report. The first revision, effective on June 5, 1997, incorporated a detailed study of flooding on Boggy Creek South from the confluence with Onion Creek to approximately 300 feet upstream of Cameron Loop. The total length of the study was 6.2 miles. Several Letters of Map Revision (LOMR) were incorporated into the first revision (Reference 11).

The second major revision to the original countywide FIS report, effective on January 19, 2000, incorporated revised detailed flood hazard information along Barton Creek, Bear Creek, Little Bear Creek, Long Branch, and Onion Creek (Reference 11).

The third major revision to the original countywide FIS report, effective April 15, 2002, converted detailed flood hazard information for Lake Travis and the Colorado River affecting the Cities of Jonestown, Lago Vista, and Lakeway, the Village of Point Venture and some portions of the unincorporated areas of Travis County, into digital format (Reference 11).

The fourth major revision to the original county-wide FIS report, effective on September 26, 2008, included several new hydrologic and hydraulic analyses. New detailed studies were prepared by Halff Associates, Inc., under Contract No. EMT-2002-CO-0051. Under this contract, new detailed studies were prepared for the following flooding sources: Danz Creek, Danz Creek Split, East Bouldin Creek, Little Walnut Creek, Little Walnut Creek Tributary 1, Little Walnut Creek Tributary 2, Little Walnut Creek Tributary 3, Marble Creek, North Fork West Bouldin Creek, Slaughter Creek, Slaughter Creek Tributary 1, South Boggy Creek, Walnut Creek, Walnut Creek Tributary 1, Walnut Creek Tributary 2, Walnut Creek Tributary 3, Walnut Creek Tributary 4, Walnut Creek Tributary 5, Walnut Creek Tributary 6, Walnut Creek Tributary 7, Walnut Creek Tributary 7A, Walnut Creek Tributary 8, Walnut Creek Tributary 9, Walnut Creek Tributary 10, Wells Branch, and West Bouldin Creek. Under this same contract, Walnut Creek Tributary 2A was studied using limited detailed methods.

Also under Contract No. EMT-2002-CO-0051, Halff Associates, Inc., incorporated several new detailed studies for the following flooding sources: Federally funded MAS No. 1 provided for new detailed studies prepared by Watershed Concepts A Division of HSMM Inc., for Carson Creek, Carson Creek Tributary 2, Carson Creek Tributary 3, Carson Creek Tributary 4; other new detailed studies included the following flooding sources: Colorado River, East Branch of Fort Branch Tributary 1, Fort Branch, Fort Branch Tributary 1, Fort Branch Tributary 2, Foster Branch, Hancock Branch, Montopolis Tributary, Onion Creek, and Shoal Creek.

New detailed analyses were prepared for the Tannehill Branch Watershed and the Waller Creek Watershed. The Tannehill Branch Watershed was submitted to FEMA and a LOMR was issued for Case No. 00-06-2129, effective January 04, 2001. The LOMR included the following flooding sources: Tannehill Branch of Boggy Creek North, Givens Park Tributary No. 1, Givens Park Tributary No. 2, and West Tributary 3 of Tannehill Branch. The Waller Creek Watershed study was submitted to FEMA and a LOMR was issued for Case No. 03-06-2670P, effective March 23, 2005. The LOMR included the following flooding sources: Waller Creek and Hemphill Branch. Under Contract No. EMT-2002-CO-0051, Halff Associates, Inc., incorporated each of these LOMRs into this FIS.

The City of Austin, as a FEMA Cooperating Technical Partner (CTP), entered into non-federally funded Mapping Activity Statement (MAS) No. 2. Under MAS No. 2, Halff Assiciates Inc., prepared new detailed studies for the following flooding sources: Boggy Creek North, Blunn Creek, Danz Creek Tributary 1, Danz Creek Tributary 2, Slaughter Creek Tributary 2, Slaughter Creek Tributary 3, Slaughter Creek Tributary 4, and Slaughter Creek Tributary 5. A portion of MAS No. 2 included a limited detailed analysis of Slaughter Creek Tributary 6, Slaughter Creek Tributary 7, Slaughter Creek Tributary 8, Slaughter Creek Tributary 8a, Slaughter Creek Tributary 9, and Slaughter Creek Tributary 10.

Under the City of Austin CTP, non-federally funded, MAS No. 3, Halff Associates, Inc., prepared new detailed analyses of the following flooding sources: Dry Creek North, Dry Creek North Tributary 1, Dry Creek North Tributary 2, Dry Creek North Tributary 3, Dry Creek North Tributary 4, Harris Branch, Harris Branch Tributary 3, Harris Branch Tributary 4, Harris Branch Tributary 5, Harris Branch Tributary 6, Johnson Creek, and Possum Trot Branch.

To be incorporated, under the City of Austin CTP non-federally funded MAS No. 4, Espey Consultants, Inc., prepared new detailed analyses of the following flooding sources: Cherry Creek, Kincheon Branch, Pleasant Hill Tributary, Sunset Valley Tributary, Williamson Creek, Williamson Creek Tributary 1, Williamson Creek Tributary 2, Williamson Creek Tributary 3, Williamson Creek Tributary 4, Williamson Creek Tributary 5, and Williamson Creek Tributary 6.

<u>August 18, 2014 Physical Map Revision</u>

For the August 18, 2014 revision, new hydrologic and hydraulic analyses were compiled for a portion of Elm Creek. This analyses updated LOMR 09-06-3280P, which was also incorporated into this revision. In addition to that analyses the following LOMRs were incorporated into this PMR: 08-06-2891P, 08-06-3201P, 08-06-1153P, 10-06-1752P, 10-

06-1794P, 10-06-1285P, 10-06-2503P, 11-06-4644P, 10-06-2464, 09-06-2275P, 09-06-0609, 09-06-0003, 09-06-2902P, 08-06-3202, 08-06-2992P, and 12-06-2557P.

This Physical Map Revision

For this revised countywide study, new hydrologic and hydraulic analyses were provided for streams in the Boggy Creek, Bull Creek, Carson Creek, Cottonmouth Creek, Dry Creek East, and Shoal Creek watersheds.

For Cottonmouth Creek and streams in the Boggy Creek and Carson Creek watersheds, hydrologic and hydraulic analyses were performed by Atkins. For streams in the Bull Creek, Dry Creek East, and Shoal Creek hydrologic and hydraulic analyses were performed by Halff and Associates. Each of these were completed for FEMA, under Contract No. EMT-2010-CA-011. The work was completed in August 2013.

Base map information shown on this FIRM was provided in a digital format by the City of Austin and CAPCOG. The projection used in the preparation of the FIRMs was Texas State Plane Central Zone (FIPSZONE 4203) and the horizontal datum was NAD83, GRS1980 spheroid.

1.3 Coordination

September 26, 2008 Countywide Revision

The initial Consultation Coordination Officer (CCO) meeting was held in October 2003, and attended by representatives of FEMA, City of Pflugerville, West Lake Hills, Sunset Valley, LCRA, Michael Baker Jr., Inc., City of Austin, Halff Associates, Inc., Travis County, TX, TxDOT, and Texas Water Development Board.

The results of the 2008 study were reviewed at the final CCO meetings held in March and April of 2006, and attended by representatives of FEMA, the communities and the study contractor. All problems raised at those meetings have been addressed in this study.

August 18, 2014 Physical Map Revision

The results of this PMR were reviewed at the final CCO meeting held on June 18, 2012, and attended by representatives of FEMA, the communities, and the study contractor. All problems raised at that meeting have been addressed in this study.

This Physical Map Revision

The results of this PMR were reviewed at the final CCO meeting held on _____, and attended by representatives of FEMA, the communities, and the study contractor. All problems raised at that meeting have been addressed in this study.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS report covers the geographic area of Travis County, Texas, including the incorporated communities listed in Section 1.1.

September 26, 2008 Countywide FIS Report

In the 2008 study, the areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction through August 2005. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and community officials.

August 18, 2014 Physical Map Revision

This PMR developed detailed Digital Flood Insurance Rate Maps (DFIRMs) and Flood Insurance Study (FIS) for selected streams in Travis County, Texas which includes the community of City of Austin (480624), City of Manor (481027), City of Pflugerville (481028), City of Lakeway (481303), City of Round Rock (481048), and Village of the Hills (480063). This PMR was originally only scoped to integrate two approved letters of map revision (LOMRs) from the City of Austin into the Travis County, Texas and incorporated areas FIS and FIRM panels. As such, there was no hydraulic or hydrologic data development task required. However, in the course of incorporating the LOMRs, a conflicting approved LOMR was discovered along Elm Creek that necessitated a change in scope to perform additional analyses. The additional analysis required was a new detailed study along an approximately 1 mile stretch of stream (Elm Creek). Flood information from this detailed study will supersede the 2008 effective data of Elm Creek in FIRM panel 48453C0470H.

This PMR incorporates Letters of Map Revision (LOMR) Case Numbers 08-06-2891P, 09-06-3280P, 08-06-1153P, 08-06-3201P, 08-06-2992P, 10-06-1752P, 10-06-1794P, 10-06-1285P, 10-06-2503P, 11-06-4644P, 10-06-2464, 09-06-2275P, 09-06-0609, 09-06-0003, 09-06-2902P, and 08-06-3202P. The flood boundaries for the following streams were revised; Colorado River, Fort Branch Creek, Fort Branch Creek 2, Gilleland Creek, Unnamed Tributary to Gilleland Creek, Unnamed Tributary to Unnamed Tributary to Gilleland Creek, Gilleland Creek Tributaries: 1, 1A, 1B, 1C, 2 & 3. Decker Creek, Decker Creek Tributaries 1, 1A, & 2. Elm Creek, Elm Creek Tributary 1, Unnamed Tributary to Decker Creek, Unnamed Tributary to Wilbarger Creek, Unnamed Tributary to Unnamed Tributary to Wilbarger Creek, Walnut Creek and Wells Branch. The profiles for the following streams were revised; Colorado River, Fort Branch Creek, Fort Branch Creek 2, Gilleland Creek, Gilleland Creek Tributaries: 1, 1A, 1B, 1C, 2 & 3. Elm Creek, Elm Creek Tributary 1. Decker Creek, Upper Decker Creek, Decker Creek Tributaries 1, 1A, & 2, Unnamed Tributary to Unnamed Tributary to Wilbarger Creek, and Wells Branch. The floodway data tables for the following streams were revised; Gilleland Creek, Gilleland Creek Tributaries: 2, 3. Elm Creek.

Detailed study streams that were studied prior to this countywide revision are shown in Table 1, “Stream Reaches Studied by Detailed Methods”.

Table 1 – Stream Reaches Studied by Detailed Methods

Stream Name	Downstream Limit	Upstream Limit	Length (mi)
Apache Shores Creek	Confluence with Colorado River	1,860 feet upstream of Apache Lake Dam	1.1
Apache Shores Tributary	Confluence with Apache Shores Creek	120 feet upstream of Indian Creek Road	0.7
Barton Creek	Confluence with Colorado River	230 feet upstream of State Route 1	5.7
Barton Creek	8.94 miles upstream of confluence with Colorado River	14.56 miles upstream of confluence with Colorado River	5.6
Barton Creek	Downstream face of State Route 71	100 feet upstream of private road	0.1
Barton Creek	0.75 mile downstream of Fitzhugh Road	Hays County/Travis County boundary	0.9
Barton Skyway Tributary of Barton Creek	Confluence with Barton Creek	740 feet upstream of Spyglass Drive	0.3
Bear Creek	Confluence with Onion Creek	Hays County/Travis County Boundary	7.3
Bear Creek Tributary	Confluence with Bear Creek	120 feet upstream of Frate Baker Lane	0.8
Bee Creek	Confluence with Colorado River	980 feet upstream of dam	1.9
Big Sandy Creek	Confluence with Colorado River	6.8 miles upstream of Round Mountain Road	9.4
Big Sandy Creek Tributary 1 (Cherry Hollow)	Confluence with Big Sandy Creek	650 feet upstream of FM 1431	0.3
Big Sandy Creek Tributary 2 (Bloody Hollow)	Confluence with Big Sandy Creek	0.48 mile upstream of confluence with Big Sandy Creek	0.5
Big Sandy Creek Tributary 3 (Bingham Creek)	Confluence with Big Sandy Creek	110 feet upstream of Round Mountain Road	0.2
Blunn Creek	Confluence with Colorado River	1,570 feet upstream of Alpine Drive	3.3
Boggy Creek North	Confluence with Colorado River	Downstream face of Airport Boulevard	7
Boggy Creek Tributary 1	Confluence with Boggy Creek North	Downstream face of Airport Boulevard	0.7
Bull Creek Tributary 1	Confluence with Bull Creek	1,380 feet upstream of FM 222	0.3
Bull Creek Tributary 2	Confluence with Bull Creek	1,125 feet upstream of Floral Park	2.5
Bull Creek Tributary 4	Confluence with Bull Creek	1,380 feet upstream of dam	1.6

Table 1 – Stream Reaches Studied by Detailed Methods *(continued)*

Stream Name	Downstream Limit	Upstream Limit	Length (mi)
Bull Creek Tributary 5	Confluence with Bull Creek	0.92 mile upstream of confluence of Bull Creek Tributary 6	1.6
Bull Creek Tributary 6	Confluence with Bull Creek Tributary 5	1.19 miles upstream of Confluence with Bull Creek Tributary 5	1.2
Carson Creek	Confluence with Colorado River	0.4 mile downstream of Montopolis Drive	4.9
Carson Creek Tributary 2	Confluence with Carson Creek	0.2 mile upstream of State Highway 71	0.3
Carson Creek Tributary 3	Confluence with Carson Creek	Thornberry Road	0.2
Carson Creek Tributary 4	Confluence with Carson Creek	0.2 mile downstream of Dalton Lane	0.3
CCE-1	Confluence with Country Club Creek East	Downstream face of Fairway Street	0.5
CCE-2	Confluence with Country Club Creek East	220 feet downstream of Crossing Place	0.3
CCE-3	Confluence with Country Club Creek East	380 feet upstream of Riverside Drive	0.3
CCE-4	Confluence with Country Club Creek East	430 feet downstream of Grove Boulevard	0.5
CCW-1	Confluence with Country Club Creek West	670 feet upstream of Riverside Farms Road	0.9
CCW-2	Confluence with Country Club Creek West	1290 feet upstream of Oltorf Street	0.9
CCW-3	Confluence with Country Club Creek West	Downstream face of SH 71/Ben White Boulevard	0.9
CCW-3A	Confluence with Country Club Creek West	1460 feet upstream of confluence with CCW-3	0.3
CCW-4	Confluence with Country Club Creek West	1000 feet upstream of Parker Lane	0.6
CCW-5	Confluence with Country Club Creek West	680 feet upstream of Granada Drive	0.4
Cherry Creek	Confluence with Williamson Creek	980 feet upstream Lazy Oaks Drive	1.9
Clarkson Branch	Confluence with Boggy Creek North	Downstream face of 38th ½ Street	0.6
Colorado River	Travis County/Bastrop County Boundary	Downstream face of Mansfield Dam	55.4
Cottonmouth Creek	Confluence with Onion Creek	75 feet upstream of Sassman Road	5.8
Country Club Creek East	Confluence with Colorado River	0.6 mile upstream of Riverside Drive	2.7

Table 1 – Stream Reaches Studied by Detailed Methods *(continued)*

Stream Name	Downstream Limit	Upstream Limit	Length (mi)
Cypress Creek	Confluence with Colorado River	0.67 mile upstream of confluence of Cypress Creek Tributary 1	1.8
Cypress Creek Tributary 1	Confluence with Cypress Creek	2,480 feet upstream of confluence of Cypress Creek Tributary 2	0.8
Cypress Creek Tributary 2	Confluence with Cypress Creek Tributary 1	1,140 feet upstream of FM 2769	0.3
Danz Creek	Confluence with Slaughter Creek	Upstream face of FM 1826	5.6
Danz Creek Split	Confluence with Danz Creek	Divergence from Danz Creek, 1560 feet upstream of State Highway 45	1.8
Danz Creek Tributary 1	Confluence with Danz Creek	0.67 mile upstream of confluence with Danz Creek	0.7
Danz Creek Tributary 2	Confluence with Danz Creek	0.75 mile upstream of confluence with Danz Creek	0.8
Decker Creek (DS of Lake)	DS of Lake	6.2 miles upstream	6.2
Decker Creek Tributary 1	Confluence with Decker Creek	1.75 miles upstream of Decker Creek	1.75
Decker Creek Tributary 1A	Confluence with Decker Creek	2.25 miles upstream of Decker Creek	2.25
Decker Creek Tributary 2	Normal pool extent of Decker Lake	2.75 miles upstream of Decker Lake	2.75
Decker Creek Upper	Normal pool extent of Decker Lake	1.19 miles upstream of Decker Lake	1.19
Dry Creek 2	Confluence with Colorado River	1,810 feet upstream of Sundown Parkway	5.6
Dry Creek 3	Travis County/Bastrop County Boundary	680 feet upstream of State Route 71	1.9
Dry Creek North	Confluence with Colorado River	1,050 feet upstream of Laurel Valley Drive	3
Dry Creek North Tributary 1	Confluence with Dry Creek North	940 feet upstream of FM 2222	0.4
Dry Creek North Tributary 2	Confluence with Dry Creek North	Upstream face of Berry Hill Drive	0.2
Dry Creek North Tributary 3	Confluence with Dry Creek North	870 feet upstream of confluence with Dry Creek North	0.2
Dry Creek North Tributary 4	Confluence with Dry Creek North	640 feet upstream of Dry Creek Road	0.3
East Bouldin Creek	Confluence with Colorado River	Downstream face of Ben White Blvd.	3.7

Table 1 – Stream Reaches Studied by Detailed Methods *(continued)*

Stream Name	Downstream Limit	Upstream Limit	Length (mi)
East Branch of Fort Branch Creek Tributary 1	Confluence with Fort Branch Tributary 1	750 feet upstream of Norwood Hill Road	0.2
Elm Creek	Confluence with Gilleland Creek	9.3 miles upstream of Gilleland Creek	9.3
Elm Creek Tributary 1	Confluence with Elm Creek	1.37 miles upstream of Elm Creek	1.37
Fort Branch Creek	Confluence with Boggy Creek	160 feet upstream of Glencrest Drive	5.5
Fort Branch Creek Tributary 1	Confluence with Fort Branch	400 feet upstream of Rogge Lane	1
Fort Branch Creek Tributary 2	Confluence with Fort Branch	900 feet upstream of Gatson Place	0.5
Foster Branch	Confluence with Shoal Creek	1,090 feet upstream of	0.8
Gilleland Creek	Confluence with Colorado River	31.2 miles upstream of Confluence with Colorado River	31.2
Gilleland Creek Tributary 1	Confluence with Gilleland Creek	2 miles upstream of confluence with Gilleland Creek	2
Gilleland Creek Tributary 1A	Confluence with Gilleland Creek	1.1 miles upstream of Gilleland Creek	1.1
Gilleland Creek Tributary 1B	Confluence with Gilleland Creek	1.6 miles upstream of Gilleland Creek	1.6
Gilleland Creek Tributary 1C	Confluence with Gilleland Creek	2.8 miles upstream of Gilleland Creek	2.8
Gilleland Creek Tributary 2	Confluence with Gilleland Creek	5.9 miles upstream of Gilleland Creek	5.9
Gilleland Creek Tributary 3	Confluence with Gilleland Creek	0.8 mile upstream of Gilleland Creek	0.8
Givens Park Tributary No. 1	Confluence with Tannehill Branch of Boggy Creek North	50 feet upstream of Anchor Lane	1.2
Givens Park Tributary No. 2	Confluence with Givens Park Tributary No. 1	2,330 feet upstream of Martin Luther King Blvd	0.9
Grayson Branch	Confluence with Boggy Creek North	Downstream face of 39th Street	0.3
Hancock Branch	Confluence with Shoal Creek	700 feet upstream of Justin Lane	2.2
Harris Branch	Confluence with Gilleland Creek	530 feet upstream of park crossing	9.2
Harris Branch Tributary 3	Confluence with Harris Branch	750 feet upstream of private drive	2
Harris Branch Tributary 4	Confluence with Harris Branch	Downstream face of Harris Ridge Blvd	3.1
Harris Branch Tributary 5	Confluence with Harris Branch	0.66 mile upstream of Yager Lane	1.8

Table 1 – Stream Reaches Studied by Detailed Methods *(continued)*

Stream Name	Downstream Limit	Upstream Limit	Length (mi)
Harris Branch Tributary 6	Confluence with Harris Branch	0.80 mile upstream of confluence with Harris Branch	0.8
Hemphill Branch	Confluence with Waller Creek	350 feet upstream of 32nd Street	0.9
Hurst Creek	Confluence with Colorado River	0.60 mile upstream of dam	2.9
Hurst Creek Tributary 1	Confluence with Hurst Creek	410 feet upstream of Clara Van Road	0.6
Johnson Creek	Confluence with Colorado River	Downstream face of MO-PAC Expressway	2.5
Kincheon Branch	Confluence with Williamson Creek	750 feet upstream of Abilene Trail	4.9
Lime Creek	Confluence with Colorado River	0.88 feet upstream of confluence of Lime Creek Tributary 2	0.2
Lime Creek Tributary 1	Confluence with Lime Creek	160 feet upstream of Trails End Road	0.2
Lime Creek Tributary 2	Confluence with Lime Creek	250 feet upstream of dam	0.5
Little Barton Creek	Confluence with Barton Creek	1,160 feet upstream of unnamed road	3.8
Little Barton Tributary	Confluence with Little Barton Creek	1,360 feet upstream of unnamed road	1.3
Little Bear Creek	Confluence with Bear Creek	Hays County/Travis County boundary	1.8
Little Bee Creek	Confluence with Colorado River	1,800 feet upstream of Laurel Valley Road	1.9
Little Walnut Creek	Confluence with Walnut Creek	Downstream face of Metric Blvd	8.6
Little Walnut Creek Tributary 1 (Buttermilk Branch)	Confluence with Little Walnut Creek	120 feet upstream of pedestrian bridge	2.2
Little Walnut Creek Tributary 2	Confluence with Little Walnut Creek	750 feet upstream of Rundberg Lane	1.5
Little Walnut Creek Tributary 3 (Quail Branch)	Confluence with Little Walnut Creek	740 feet upstream of Northgate Blvd	1.3
Long Hog Hollow	Confluence with Blue Creek	1.60 miles upstream of confluence with Bull Creek	1.6
Long Hollow Creek	Confluence with Big Sandy Creek	1,430 upstream of Big Sandy Drive	0.3
Marble Creek	Confluence with Onion Creek	150 feet upstream of Old Lockhart Highway	5.8
Montopolis Tributary	0.15 mile downstream of Highway 183	0.54 mile upstream of Dalton Lane	0.6
North Fork West Bouldin Creek	Confluence with West Bouldin Creek	300 feet upstream of Manchaca Road	0.9

Table 1 – Stream Reaches Studied by Detailed Methods *(continued)*

Stream Name	Downstream Limit	Upstream Limit	Length (mi)
Onion Creek	Confluence with Colorado River	Hays County/Travis County boundary	27.9
Pedernales River	Confluence with Colorado River	Downstream face of State Highway 71	8.6
Pleasant Hill Tributary	Confluence with Williamson Drive	South Congress Avenue	1.2
Poquito Branch	Confluence with Boggy Creek North	Downstream face of Poquito Street	0.2
Possum Trot Branch	Confluence with Johnson Creek	350 feet upstream of Woodmont Avenue	1
Rinard Creek	Confluence with Onion Creek	0.71 feet upstream of Bradshaw Road	1.4
Shoal Creek	Confluence with Colorado River	1,650 feet upstream of railroad	10.2
Slaughter Creek	Confluence with Onion Creek	730 feet upstream of US Highway 290	17.4
Slaughter Creek Tributary 1	Confluence with Slaughter Creek	1,040 feet upstream of Manchaca Road	2.8
Slaughter Creek Tributary 2	Confluence with Slaughter Creek	Downstream face of Brodie Lane	1.9
Slaughter Creek Tributary 3	Confluence with Slaughter Creek	1,050 feet upstream of Lost Oasis Hollow	0.9
Slaughter Creek Tributary 4	Confluence with Slaughter Creek	Downstream face of MO-PAC Expressway	
Slaughter Creek Tributary 5	Confluence with Slaughter Creek	0.5 mile upstream of La Cross Avenue	1.5
South Boggy Creek	Confluence with Onion Creek	650 feet upstream of West Gate Blvd	6.3
South Fork Dry Creek 3	360 feet downstream of FM 812	130 feet upstream of FM 973	1.5
St. Edward's Branch	Confluence with East Bouldin Creek	800 feet upstream of State Route 275	0.3
Stream Bear-1	220 feet downstream of the Hays/Travis County boundary	1,120 feet upstream of the boundary	0.2
Sunset Valley Tributary	Confluence with Williamson Creek	2,050 feet upstream of Monterey Oaks Drive	3.4
Tannehill Branch of Boggy Creek North	Confluence with Boggy Creek North	1,610 feet upstream of Helen Street	1.9
Tar Branch	Confluence with Walnut Creek	Downstream face of Parmer Lane	1.45
Unnamed Tributary to Barton Creek	Confluence with Barton Creek	1,450 feet upstream of State Route 1	1.5
Unnamed Tributary to Dry Creek 3	Upstream face of Pearce Lane	240 feet upstream of Ross Road	0.8

Table 1 – Stream Reaches Studied by Detailed Methods *(continued)*

Stream Name	Downstream Limit	Upstream Limit	Length (mi)
Unnamed Tributary to Gilleland Creek	Confluence with Gilleland Creek	1,610 feet upstream of confluence with Gilleland Creek	0.3
Unnamed Tributary to Lake Austin	Confluence with Colorado River	5,140 feet upstream of Westlake Drive	1
Unnamed Tributary to Lake Austin (St. Stephens Creek)	750 feet upstream of Cedar Street	700 feet upstream of Royal Approach Drive	0.5
Waller Creek	Confluence with Colorado River	960 feet upstream of Denson Drive	6.1
Walnut Creek	Confluence with Colorado River	Downstream face of McNeil Drive	23
Walnut Creek Tributary 1	Confluence with Walnut Creek	Downstream face of Colony Loop Drive	3.5
Walnut Creek Tributary 10	Confluence with Walnut Creek	Downstream face of Howard Lane	1
Walnut Creek Tributary 2	Confluence with Walnut Creek	0.50 mile upstream of Tracor Lane	1.5
Walnut Creek Tributary 3	Confluence with Walnut Creek	Downstream face of Cameron Road	3.8
Walnut Creek Tributary 4	Confluence with Walnut Creek	2,410 feet upstream of Springdale Road	1
Walnut Creek Tributary 5	Confluence with Walnut Creek	2,610 feet upstream of Sansom Road	1.3
Walnut Creek Tributary 6	Confluence with Walnut Creek	1,030 feet upstream of Canyon Ridge Drive	1.6
Walnut Creek Tributary 7	Confluence with Walnut Creek	Downstream face of Research Blvd	2.6
Walnut Creek Tributary 7A	Confluence with Walnut Creek	480 feet upstream of private driveway	1.3
Walnut Creek Tributary 8	Confluence with Walnut Creek	Downstream face of Union Pacific Railroad	2
Walnut Creek Tributary 9	Confluence with Walnut Creek	730 feet upstream of Howard Lane	1.9
Wells Branch	Confluence with Walnut Creek	710 feet upstream of Wells Branch Parkway	3.9
West Bouldin Creek	Confluence with Colorado River	240 feet upstream of Clawson Road	3.5
West Bull Creek	Confluence with Bull Creek	0.63 mile upstream of the most upstream crossing of FM 2222	1.7
West Bull Creek Tributary 1	Confluence with West Bull Creek	1,050 feet upstream of confluence with West Bull Creek	0.2

Table 1 – Stream Reaches Studied by Detailed Methods *(continued)*

Stream Name	Downstream Limit	Upstream Limit	Length (mi)
West Tributary 3 of Tannehill Branch	Confluence with Tannehill Branch of Boggy Creek North	30 feet upstream of Manor Road	0.5
Williamson Creek	Confluence with Onion Creek	200 feet upstream of Mowinkle Drive	17.7
Williamson Creek Tributary 1	Confluence with Williamson Creek	120 feet upstream of Nuckols Crossing	1.3
Williamson Creek Tributary 2	Confluence with Williamson Creek	250 feet upstream of Nuckols Crossing	1.2
Williamson Creek Tributary 3	Confluence with Williamson Creek	670 feet upstream of Pino Street	0.9
Williamson Creek Tributary 4	Confluence with Williamson Creek	210 feet upstream of S. First Street	1
Williamson Creek Tributary 5	Confluence with Williamson Creek	340 feet upstream of Southbrook Drive	1.1
Williamson Creek Tributary 6	Confluence with Williamson Creek	Lantana Regional Detention Pond	1.3
Yaupon Creek	Confluence with Hurst Creek	800 feet upstream of dam	2.5
Enhanced Approximate Study Type II			
Pedernales River	Downstream face of State Highway 71	Hays County /Travis County boundary	7.8
Slaughter Creek Tributary 6	Confluence with Slaughter Creek	3600 feet upstream of confluence	0.68
Slaughter Creek Tributary 7	Confluence with Slaughter Creek	130 feet upstream of El Rey Boulevard	0.99
Slaughter Creek Tributary 8	Confluence with Slaughter Creek	310 feet upstream of Weir Loop Circle	2.43
Slaughter Creek Tributary 8a	Confluence with Slaughter Creek Tributary 8	750 feet upstream of Flintrock Circle	0.53
Slaughter Creek Tributary 9	Confluence with Slaughter Creek	3410 feet upstream of confluence	0.65
Slaughter Creek Tributary 10	Confluence with Slaughter Creek	Just downstream of US Highway 290	0.95
Walnut Creek Tributary 2a	Confluence with Walnut Creek Tributary 2	Just downstream of Ed Bluestein Boulevard (US 183)	0.52

This Physical Map Revision

As part of this countywide FIS, updated analyses were performed for Cottonmouth Creek and other flooding sources presented in the following tables:

Boggy Creek Watershed

Boggy Creek
Boggy Creek Clarkson Branch
Boggy Creek Grayson Branch
Boggy Creek Poquito Branch
Boggy Creek Tributary 1
Fort Branch Creek
Fort Branch Creek Split Flow Reach
Fort Branch Creek Tributary 1
Fort Branch Creek Tributary 1 East Branch
Fort Branch Creek Tributary 2
Tannehill Branch Givens Park Tributary No. 1
Tannehill Branch Givens Park Tributary No. 2
Tannehill Branch of Boggy Creek
Tannehill Branch West Tributary 1
Tannehill Branch West Tributary 3

Bull Creek Watershed

Bull Creek
Bull Creek Tributary 1
Bull Creek Tributary 1.1
Bull Creek Tributary 1A
Bull Creek Tributary 2
Bull Creek Tributary 2.1
Bull Creek Tributary 2.2
Bull Creek Tributary 4
Bull Creek Tributary 4.3
Bull Creek Tributary 4A
Bull Creek Tributary 4B
Bull Creek Tributary 5
Bull Creek Tributary 6
Bull Creek Tributary 6.1
Cow Fork West Bull Creek
Long Hog Hollow
West Bull Creek
West Bull Creek Tributary 1
West Bull Creek Tributary 5

Carson Creek Watershed

Carson Creek
Carson Creek Montopolis Tributary
Carson Creek Overflow
Carson Creek Tributary 1
Carson Creek Tributary 2
Carson Creek Tributary 3
Carson Creek Tributary 4

Dry Creek East Watershed

Berdoll Tributary
Berdoll Tributary 1
Dry Creek East
Dry Creek East Tributary 5
Dry Creek East Tributary 6
Dry Creek East Tributary 7
Dry Creek East Tributary 8
Dry Creek East Tributary 9

Dry Creek East Watershed *(continued)*

Dry Creek East Tributary 10
North Fork Dry Creek East
South Fork Dry Creek East
South Fork Dry Creek East Tributary 1
South Fork Dry Creek East Tributary 2
South Fork Dry Creek East Tributary 3

Shoal Creek Watershed

Shoal Creek
Shoal Creek Foster Branch
Shoal Creek Grover Tributary
Shoal Creek Hancock Branch

The following tabulation presents Letters of Map Change (LOMCs) incorporated into this countywide study:

LOMC	Case Number	Date Issued	Project Identifier
LOMR	08-06-1041P	January 21, 2009	Double Creek Village
LOMR	09-06-0763P	March 3, 2010	Waller Creek Restudy
LOMR	11-06-0223P	August 4, 2011	Fox Hill Subdivision
LOMR	11-06-3451P	August 10, 2011	Maha Creek at Green Crossing
LOMR	11-06-3301P	November 2, 2011	Crescent Machinery
LOMR	11-06-4564P	December 3, 2012	Gables – Sand Beach
LOMR	12-06-1380P	December 10, 2012	William Cannon at Onion Creek
LOMR	12-06-3962P	December 26, 2013	Formula 1 United States at Dry Creek

The portion of Dry Creek East affected by LOMR 12-06-3962P, from just downstream of Elroy Road to approximately 700 feet upstream of Farm to Market Road 812, has been updated with hydrologic data that aligns more closely with the extensive study of Dry Creek East.

The following tabulation lists streams that have names in this countywide FIS other than those used in the previously printed FIS reports for the communities in which they are located.

Old Name	New Name
Boggy Creek North	Boggy Creek
Clarkson Branch	Boggy Creek Clarkson Branch
Dry Creek 3	Dry Creek East
Foster Branch	Shoal Creek Foster Branch
Grover Tributary	Shoal Creek Grover Tributary
Hancock Branch	Shoal Creek Hancock Branch
Montopolis Tributary	Carson Creek Montopolis Tributary
North Fork Dry Creek 3	North Fork Dry Creek East
South Fork Dry Creek 3	South Fork Dry Creek East
Tannehill Branch of Boggy Creek North	Tannehill Branch of Boggy Creek
Unnamed Tributary to Dry Creek 3	Berdoll Tributary

2.2 Community Description

Travis County is located in south-central Texas. The county is bordered by Bastrop County to the east; Blanco and Burnet Counties to the west; Caldwell County to the southeast; Hays County to the southwest; and Williamson County to the north. Travis County covers approximately 989 square miles of land area and 33 square miles of water area for a total area of 1,022 square miles.

According to U.S. Census 2010 figures, the population of Travis County was 1,024,266. This represents an increase in population of 79.3% since the 1990 census. The City of Austin is the county seat, the Capitol of Texas, and has a population of 774,229 (U.S. Census 2010). This represents an increase of 84.8% since the 1990 census (Reference 12).

The county is of moderate size yet is distinguished by relatively diverse geographic features. The northern and western portions of the county, situated in the rugged topography of the Edwards Plateau and along the Balcones Escarpment, are marked by steep, cedar-covered hills and an assortment of waterways derived primarily from within the Colorado River Basin. The topography of the remainder of the county is considerably less extreme and is characterized by gently rolling hills and plains of the Blackland Prairies to the east and the Gulf Coast Plains to the south.

The soils of the county reflect the geographic diversity of the county. Calcareous stoney clays and some clay loams are found in the Edwards Plateau region and, moving eastward into the southern plains, the soils grade into dark calcareous clays interspersed with acidic sandy loams (Reference 13).

The climate of the region is humid subtropical, with hot summers and relatively mild winters. However, the interplay of warm, humid Gulf of Mexico breezes from the south and strong, polar fronts from the north accounts for a wide variation between maximum and minimum temperatures that have been recorded. During winter, occasional sharp drops in temperature may occur as cold fronts move through the area, but consistently cold weather is rare. The maximum average daily temperature during the county's coldest month, for instance, is approximately 60 degrees Fahrenheit. Maximum average daily temperatures for the summer range from the middle to upper nineties, with the peak usually occurring in the month of August. Prevailing winds are from the southeast and frequently persist from this direction for several days. The strongest winds are from the north, with some velocities having been measured as high as 57 miles per hour (Reference 14).

Rainfall in the county averages approximately 33 inches per year and, although it is fairly evenly distributed, the heaviest occurs in late spring or early fall. A large portion of the precipitation is a direct result of thunderstorm activity associated with seasonal cold fronts (Reference 14).

2.3 Principal Flood Problems

Stream channels along the north and west of the Balcones Escarpment tend to be narrow, with rock beds and banks of high relief. Because soils in these areas are relatively nonporous, there is considerable runoff and, hence, a possibility of flash

flooding. As the soils change into clay and sand toward the south and east, the stream channels widen, increasing the area of the floodplain.

The U.S. Geological Survey (USGS), the National Weather Service, and local sponsors such as the Lower Colorado River Authority and the City of Austin have established and maintain gages that have recorded flood stages at several locations in the area since February 1898. From these records, a considerable amount of flood history has been gathered. Additional historical information on flood history in the area was obtained from other USGS records dealing with particular floods, or from newspaper records, the Texas Department of Transportation, the City of Austin, and the Austin-Travis County Collection.

These sources reveal that large and damaging floods occurred in the area in 1833, 1843, 1852, July 1869, 1870, June 1899, April 1900, April 1908, December 1913, April and September 1915, September 1921, May 1922, May 1929, June 1935, September 1936, July 1938, June 1940, April 1941, September 1952, June 1957, October 1959, 1960, 1961, May 1965, May 1970, May 1981, June 1981, December 1991 through February 1992, May 1995, and June 1997.

Information in Annals of Travis County and all of the City of Austin, an unpublished manuscript in the University of Texas Library, by Frank Brown, indicates that the flood of July 7, 1869 created flood heights in area creeks and rivers greater than any recorded flood (since 1833). The second largest flood occurred on June 15, 1935. Since the completion of the Lake Travis reservoir in 1940, there has been no flood on the Colorado River comparable in magnitude to the floods of 1869 and 1935.

Certain tributaries of the Colorado River, no less significant for their size, have experienced record-breaking floods since that time. For instance, the flood of September 11, 1952 produced a peak discharge unparalleled since 1869 for the Pedernales River, one of the major tributaries of the Colorado River (Reference 15). In June 1997, the Llano River produced a flood nearly as great as the flood on that river in 1935. In 1991, near record flooding on the Colorado River below Austin preceded four days of rain upstream of Lake Travis, on the upper Colorado, Llano, and Perdernales Rivers. This event resulted in the highest recorded elevation to Lake Travis on Christmas Day, 1991. Additional record floods were recorded by the City of Austin in November 2002 and November 2004.

Considerable floodplain development has increased the severity of flood hazards in the county. The existence of numerous low-water crossings, dams, small bridges, and culverts has also aggravated flood hazards in the area. Frequently, trees, brush, and assorted debris that are washed downstream during floods collect against bridges or within restricted flow areas, reducing the effective waterway openings and otherwise impeding flood flow.

2.4 Flood Protection Measures

A system of reservoirs have been developed on the Colorado River that stretches from Lake Buchanan in Llano and Burnet Counties to Lake Austin, the site of the Tom Miller Dam (formerly Lake Austin Dam). Six dams, stretching like massive steps down the length of the lower Colorado River, comprise the system. Listed in descending order, they are Buchanan Dam, impounding Lake Buchanan; Inks Dam, impounding Inks Lake;

the Alvin Wirtz Dam, impounding Lake Lyndon B. Johnson; the Max Starcke Dam, impounding Lake Marble Falls; the Marshall Ford Dam (Mansfield Dam), forming Lake Travis; and the Tom Miller Dam, impounding Lake Austin. These six dams are maintained by the Lower Colorado River Authority. Below this chain lies a smaller channel lake, Town Lake, which is impounded by Longhorn Dam, a dam built and maintained by the City of Austin.

The City of Austin and Travis County have established stream and subdivision ordinances and a building code, in order to minimize flood damage. The City of Austin installed and continues the implementation of a Flood Early Warning System following the Memorial Day flood of 1981. As for flood protection measures, the City of Austin continues to construct numerous flood control projects and improvements.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood-hazard data required for this study. Flood events of a magnitude that is expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

Previous County-wide FIS Revision

Hydrologic methods used for this study are in accordance with FEMAs Guidelines and Specifications for Flood Hazard Mapping Partners dated April 2003 (Reference 16). The analytical approach generally followed the Natural Resources Conservation Service (formerly Soil Conservation Service) procedures as outlined in Technical Release Number 55 (TR-55) (Reference 17). The hydrologic rainfall/runoff model developed by the USACE Hydrologic Engineering Center (HEC), HEC-HMS Version 2.2.2 (May 2003), was used to estimate peak discharges in Travis County (Reference 18).

The primary source of terrain data used for the 2008 hydraulic study was developed from the 2003 LIDAR data. The City of Austin contracted Sanborn Map Company, Inc., to re-map the City and their 5-mile extra territorial jurisdiction (ETJ) and utility service area. LIDAR flights were conducted in January 2003 and a preliminary data set was provided in February 2004. LIDAR topography was accepted by the City of Austin on August 10,

2004. The terrain data was used along with the HEC-GeoHMS extension to generate the sub-basin delineations. USGS 30 meter National Elevation Dataset Digital Elevation Model (DEM) was used for areas outside of Travis County.

Travis County rainfall totals for the frequency floods were obtained from the Depth-Duration Frequency of Precipitation for Texas, Water Resources Investigations Report 98-4044 by USGS by William Asquith developed in November 2001. A Natural Resources Conservation Service Type-III, 24 hour duration, storm distribution was used for the various frequency event simulations in HEC-HMS.

Soils information was obtained from the U.S. Department of Agriculture, NRCS Soil Survey Geographic (SSURGO) database for Travis County published in January 2001 (Reference 19). Hydrologic Soil types C and D are generally the dominant soils in the study watersheds. An existing 2003 land use map was obtained from the City of Austin and confirmed using the 2003 digital orthophotos.

Runoff losses were computed using the NRCS Loss Rate Method. Assumed CN values for open space and undeveloped areas were based on the assumption of "woods in good condition." This assumption was confirmed by visual inspection based on field reconnaissance and 2003 digital orthophotos. Composite, soil based, CN's were computed for each sub-basin using GIS Tools.

Percent impervious values were computed based on the composite land use for each sub-basin. Assumed percent impervious values for land use categories are based on information provided by the City of Austin in "Determination of Impervious Cover and Hydrologic Soil Group for Urban and Suburban Watershed under Existing and Future Land-use Conditions".

The NRCS dimensionless unit hydrograph was selected to compute the unit hydrograph. The time of concentration calculations were split into three sections including overland, shallow, and channel flow. Overland flow was calculated using the coefficient of velocity. Times of concentration (t_c) were computed using a modified velocity method outlined in the NRCS Technical Release 55 for shallow, and channel flow (Reference 17). Lag time (t_{lag}) for each watershed was calculated by using the equation $t_{lag} = (0.6)t_c$.

The Modified Puls method was selected to route the hydrographs for all reaches. Discharge-storage relationships were computed using the HEC-RAS models developed for the hydraulic studies. The RAS models were generated using HEC-GeoRAS and the triangular irregular network (TIN) developed specifically for this study from available topography.

Walnut Creek

In the 2008 study, new detailed hydrology analysis was prepared for the Walnut Creek Watershed. Many aspects of the new detailed analysis are the same as the general discussion in Section 3.1, with the following exceptions.

In preparation of a new hydrologic model for the Walnut Creek Watershed, the primary source of terrain data was developed from topography provided by the City of Austin, dated 1997. USGS 30-meter National Elevation Dataset DEM was used where the aerial topography was not available.

A 24-hour duration, triangular distributed, hypothetical storm was used for the various frequency event simulations in HEC- HMS.

Areal reduction of point rainfall was estimated for selected storm areas using the method outlined in the TP-40, which is incorporated in the HEC-HMS model. Simulations were computed for each storm event with varying storm areas. Adjustments were automatically made to the frequency storm by HEC-HMS based on exceedance probability. The resulting peak flow rates were tabulated and each design point was interpolated to the closest storm area to determine the peak discharge for each subbasin.

Percent impervious values for the Walnut Creek Watershed for single family are based on digitized impervious areas for three typical neighborhoods using the 2003 orthophotos. The assumed 32 percent impervious for single family was based on an average of digitized impervious coverage (rooftops, driveways, patios, etc) for single family. A similar method was used to determine the 12 percent impervious for large lot single family land use categories.

Onion Creek

The most recent study of Onion Creek was the Onion Creek Interim Feasibility Study Phase I by the Corps of Engineers in December 2002 (Reference 20). The HEC-HMS model prepared for the 2002 study is the basis of this FIS report. The Onion Creek hydrology model has been reviewed by several agencies including the Corps of Engineers and the City of Austin. A part of the Onion model, the Williamson Creek Watershed, was further revised by CDM as part of a LOMR submittal.

The primary source of terrain data used for the Onion Creek Watershed hydrologic study was developed from city topography dated 1997. To supplement the aerial mapping, USGS 30-meter National Elevation Dataset DEM was used where the aerial topography was not available.

Watershed delineations for the Onion Creek Watershed were based on the following topographic data. The Onion Creek hydrology, based on the 1997 city topography (1-meter grid size) was merged with Hays County 30-meter DEM's to create a single seamless "quilted" digital topographic file using 10-meter grids. This quilted digital topographic file was provided by the City of Austin for the 2002 Onion Creek HEC-HMS Hydrologic study.

New terrain data became available during this study. The City of Austin contracted Sanborn Map Company, Inc. to re-map the City and the 5-mile ETJ service area. LIDAR flights were conducted in January 2003, and a preliminary data set was provided in February 2004.

Sub-basin delineation was performed using the United States Army Corps of Engineers' hydrologic GIS program HEC-GeoHMS version 1.0. HEC-GeoHMS generated basin areas, stream lengths, and slopes as well as a "skeleton" HEC-HMS model. The Onion Creek Watershed is approximately 344 square miles and was subdivided into approximately 475 sub-basins with drainage areas varying from .03 to 8.7 sq. mi.

Similar to the Walnut Creek Watershed analysis, a 24-hour duration, triangular distributed, hypothetical storm was used for the various frequency event simulations in HEC-HMS.

Areal reduction of point rainfall was estimated for selected storm areas using the method outlined in the TP-40, which is incorporated in the HEC-HMS model. Simulations were computed for each storm event with varying storm areas. Adjustments were automatically made to the frequency storm by HEC-HMS based on exceedance probability. The resulting peak flow rates were tabulated and each design point was interpolated to the closest storm area to determine the peak discharge for each subbasin.

An existing 2002 land use map was obtained from the City of Austin and confirmed using the 2003 digital orthophotos for Marble Creek, and South Boggy Creek Watersheds. The land use in the remaining Onion Creek Watershed, prepared in 2002, is based on a 2000 land use provided by the City of Austin. The 2000 land use file is an aggregate of 1990, 1995, and USGS (via EPA) land use files.

The Onion Creek CN assumptions and percent impervious values are based on previous study efforts by the USACE and the City of Austin.

Colorado River

The most recent study of the Colorado River was the Lower Colorado River Flood Damage Evaluation Project (FDEP) prepared on June 24, 2002, for the Lower Colorado River Authority (LCRA) and the USACE Fort Worth District. The HEC-HMS model, flood frequency analysis, and period-of-record simulation prepared for the 2002 study are the basis of the hydrology for the Colorado River in this FIS report. The Lower Colorado River FDEP hydrology has been reviewed by several agencies including LCRA, the USACE Fort Worth District, and FEMA. The Basinwide (Colorado River) hydrology was approved by FEMA on November 11, 2003.

The limits of the FDEP hydrologic study extended from Lake O.H. Ivie in Concho County to the Gulf of Mexico at Matagorda Bay, a drainage area of over 18,300 square miles. The objective of the hydrologic study was to develop frequency runoff hydrographs for use in unsteady flow hydraulic models extending from the Colorado River near San Saba gauge downstream to the Gulf of Mexico. Hydrologic techniques included period-of-record studies, historical analysis of stream gauges, analysis of rainfall patterns at critical locations, and calibration to both historical and statistical storms.

Six special Points-of-Interest (POI) were selected as target locations to compute/calibrate critical peak flow hydrographs (in addition to other, less critical gauge locations). These POI were selected based on their location in the basin and because they were identified as key calibration points for this study. The six POI were the Llano River at Llano, the San Saba River at San Saba, Lake Buchanan, Lake Travis, Colorado River at Bastrop, and the Colorado River at Wharton.

The 18,300 square mile basin was divided into 290 sub-basins with an average size of approximately 63 square miles. Sub-basin divides were set at major reservoirs, future and existing stream gauges, and major tributary confluences. Selection of the sub-basins was also based on predicted simulation time and computation interval, which is directly related to the basin time to peak.

The initial calibration of the HEC-HMS hydrologic models involved three historical storms. Historical storm selection was based on availability of adequate rainfall and gauge data (storms in the 1990s with NEXRAD data). The next phase of the hydrologic study included generating synthetic rainfall to produce flood frequency hydrographs for the 50-, 20-, 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance events. The model parameters were adjusted to match the results of the historical flood frequency analyses at the various gauges.

A storm centering procedure was performed to determine the largest (critical) peak flood runoff generated by the basin at the six POI. In order to generate frequency rainfall data for the 290 sub-basins, a computer program was developed to reduce the point precipitation values from a storm centered on a particular sub-basin to the other 289 sub-

basins in the watershed. In order to reduce the rainfall from the point rainfall value, Areal Reduction Factor (ARF) curves were taken from TP-40 and extended from the 400 square mile limit to a 100,000 square mile limit. Critical storm centers were found using this ARF curve for the six POI.

Reservoir operations were simulated for the FDEP study utilizing HEC-5 models (Reference 21). All six Highland Lakes and Town Lake were included in the HEC-5 models developed for the study. Lake Travis is the only flood control reservoir in the system. A combination of a 70-year period-of-record SUPER model simulation (Reference 22), a joint probability analysis, an investigation into previous studies, and HEC-5 modeling was utilized to determine Lake Travis frequency pool elevations for the FDEP study.

Details related to the hydrologic and reservoir operations of the FDEP study can be found as part of the Lower Colorado River Basin/CTP - Flood Insurance Study.

The redelineated streams were initially studied by detailed methods. These flooding sources include all those listed in the redelineation section of Table 1 unless identified otherwise below.

Hydrologic analyses in the previous FIS reports for Travis County and its incorporated areas, were derived from a variety of methods. The Austin Standard Method, the NRCS (SCS) Method, and NUDALLAS computer program, were used to compute the peak discharges in the watersheds of each stream studied by detailed methods (Reference 23). Generally, the Austin Standard Method was used for urbanized watersheds and the NRCS Method was used for less urbanized watersheds and those over 15 square miles of drainage area.

Topographic maps of each watershed were used to determine the majority of the physical parameters required for the peak discharge calculations. The drainage area, length of the main channel, and the main channel slope were all measured directly from the topographic maps. The percentage of impervious cover and the measurement of the conveyance efficiency of the drainage system were determined following a detailed field reconnaissance of the watershed.

The physical parameters of soil type and group classification were determined following a reconnaissance of the watershed and the use of the Soil Survey of Travis County, published by the NRCS in June 1974. Each watershed was divided into the percentage of

contributing soil classification and land use cover; and a calculated composite curve number that described the physical parameters was used to modify the unit hydrograph tabulations.

NWS Technical Paper No. 40, National Oceanic and Atmospheric Administration Technical Memorandum NWS Hydro-35, and USACE Civil Engineer Bulletin No. EM 1110-2-1411 were used in developing the 10-, 2-, and 1-percent-annual-chance flood events (Reference 24). The 0.2-percent-annual-chance flood event was based on extrapolated data from these sources. Routing of the flood hydrographs through each sub-basin reach was accomplished using a Modified PULS reservoir routing. The HEC-2 backwater model provided the elevation-discharge storage relationships for each reach.

Peak discharge-frequency relationships for streams studied by Enhanced Approximate Methods Type II, also referred to as Limited Detail Studies (LDS), were analyzed using generally the same methods as the New Detailed Study streams described in Section 3.1. Depending on the availability of existing information, hydrology for LDS may have been derived from regional discharge-drainage area relationships or USGS regression calculations.

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The HEC-HMS Rainfall Runoff model was used to compute the peak discharges for the Elm, Decker and Gilleland Creek watershed. HEC-HMS version 3.0.1 was used for computation of the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance storm event discharge values.

The hydrologic analysis performed as part of approved LOMR 08-06-2891P was completed using the Corps of Engineer's HEC-HMS (version 3.0.1) applying the SCS Unit Hydrograph procedure. Loss Rates were determined using the Natural Resource Conservation Service (NRCS) Curve Number Method. More detailed information is available in the supportive document for Walnut Creek, LOMR 08-06-2891P (Reference 42).

There were no Enhanced Approximate Methods or redelineated streams studied for this Physical Map Revision.

Table 2 presents flow data associated with the August 18, 2014, Physical Map Revision and prior FIS reports.

Table 2 - Summary of Discharges

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
APACHE SHORES CREEK					
At confluence with the Colorado River	2.46	3,770	5,670	6,282	9,270
(Lake Austin) Spillway at Apache Lake	0.72	1,425	1,850	2,325	3,125
APACHE SHORES TRIBUTARY					
At confluence with Apache Shores Creek	1.53	2,342	3,470	3,910	5,000
At Indian Creek Road	1.21	2,000	2,600	3,220	4,300
BARTON CREEK					
Approximately 4,000 feet downstream of Fitzhugh Road	44.34	9,180	19,960	25,590	43,970
At Fitzhugh Road	41.95	8,850	19,590	25,180	43,740
BARTON SKYWAY TRIBUTARY OF BARTON CREEK					
At confluence with Barton Creek	0.18	573	807	947	1,160
Below Mopac Boulevard	0.14	449	632	741	907
BEAR CREEK					
At confluence with Onion Creek	50.57	10,450	28,720	40,150	81,740
Downstream of confluence with Little Bear Creek	49.23	10,250	28,390	39,700	81,170
Upstream of confluence with Little Bear Creek	26.24	6,970	20,490	29,540	63,330
At abandoned USGS gage at F.M. 1626	24.24	6,610	19,400	27,960	59,860
Approximately 4.73 miles upstream of F.M. 1626	20.36	5,890	17,560	25,350	54,820
At confluence with Onion Creek	50.57	10,450	28,720	40,150	81,740
Downstream of confluence with Little Bear Creek	49.23	10,250	28,390	39,700	81,170
Upstream of confluence with Little Bear Creek	26.24	6,970	20,490	29,540	63,330
At abandoned USGS gage at F.M. 1626	24.24	6,610	19,400	27,960	59,860
Approximately 4.73 miles upstream of F.M. 1626	20.36	5,890	17,560	25,350	54,820

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
BEAR CREEK TRIBUTARY					
At F.M. 1626	1.17	1,440	2,223	2,495	3,260
At Frate Barker Lane	0.58	802	1,501	1,671	2,335
BEE CREEK					
At West Lake Drive	3.25	5,665	771	8,698	10,810
At Small Dam	2.85	5,058	6,926	7,785	9,668
At low water crossing	1.25	2,690	3,629	4,225	5,214
BIG SANDY CREEK					
At City of Jonestown corporate limits	51.06	23,000	41,000	48,000	66,000
At confluence of Big Sandy Creek Tributary 2 (Bloody Hollow)	34.00	18,500	33,000	38,000	51,500
At confluence of Long Hollow Creek	9.60	900	15,000	17,000	23,000
At confluence of Big Sandy Creek Tributary 3 (Bingham Creek)	3.35	5,000	8,000	8,700	11,900
BIG SANDY CREEK TRIBUTARY 2 (BLOODY HOLLOW)	9.68	8,910	13,750	15,440	20,175
BIG SANDY CREEK TRIBUTARY 3 (BINGHAM CREEK)	5.28	4,870	9,800	11,100	15,800
BLUNN CREEK					
At confluence with Colorado River	1.26	1,870	3,010	3,580	5,000
At intersection of Mariposa Street and Sunset Street	1.03	1,630	2,600	3,100	4,300
Downstream of Oltorf Street	0.79	1,290	2,100	2,480	3,470
Approximately 370 feet upstream of Woodward Drive	0.29	580	900	1,060	1,460
Approximately 470 feet upstream of Woodward Drive	0.20	400	610	720	1,000
CHERRY CREEK					
At confluence with Williamson Creek	0.91	1,090	1,920	2,290	3,280
At Westgate Boulevard	0.77	980	1,720	2,050	2,940
At Blarwood Drive	0.59	780	1,370	1,630	2,360

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
CHERRY CREEK *(continued)*					
At Cockburn Drive	0.44	600	1,050	1,250	1,800
At William Cannon Drive	0.22	310	540	640	910
Upstream of William Cannon Drive	0.11	150	260	310	440
COLORADO RIVER					
At Travis/Bastrop county boundary	38,900	48,100	95,100	109,500	339,100
At confluence of Onion Creek	38,500	30,900	89,900	90,000	360,000
At the Tom Miller Dam	38,250	29,900	90,000	90,100	366,900
COUNTRY CLUB CREEK EAST					
Approximately 200 feet downstream of confluence with CCE-2	0.49	1,010	1,620	1,910	2,640
Downstream of confluence with CCE-1	0.97	1,660	2,640	3,100	4,170
At confluence with the Colorado River	1.82	1,930	3,440	4,160	6,020
CCE-1					
At confluence with Country Club Creek East	0.23	440	680	790	970
CCE-2					
At confluence with Country Club Creek East	0.14	310	480	560	770
CCE-4					
At confluence with Country Club Creek East	0.21	430	660	780	1,050
COUNTRY CLUB CREEK WEST					
Below confluence with CCW-5	0.45	970	1,520	1,800	2,500
Below confluence with CCW-1	2.29	4,090	6,570	7,740	10,560
Confluence with the Colorado River	2.66	3,910	6,330	7,570	10,770

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
CCW-1					
Approximately 700 feet upstream of Riverside Farms Road	0.10	240	380	450	610
At confluence with Country Club Creek West	0.28	530	840	990	1,370
CCW-2					
At confluence with Country Club Creek West	0.21	430	670	800	1,090
CCW-3					
Above the confluence with CCW-3A	0.16	340	530	630	870
At the confluence with Country Club Creek West	0.41	740	1,260	1,490	2,090
CCW-3A					
At the confluence with CCW-3	0.08	210	330	380	520
CCW-4					
At the confluence with Country Club Cree West	0.38	820	1,270	1,480	2,040
CCW-5					
At the confluence with Country Club Cree West	0.14	300	480	560	760
CYPRESS CREEK					
At Lake Travis	6.30	9,000	11,800	13,500	16,500
At confluence of Cypress Creek Tributary 1	2.70	4,600	6,200	6,900	8,600
CYPRESS CREEK TRIBUTARY 1					
At confluence of Cypress Creek Tributary 2	2.20	4,200	5,800	6,600	8,500
Approximately 0.5 mile upstream of confluence of Cypress Creek Tributary 2	0.70	1,800	2,500	3,500	4,500
At confluence of Cypress Creek Tributary 2	2.20	4,200	5,800	6,600	8,500
CYPRESS CREEK TRIBUTARY 2					
At confluence with Cypress Creek	0.90	2,300	3,000	3,500	5,000

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
DANZ CREEK					
At confluence with Slaughter Creek	4.89	2,650	6,350	7,850	12,110
At Mopac Expressway	3.36	2,310	5,530	6,910	10,420
Downstream of the confluence with Danz Creek Tributary 2	2.34	2,090	4,840	5,980	8,830
At State Highway 45	1.18	1,320	2,930	3,590	5,210
Approximately 3,000 feet downstream of F.M. 1826	0.73	920	1,980	2,410	3,500
DANZ CREEK SPLIT					
At confluence with Danz Creek	0.60	1,320	3,450	4,160	6,010
At State highway 45	0.33	1,210	3,060	3,670	6,000
DANZ CREEK TRIBUTARY 1					
At confluence with Danz Creek	0.39	540	1,090	1,320	1,880
Approximately 2,380 feet upstream of	0.15	290	570	680	960
DANZ CREEK TRIBUTARY 2					
At confluence with Danz Creek	0.90	790	1,950	2,430	3,640
Approximately 1,500 feet upstream of the confluence with Danz Creek	0.83	780	1,880	2,350	3,510
Approximately 3,100 feet upstream of the confluence with Danz Creek	0.65	680	1,570	1,950	2,870
Approximately 3,900 feet upstream of the confluence with Danz Creek	0.45	530	1,170	1,420	2,060
DECKER CREEK					
Approximately 950 feet upstream of confluence with Gilleland Creek	17.34	4,830	9,990	12,500	20,400
Approximately 3,600 feet upstream of confluence with Gilleland Creek	17.25	4,840	10,000	12,500	20,400

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
DECKER CREEK *(continued)*					
Approximately 3,700 feet downstream of FM 969	17.09	4,840	10,000	12,500	20,500
Approximately 2,400 feet downstream of FM 969	16.47	4,640	9,910	12,300	20,100
Approximately 430 feet upstream of FM 969	16.40	4,660	9,930	12,400	20,500
At confluence with Tributary 1A	15.79	4,240	9,330	11,100	19,900
Upstream of confluence with Tributary 1A	13.05	3,080	7,770	9,460	16,200
Approximately 1,800 feet downstream of confluence with Tributary 1	12.97	3,150	7,920	9,650	16,800
At confluence with Tributary 1	12.89	3,170	7,930	9,690	16,800
Approximately 1,000 feet upstream of confluence with Tributary 1	12.25	3,110	7,590	9,410	15,700
Approximately 3,000 feet downstream of Gilbert lane	11.88	3,070	7,430	9,280	15,200
Approximately 1,700 feet downstream of Gilbert Lane	11.73	3,120	7,510	9,380	15,200
Approximately 1,000 feet downstream of Gilbert Lane	11.65	3,170	7,590	9,480	15,300
At Gilbert Lane	11.42	3,150	7,510	9,430	15,000
Approximately 3,250 feet downstream of Sh 130 northbound lane	11.18	3,110	7,270	9,290	14,400
Approximately 600 feet downstream of Sh 130 northbound lane	10.99	3,180	7,330	9,450	14,400
At state highway 130	10.86	3,160	7,220	9,410	14,100
Approximately 700 feet upstream of Sh 130 southbound lane	10.54	3,210	6,770	9,290	13,100
Approximately 1,200 feet downstream of FM 973	9.92	3,270	5,580	9,290	11,100
At FM 973	9.75	3,290	5,430	9,490	10,800
Outflow from Decker Lane	9.60	3,350	5,190	9,870	10,300

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
DECKER CREEK TRIBUTARY 1					
At confluence with Decker Creek	0.6	650	1,190	1,440	2,050
At Decker Lake Road	0.45	560	980	1,160	1,600
Approximately 1,200 feet downstream of Nez Perce Trace	0.32	440	730	890	1,240
At Wells Trace	0.23	320	580	690	970
Approximately 2,000 feet upstream of Wells Trace	0.1	180	290	340	460
DECKER CREEK TRIBUTARY 1A					
Approximately 600 feet upstream of confluence with Decker Creek	2.75	2,310	4,120	4,950	6,910
Approximately 1,800 feet upstream of confluence with Decker Creek	2.70	2,320	4,100	4,930	6,880
Approximately 2,600 feet upstream of confluence with Decker Creek	2.58	2,310	4,010	4,790	6,690
Approximately 1,500 feet downstream of FM 969	2.15	1,980	3,420	4,100	5,790
Approximately 1,200 feet downstream of FM 969	2.06	1,990	3,390	4,070	5,760
At downstream FM 969 Crossing	1.88	1,900	3,210	3,860	5,450
At upstream FM 969 Crossing	1.51	1,700	2,850	3,410	4,760
Approximately 500 feet upstream of Delta Post Drive	1.34	1,670	2,7700	3,320	4,660
Approximately 500 feet upstream of unnamed street	1.13	1,570	2,580	3,080	4,310
DECKER CREEK TRIBUTARY 2					
At Decker Creek	2.41	2,000	2,420	2,830	3,760
At Lindell lane	2.17	1,780	2,080	2,380	3,290
Approximately 1,100 feet downstream Decker lane	1.91	1,140	1,620	1,940	4,880
At Decker Lane (FM 3177)	1.75	1,030	1,560	1,880	8,130

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
DECKER CREEK TRIBUTARY 2 *(continued)*					
Approximately 1,500 feet downstream US 290	1.51	880	1,490	1,870	2,880
Approximately 800 feet downstream of US 290	1.12	570	1,000	1,210	1,840
Flow at US 290	1.07	650	1,130	1,353	2,080
Inflow to Lower Bluebonnet Pond	0.89	440	760	900	1,430
Outflow from Upper Bluebonnet Pond Inflow to Upper Bluebonnet Pond	0.89	743	1,153	1,360	1,893
At Giles Road	0.60	400	670	800	1,140
EAST BOULDIN CREEK					
At confluence with Colorado River	2.03	1,260	1,810	2,080	2,560
EAST BRANCH OF FORT BRANCH					
Just upstream of the confluence with Fort Branch Creek Tributary 1	0.14	295	458	536	730
ELM CREEK					
Confluence of Gilleland Creek	8.25	3,100	4,100	4,500	5,700
Approximately 266 feet upstream of confluence with Gilleland Creek	8.10	3,100	4,100	4,500	5,700
Approximately 3,000 feet downstream of Milo	7.91	3,100	4,100	4,400	5,600
At Milo	7.76	3,100	4,000	4,400	5,600
Approximately 1,500 feet downstream of Dunlap Road	7.46	3,100	4,000	4,400	5,500
At Dunlap Road	7.20	3,100	4,000	4,300	5,400
Approximately 2,100 feet upstream of Dunlap Road	6.50	3,000	3,900	4,200	5,100
At Austin's Colony Boulevard	6.32	3,000	3,800	4,200	5,100
Approximately 1,300 feet upstream of Austins Colony	6.19	3,000	3,800	4,100	5,000
Approximately 2,500 feet upstream of Austins Colony	6.07	3,000	3,800	4,100	5,200

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
ELM CREEK *(continued)*					
Approximately 4,500 feet upstream of Austins Colony	5.85	3,000	3,800	4,000	4,900
Approximately 5,800 feet upstream of Austins Colony	5.67	3,000	3,700	4,000	4,700
Approximately 1,300 feet downstream of SH130	5.51	3,200		4,500	5,000
Approximately 1,000 feet upstream of SH130	4.95	3,100	4,300	4,700	5,800
At FM 973	3.67	2,900	4,900	6,000	8,900
Approximately 350 feet upstream of FM 989	3.53	2,900	4,800	5,900	8,800
At confluence of Tributary 1	3.40	2,800	4,800	5,900	8,700
At Blue Bluff Road	1.79	1,400	2,400	3,100	4,900
Approximately 1,200 feet downstream of Imperial Drive	1.74	1,300	2,400	3,100	4,900
At Imperial Drive	1.54	1,300	2,300	3,000	4,600
Approximately 2,500 feet upstream of Imperial Drive	1.42	1,200	2,300	3,000	4,500
Approximately 4,000 feet downstream of Decker Lane	1.12	1,000	2,000	2,600	4,000
Approximately 2,400 feet downstream of Decker Lane	0.99	1,000	1,900	2,500	3,700
At Decker Lane	0.71	840	1,500	2,000	2,800
At Hidden West Blvd	0.47	660	1,000	1,300	1,800
ELM CREEK TRIBUTARY 1					
At confluence of Elm Creek	1.39	1,500	2,500	3,100	4,300
Approximately 900 feet downstream of Blue Bluff Road	1.02	1,600	2,700	3,200	4,400
Approximately 1,200 feet downstream of Imperial Drive	0.30	1,200	2,000	2,400	3,200
Approximately 1,200 feet upstream of Imperial Drive	0.16	360	580	680	930
GILLELAND CREEK					
At confluence with Colorado River	75.69	14,200	22,600	25,700	34,800
Just downstream of confluence with Elm Creek	74.78	14,200	22,600	25,600	34,500

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
GILLELAND CREEK *(continued)*					
Just downstream of confluence with Decker Creek	66.23	12,100	18,900	21,700	29,900
Approximately 1.08 miles downstream of F.M. 969	48.77	8,660	10,200	10,800	12,700
Approximately 0.93 mile downstream of FM 969	48.77	8,660	10,200	10,800	12,700
Approximately 0.76 mile downstream of FM 969	48.77	8,660	10,200	10,800	12,800
Approximately 0.47 mile downstream of FM 969	48.65	8,660	10,700	11,800	15,700
Approximately 0.30 mile downstream of FM 969	48.65	9,620	14,500	16,900	25,100
Approximately 460 feet downstream of FM 969	48.65	15,000	27,800	34,400	52,200
Approximately 0.96 mile upstream of Taylor Lane	46.37	15,200	27,600	34,200	52,000
Just downstream of confluence with Gilleland Creek Tributary 1	44.86	15,100	27,500	34,000	51,700
Approximately 0.64 mile downstream of FM 973	42.91	15,000	27,200	33,600	51,100
Just downstream of confluence with Gilleland Creek Tributary 1B	40.93	14,900	26,900	33,300	50,700
Approximately 1.37 miles downstream of Gilleland Creek Tributary 1C	37.90	14,700	26,500	32,800	49,900
Just downstream of confluence with Gilleland Creek Tributary 1C	36.25	14,600	26,300	32,500	49,600
Approximately 20 feet upstream of RR	32.85	14,000	25,300	31,000	46,100
Approximately 20 feet upstream of Westbound US 290	32.37	14,000	25,200	30,900	46,100
Approximately 0.65 mile upstream Westbound US 290	31.18	13,900	25,100	30,700	45,900
Just downstream of confluence with Harris Branch	30.65	13,900	25,000	30,600	45,800

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
GILLELAND CREEK *(continued)*					
Approximately 0.44 mile upstream of Southbound SH 130	18.79	9,200	15,300	18,000	26,100
Just downstream of confluence with Gilleland Creek Tributary 2	18.14	9,160	15,200	17,800	25,800
Just upstream of confluence with Gilleland Creek Tributary 2	12.24	7,060	11,500	13,700	19,500
Approximately 1.54 miles downstream of Cameron Road	11.79	7,020	11,500	13,600	19,400
Approximately 315 feet upstream of Cameron Road	11.03	6,950	11,300	11,400	19,100
Approximately 2.07 miles upstream of Cameron Road	10.33	6,840	11,100	13,200	18,800
Approximately 1.92 miles downstream of Immanuel Road	9.54	6,810	11,100	13,100	18,600
Approximately 0.2 mile downstream of Immanuel Road	8.62	6,600	10,700	12,600	18,000
Approximately 10 feet upstream of FM 685 (Dessau Road)	8.14	6,340	10,300	12,100	17,300
Approximately 10 feet downstream of North Railroad Avenue	7.45	6,080	9,820	11,500	16,500
Approximately 2.07 miles upstream of Cameron Road	10.33	6,840	11,100	13,200	18,800
Approximately 1.92 miles downstream of Immanuel Road	9.54	6,810	11,100	13,100	18,600
Approximately 0.2 mile downstream of Immanuel Road	8.62	6,600	10,700	12,600	18,000
Approximately 0.48 mile upstream of North Railroad Avenue	7.13	5,990	9,610	11,300	16,100
Approximately 20 feet upstream of Swenson Farms Blvd.	6.26	5,500	8,690	10,200	14,500

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
GILLELAND CREEK *(continued)*					
Approximately 20 feet upstream of North Heatherwilde Blvd.	5.66	5,030	7,890	9,240	13,000
Approximately 20 feet upstream of Grand Avenue Parkway	4.14	3,500	5,320	6,220	8,410
Approximately 20 feet upstream of Picadilly Drive	2.46	1,880	2,550	3,160	5,220
Approximately 0.37 mile upstream of Picadilly Drive	1.67	1,440	2,030	2,420	4,180
Just downstream of confluence with Gilleland Creek Tributary 3	1.54	1,870	3,010	3,460	4,380
Just upstream of confluence with Gilleland Creek Tributary 3	0.83	930	1,510	1,800	2,410
Approximately 20 feet upstream of I-35	0.58	760	1,190	1,390	1,850
GILLELAND CREEK TRIBUTARY 1					
At confluence with Gilleland Creek	1.92	2,350	3,890	4,620	6,510
Approximately 1.16 miles upstream of confluence with Gilleland Creek	1.55	2,110	3,420	4,050	5,640
Approximately 2.21 miles upstream of confluence with Gilleland Creek	0.50	760	1,210	1,430	1,970
GILLELAND CREEK TRIBUTARY 1A					
At confluence with Gilleland Creek	0.94	1,400	2,220	2,530	2,940
Approximately 20 feet upstream of the Southbound SH 130 Feeder Road	0.83	1,240	2,030	2,330	2,840
Approximately 230 feet downstream of Bloor Road	0.37	630	1,010	1,190	1,630

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
GILLELAND CREEK TRIBUTARY 1B					
At confluence with Gilleland Creek	2.02	2,750	4,590	5,490	7,610
Approximately 0.44 mile downstream of Northbound SH 130	1.52	2,250	3,600	4,250	5,770
Approximately 300 feet downstream of Northbound SH 130	1.21	1,850	2880	3,360	4520
Approximately 20 feet upstream of Blue Bluff Road	0.57	830	1,200	1,420	1,760
Approximately 0.31 mile upstream of Blue Bluff Road	0.43	740	1,170	1,380	1,880
GILLELAND CREEK TRIBUTARY 1C					
At confluence with Gilleland Creek	3.35	2,650	4,100	4,550	6,310
Approximately 80 feet upstream of Blue Bluff Road	3.29	2,650	4,100	4,540	6,300
Approximately 20 feet upstream of Old Highway 20	3.03	2,590	4,000	4,440	6,220
Approximately 20 feet upstream of Westbound US 290	0.44	2,350	3,580	4,120	5,820
Approximately 50 feet downstream of East Parmer Lane (crossing 3)	2.26	2,360	3,690	4,320	5,910
Approximately 930 feet downstream of East Parmer Lane (crossing 2)	1.99	2,220	3,350	3,870	5,800
Approximately 30 feet upstream of Southbound SH 130 Frontage Rd	1.28	1,550	2,380	2,940	4,600
Approximately 20 feet downstream of East Parmer Lane (crossing 1)	1.16	1,500	2,390	3,060	4,570

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
GILLELAND CREEK TRIBUTARY 2					
At confluence with Gilleland Creek	5.90	4,550	8,170	10,100	14,900
Approximately 450 feet downstream of Cameron Road	5.50	4,520	8,130	10,000	14,700
Approximately 0.95 mile upstream of Cameron Road	4.75	4,410	8,070	9,960	14,100
Approximately 1.84 mile upstream of Cameron Road	3.39	3,940	7,030	8,460	11,900
Approximately 1.28 miles downstream of Killingsworth Lane	3.00	3,810	6,500	7,780	10,900
Approximately 20 feet upstream of Killingsworth Lane	2.29	3,310	5,510	6,560	9,150
Approximately 20 feet upstream of Immanuel Road	2.00	2,970	4,890	5,820	8,100
GILLELAND CREEK TRIBUTARY 3					
Approximately 300 feet upstream of confluence with Gilleland Creek	0.71	940	1,510	1,680	2,100
Approximately 20 feet upstream of Southbound I-35	0.61	890	1,410	1,580	2,010
HARRIS BRANCH					
Above confluence with Gilleland Creek	1.58	7,410	12,630	15,070	21,050
Below confluence with Harris Branch Tributary #5	0.17	76,790	11,410	13,590	18,990
At Parmer Lane	8.57	5,880	9,750	11,530	16,250
Below confluence with Harris Branch Tributary #4	7.49	5,240	8,520	10,190	14,500
Above confluence with Harris Branch Tributary #4	5.57	4,170	6,830	8,150	11,630
At Old Gregg Lane	4.72	3,690	6,050	7,220	10,310
Below confluence with Harris Branch Tributary #3	3.71	3,260	5,360	6,400	9,140
Approximately 240 feet upstream of Heatherwilde Boulevard	2.23	2,090	3,340	3,950	5,680

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
HARRIS BRANCH *(continued)*					
Approximately 200 feet upstream of Heatherwilde Boulevard	1.91	1,840	2,930	3,460	5,000
Approximately 0.58 miles upstream of Heatherwilde Boulevard	1.67	1,740	2,780	3,280	4,730
Approximately 1.24 miles upstream of Heatherwilde Blvd.	1.36	1,450	2,310	2,730	4,000
HARRIS BRANCH TRIBUTARY 3					
Above confluence with Harris Branch Creek	1.24	1,090	1,860	2,270	3,250
At Orange Pekoe Trail	0.95	820	1,450	1,770	2,570
HARRIS BRANCH TRIBUTARY 4					
Above confluence with Harris Branch	1.92	1,850	2,980	3,520	4,840
Approximately 1.42 miles upstream of Harris Branch Creek	1.58	1,530	2,450	2,870	3,920
Approximately 7,600 feet upstream of Harris Branch Creek	1.11	1,010	1,600	1,870	2,540
HARRIS BRANCH TRIBUTARY 5					
Above confluence with Harris Branch Creek	1.49	1,090	1,710	2,050	2,990
Approximately 60 feet downstream of Cameron Road	1.23	920	1,480	1,810	2,650
HURST CREEK					
At Lakeway Drive	4.80	5,900	8,700	10,000	12,500
At Lohmann Crossing Road	4.40	5,600	8,200	9,400	12,000
Approximately 0.27 mile upstream of Lakeway Boulevard	3.40	4,800	7,500	8,400	10,750

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
HURST CREEK TRIBUTARY 1					
At confluence with Hurst Creek	0.91	2,050	3,100	3,450	4,450
At Clara Vann Road	0.45	900	1,350	1,500	1,950
JOHNSON CREEK					
Above confluence with the Colorado River	1.82	2,990	4,380	4,970	6,470
KINCHEON BRANCH					
At confluence with Williamson Creek	8.01	6,050	10,130	11,840	16,260
At William Cannon Drive	7.41	5,810	9,600	11,150	16,220
At Brodie Lane	6.59	5,120	8,270	9,550	14,920
At Mopac Expressway	4.56	3,4701	5,1201	6,0401	12,3401
At Dick Nichols Park Pond	3.38	3,670	6,150	7,170	12,960
At Mopac Expressway	2.77	2,910	5,260	6,160	10,650
At Beckett Road	2.48	2,670	5,400	6,570	9,730
Approximately 1,600 feet downstream of Abilene Trail	1.43	1,560	3,200	3,900	5,740
Approximately 800 feet downstream of Abilene Trail	0.82	860	1,760	2,150	3,130
At Escarpment Boulevard	0.76	830	1,700	2,070	3,010
LIME CREEK					
At Lake Travis	6.00	8,200	11,000	12,500	15,500
At confluence with Lime Creek Tributary 1	4.60	6,600	8,800	10,000	12,500
At confluence with Lime Creek Tributary 2	3.00	4,700	6,200	7,200	8,800
LIME CREEK TRIBUTARY 1					
At confluence with Lime Creek	0.37	850	1,135	1,280	1,570
At Trails End Road	0.20	453	604	680	835
LIME CREEK TRIBUTARY 2					
At confluence with Lime Creek	0.50	1,080	1,450	1,635	2,005
At stock pond	0.23	528	706	796	977

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
LITTLE BARTON CREEK					
At confluence with Barton Creek	11.52	7,900	12,500	14,000	22,500
Approximately 1.91 miles upstream of confluence with Barton Creek	10.60	7,400	11,500	13,200	21,000
Approximately 0.22 mile upstream of confluence with Little Barton Tributary	8.57	6,400	10,000	11,500	18,000
Approximately 1.02 miles upstream of confluence of Little Barton Tributary	7.17	5,700	9,000	10,000	16,000
LITTLE BARTON TRIBUTARY					
At confluence with Little Barton Creek	1.15	1,600	2,500	2,850	4,300
LITTLE BEAR CREEK					
At confluence with Bear Creek	22.99	5,930	12,430	15,800	26,520
At abandoned USGS gage at F.M. 1626	20.83	5,550	11,660	14,820	24,910
LITTLE BEE CREEK					
At confluence with Bee Creek	1.15	2,370	3,236	3,688	4,574
At Red Bud Trail	0.98	2,239	3,102	3,516	4,391
At Westlake Drive	0.52	1,530	2,130	2,400	3,100
At unnamed Asphalt Road	0.12	640	910	1,030	1,330
LITTLE WALNUT CREEK					
At confluence with Walnut Creek	13.13	12,880	18,800	21,320	28,450
At Manor Road	11.93	12,150	17,430	19,890	26,650
Below confluence of Little Walnut Creek Tributary 1	8.94	9,090	12,220	14,730	21,360
Above confluence of Little Walnut Creek Tributary 1	8.42	8,500	11,750	14,420	20,820
Below confluence of Little Walnut Creek Tributary 2	5.75	5,620	9,410	11,690	16,770
Above confluence of Little Walnut Creek Tributary 2	5.29	5,370	9,460	11,410	16,050
Below confluence of Little Walnut Creek Tributary 3	2.55	2,850	5,670	6,760	9,520

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
LITTLE WALNUT CREEK *(continued)*					
Above confluence of Little Walnut Creek Tributary 3	2.42	2,830	5,670	6,680	9,310
Approximately 500 feet upstream of Parkfield Road	1.1	1,950	2,910	3,400	4,730
At Quail Valley Road	0.57	1,060	1,580	1,840	2,600
LITTLE WALNUT CREEK TRIBUTARY 1 (BUTTERMILK BRANCH)					
At confluence with Little Walnut Creek	3.69	3,720	5,800	6,770	9,510
LITTLE WALNUT CREEK TRIBUTARY 2					
At confluence with Little Walnut Creek	1.23	1,920	3,050	3,620	5,240
Just upstream of Rundberg Lane	0.71	1,050	1,630	1,910	2,720
LITTLE WALNUT CREEK TRIBUTARY 3 (QUAIL CREEK)					
At confluence with Little Walnut Creek	1.88	1,960	3,150	3,770	5,340
At Hunters Trace	0.96	1,010	1,470	1,700	2,350
LONG BRANCH					
Approximately 3,325 feet upstream of dam	2.41	1,315	2,800	3,530	5,950
LONG HOLLOW					
At confluence with Big Sandy Creek	10.43	7,600	15,000	16,000	22,500
MARBLE CREEK					
Above confluence with Onion Creek	4.41	2,420	6,320	8,130	8,130
At Thaxton Road	3.57	2,420	6,210	7,870	7,510
Below confluence with Stream Unknown 1	2.92	2,210	5,470	6,880	6,380
Below confluence with Stream Marble Creek Tributary 1	2.68	2,230	5,310	6,650	6,040

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
MARBLE CREEK *(continued)*					
Above confluence with Stream Marble Creek Tributary 1	1.82	1,350	3,350	4,290	4,120
Below confluence with Stream Marble Creek Tributary 2	1.56	1,280	3,020	3,930	3,760
Above confluence with Stream Marble Creek Tributary 2	1.03	850	1,930	2,670	2,540
ONION CREEK					
Above confluence of Colorado River	344.37	35,600	82,600	92,900	116,500
Approximately 1,200 feet upstream of the confluence of Cottonmouth Creek	327.56	34,840	94,530	118,630	185,850
At State Highway 183 Gage	323.73	34,620	94,190	118,160	185,350
Below confluence of Williamson Creek	322.35	34,560	94,130	118,100	185,330
Below confluence of Marble Creek	290.98	31,940	87,560	114,400	178,940
Approximately 5,200 feet upstream of William Cannon Drive	286.26	31,690	87,500	114,470	179,080
Approximately 5,100 feet downstream of the confluence with South Boggy Creek	283.76	31,680	87,550	114,590	179,530
Approximately 900 feet downstream of the confluence with South Boggy Creek	282.61	31,660	87,530	114,570	179,590
Below confluence of South Boggy Creek	282.47	31,660	87,510	114,550	179,560
Approximately 900 feet downstream of the confluence of Slaughter Creek	276.34	31,660	87,510	114,550	179,560
Below confluence of Slaughter Creek	275.67	31,360	86,840	113,680	178,350
Below confluence of Rinard Creek	244.51	25,560	75,030	98,370	153,030

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
PEDERNALES RIVER					
At confluence with the Colorado River (Lake Travis)	1,329	83,000	230,000	330,000	680,000
RINARD CREEK					
At confluence with Onion Creek	7.73	5,300	7,600	8,200	10,500
At Bradshaw Road	7.54	5,250	7,500	8,150	10,400
Approximately 1.39 miles upstream from the confluence with Onion Creek	7.08	5,100	7,100	7,900	10,100
ST. EDWARDS BRANCH					
At State Route 275/South Congress Avenue	0.10	215	290	325	430
SLAUGHTER CREEK					
At confluence with the Colorado River	30.71	7,470	16,250	22,060	33,560
At Interstate Route 35	30.16	7,450	16,220	22,040	33,530
Approximately 3,700 feet downstream of Chappell Lane	24.61	7,340	16,240	21,610	34,430
Approximately 2,000 feet downstream of Manchaca Road	23.88	7,310	16,230	21,610	34,480
Approximately 1,800 feet downstream of Brodie Lane	19.50	7,170	16,250	20,930	35,130
Downstream of the confluence with Slaughter Tributary 4	13.11	5,720	13,260	17,290	27,750
SLAUGHTER CREEK TRIBUTARY 2					
At confluence with Slaughter Creek	2.50	2,000	4,320	5,180	7,780
Approximately 3,500 feet downstream of Brodie Lane	2.00	1,760	3,620	4,270	6,370
At Brodie Lane	0.14	150	310	380	550

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
SLAUGHTER CREEK TRIBUTARY 3					
At confluence with Slaughter Creek	0.78	1,000	2,180	2,640	3,820
Approximately 1,000 feet upstream of Lost Oasis	0.30	440	930	1120	1600
SLAUGHTER CREEK TRIBUTARY 4					
At confluence with Slaughter Creek	0.87	1,110	2,140	2,320	3,750
SLAUGHTER CREEK TRIBUTARY 5					
At confluence with Slaughter Creek	1.17	1,290	2,980	3,650	5,360
Approximately 2,500 feet upstream of La Crosse Avenue	0.21	350	730	880	1,260
SOUTH BOGGY CREEK					
Above confluence with Onion Creek	4.79	4,300	7,330	8,350	13,150
Approximately 300 feet upstream of Congress Avenue	3.43	3,550	6,560	8,030	11,850
Approximately 400 feet upstream of 1st Street	2.42	2,630	4,910	5,960	8,760
Approximately 400 feet upstream of 1st Street	1.98	2,190	3,990	4,820	7,070
Approximately 1,100 feet downstream of Union Pacific Railroad	1.39	1,820	3,220	3,830	5,540
Approximately 300 feet upstream of Seminary Ridge Drive	0.60	850	1,450	1,830	2,890
Approximately 900 feet downstream of Westgate Boulevard	0.20	230	530	650	970
SOUTH FORK DRY CREEK 3					
At F.M. 812	9.25	4,067	6,884	7,680	10,385
Approximately 0.56 mile downstream of F.M. 973	8.79	3,864	6,542	7,298	9,870
At F.M. 973	8.28	3,639	6,162	6,875	9,289

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
STREAM BEAR-1					
Above Bear Creek	4.85	5,500	8,500	9,730	12,580
SUNSET VALLEY TRIBUTARY					
At confluence with Williamson Creek	1.24	980	1,710	2,030	3,080
At Pillow Road	1.01	900	1,510	1,800	2,490
At Brodie Lane	0.67	780	1,290	1,520	2,160
At Mopac Expressway	0.54	710	1,180	1,400	1,970
At Monterey Oaks Boulevard	0.24	320	530	630	880
At Hill Forest Drive	0.11	150	250	300	410
TAR BRANCH					
At confluence with Walnut Creek	0.71	550	960	1180	1960
UNNAMED TRIBUTARY TO BARTON CREEK					
Approximately 1.45 miles upstream of confluence with Barton Creek	1.70	2,080	3,200	3,680	5,700
UNNAMED TRIBUTARY TO DRY CREEK 3	n/a	n/a	n/a	n/a	n/a
UNNAMED TRIBUTARY TO GILLELAND CREEK					
Approximately 100 feet downstream of Royston Lane	0.97	--n	--n	2,541	--n
UNNAMED TRIBUTARY TO LAKE AUSTIN					
At Westlake Drive	0.95	2,130	3,010	3,270	3,925
At confluence of two tributaries approximately 300 feet downstream of Toro Canyon Road	0.47	1,250	1,390	1,950	2,380
UNNAMED TRIBUTARY TO LAKE AUSTIN (ST. STEPHENS CREEK)					
760 feet upstream of Cedar Street	0.93	--n	--n	2,365	--n
3,280 feet upstream of Cedar Street	0.79	--n	--n	2,068	--n

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
YAUPON CREEK					
At confluence with Hurst Creek	1.83	2,750	4,200	4,750	5,900
At Rolling Green Drive	1.03	1,700	2,625	2,975	3,750
At Lohmann Crossing Road	0.45	910	1,400	1,560	2,020
Approximately 0.36 mile upstream of Lohmann Crossing Road	0.27	580	890	1,010	1,340
UPPER DECKER CREEK					
At Decker lane	1.61	2,380	3,890	4,640	6,520
Approximately 2,600 feet upstream of Decker Lane	1.39	2,140	3,480	4,150	5,800
Approximately 1,000 feet upstream of Daffen Lane	0.54	880	1,380	1,620	2,220
At Private Drive	0.37	640	1,000	1,170	1,590
WALNUT CREEK					
Below the confluence with Little Walnut Creek	50.93	17,250	26,860	32,440	50,810
Above confluence with Little Walnut Creek	37.55	14,2902	23,0102	27,4102	41,6302
Below confluence with Walnut Creek Tributary 3	36.63	14,890	24,020	28,590	42,260
Above confluence with Walnut Creek Tributary 3	32.94	14,4402	23,1002	27,4102	39,8902
Below confluence with Walnut Creek Tributary 4	32.86	14,510	23,200	27,520	39,930
Below confluence with Walnut Creek Tributary 5	31.88	14,8902	23,7402	28,1002	41,5802
At Springdale Road	29.95	15,250	24,130	28,460	41,730
Approximately 2,500 feet upstream of Sprinkle Road	28.58	15,390	24,120	28,380	41,390
Approximately 6,000 feet upstream of Cameron Road	27.75	15,530	24,040	28,220	40,930
Approximately 5,000 feet downstream Dessau Road	26.29	15,340	23,460	27,510	39,760
At Dessau Road	25.71	15,020	22,970	26,940	38,830
Below confluence with Walnut Creek Tributary 6	23.47	14,640	22,070	25,960	37,390
Below confluence with Wells Branch	20.83	13,110	19,890	23,530	34,090

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
WALNUT CREEK *(continued)*					
Below confluence with Tar Branch	16.56	9,960	15,210	18,060	26,390
Above confluence of Walnut Creek Tributary 7	8.99	6,460	10,790	13,300	20,070
Below confluence with Tributary 8	7.29	5,900	10,070	12,380	18,620
Below confluence of Walnut CreekTributary 10	3.84	3,180	6,140	7,620	11,600
Above confluence of Walnut Creek Tributary 10	2.98	2,250	4,610	5,840	9,040
WALNUT CREEK TRIBUTARY 1					
At confluence with Walnut Creek	2.47	5,220	13,500	17,660	11,600
At F.M. 969	1.81	5,220	13,420	17,560	35,510
Below confluence with Walnut Creek Tributary 1a	1.09	1,690	2,760	3,280	4,700
WALNUT CREEK TRIBUTARY 2					
At confluence with Walnut Creek					
WALNUT CREEK TRIBUTARY 3					
At confluence with Walnut Creek	3.69	3,720	5,800	6,770	9,510
Approximately 900 feet upstream from U.S. Route 290	2.88	3,650	5,690	6,650	9,240
Approximately 3,500 feet downstream of confluence with Unknown Tributary of Walnut Creek	2.19	2,660	4,190	4,910	7,010
Approximately 1,200 feet upstream of U.S. 290	1.81	2,380	3,810	4,510	6,530
WALNUT CREEK TRIBUTARY 4					
At confluence with Walnut Creek	0.79	1,420	2,220	2,600	3,670

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
WALNUT CREEK TRIBUTARY 5					
Approximately 200 feet upstream of Sansom Road	1.67	2,130	3,630	4,410	6,530
WALNUT CREEK TRIBUTARY 6					
At confluence with Walnut Creek	1.88	1,960	3,150	3,770	5,340
Approximately 2,500 feet upstream from Interstate Highway 35	1.31	1,400	2,200	2,610	3,770
WALNUT CREEK TRIBUTARY 7					
At confluence with Walnut Creek	3.71	2,090	2,610	2,810	5,850
At Duval Road	1.96	1,2701	1,6601	1,8302	3,8902
At Union Pacific Railroad	1.70	1,730	2,960	3,500	4,590
Approximately 700 feet upstream from Mustang Chase	1.23	1,310	1,980	2,310	3,260
WALNUT CREEK TRIBUTARY 7A					
At confluence with Walnut Creek Tributary 7	0.87	860	1,300	1,560	2,390
At Union Pacific Railroad	0.75	880	1,340	1,630	2,520
WALNUT CREEK TRIBUTARY 8					
At confluence with Walnut Creek	1.48	1,350	2,030	2,360	3,320
WALNUT CREEK TRIBUTARY 9					
At Austin Northwestern Railroad	3.08	2,850	4,310	5,020	6,610
At Waters Park Road	2.57	2,570	3,860	4,570	6,760
Approximately 900 feet downstream of Austin Northwestern Railroad	2.25	2,390	3,580	4,290	6,410
Approximately 900 feet upstream of Howard Lane	1.23	1,620	2,490	2,990	4,340

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
WALNUT CREEK TRIBUTARY 10					
At confluence with Walnut Creek	0.87	990	1,610	1,910	2,770
WELLS BRANCH					
At confluence with Walnut Creek	4.11	3,5601	5,5201	6,4101	9,7501
Just after the confluence of Unknown Wells Branch Tributary	3.44	3,490	5,650	6,710	9,690
Approximately 900 feet upstream of Wells Branch Parkway	2.62	2,320	3,750	4,420	6,680
Approximately 900 feet upstream of Wells Branch Parkway	1.55	1,750	2,810	3,530	6,810
WEST BOULDIN CREEK					
At confluence with the Colorado River	3.06	3,800	5,810	6,800	9,180
WILLIAMSON CREEK					
At confluence with Onion Creek	30.42	11,440	20,1301	24,3401	35,170
Downstream of the confluence with Williamson Creek Tributary 1	30.32	11,440	20,150	24,360	35,170
Downstream of the confluence with Williamson Creek Tributary 2	28.5	11,350	20,010	24,180	34,930
Upstream of the confluence with Williamson Creek Tributary 2	28.3	11,270	19,870	24,020	34,690
Near Ecuelita Drive	26.38	11,300	19,950	24,050	34,710
At Creek Bend	25.9	11,290	19,930	24,020	34,670
Downstream of the confluence with Pleasant Hill Tributary	25.09	11,260	19,910	23,990	34,640
At Interstate Highway 35	25.04	11,240	19,870	23,940	34,570
At Stassney Lane	23.77	11,200	19,830	23,900	34,550
Downstream of the confluence with Williamson Creek Tributary 4	23.25	11,200	19,880	23,880	34,530

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
WILLIAMSON CREEK *(continued)*					
Upstream of the confluence with Williamson Creek Tributary 4	22.37	11,140	19,820	23,810	34,440
At South First Street	21.50	11,110	19,860	23,830	34,370
At Mopac Railroad	19.30	10,790	19,420	23,330	33,660
At Manchaca Road	18.78	10,730	19,360	23,260	33,600
Downstream of confluence with Sunset Valley Tributary	18.36	10,710	19,430	23,340	33,690
Downstream of confluence with Cherry Creek	17.91	10,540	19,130	22,970	33,290
Upstream of confluence with Cherry Creek	15.77	9,740	17,590	20,960	31,020
Downstream of the confluence with Kincheon Branch	15.59	9,780	17,710	21,080	31,410
WILLIAMSON CREEK TRIBUTARY 1					
At confluence with Williamson Creek	1.63	1,300	2,580	3,120	4,430
Upstream of Stassney Lane	1.21	1,010	1,860	2,180	3,440
At Nuckols Crossing	0.69	700	1,260	1,520	2,180
WILLIAMSON CREEK TRIBUTARY 2					
At confluence with Williamson Creek	0.63	870	1,660	2,020	2,920
At Stassney Lane	0.48	700	1,310	1,590	2,280
At Nuckols Crossing	0.29	490	850	1,030	1,470
Upstream of Nuckols Crossing	0.11	180	310	380	540
WILLIAMSON CREEK TRIBUTARY 3					
At confluence with Williamson Creek	0.75	480	910	1,110	1,610
At Pleasant Valley Road	0.44	280	530	650	950
At Pino Lane	0.43	280	520	640	930
Upstream of Pino Lane	0.42	270	520	630	910

Table 2 – Summary of Discharges *(continued)*

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (square miles)	PEAK DISCHARGES (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
WILLIAMSON CREEK TRIBUTARY 4					
At confluence with Williamson Creek	0.64	900	1,560	1,850	2,640
At South Congress Avenue	0.60	830	1,420	1,690	2,410
At South First Street	0.36	490	840	1,000	1,430
WILLIAMSON CREEK TRIBUTARY 5					
At confluence with Williamson Creek	0.86	1,300	2,380	2,880	4,220
At South Brook Drive	0.48	900	1,550	1,850	2,630
WILLIAMSON CREEK TRIBUTARY 6					
At confluence with Williamson Creek	1.04	920	1,790	2,180	3,260
At Latana Pond	0.50				
Upstream of Latana Pond	0.46	600	1,340	1,650	2,410
YAUPON CREEK					
At confluence with Hurst Creek	1.83	2,750	4,200	4,750	5,900
At Rolling Green Drive	1.03	1,700	2,625	2,975	3,750
At Lohmann Crossing Road	0.45	910	1,400	1,560	2,020
Approximately 0.36 mile upstream of Lohmann Crossing Road	0.27	580	890	1,010	1,340

[1]Discharge decreased due to detention pond
[2]Discharge decreased due to storage routing
[3]Flows affected by diversion splits n/a Data not available
--[n] Not computed

This Physical Map Revision

For a revised portion of Maha Creek, a revised hydrologic analysis on the contributing drainage area was conducted. TR-55 was used to determine the time of concentration. HEC-HMS was used for generating peak runoff rates (Reference 54). Input data for the HEC-HMS model was based on the City of Austin Drainage Criteria Manual (Reference 55).

Lake Park Detention Pond, near Robert Mueller Municipal Airport, was incorporated into an effective model for streams in the Boggy Creek Watershed, using HEC-HMS, version 3.5 (Reference 56). Watershed boundaries were matched to surrounding effective watershed boundaries. New detailed sub basin delineations, hydrologic parameters, and HEC-HMS models for Tannehill Branch and Fort Branch sub-watersheds were developed. Southwest Greenway Pond and the Bartholomew Park Pond in the Tannehill Branch watershed were also modeled.

For streams in the Bull Creek Watershed, peak discharges at computation points were placed approximately one-third to one-half the distance upstream along the reach within the contributing sub-basin. Peak discharges at tributary confluences were input directly at the computation point location. The selected flow break locations were based on engineering judgment of logical break locations. This was done in locations where the flow did not increase sufficiently to warrant the complication of an additional flow change location.

For streams in Carson Creek watershed, discharge estimates were developed using HEC-HMS, version 3.5 (Reference 56). Drainage areas were delineated based on 3 foot grid cells derived from LiDAR topographic data (Reference 57). Model results were validated by comparing them to rainfall data from January 2007 and similar watersheds in the surrounding Travis County area.

For all streams in Dry Creek East Watershed, excluding Berdoll Tributary, Berdoll Tributary 1, Dry Creek East Tributary 7A, Dry Creek East Tributary 8A, Dry Creek East Tributary 8B, and Dry Creek East Tributary 8C, flow data was based on aerially reduced peak discharges computed for the Dry Creek East H&H Modeling and Mapping Scope of Service Phase II Task 4. Peak discharges at key locations along the study streams were placed approximately one-half to one-third upstream of the reach between the key flow break locations. For the portion of Dry Creek East affected by LOMR 12-06-3962P, from just downstream of Elroy Road to approximately 700 feet upstream of Farm to Market Road 812, updated hydrology was incorporated that more closely aligned with the aforementioned study. For other streams affected by LOMR 12-06-3962P, Dry Creek East Tributary 7A, Dry Creek East Tributary 8A, Dry Creek East Tributary 8B, and Dry Creek East Tributary 8C, flow values were incorporated from the revised hydrologic study of the Dry Creek East watershed.

For Berdoll Tributary and Berdoll Tributary 1, discharges were approximated using a weighted drainage area approach. Initial discharges were placed at the upstream location of each reach and adjusted accordingly for the confluence of tributaries, diverted flow, and the entrance of flow from additional basins.

For streams within the Shoal Creek Watershed, rainfall totals for the frequency floods were obtained from the Depth-Duration Frequency of Precipitation for Texas, Water Resources Investigations Report 98-4044 (Reference 58). A SCS Type-III twenty-four hour duration storm was used for the various frequency event simulations in HEC-HMS, version 3.5. Runoff losses were computed using the SCS Loss Rate Method. Gage analysis was performed using

the HEC-SSP, version 2.0. Statistical analysis procedures were used in the gage analysis (Reference 59).

Table 3 contains flow data associated with “This Physical Map Revision”.

Table 3 – Revised Summary of Discharges

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Boggy Creek Watershed						
BOGGY CREEK						
Approximately 1,000 feet upstream of the confluence with Colorado River	13.810	13,022	17,057	19,969	23,164	30,144
Approximately 350 feet downstream of Delwau Lane	13.780	13,082	17,138	20,025	23,207	30,130
Approximately 250 feet upstream of Austin Northwestern Railroad	13.520	12,966	16,975	19,830	23,052	29,925
Approximately 150 feet downstream of confluence of Fort Branch	13.260	12,796	16,630	19,511	22,783	29,662
Approximately 800 feet upstream of confluence of Fort Branch	9.840	8,791	11,517	13,632	16,013	20,652
Approximately 50 feet downstream of confluence of Tannehill Branch of Boggy Creek	9.570	8,657	11,229	13,377	15,686	20,160
Approximately 150 feet upstream of Jain Lane	5.480	5,297	6,968	8,551	10,334	14,422
Approximately 150 feet downstream of the confluence of Boggy Creek Tributary 1	5.440	5,283	6,947	8,541	10,319	14,385
Approximately 250 feet downstream of Bolm Road	5.140	4,950	6,519	8,047	9,760	13,692
Approximately 200 feet upstream of Mansell Avenue	4.970	4,829	6,351	7,883	9,534	13,384
Approximately 550 feet downstream of Tillery Street	4.600	4,526	5,950	7,454	8,939	12,482
Approximately 350 feet downstream of Castro Street	4.030	4,067	5,372	6,688	7,915	10,869
Approximately 200 feet upstream of North Pleasant Valley Road	3.570	3,649	4,846	6,095	7,241	9,894
Approximately 1,050 feet upstream of Webberville Rd	3.520	3,631	4,825	6,068	7,205	9,834
Approximately 150 feet downstream of confluence with Boggy Creek Poquito Branch	3.400	3,597	4,790	6,050	7,147	9,701
Approximately 300 feet upstream of North Pleasant Valley Road	2.410	2,457	3,269	3,947	4,607	6,281

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Boggy Creek Watershed						
BOGGY CREEK *(continued)*						
Approximately 550 feet upstream of East 12th Street	2.220	2,418	3,156	3,738	4,341	5,982
Approximately 750 feet downstream of East Martin Luther King Jr. Boulevard	2.050	2,259	2,939	3,465	3,999	5,647
Approximately 650 feet upstream of East Martin Luther King Jr. Boulevard	1.870	2,090	2,716	3,207	3,752	5,325
Approximately 50 feet downstream of confluence with Boggy Creek Grayson Branch	1.710	1,876	2,460	2,915	3,504	4,929
Approximately 150 feet upstream of confluence with Boggy Creek Grayson Branch	1.270	1,694	2,211	2,632	3,202	4,526
Approximately 100 feet downstream of confluence with Boggy Creek Clarkson Branch	1.250	1,692	2,208	2,627	3,215	4,522
Approximately 200 feet downstream of East 38th Half Street	0.490	709	915	1,084	1,341	1,834
BOGGY CREEK CLARKSON BRANCH						
Approximately 750 feet upstream of confluence with Boggy Creek	0.755	1,087	1,418	1,690	1,986	2,755
Approximately 550 feet upstream of Cherrywood Road	0.659	967	1,271	1,514	1,781	2,487
Approximately 1,400 feet upstream of Cherrywood Road	0.468	606	799	970	1,158	1,640
BOGGY CREEK GRAYSON BRANCH						
Approximately 200 feet upstream of Banton Road	0.444	281	358	456	533	708
Approximately 800 feet upstream of East 40th Street	0.418	248	317	372	429	580

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Boggy Creek Watershed						
BOGGY CREEK						
POQUITO BRANCH						
Approximately 100 feet downstream of Northwestern Avenue	0.543	849	1,097	1,301	1,524	2,080
Approximately 450 feet upstream of Northwestern Avenue	0.522	829	1,080	1,283	1,503	2,051
BOGGY CREEK						
TRIBUTARY 1						
Approximately 450 feet downstream of Shady Lane	0.299	373	486	579	679	924
Approximately 350 feet upstream of Austin Northwestern Railroad	0.158	326	421	496	578	781
Approximately 250 feet upstream of Utility Access Bridge	0.158	326	421	496	578	781
FORT BRANCH CREEK						
Approximately 200 feet upstream of Austin Northwestern Railroad	3.420	4,073	5,113	5,986	7,009	9,391
Approximately 450 feet upstream of Austin Northwestern Railroad	3.350	4,041	5,069	5,965	6,982	9,371
Approximately 3,100 feet upstream of Austin Northwestern Railroad	3.310	4,029	5,100	5,988	7,039	9,391
Approximately 2,750 feet downstream of Fort Branch Boulevard	3.230	4,008	5,064	5,982	6,977	9,347
Approximately 1,950 feet downstream of Fort Branch Boulevard	3.010	3,941	4,990	5,909	6,865	9,161
Approximately 100 feet downstream of Fort Branch Boulevard	2.930	3,916	4,969	5,887	6,825	9,068
Approximately 150 feet upstream of Webberville Road	2.660	3,818	4,849	5,765	6,703	8,787
Approximately 650 feet downstream of Heflin Lane	2.590	3,783	4,806	5,709	6,638	8,669
Approximately 200 feet upstream of Heflin Lane	2.510	3,754	4,768	5,666	6,591	8,586

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Boggy Creek Watershed						
FORT BRANCH CREEK *(continued)*						
Approximately 1,000 feet downstream of Springdale Road	2.360	3,707	4,713	5,599	6,509	8,456
Approximately 600 feet downstream of Springdale Road	2.150	3,641	4,614	5,446	6,301	8,203
Approximately 50 feet downstream of confluence of Fort Branch Tributary 1	2.150	3,623	4,398	4,952	5,664	7,412
Approximately 50 feet upstream of Pecan Springs Road	1.640	3,168	3,990	4,679	5,431	7,190
Approximately 200 feet upstream of East 51st Street	1.570	3,233	3,975	4,652	5,400	7,194
Approximately 1,200 feet downstream of confluence of Fort Branch Creek Tributary 2	1.450	3,166	3,880	4,542	5,242	7,073
Approximately 150 feet downstream of confluence of Fort Branch Creek Tributary 2	1.320	2,965	3,642	4,341	5,028	6,817
Approximately 200 feet upstream of Greenbrook Parkway	0.820	1,893	2,309	2,739	3,138	4,269
Approximately 850 feet upstream of Rogge Lane	0.760	1,809	2,260	2,621	3,013	4,040
Approximately 300 feet upstream of Berkman Drive	0.640	1,575	1,974	2,279	2,655	3,553
Approximately 1,100 feet upstream of Briarcliff Boulevard	0.470	1,208	1,524	1,762	2,038	2,693
Approximately 2,000 feet upstream of Briarcliff Boulevard	0.290	805	1,021	1,193	1,379	1,840
FORT BRANCH CREEK SPLIT FLOW REACH						
Approximately 250 feet downstream of the divergence of Fort Branch Creek	n/a	19	215	494	637	791

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Boggy Creek Watershed						
FORT BRANCH CREEK TRIBUTARY 1						
Approximately 500 feet downstream of 51st Street	0.440	1,020	1,314	1,534	1,777	2,349
Approximately 600 feet downstream of confluence of Fort Branch Creek Tributary 1 East Branch	0.400	944	1,217	1,425	1,657	2,235
Approximately 50 feet downstream of confluence of Fort Branch Creek Tributary 1 East Branch	0.310	717	925	1,089	1,262	1,723
Approximately 450 feet downstream of Rexford Drive	0.160	337	436	511	598	835
Approximately 200 feet upstream of Rogge Lane	0.100	235	300	352	408	547
FORT BRANCH CREEK TRIBUTARY 1 EAST BRANCH						
Approximately 750 feet upstream of Norwood Hill Road	0.140	383	491	578	672	905
FORT BRANCH CREEK TRIBUTARY 2						
Approximately 300 feet downstream of Wellington Drive	0.490	1,082	1,412	1,656	1,949	2,620
Approximately 250 feet downstream of Gaston Place Drive	0.400	923	1,204	1,429	1,669	2,215
Approximately 700 feet upstream of Wheless Lane	0.260	624	810	958	1,119	1,510
Approximately 1,500 feet upstream of Wheless Lane	0.110	293	374	438	508	681
TANNEHILL BRANCH GIVENS PARK TRIBUTARY NO. 1						
Approximately 350 feet upstream of confluence with Tannehill Branch of Boggy Creek	0.800	1,044	1,417	1,715	2,019	2,717
Just downstream of confluence of Tannehill Branch Givens Park Tributary No. 2	0.780	1,004	1,369	1,652	1,941	2,610

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Boggy Creek Watershed						
TANNEHILL BRANCH GIVENS PARK TRIBUTARY NO. 1 *(continued)*						
Approximately 100 feet downstream of Greenwood Avenue	0.600	637	884	1,062	1,248	1,709
Approximately 150 feet upstream of Pershing Drive	0.400	318	404	475	558	816
Approximately 200 feet upstream of Manor Road	0.300	176	257	325	403	598
TANNEHILL BRANCH GIVENS PARK TRIBUTARY NO. 2						
Approximately 150 feet upstream of Commerce Street	0.180	367	493	591	696	901
Approximately 800 feet upstream of East Martin Luther King Jr. Boulevard	0.110	248	333	402	478	669
Approximately 600 feet downstream of Golf Course path	0.060	136	182	220	261	366
Approximately 300 feet upstream of Golf Course path	0.020	36	48	58	69	96
TANNEHILL BRANCH OF BOGGY CREEK						
Approximately 350 feet upstream of Pedestrian Drive	4.090	3,491	4,475	5,041	5,452	7,500
Approximately 50 feet downstream of Oak Springs Drive	3.930	3,440	4,216	4,786	5,475	7,442
Approximately 250 feet upstream of Oak Springs Drive	3.730	3,377	4,122	4,827	5,636	7,460
Approximately 50 feet downstream of confluence of Tannehill Branch Givens Park Tributary 1	n/a	3,360	4,001	4,371	4,687	5,329
Approximately 250 feet downstream of East 12th Street	3.670	3,360	4,094	4,801	5,540	7,502
Approximately 1,050 feet upstream of East 12th Street	3.580	3,334	4,038	4,744	5,440	7,344
Approximately 100 feet downstream of confluence of Tannehill Branch West Tributary 3	2.780	2,972	3,499	3,999	4,524	6,252

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Boggy Creek Watershed						
TANNEHILL BRANCH OF BOGGY CREEK *(continued)*						
Approximately 300 feet upstream of East Martin Luther King Jr. Boulevard	2.690	2,947	3,463	3,948	4,472	6,217
Approximately 850 feet upstream of Lovell Drive	2.580	2,911	3,420	3,897	4,453	6,412
Approximately 200 feet downstream of Old Manor Road	2.110	2,562	2,967	3,223	3,840	5,733
Approximately 500 feet upstream of East 51st Street	1.930	2,518	2,910	3,154	3,784	5,693
Approximately 1,250 feet upstream of East 51st Street	1.830	2,489	2,876	3,114	3,745	5,657
Approximately 550 feet downstream of Berkman Drive	1.710	2,439	2,820	3,050	3,679	5,625
Approximately 50 feet downstream of Berkman Drive	1.640	2,418	2,794	3,020	3,663	5,635
Approximately 1,100 feet upstream of Berkman Drive	1.640	2,799	3,504	4,114	4,784	6,311
Approximately 1,030 feet downstream of Cameron Road	1.520	2,628	3,319	3,892	4,504	5,902
Approximately 50 feet downstream of Cameron Road	1.460	2,541	3,225	3,777	4,360	5,692
Approximately 50 feet upstream of Cameron Road	1.360	2,432	3,118	3,649	4,203	5,460
Just upstream of U.S. Highway 35	1.190	2,252	2,887	3,450	4,035	5,275
Approximately 650 feet downstream of Bennett Avenue	n/a	1,750	2,179	2,376	2,608	3,393
Approximately 50 feet downstream of confluence of Tannehill Branch West Tributary 1	n/a	23	398	577	900	1,736
Approximately 500 feet upstream of confluence of Tannehill Branch West Tributary 1	0.840	1,750	2,179	2,376	2,608	3,393
TANNEHILL BRANCH WEST TRIBUTARY 1						
Approximately 350 feet upstream of confluence with Tannehill Branch of Boggy Creek	0.220	440	563	656	761	956

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Boggy Creek Watershed						
TANNEHILL BRANCH WEST TRIBUTARY 3						
Approximately 400 feet upstream of East Martin Luther King Jr. Boulevard	0.460	516	748	932	1,125	1,648
Approximately 100 feet upstream of Manor Road	0.340	457	629	772	930	1,329
Bull Creek Watershed						
BULL CREEK						
Approximately 0.40 miles upstream of the confluence with Colorado River	31.284	14,200	21,300	28,600	35,900	54,200
Approximately 0.03 miles downstream of the confluence with Bull Creek Tributary 1	31.013	14,200	21,300	28,600	35,800	54,100
Just downstream of the confluence of West Bull Creek	29.978	14,100	21,000	28,300	35,400	53,200
Approximately 0.23 miles upstream of Lakewood Drive	22.755	11,900	16,900	20,900	25,600	37,700
Approximately 0.02 miles downstream of the confluence of Bull Creek Tributary 1B	21.876	11,800	16,700	20,700	25,300	37,300
Approximately 0.01 miles upstream of the confluence of Bull Creek Tributary 2	20.649	11,600	16,300	20,200	24,800	36,500
Approximately 0.03 miles downstream of the confluence of Long Hog Hollow	15.700	8,090	12,000	15,400	18,900	28,300
Approximately 0.10 miles upstream of Spicewood Springs Road (2nd Crossing)	14.334	7,650	11,400	14,500	17,700	26,300
Approximately 0.03 miles downstream of the confluence of Bull Creek Tributary 3	13.737	7,450	11,100	14,100	17,200	25,500
Approximately 0.23 miles downstream of Spicewood Springs Road (5th Crossing)	13.255	7,310	10,800	13,800	16,800	24,800
Approximately 0.03 miles downstream of the confluence of Bull Creek Tributary 3A	12.667	7,200	10,700	13,500	16,500	24,300
Approximately 0.02 miles downstream of the confluence of Bull Creek Tributary 3C	12.026	7,030	10,400	13,100	15,900	23,300

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Bull Creek Watershed						
BULL CREEK *(continued)*						
Approximately 0.02 miles downstream of the confluence of Bull Creek Tributary 3E	11.422	6,890	10,100	12,800	15,500	22,700
Just downstream of the confluence of Bull Creek Tributary 4	10.710	6,620	9,640	12,100	14,600	21,200
Approximately 0.04 miles downstream of the confluence of Bull Creek Tributary 4B	7.860	4,760	6,700	8,270	10,000	14,800
Approximately 0.03 miles downstream of the confluence of Bull Creek Tributary 5	7.615	4,670	6,550	8,070	9,760	14,400
Approximately 0.08 miles downstream of the confluence of Bull Creek Tributary 7	3.980	3,020	4,670	6,020	7,550	11,800
BULL CREEK TRIBUTARY 1						
Approximately 0.10 miles upstream of the confluence with Bull Creek	0.900	920	1,410	1,970	2,780	4,180
Just downstream of the confluence with Bull Creek Tributary 1.1	0.805	830	1,290	1,950	2,690	3,850
Approximately 0.02 miles upstream of Ladera Norte Drive	0.421	620	960	1,240	1,510	2,180
Approximately 0.25 miles upstream of Ladera Norte Drive	0.347	610	860	1,060	1,290	1,850
Approximately 0.34 miles upstream of Ladera Norte Drive	0.253	480	670	820	990	1,400
BULL CREEK TRIBUTARY 1.1						
Approximately 0.26 miles upstream of the confluence with Bull Creek Tributary 1	0.384	230	580	930	1,200	1,690
BULL CREEK TRIBUTARY 1A						
Approximately 0.03 miles upstream of Creekbluff Drive	0.157	310	460	570	690	980
Approximately 0.07 miles upstream of Waldon Drive	0.094	220	300	370	440	620

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Bull Creek Watershed						
BULL CREEK TRIBUTARY 2						
Approximately 0.05 miles upstream of the confluence with Bull Creek	4.610	4,030	5,920	7,580	9,320	13,600
Approximately 0.12 miles upstream of Bluffstone Lane	2.864	3,250	4,420	5,380	6,440	8,880
Approximately 0.60 miles upstream of Bluffstone Lane	2.745	3,410	4,400	5,320	6,370	8,550
Approximately 0.24 miles downstream of Rain Creek Parkway	2.581	3,180	4,110	4,940	5,860	7,790
Approximately 0.08 miles upstream of Rain Creek Parkway	2.361	2,980	3,840	4,530	5,230	6,820
Approximately 0.20 miles upstream of Rain Creek Parkway	2.245	2,900	3,700	4,300	4,920	6,340
Approximately 0.03 miles upstream of the confluence of Bull Creek Tributary 2.2	2.041	2,670	3,300	3,750	4,210	5,830
Approximately 0.01 miles downstream of the confluence of Bull Creek Tributary 2.3	1.822	2,500	2,900	3,230	3,620	5,300
Approximately 0.09 miles upstream of the confluence of Bull Creek Tributary 2.3	1.755	2,440	2,810	3,120	3,540	5,210
Approximately 0.12 miles downstream of Floral Park Drive	1.661	2,340	2,670	2,960	3,380	5,030
At downstream face of Floral Park Drive	1.426	2,030	2,310	2,590	2,960	4,460
Approximately 0.20 miles upstream of the confluence of Bull Creek Tributary 2.5	0.763	1,340	1,810	2,170	2,560	3,540
Approximately 0.49 miles upstream of the confluence of Bull Creek Tributary 2.5	0.650	1,170	1,580	1,880	2,220	3,060
Approximately 0.16 miles downstream of Bunting Drive	0.557	1,010	1,370	1,630	1,910	2,640
Approximately 0.05 miles downstream of Bunting Drive	0.499	940	1,270	1,510	1,780	2,450
Approximately 0.02 miles upstream of Oak Knoll Drive	0.388	750	1,010	1,220	1,430	1,980
Approximately 0.03 miles upstream of Oak View Drive	0.298	600	810	970	1,150	1,590

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Bull Creek Watershed						
BULL CREEK TRIBUTARY 2 *(continued)*						
Approximately 0.07 miles upstream of Oak View Drive	0.265	550	730	880	1,040	1,450
Approximately 0.12 miles upstream of Oak View Drive	0.038	70	100	120	140	200
BULL CREEK TRIBUTARY 2.1						
Approximately 0.02 miles upstream of the confluence of Bull Creek Tributary 2.1.1	1.685	2,300	2,860	3,330	3,840	5,150
Approximately 0.12 miles downstream of the confluence of Bull Creek Tributary 2.1.3	0.818	1,550	2,080	2,490	2,960	4,140
Just downstream of the confluence of Bull Creek Tributary 2.1.3	0.757	1,470	1,970	2,380	2,820	3,920
Approximately 0.18 miles upstream of the confluence of Bull Creek Tributary 2.1.3	0.516	1,010	1,350	1,620	1,920	2,660
Approximately 0.37 miles upstream of the confluence of Bull Creek Tributary 2.1.3	0.407	850	1,130	1,360	1,610	2,230
Approximately 0.41 miles upstream of the confluence of Bull Creek Tributary 2.1.3	0.118	240	330	390	460	650
BULL CREEK TRIBUTARY 2.2						
Approximately 0.10 miles upstream of Rain Creek Parkway	0.193	310	430	530	630	870
BULL CREEK TRIBUTARY 4						
Approximately 0.11 miles upstream of the confluence of Bull Creek	2.382	2,890	3,940	4,860	5,880	8,300
Approximately 0.30 miles upstream of Spicewood Springs Road	2.017	2,560	3,530	4,380	5,280	7,540
Approximately 0.02 miles downstream of the confluence of Bull Creek Tributary 4.2	1.747	2,330	3,220	3,960	4,770	6,800
Approximately 0.20 miles upstream of the confluence of Bull Creek Tributary 4.2	1.215	1,620	2,240	2,760	3,330	4,750

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Bull Creek Watershed						
BULL CREEK TRIBUTARY 4 *(continued)*						
Approximately 0.27 miles downstream of the confluence of Bull Creek Tributary 4.3	1.008	1,400	1,920	2,360	2,840	4,040
Just below the confluence of Bull Creek Tributary 4.3	0.826	1,170	1,610	1,970	2,370	3,360
Approximately 0.33 miles upstream of the confluence of Bull Creek Tributary 4.3	0.410	600	830	1,020	1,230	1,740
BULL CREEK TRIBUTARY 4.3						
Approximately 0.10 miles upstream of the confluence of Bull Creek Tributary 4	0.324	440	610	750	890	1,260
Approximately 0.02 miles upstream of Jolly Hollow Drive	0.261	360	490	600	720	1,020
BULL CREEK TRIBUTARY 4A						
Approximately 0.08 miles upstream of the confluence with Bull Creek	0.415	310	340	370	410	790
Approximately 0.05 miles upstream of Old Lampasas Trail	0.384	290	330	350	380	770
BULL CREEK TRIBUTARY 4B						
Approximately 0.06 miles upstream of Old Lampasas Trail	0.108	200	270	330	390	540
BULL CREEK TRIBUTARY 5						
Approximately 0.09 miles upstream of the confluence with Bull Creek	3.560	1,660	1,890	2,040	2,170	2,720
Approximately 0.02 miles downstream of the confluence of Bull Creek Tributary 5.1	3.488	1,640	1,870	2,020	2,140	2,410
Approximately 0.09 miles upstream of the confluence of Bull Creek Tributary 5.1	3.349	1,610	1,820	1,970	2,080	2,290
Approximately 0.04 miles upstream of the confluence of Bull Creek Tributary 5.1	3.349	1,610	1,820	1,970	2,080	2,290

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Bull Creek Watershed						
BULL CREEK TRIBUTARY 5 *(continued)*						
Approximately 0.18 miles upstream of the confluence of Bull Creek Tributary 6	1.331	1,700	2,410	2,980	3,670	5,310
Approximately 0.39 miles upstream of the confluence of Bull Creek Tributary 6	1.214	1,610	2,250	2,780	3,410	4,900
Approximately 0.60 miles upstream of the confluence of Bull Creek Tributary 6	1.123	1,560	2,180	2,710	3,290	4,700
Approximately 0.72 miles upstream of the confluence of Bull Creek Tributary 6	0.968	1,390	1,950	2,420	2,930	4,180
Approximately 0.98 miles upstream of the confluence with Bull Creek Tributary 6	0.713	1,150	1,590	1,960	2,350	3,300
Approximately 1.12 miles upstream of the confluence with Bull Creek Tributary 6	0.441	670	940	1,160	1,400	1,980
Approximately 1.29 miles upstream of the confluence with Bull Creek Tributary 6	0.287	510	690	830	990	1,380
BULL CREEK TRIBUTARY 6						
Approximately 0.25 miles upstream of the confluence with Bull Creek Tributary 5	1.920	2,370	3,260	4,010	4,930	7,390
Approximately 0.41 miles upstream of the confluence with Bull Creek Tributary 5	1.835	2,320	3,190	3,910	4,810	7,200
Approximately 0.74 miles upstream of the confluence with Bull Creek Tributary 5	1.694	2,250	3,060	3,740	4,610	6,870
Approximately 0.36 miles downstream of the confluence of Bull Creek Tributary 6.1	1.604	2,220	3,000	3,650	4,520	6,740
Approximately 0.24 miles downstream of the confluence of Bull Creek Tributary 6.1	1.483	2,070	2,780	3,390	4,220	6,270
Approximately 0.12 miles downstream of the confluence of Bull Creek Tributary 6.1	1.339	1,900	2,540	3,100	3,900	5,750
Approximately 0.02 miles downstream of the confluence of Bull Creek Tributary 6.1	1.097	1,550	2,050	2,530	3,210	4,750

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Bull Creek Watershed						
BULL CREEK TRIBUTARY 6 *(continued)*						
Approximately 0.11 miles upstream of the confluence of Bull Creek Tributary 6.1	0.781	1,070	1,420	1,800	2,270	3,320
Approximately 0.02 miles upstream of Sierra Blanca Street	0.681	940	1,260	1,620	2,030	2,920
Approximately 0.14 miles upstream of Sierra Blanca Street	0.572	880	1,200	1,470	1,760	2,490
BULL CREEK TRIBUTARY 6.1						
Approximately 0.24 miles upstream of the confluence with Bull Creek Tributary 6	0.316	520	710	870	1,040	1,470
COW FORK WEST BULL CREEK						
Approximately 0.13 miles upstream of the confluence with West Bull Creek	2.571	2,520	3,730	4,750	5,940	9,020
Approximately 0.40 miles upstream of the confluence with West Bull Creek	2.493	2,490	3,680	4,690	5,870	8,880
Approximately 0.02 miles downstream of the confluence of Cow Fork West Bull Tributary 1	2.195	2,320	3,450	4,390	5,500	8,260
Approximately 0.20 miles upstream of the confluence of Cow Fork West Bull Tributary 2	1.933	2,140	3,180	4,060	5,070	7,570
Approximately 0.16 miles downstream of the confluence of Cow Fork West Bull Tributary 3	1.863	2,080	3,100	3,960	4,940	7,360
Approximately 0.03 miles downstream of the confluence of Cow Fork West Bull Tributary 3	1.741	2,030	3,010	3,840	4,780	7,120
Approximately 0.18 miles upstream of the confluence of Cow Fork West Bull Tributary 3	1.447	1,770	2,610	3,310	4,110	6,090

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Bull Creek Watershed						
COW FORK WEST BULL CREEK *(continued)*						
Approximately 0.29 miles downstream of the confluence of Cow Fork West Bull Tributary 4	1.286	1,650	2,420	3,070	3,810	5,630
LONG HOG HOLLOW						
Approximately 0.21 miles upstream of the confluence with Bull Creek	1.168	1,380	1,920	2,350	2,820	4,030
Approximately 0.53 miles upstream of the confluence with Bull Creek	1.031	1,330	1,830	2,220	2,670	3,770
Approximately 0.80 miles upstream of the confluence with Bull Creek	0.957	1,280	1,760	2,140	2,580	3,620
Approximately 1.06 miles upstream of the confluence with Bull Creek	0.849	1,130	1,560	1,900	2,290	3,210
Approximately 0.89 miles downstream of Fire Oak Drive	0.703	1,010	1,390	1,690	2,030	2,820
Approximately 0.59 miles downstream of Fire Oak Drive	0.587	930	1,270	1,540	1,840	2,550
Approximately 0.31 miles downstream of Fire Oak Drive	0.445	750	1,010	1,230	1,470	2,040
Approximately 0.09 miles downstream of Fire Oak Drive	0.319	540	730	880	1,050	1,470
Approximately 0.04 miles upstream of Fire Oak Drive	0.157	260	360	430	520	720
Approximately 0.13 miles upstream of Fire Oak Drive	0.127	220	300	360	430	600
WEST BULL CREEK						
Approximately 0.27 miles upstream of the confluence with Bull Creek	6.913	5,510	8,380	10,800	13,500	20,500
Approximately 0.10 miles downstream of the confluence of West Bull Creek Tributary 1	6.707	5,460	8,310	10,700	13,400	20,400
Approximately 0.01 miles downstream of the confluence of West Bull Creek Tributary 1	6.673	5,450	8,310	10,700	13,400	20,400
Approximately 0.15 miles upstream of the confluence of West Bull Creek Tributary 1	6.456	5,340	8,150	10,500	13,100	20,000

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Bull Creek Watershed						
WEST BULL CREEK *(continued)*						
Approximately 0.23 miles upstream of the confluence of West Bull Creek Tributary 2	6.238	5,270	8,070	10,400	13,000	19,800
Approximately 0.01 miles downstream of the confluence of Cow Fork West Bull Creek	5.799	5,070	7,770	9,990	12,500	19,000
Approximately 0.06 miles upstream of the confluence of West Bull Creek Tributary 5	3.161	2,540	4,020	5,220	6,530	9,900
Approximately 0.31 miles upstream of the confluence of West Bull Creek Tributary 5	1.465	1,140	1,820	2,380	3,000	4,680
WEST BULL CREEK TRIBUTARY 1						
Approximately 0.20 miles upstream of the confluence with West Bull Creek	0.217	290	410	510	620	900
WEST BULL CREEK TRIBUTARY 5						
Approximately 0.20 miles upstream of the confluence with West Bull Creek	0.217	290	410	510	620	900
Approximately 0.14 miles upstream of the confluence with West Bull Creek	1.318	1,280	1,960	2,520	3,140	4,650
Approximately 0.43 miles upstream of the confluence with West Bull Creek	1.225	1,220	1,880	2,410	2,990	4,430
Approximately 0.21 miles downstream of the confluence of West Bull Creek Tributary 5.2	1.118	1,120	1,730	2,220	2,760	4,090
Approximately 0.02 miles downstream of the confluence of West Bull Creek Tributary 5.2	0.953	980	1,520	1,940	2,420	3,610

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Carson Creek Watershed						
CARSON CREEK						
Approximately 1,850 feet upstream of confluence with Colorado River	5.970	3,266	4,127	4,662	5,481	7,061
Approximately 50 feet downstream of confluence of Carson Creek Tributary 4	5.780	3,244	4,099	4,621	5,469	6,987
Approximately 900 feet upstream of confluence of Carson Creek Tributary 4	4.680	2,855	3,242	3,551	3,822	4,712
Approximately 1,200 feet downstream of Dalton Lane	4.580	2,840	3,218	3,525	3,793	4,509
Approximately 400 feet downstream of Dalton Lane	4.360	2,797	3,156	3,446	3,704	4,364
Approximately 150 feet downstream of Dalton Lane	4.360	2,801	3,160	3,457	3,723	4,418
Approximately 600 feet upstream of Dalton Lane	4.160	2,758	3,099	3,379	3,637	4,257
Approximately 600 feet downstream of confluence with Carson Creek Overflow	3.990	2,725	3,049	3,314	3,584	4,125
Approximately 450 feet downstream of confluence with Carson Creek Overflow	3.990	3,284	3,867	4,202	4,478	4,842
Approximately 100 feet downstream of confluence with Carson Creek Overflow	3.930	3,437	4,308	4,886	5,391	6,451
Approximately 500 feet upstream of confluence with Carson Creek Overflow	3.930	3,502	4,628	5,552	6,578	9,585
Approximately 850 feet downstream of Bastrop Highway Service Road	2.410	2,503	3,103	3,489	3,912	5,740
Approximately 1,100 feet upstream of confluence of Carson Creek Montopolis Tributary	2.310	2,736	3,605	4,277	5,013	7,107
Approximately 150 feet upstream of East Riverside Drive	2.040	2,632	3,403	4,014	4,710	6,636

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Carson Creek Watershed						
CARSON CREEK *(continued)*						
Approximately 100 feet downstream of confluence of Carson Creek Tributary 1	1.770	2,573	3,298	3,898	4,580	6,492
Approximately 400 feet upstream of Hoeke Lane	1.510	2,279	2,967	3,539	4,171	5,836
Approximately 1,500 feet downstream of Low Water Crossing	1.300	2,217	2,890	3,472	4,085	5,653
Approximately 1,000 feet upstream of Low Water Crossing	0.830	1,609	2,096	2,496	2,911	3,912
At the limit of study	0.570	1,159	1,494	1,762	2,052	2,769
CARSON CREEK MONTOPOLIS TRIBUTARY						
Approximately 300 feet downstream of U.S. Highway 183	1.080	2,338	2,998	3,491	3,989	4,969
Approximately 1,150 feet upstream of U.S. Highway 183	1.080	1,843	2,411	2,865	3,358	4,701
Approximately 400 feet downstream of Low Water Crossing	0.980	1,837	2,397	2,846	3,330	4,528
Approximately 150 feet upstream of Low Water Crossing	0.750	1,620	2,110	2,501	2,922	3,966
CARSON CREEK OVERFLOW						
Approximately 250 feet downstream of Dirt Road	0.000	151	410	716	1,038	1,681
CARSON CREEK TRIBUTARY 1						
Approximately 250 feet downstream of Dirt Road	0.260	414	484	539	597	988
Approximately 200 feet upstream of Metropolis Drive	0.160	404	533	637	749	1,025
CARSON CREEK TRIBUTARY 2						
Approximately 100 feet downstream of Brandt Drive	0.220	574	744	884	1,028	1,387
Approximately 850 feet upstream of Brandt Drive	0.090	234	306	364	427	584

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Carson Creek Watershed						
CARSON CREEK TRIBUTARY 3						
Approximately 350 feet upstream of Thornberry Road	0.250	321	417	495	578	787
CARSON CREEK TRIBUTARY 4						
Approximately 1,000 feet upstream of confluence with Carson Creek	0.850	532	856	1,141	1,513	2,393
Approximately 50 feet upstream of Dalton Lane	0.800	540	868	1,137	1,546	2,386
Approximately 750 feet upstream of Dalton Lane	0.030	486	775	1,015	1,331	2,017
Approximately 850 feet downstream of divergence from Carson Creek	0.000	481	768	1,007	1,319	1,998
COTTONMOUTH CREEK						
Approximately 5,400 feet downstream of Colton Road	5.411	520	1,485	2,922	5,474	7,635
Approximately 3,600 feet downstream of Colton Road	5.337	511	1,516	2,987	5,567	7,713
Approximately 2,250 feet downstream of Colton Road	4.617	356	1,383	2,697	5,013	6,917
Just downstream of Colton Road	4.456	349	1,367	2,666	4,951	6,823
Approximately 1,550 feet upstream of Cottonmouth School Road	3.522	303	1,193	2,309	4,246	5,832
Approximately 4,900 feet downstream of Colton Bluff Springs Road	2.573	256	922	1,705	3,157	4,361
Approximately 2,700 feet downstream of Colton Bluff Springs Road	2.188	241	866	1,553	2,688	3,582
Approximately 950 feet downstream of Colton Bluff Springs Road	1.726	216	783	1,420	2,411	3,113
Approximately 1,250 feet upstream of Colton Bluff Springs Road	1.364	202	724	1,334	2,198	2,821
Approximately 2,500 feet downstream of Sassman Drive	1.003	159	639	1,196	1,890	2,415
Approximately 850 feet upstream of Sassman Drive	0.359	50	265	513	854	1,094

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Dry Creek East Watershed						
BERDOLL TRIBUTARY						
Just downstream of the confluence of Berdoll Tributary 1	0.099	222	291	345	404	548
Approximately 1,700 feet upstream of the confluence with Dry Creek East	0.338	659	852	1,006	1,171	1,578
Dry Creek East Watershed						
BERDOLL TRIBUTARY 1						
Approximately 850 feet upstream of the confluence with Berdoll Tributary	0.006	14,100	11	14	17	20
DRY CREEK EAST						
Approximately 385 feet downstream of Travis/Bastrop County Line	43.790	10,800	13,500	15,100	16,700	20,600
Approximately 385 feet downstream of Travis/Bastrop County Line	43.790	10,800	13,500	15,100	16,700	20,600
Approximately 0.57 miles upstream of Tucker Hill Lane	42.990	12,900	17,400	20,500	23,500	29,800
Just upstream of State Highway 71	41.970	12,900	18,200	22,800	27,500	39,200
Just downstream of confluence of Dry Creek East Tributary 4	40.930	12,900	18,400	22,800	27,500	39,200
Just downstream of confluence of Dry Creek East Tributary 5	38.620	12,800	18,200	22,600	27,200	38,800
Just upstream of Wolf Lane (combined flow with Dry Creek East Tributary 5)	38.510	12,800	18,200	22,600	27,200	38,800
Approximately 0.75 miles upstream of Wolf Lane (combined flow with Dry Creek East Tributary 5)	37.350	12,800	18,200	22,600	27,200	38,800
Approximately 0.38 miles downstream of confluence of Dry Creek East Tributary 6	35.850	12,700	18,100	22,500	27,000	38,500
Just downstream of confluence of Dry Creek East Tributary 6	32.860	12,500	17,800	22,100	26,500	37,600
Approximately 0.32 miles upstream of confluence with Dry Creek East Tributary 6	30.960	12,300	17,500	21,700	26,000	36,800

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Dry Creek East Watershed						
DRY CREEK EAST *(continued)*						
Approximately 0.52 miles downstream of confluence of Dry Creek East Tributary 7	29.900	12,300	17,500	21,700	26,000	36,600
Just downstream of confluence of Dry Creek East Tributary 7	28.680	12,200	17,400	21,500	25,800	36,200
Approximately 0.52 miles upstream of confluence of Dry Creek East Tributary 7	27.360	12,100	17,200	21,300	25,500	35,800
Approximately 0.74 miles downstream of Pearce Lane	26.880	12,000	17,200	21,300	25,500	35,700
Just upstream of Pearce Lane	25.930	12,000	17,100	21,100	25,300	35,400
Approximately 0.51 miles upstream of Pearce Lane	24.800	12,000	17,000	21,000	25,100	35,000
Approximately 0.88 miles upstream of Pearce Lane	24.410	11,900	17,000	20,900	25,000	34,900
Approximately 0.38 miles downstream of Elroy Road	23.710	11,900	16,900	20,900	24,900	34,800
Just upstream of Elroy Road and just downstream of confluence of Dry Creek East Tributary 8	22.750	11,700	16,900	20,800	24,800	34,500
Approximately 0.51 miles upstream of Elroy Road	21.160	11,400	16,500	20,300	24,300	33,800
Just downstream of confluence of South Fork Dry Creek East	20.130	11,300	16,400	20,200	24,100	33,500
Just upstream of confluence of South Fork Dry Creek East	6.420	3,790	5,210	6,650	8,420	12,500
Just upstream of Farm to Market Highway 812	5.940	3,690	5,380	6,930	8,680	12,400
Just downstream of confluence of Dry Creek East Tributary 9	5.410	3,650	5,390	6,910	8,460	12,000
Approximately 0.59 miles upstream of confluence of Dry Creek East Tributary 9	4.380	3,470	5,100	6,580	7,900	11,100
Just upstream of Moore Road (just downstream of confluence of Dry Creek East Tributary 10)	3.800	3,480	4,980	6,450	7,580	10,600
Just upstream of State Highway 130 Southbound Frontage Road	2.830	3,180	4,220	5,130	6,110	8,680
Approximately 0.18 miles downstream of Blocker Lane	2.650	3,140	4,150	5,030	5,990	8,500
Approximately 0.18 miles upstream of Blocker Lane	2.320	2,940	3,920	4,700	5,620	7,880

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Dry Creek East Watershed						
DRY CREEK EAST *(continued)*						
Approximately 250 feet upstream of Sunflower Drive	1.870	2,480	3,320	3,970	4,770	6,600
Approximately 0.54 miles downstream of Maha Loop Road	1.420	2,090	2,710	3,260	3,820	5,500
Approximately 0.26 miles downstream of Maha Loop Road	0.980	1,480	1,960	2,290	2,690	3,910
Just upstream of U.S. Highway 183	0.510	910	1,130	1,360	1,650	2,310
DRY CREEK EAST TRIBUTARY 5						
Approximately 2.0 miles upstream of Wolf Lane	2.180	2,270	3,130	3,880	4,770	6,820
Approximately 0.53 miles downstream of Navarro Creek Road	1.910	2,190	3,020	3,750	4,560	6,470
Approximately 250 feet upstream of Navarro Creek Road	1.680	2,140	2,950	3,580	4,340	6,120
Approximately 840 feet upstream of Navarro Creek Road	1.500	2,020	2,760	3,360	4,040	5,680
Approximately 0.71 miles upstream of Navarro Creek Road	1.250	1,860	2,520	3,060	3,650	5,090
Approximately 1.24 miles upstream of Navarro Creek Road	0.620	1,090	1,450	1,740	2,060	2,850
DRY CREEK EAST TRIBUTARY 6						
At confluence with Dry Creek East	1.810	1,260	2,070	2,730	3,300	6,320
Just downstream of Dry Creek East Tributary 6 Pond outlet	1.330	1,330	2,130	2,740	3,380	4,970
Approximately 1.56 miles upstream of confluence with Dry Creek East	0.990	1,930	2,560	3,060	3,610	4,910
Approximately 1.84 miles upstream of confluence with Dry Creek East	0.760	1,540	2,030	2,430	2,860	3,850

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Dry Creek East Watershed						
DRY CREEK EAST TRIBUTARY 7						
At confluence with Dry Creek East	1.110	1,700	2,360	2,900	3,480	5,810
Just upstream of Pearce Lane	0.820	1,490	2,020	2,460	2,980	4,110
Approximately 900 feet upstream of Pearce Lane	0.750	1,440	1,940	2,330	2,870	3,900
DRY CREEK EAST TRIBUTARY 7A						
Approximately 2,800 feet upstream of the confluence with Dry Creek East	0.44	*	*	*	1,200	*
DRY CREEK EAST TRIBUTARY 8						
At confluence with Dry Creek East	0.780	1,080	1,540	1,910	2,300	3,230
Just downstream of Stoney Ridge Pond outlet	0.590	1,090	1,410	1,660	1,920	2,590
Approximately 0.23 miles downstream of Schebler Street	0.490	900	1,180	1,380	1,600	2,160
Just upstream of Moores Crossing Boulevard	0.130	240	320	370	440	590
DRY CREEK EAST TRIBUTARY 8A						
Approximately 500 feet upstream of McAngus Road	0.11	*	*	*	235	*
DRY CREEK EAST TRIBUTARY 8B						
Approximately 1,200 feet upstream of Dam	0.30	*	*	*	1,000	*
DRY CREEK EAST TRIBUTARY 8C						
Approximately 400 feet upstream of Farm to Market Highway 812	0.22	*	*	*	757	*

*Data not available

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Dry Creek East Watershed						
DRY CREEK EAST TRIBUTARY 9						
At confluence with Dry Creek East	0.860	1,570	2,080	2,440	2,800	3,460
Just upstream of State Highway 130	0.670	1,260	1,680	1,970	2,310	3,040
Approximately 0.41 miles upstream of State Highway 130	0.460	920	1,210	1,440	1,680	2,290
DRY CREEK EAST TRIBUTARY 10						
At confluence with Dry Creek East	0.830	1,230	1,440	1,880	2,330	3,420
Approximately 0.68 miles upstream of confluence with Dry Creek East	0.580	980	1,290	1,540	1,820	2,570
NORTH FORK DRY CREEK EAST						
Just downstream of confluence with South Fork Dry Creek East	13.020	8,450	11,500	13,700	16,100	21,700
Just upstream of confluence with South Fork Dry Creek East	3.840	3,230	4,240	5,040	5,770	8,710
Approximately 0.39 miles upstream of State Highway 130 Southbound Frontage Road	3.620	3,190	4,200	4,980	5,700	8,620
Just upstream of FM 973	3.220	3,100	4,070	4,780	5,510	8,240
Approximately 0.67 miles upstream of FM 973	2.840	3,090	3,960	4,630	5,400	7,980
Approximately 0.84 miles downstream of US Highway 183	2.600	2,980	3,810	4,420	5,210	7,660
Approximately 0.64 miles downstream of US Highway 183	2.390	2,860	3,630	4,180	4,970	7,230
Approximately 0.26 miles downstream of US Highway 183	2.200	2,780	3,510	4,060	4,820	6,980

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Dry Creek East Watershed						
NORTH FORK DRY CREEK EAST *(continued)*						
Approximately 0.20 miles downstream of US Highway 183	2.030	2,650	3,320	3,880	4,590	6,540
Just upstream of Farm to Market Highway 1625	1.520	2,030	2,590	3,030	3,520	4,740
Just upstream of Colton Bluff Springs Road	0.720	890	1,200	1,450	1,740	2,500
Approximately 0.76 miles upstream of Colton Bluff Springs Road	0.290	490	650	780	920	1,280
SOUTH FORK DRY CREEK EAST						
At confluence with Dry Creek East	13.630	8,550	11,600	13,800	16,200	22,000
Approximately 0.33 miles downstream of confluence of North Fork Dry Creek East	13.430	8,540	11,600	13,800	16,200	21,900
Just downstream of confluence of North Fork Dry Creek East	13.020	8,450	11,500	13,700	16,100	21,700
Just upstream of confluence of North Fork Dry Creek East	9.180	5,640	7,950	9,790	11,700	16,200
Just upstream of State Highway 130 Southbound Frontage Road	9.030	5,610	7,920	9,750	11,600	16,100
Approximately 0.29 miles upstream of State Highway 130	8.860	5,600	7,920	9,750	11,800	16,200
Approximately 0.46 miles downstream of FM 973	8.520	5,540	7,860	9,700	12,100	16,100
Approximately 990 feet downstream of FM 973	8.280	5,500	7,800	9,630	12,000	16,000
Just upstream of FM 973 and just downstream of confluence of South Fork Dry Creek East Tributary 1	8.120	5,470	7,770	9,580	12,000	15,900

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Dry Creek East Watershed						
SOUTH FORK DRY CREEK EAST *(continued)*						
Approximately 0.60 miles downstream of U.S. Highway 183	6.980	5,160	7,350	9,200	11,100	16,000
Approximately 770 feet downstream of U.S. Highway 183	6.660	5,090	7,270	9,020	10,900	15,700
Just upstream of U.S. Highway 183	6.480	5,040	7,200	8,920	10,700	15,600
Just downstream of confluence of South Fork Dry Creek East Tributary 2	6.290	5,020	7,070	8,730	10,500	15,200
Just upstream of confluence of South Fork Dry Creek East Tributary 2	5.220	4,220	5,880	7,220	8,390	13,000
Approximately 0.52 miles upstream of confluence of South Fork Dry Creek East Tributary 2	5.140	4,220	5,890	7,210	8,350	13,300
Approximately 0.80 miles upstream of confluence of South Fork Dry Creek East Tributary 2	4.960	4,170	5,830	7,130	8,220	13,100
Approximately 0.50 miles downstream of Rodriguez Road	4.610	4,040	5,670	6,910	7,860	12,700
Just downstream of confluence of South Fork Dry Creek East Tributary 3	4.360	3,890	5,470	6,650	7,410	12,500
Approximately 0.61 miles upstream of confluence of South Fork Dry Creek East Tributary 3	3.370	3,040	4,250	5,180	6,230	9,040
Approximately 0.49 miles downstream of FM 1625 crossing #1	2.900	2,800	3,840	4,600	5,790	8,620
Approximately 500 feet upstream of FM 1625 crossing #1	2.710	2,680	3,610	4,640	5,850	8,530
Just upstream of FM 1625 crossing #2	1.690	2,150	2,970	3,820	4,690	6,670
Approximately 620 feet downstream of FM 1625 crossing #3	1.290	1,930	2,720	3,310	3,960	5,530

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Dry Creek East Watershed						
SOUTH FORK DRY CREEK EAST *(continued)*						
Approximately 130 feet downstream of FM 1625 crossing #3	1.160	1,810	2,500	3,030	3,610	5,020
Approximately 0.21 miles upstream of FM 1625 crossing #3	1.110	1,810	2,450	2,960	3,510	4,870
SOUTH FORK DRY CREEK EAST TRIBUTARY 1						
At confluence with South Fork Dry Creek East	0.990	1,550	2,050	2,530	3,030	3,960
Just upstream of FM 973	0.840	1,420	1,890	2,310	2,760	3,900
Approximately 0.29 miles upstream of FM 973	0.800	1,450	1,920	2,320	2,770	3,840
Approximately 0.56 miles upstream of FM 973	0.510	940	1,260	1,520	1,800	2,500
SOUTH FORK DRY CREEK EAST TRIBUTARY 2						
At confluence with South Fork Dry Creek East	1.070	1,670	2,280	2,800	3,350	4,760
Just upstream of FM 1625	0.840	1,370	1,910	2,330	2,760	3,920
SOUTH FORK DRY CREEK EAST TRIBUTARY 3						
At confluence with South Fork Dry Creek East	0.930	1,430	1,920	2,300	2,730	3,780
Just downstream of South Fork Dry Creek East Tributary 3 Pond outlet	0.600	850	1,140	1,370	1,630	2,260
Approximately 0.85 miles upstream of confluence with South Fork Dry Creek East	0.380	570	760	920	1,080	1,510
HEMPHILL BRANCH						
At 26th Half Street	1.44	1,890	2,932	n/a	3,545	4,991
At 32nd Street West	0.95	1,194	2,030	n/a	2,433	3,400

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Shoal Creek Watershed						
SHOAL CREEK						
At confluence with Colorado River	12.940	10,740	13,240	15,510	17,580	22,570
Approximately 360 feet downstream of West Avenue	12.910	10,740	13,230	15,510	17,570	22,560
Approximately 350 feet downstream of West Avenue	12.380	10,610	13,070	15,300	17,340	22,220
At West 9th Street	12.250	10,590	13,060	15,280	17,370	22,170
At West 12th Street	12.160	10,590	13,070	15,280	17,350	22,130
At West 15th Street	12.010	10,620	13,120	15,220	17,270	22,010
Approximately 150 feet downstream of West 24th Street	11.710	10,590	13,050	15,120	17,130	21,770
At West 24th Street	11.610	10,560	13,020	15,070	17,080	21,690
At West 29th Street	11.220	10,480	12,910	14,930	16,890	21,380
Just downstream of West 34th Street	10.990	10,420	12,840	14,840	16,770	21,210
Just upstream of West 34th Street	10.920	10,400	12,810	14,810	16,730	21,150
Approximately 1,225 feet upstream of West 38th Street	10.550	10,310	12,690	14,620	16,500	20,860
At confluence of Shoal Creek Hancock Branch	10.010	10,050	12,330	14,170	15,900	20,140
Upstream of confluence of Shoal Creek Hancock Branch	8.130	7,780	9,500	10,760	12,120	15,170
At Hancock Drive	7.990	7,660	9,320	10,550	11,830	14,810
Approximately 15,00 feet downstream of Allandale Road	7.700	7,460	9,000	10,170	11,360	14,350
At Alllandale Road	7.390	7,190	8,630	9,760	10,950	14,140
At White Rock Drive	7.000	6,750	8,060	9,130	10,340	13,820
Approximately 550 feet upstream of Shoal Creek Boulevard	6.620	6,580	7,840	8,920	10,150	13,770
Approximately 560 feet upstream of Shoal Creek Boulevard	6.390	6,230	7,410	8,400	9,560	12,260

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Shoal Creek Watershed						
SHOAL CREEK *(continued)*						
Approximately 1230 feet downstream of Greenlawn Parkway	6.250	6,030	7,130	8,030	9,150	11,970
Approximately 425 feet downstream of Greenlawn Parkway	5.840	5,870	6,940	7,830	8,940	11,540
At Greenlawn Parkway	5.840	6,830	8,600	9,960	11,390	14,670
Approximately 200 feet upstream of Silverway Drive	5.580	6,430	8,120	9,400	10,780	14,190
At confluence of Shoal Creek Foster Branch	4.500	4,810	6,040	6,910	8,110	10,540
At Foster Lane	3.000	3,030	3,990	4,550	5,260	6,930
At Steck Avenue	2.790	2,840	3,760	4,250	5,150	6,860
Just upstream of Steck Avenue	2.530	2,480	3,240	3,680	4,360	5,710
Approximately 575 feet downstream of Crosscreek Drive	2.440	2,400	3,120	3,620	4,140	5,380
Approximately 570 feet downstream of Crosscreek Drive	2.120	1,840	2,390	2,760	3,140	4,030
Approximately 475 feet upstream of Crosscreek Drive	1.700	1,260	1,420	1,540	1,680	2,340
At UT Pond	1.540	1,170	1,310	1,400	1,540	2,240
At ZK Pond Outlet	0.610	270	380	720	1,050	1,900
SHOAL CREEK FOSTER BRANCH						
At confluence with Shoal Creek	1.500	1,780	2,070	2,420	2,950	3,610
At Mopac Expressway	1.470	1,770	2,110	2,550	2,980	3,640
At Koger Pond	1.280	1,660	1,970	2,350	2,680	3,130
At North Mopac Service Road	0.650	1,050	1,290	1,510	1,920	2,900
At Spicewood Pond 2	0.390	620	740	940	1,260	1,830

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Shoal Creek Watershed						
SHOAL CREEK GROVER TRIBUTARY						
At confluence with Shoal Creek Hancock Branch	0.580	890	1,150	1,360	1,590	2,150
Approximately 30 feet downstream of Woodrow Avenue	0.580	890	1,150	1,360	1,590	2,150
Approximately 95 feet upstream of Grover Avenue	0.450	664	861	1,018	1,191	1,592
Approximately 320 feet upstream of West Koenig Lane	0.370	533	694	821	960	1,269
At Alegria Road	0.300	420	550	650	760	990
Approximately 120 feet upstream of Karen Avenue	0.280	388	509	603	704	927
Approximately 110 feet upstream of Brentwood Street	0.230	334	439	520	606	817
Approximately 300 feet upstream of Ruth Avenue	0.180	280	370	440	510	710
Approximately 750 feet upstream of Ruth Avenue	0.130	198	262	311	361	502
SHOAL CREEK HANCOCK BRANCH						
At confluence with Shoal Creek	1.880	2,290	2,890	3,440	3,900	5,090
Approximately 230 feet downstream of Shoal Creek Boulevard	1.790	2,240	2,850	3,390	3,840	5,010
Approximately 345 feet upstream of Hancock Drive	1.610	2,170	2,800	3,290	3,790	4,960
At Burnet Road	1.610	2,170	2,800	3,290	3,790	4,960
Just upstream of Burnet Road	1.490	2,090	2,690	3,160	3,640	4,740
At Houston Street	1.450	2,160	2,770	3,260	3,720	4,830
Just upstream of Houston Street	1.370	2,050	2,630	3,090	3,530	4,580
At confluence of Shoal Creek Grover Tributary	1.260	2,000	2,540	2,990	3,470	4,490
Upstream of confluence of Shoal Creek Grover Tributary	0.680	1,120	1,420	1,660	1,890	2,410
At Alegria Road	0.550	890	1,130	1,310	1,490	1,890
Approximately 390 feet upstream of Payne Avenue	0.320	550	730	870	1,020	1,890

Table 3 – Revised Summary of Discharges *(continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Shoal Creek Watershed						
SHOAL CREEK HANCOCK TRIBUTARY *(continued)*						
At Brentwood Street	0.320	550	730	870	1,020	1,400
Approximately 100 feet upstream of Justin Lane	0.150	250	340	400	470	640
Approximately 330 feet upstream of Cullen Avenue	0.100	180	230	280	330	450
WALLER CREEK						
At confluence with the Colorado River	5.60	4,636	n/a	7,039	8,222	11,265
At 15th Street	4.70	4,398	n/a	6,725	7,820	10,658
At 38th Street	2.20	2,319	n/a	3,402	3,941	5,439
At Upstream Limit of Detailed Study	0.20	332	n/a	522	613	841

The stillwater elevations for the 10-, 2-, 1-, and 0.2-percent-annual-chance flood have been determined for Lake Travis and Pflugerville Raw Water Storage Reservoir and are summarized in Table 4, "Summary of Reservoir Elevations."

Table 4 – Summary of Reservoir Elevations

FLOODING SOURCE AND LOCATION	Elevation in Feet (NAVD 88) 10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
LAKE TRAVIS				
At Mansfield Dam	697.0	716.7	722.0	732.7
PFLUGERVILLE RAW WATER STORAGE Reservoir	636.7	637.3	637.6	638.2

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the FIRM (Exhibit 2).

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Roughness coefficients (Manning's "n" values) used in the hydraulic computations were estimated on the basis of field inspection, aerial photography, and photographs. The channel and overbank "n" values for all streams associated with the August 18, 2014, Physical Map Revision and prior FIS reports are shown in Table 4, "Summary of Roughness Coefficients."

Previous County-wide FIS Revision

Detailed study streams are listed in Section 1.2 and shown in Table 1. Hydraulic methods used for this study are in accordance with the Guidelines and Specifications for Flood Hazard Mapping Partners dated April 2003. The following is a summary of data sources, assumptions, and procedures used to create the hydraulic models for the study streams.

The primary source of terrain data used for this hydraulic study was developed from 2003 LiDAR data. The City of Austin contracted Sanborn Map Company, Inc., to re-map the city and their 5-mile ETJ and utility service area. LiDAR flights were conducted in January 2003 and a preliminary data set was provided in February 2004. LiDAR topography was accepted by the City of Austin on August 10, 2004.

A TIN was created utilizing the 2003 LiDAR mass points and break lines in order for HEC- GeoRAS 8.1 to extract cross-section geometry data for use in HEC-RAS. All floodplains were mapped using the 2003 LiDAR data.

Water surface profiles for the 10-, 2-, 1- and 0.2-percent-annual-chance-flood events were computed using the River Analysis System HEC-RAS Version 3.1.2., dated April 2004, unless noted otherwise (Reference 25). The downstream slopes for each reach were used for the steady flow boundary conditions at normal depth. Cross-sections, taken from the TIN's generated using the 2003 LiDAR, were supplemented with field surveys conducted during the Spring of 2004 as part of this study. Bridge data used for the hydraulic models were taken from field surveys.

Profiles (Exhibit 1) were generated using RAS-PLOT. Profiles were generally plotted at a similar scale as the previous FIS profiles; typically 1"=1000' horizontal scale and 1"= 10' vertical scale.

Onion Creek

The Onion Creek RAS model was provided by the USACE Fort Worth District for incorporating into this study. The USACE originally prepared the Onion Creek Hydraulic model for the July 1997 Second Revision of the Travis County FIS. The 1997 HEC-2 model was translated into HEC-RAS in December 2003. According to the USACE, the RAS model did not appropriately reproduce the split flow analysis included in the 1997 HEC-2 model. To resolve the issue, the USACE eliminated the split analysis from the RAS model and utilized the flows estimated from the HEC-2 split analysis.

For the 2008 study, the 2003 Onion Creek HEC-RAS model was updated with the peak discharges computed for this study. The resulting peak flows were input in the HEC-2 model in order to estimate the split flows and subsequently input into the RAS model.

The Onion Creek HEC-RAS model was developed based on topography other than that of the detailed study streams listed in this section. Results from the RAS models were redelineated on the 2003 LiDAR data. For additional information on the Onion Creek terrain sources and hydraulics, please refer to the April 15, 2002 FIS. No modifications were made to the Onion Creek HEC-RAS model except updated the peak flows.

Colorado River

The most recent study of the Colorado River was the Lower Colorado River FDEP prepared on June 24, 2002, for the LCRA and the USACE Fort Worth District. The unsteady state HEC-RAS models developed for the 2002 study are the basis of the hydraulics for the Colorado River in this FIS report. The Lower Colorado River FDEP preliminary hydraulics have been reviewed by several agencies including LCRA, the USACE Fort Worth District, and FEMA. The Colorado River preliminary hydraulics were approved by FEMA on November 11, 2003.

Unsteady state HEC-RAS models for the Lower Colorado River between the Gulf of Mexico and the Colorado River gauge near San Saba (470 river miles) were developed for the FDEP study. These unsteady state HEC-RAS models were calibrated to an observed flood event and subsequently used to simulate a range of frequency events, compute water surface profiles and flood inundation surfaces.

Separate HEC-RAS models were developed for each of the gated Highland Lake reservoirs, and model designations were assigned corresponding to the name of the reservoir or stream gauge at its downstream end. Fourteen HEC-RAS models were created in total for the Colorado River mainstem during the FDEP study. Four of the unsteady state HEC-RAS models created in the Basinwide study extend within Travis County. The "Travis Lake" model extends from Starcke Dam to Mansfield Dam, the "Lake Austin" model extends from Mansfield Dam to Tom Miller Dam, the "Town Lake" model extends from Tom Miller Dam to Longhorn Dam, and the "Bastrop model" extends from Longhorn Dam to the Bastrop gauge (USGS gauge 08159200, Colorado River at Bastrop, TX). The topography used to develop the HEC-RAS cross-

section geometry data were taken from the TIN for the Lower Colorado River developed using LCRA 2 foot contour topographic mapping along the river corridor, USGS 30-meter DEM data, USACE field surveys, and lake bathymetric surveys provided by LCRA. A total of 59 bridge crossings were modeled in the FDEP HEC-RAS models based on Texas Department of Transportation record plans, USACE field surveys, LCRA topographic maps, and visual inspections. The bridge geometries for the Colorado River within Travis County were modified based on field surveys conducted in the winter of 2003 for this FIS. Initial Manning's "n" values were assigned using the USGS National Land Cover Dataset coverage, and adjusted based on visual inspection and aerial photographs.

The bridge geometries for the Colorado River within Travis County were modified based on field surveys conducted in the winter of 2003. Details related to the hydraulic and reservoir operations of the FDEP study can be found as part of the Lower Colorado River Basin/CTP – Flood Insurance Study (Reference 26).

The analyses for the redelineated study stream were taken from the prior Flood Insurance Studies for Travis County. The BFEs from the profiles were plotted on the 2003 LiDAR mentioned previously, to better define the special flood hazard areas. The redelineated streams are identified in Table 1.

For the prior analyses, cross-section data for channels and bridges were taken from field surveys. Elevation data for overbank areas were obtained from aerial photography maps with 2-foot contour intervals and spot elevations. All bridges and culverts were field surveyed to obtain elevation data and structural geometry.

In addition, there was an incorporation of existing studies of two basin wide LOMRs. They were redelineated on the 2003 LiDAR and incorporated into this FIS. LOMR case number 03-06-2670P, effective March 23, 2005 for Waller Creek and Hemphill Branch. LOMR case number 00-06-212P, effective January 04, 2001 for Tannehill Branch of Boggy Creek North, Givens Park Tributary No. 1, Givens Park Tributary No. 2, and West Tributary No. 3 were incorporated into this FIS.

Streams listed in Table 1, Streams Studied by, as having been studied by Enhanced Approximate Methods Type II (also referred to as Limited Detailed Studies) were analyzed using the same general methods as the Detailed Study Streams, except that culvert and bridge survey data were generated by field sketches and structure measurements. The streams were modeled using HEC-RAS 3.1.2 and downstream starting conditions were computed using slope area method. Manning's "n"-values were based on aerial photography.

For streams studied using Enhanced Approximate Methods Type II, only the 1-percent-annual-chance flood was computed. No profiles, roughness values or discharges are provided.

August 18, 2014 Physical Map Revision

The August 18, 2014 revision incorporates LOMR Case Numbers 08-06-2891P, 09-06-3280P, 08-06-1153P, 08-06-3201P, 08-06-2992P, 10-06-1752P, 10-06-1794P, 10-06-1285P, 10-06-2503P, 11-06-4644P, 10-06-2464, 09-06-2275P, 09-06-0609, 09-06-0003, 09-06-2902P, and 08-06-3202P. These LOMRs affect the following streams; Colorado

River, Fort Branch Creek, Fort Branch Creek 2, Gilleland Creek, Unnamed Tributary to Gilleland Creek, Unnamed Tributary to Unnamed Tributary to Gilleland Creek, Gilleland Creek Tributaries: 1, 1A, 1B, 1C, 2 & 3. Decker Creek, Decker Creek Tributaries 1, 1A, & 2, Elm Creek, Elm Creek Tributary 1, Unnamed Tributary to Decker Creek, Unnamed Tributary to Wilbarger Creek, Unnamed Tributary to Unnamed Tributary to Wilbarger Creek, Walnut Creek and Wells Branch. A conflicting approved LOMR was discovered along Elm Creek that necessitated a change in scope to perform additional analyses. The additional analysis required was a new detailed study along an approximately 1 mile stretch of stream (Elm Creek).

Below is a description of each stream studied by detailed methods in this Physical Map Revision.

Colorado River

Colorado River was updated with approved LOMR Case Number 10-06-1794P. The revised reach is from approximately 18,050 feet downstream of FM 973 to approximately 7,300 feet upstream of FM 973.

Decker Creek

Decker Creek was studied from its confluence with the Gilleland Creek for approximately 6.20 miles upstream till Walter E Long Lake. Existing channel slopes average 0.4%. The calculated depth of flow (maximum depth at channel) for the baseline conditions 1% annual chance flood event averages about 11.65 feet with estimated average channel velocities of 6.5 fps. Results of the hydraulic analysis indicate that 2 of the 4 structures analyzed are overtopped by the 1% ACFE.

Decker Creek Tributary 1

Decker Creek Tributary 1 was studied from its confluence with Decker Creek for approximately 1.75 miles. Existing channel slopes average 0.9%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 4.2 feet with estimated average channel velocities of 5.4 fps. Results of the hydraulic analysis indicate that all the 3 culverts analyzed are overtopped by the 1% ACFE.

Decker Creek Tributary 1A

Decker Creek Tributary 1A was studied from its confluence with Decker Creek for approximately 2.25 miles. Existing channel slopes average 0.28%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 5.7 feet with estimated average channel velocities of 5 fps. Results of the hydraulic analysis indicate that 3 of the 4 bridges analyzed are overtopped by the 1% ACFE.

Decker Creek Tributary 2

Decker Creek Tributary 2 was studied upstream from the normal pool extent of Decker Lake for approximately 2.75 miles. Existing channel slopes average 0.35%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 5.32 feet with estimated average channel velocities of 3.6 fps. Results of

the hydraulic analysis indicate that 2 of the 7 bridges analyzed are overtopped by the 1% ACFE.

Elm Creek

Elm Creek was studied from its confluence with Gilleland Creek for approximately 9.3 miles. Existing channel slopes average 0.29%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 8.0 feet with estimated average channel velocities of 3.6 fps. Results of the hydraulic analysis indicate that 2 of the 5 bridges analyzed is overtopped by the 1% flood event and 10 of the 11 culvert locations are overtopped.

Elm Creek Tributary 1

Elm Creek Tributary 1 was studied from its confluence with Elm Creek for approximately 1.5 miles. Existing channel slopes average 0.64%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 6.0 feet with estimated average channel velocities of 5.0 fps. Results of the hydraulic analysis indicate that 4 of the 4 culvert locations analyzed are overtopped by the 1% flood event.

Fort Branch Creek

Fort Branch Creek was updated with approved LOMR Case Number 10-06-1285P. The revised reach is from just upstream of Manor Road to just downstream of Westminster Drive.

Fort Branch Creek Tributary 1

Fort Branch Creek Tributary 1was updated with approved LOMR Case Number 08-06-3202P. The revised reach is from just upstream of Manor Road to just downstream of Westminster Drive.

Fort Branch Creek Tributary 2

Fort Branch Creek Tributary 2 was updated with approved LOMR Case Number 10-06-1285P. The revised reach is from its confluence with Fort Branch Creek to approximately 470 feet upstream of its confluence with Fort Branch Creek.

Gilleland Creek

Gilleland Creek was studied from its confluence with the Colorado River for approximately 31.2 miles. Existing channel slopes average 0.45% in the upper model and 0.23% in the lower model. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 14.9 feet in the upper model and 21.1 in the lower model with estimated average channel velocities of 6.2 fps in the upper model and 4.7 fps in the lower model. Results of the hydraulic analysis indicate that 22 of the 32 bridges analyzed are overtopped by the 1% ACFE. It should be noted that 10 of these bridges are considered low water crossings. The 1% ACFE profile compares closely to, but is consistently higher than the current effective profile.

Gilleland Creek Tributary 1

Gilleland Creek Tributary 1 was studied from its confluence with Gilleland Creek for approximately 2.0 miles. Existing channel slopes average 0.64%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 8.1 feet with estimated average channel velocities of 5.7 fps.

Gilleland Creek Tributary 1A

Gilleland Creek Tributary 1A was studied from its confluence with Gilleland Creek for approximately 1.1 miles. Existing channel slopes average 1.33%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 6.1 feet with estimated average channel velocities of 7.1 fps. Results of the hydraulic analysis indicate that the only bridge analyzed is not overtopped by the 1% ACFE.

Gilleland Creek Tributary 1B

Gilleland Creek Tributary 1B was studied from approximately one mile upstream of its confluence with Gilleland Creek for approximately 1.6 miles. Existing channel slopes average 0.59%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 6.3 feet with estimated average channel velocities of 5.1 fps. Results of the hydraulic analysis indicate that neither of the two bridges analyzed are overtopped by the 1% ACFE.

Gilleland Creek Tributary 1C

Gilleland Creek Tributary 1C was studied from its confluence with Gilleland Creek for approximately 2.8 miles. Existing channel slopes average 0.46%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 10.5 feet with estimated average channel velocities of 4.2 fps. Results of the hydraulic analysis indicate that 6 of the 13 bridges analyzed are overtopped by the 1% ACFE. It should be noted that 3 of these bridges are considered low water crossings.

Gilleland Creek Tributary 2

Gilleland Creek Tributary 2 was studied from its confluence with Gilleland Creek for approximately 5.9 miles. Existing channel slopes average 0.64%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 12.0 feet with estimated average channel velocities of 8.6 fps. Results of the hydraulic analysis indicate that 3 of the 4 bridges analyzed are overtopped by the 1% ACFE. The 1% ACFE profile compares closely to the current effective profile.

Gilleland Creek Tributary 3

Gilleland Creek Tributary 3 was studied from its confluence with Gilleland Creek for approximately 0.8 mile. Existing channel slopes average 1.27%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 6.7 feet with estimated average channel velocities of 4.8 fps. Results of the hydraulic analysis indicate that 2 of the 3 bridges analyzed are overtopped by the 1% ACFE. It

should be noted that one of the bridges is considered a low water crossing. The 1% ACFE profile does not compare closely to the current effective profile. The difference in profiles is likely caused by differences in the hydrologic discharges and channel geometries between the current effective models that were generated in 1990 and the 2008 models. The hydrologic discharges are increased by approximately 15-30% from the current effective model. Since the drainage areas remain similar, the increase in discharge is likely caused by urbanization. The differences in geometry are likely due to the increased resolution of the terrain data, the denser spacing of the cross-sections, and changes in the topography of the stream corridor between 1990 and 2008.

Unnamed Tributary to Unnamed Tributary to Wilbarger Creek

Unnamed Tributary to Unnamed Tributary to Wilbarger Creek was updated with approved LOMR Case Number 09-06-2902P. The revised reach is from approximately 4,200 feet downstream of Becker Farm Road to approximately 1,360 feet upstream. The stream name has been changed to Unnamed Tributary A to Unnamed Tributary to Wilbarger Creek.

Unnamed Tributary to Unnamed Tributary to Wilbarger Creek

Unnamed Tributary to Unnamed Tributary to Wilbarger Creek was updated with approved LOMR Case Number 09-06-0609P. The revised reach is from approximately 3,450 feet downstream to approximately 2,650 feet upstream of Jakes Hill Road. The stream name has been changed to Unnamed Tributary B to Unnamed Tributary to Wilbarger Creek.

Upper Decker

Upper Decker Creek was studied upstream from the normal pool extent of Decker Lake for approximately 1.19 miles. Existing channel slopes average 0.72%. The calculated depth of flow for the baseline conditions 1% annual chance flood event averages about 4.9 feet with estimated average channel velocities of 5.3 fps. Results of the hydraulic analysis indicate that none of the bridges analyzed are overtopped by the 1% ACFE.

Walnut Creek

The hydraulic analysis was completed using the Corps of Engineers HEC-RAS version 3.1.3 hydraulic modeling program. The hydraulic study limits for the effective model begins approximately 600 feet upstream of the confluence with the Colorado River and continues upstream to approximately 100 feet southeast of McNeil Road.

Wells Branch

Wells Branch was updated with approved LOMR Case Number 09-06-2275P. The revised reach is from approximately 160 feet upstream of Parmer Lane to approximately 3,150 feet upstream.

There were no Enhanced Approximate Methods or redelineated streams studied for the August 18, 2014 revision.

Table 5 – Manning' s "n" Values

Stream Name	Channel "n" values	Overbank "n" values
Apache Shores Creek	n/a	n/a
Apache Shores Tributary	n/a	n/a
Barton Creek	0.050-0.065	0.070-0.080
Barton Skyway Tributary of Barton Creek	n/a	n/a
Bear Creek	0.035-0.060	0.055-0.090
Bear Creek Tributary	n/a	n/a
Bee Creek	n/a	n/a
Big Sandy Creek	n/a	n/a
Big Sandy Creek Tributary 1 (Cherry Hollow)	n/a	n/a
Big Sandy Creek Tributary 2 (Bloody Hollow)	n/a	n/a
Big Sandy Creek Tributary 3 (Bingham Creek)	n/a	n/a
Blunn Creek	0.015-0.080	0.040-0.100
CCE-1	0.035-0.045	0.040-0.120
CCE-2	0.035-0.050	0.040-0.100
CCE-3	0.035-0.065	0.050-0.090
CCE-4	0.05	0.050-0.070
CCW-1	0.020-0.070	0.050-0.090
CCW-2	0.035-0.080	0.040-0.090
CCW-3	0.070-0.080	0.065-0.100
CCW-3A	0.070-0.080	0.070-0.100
CCW-4	0.030-0.070	0.040-0.090
CCW-5	0.040-0.060	0.070-0.085
Cherry Creek	0.045-0.120	0.035-0.120
Colorado River	0.025-0.040	0.035-0.100
Country Club Creek East	0.030-0.050	0.040-0.120
Country Club Creek West	0.035-0.070	0.040-0.100
Cypress Creek	n/a	n/a
Cypress Creek Tributary 1	n/a	n/a
Cypress Creek Tributary 2	n/a	n/a
Danz Creek	0.035-0.060	0.040-0.100
Danz Creek Split	0.050-0.060	0.040-0.090
Danz Creek Tributary 1	0.035	0.040-0.060
Danz Creek Tributary 2	0.040-0.060	0.040-0.100
Decker Creek	0.024-0.05	0.07-0.12
Decker Creek Tributary 1	0.035-0.05	0.07-0.12
Decker Creek Tributary 1A	0.035-0.05	0.07-0.12
Decker Creek Tributary 2	0.045-0.05	0.07-0.12
Dry Creek 2	n/a	n/a
Dry Creek 3	n/a	n/a

Table 5 – Manning' s "n" Values *(continued)*

Stream Name	Channel "n" values	Overbank "n" values
Dry Creek North	0.045-0.060	0.080-0.120
Dry Creek North Tributary 1	0.040-0.080	0.060-0.090
Dry Creek North Tributary 2	0.045-0.080	0.040-0.090
Dry Creek North Tributary 3	0.07	0.070-0.090
Dry Creek North Tributary 4	0.055	0.060-0.090
East Bouldin Creek	0.030-0.060	0.040-0.100
East Branch of Fort Branch Creek Trib 1	0.030-0.040	0.040-0.075
Elm Creek	0.02-0.09	0.02-0.12
Elm Creek Tributary 1	0.02-0.09	0.02-0.12
Gilleland Creek (Lower)	0.07-0.085	0.065-0.12
Gilleland Creek (Upper)	0.05-0.08	0.05-0.12
Gilleland Creek Tributary 1	0.06-0.07	0.08-0.08
Gilleland Creek Tributary 1A	0.035-0.065	0.05-0.07
Gilleland Creek Tributary 1B	0.035-0.065	0.05-0.07
Gilleland Creek Tributary 1C	0.04-0.080	0.04-0.12
Gilleland Creek Tributary 2	0.025-0.07	0.025-0.12
Gilleland Creek Tributary 3	0.035-0.08	0.06-0.12
Hancock Branch	0.020-0.050	0.020-0.120
Harris Branch	0.035-0.060	0.050-0.120
Harris Branch Tributary No. 3	0.040-0.050	0.050-0.090
Harris Branch Tributary No. 4	0.035-0.050	0.050-0.100
Harris Branch Tributary No. 5	0.040-0.045	0.050-0.080
Harris Branch Tributary No. 6	0.040-0.050	0.045-0.050
Hemphill Branch	0.020-0.095	0.020-0.200
Hurst Creek	n/a	n/a
Hurst Creek Tributary 1	n/a	n/a
Johnson Creek	0.020-0.060	0.040-0.090
Kincheon Branch	0.035-0.200	0.035-0.200
Lime Creek	n/a	n/a
Lime Creek Tributary 1	n/a	n/a
Lime Creek Tributary 2	n/a	n/a
Little Barton Creek	n/a	n/a
Little Barton Tributary	n/a	n/a
Little Bear Creek	0.055-0.065	0.080-0.085
Little Bee Creek	n/a	n/a
Little Walnut Creek	0.020-0.060	0.034-0.12
Little Walnut Creek Tributary 1 (Buttermilk Branch)	0.020-0.070	0.035-0.100
Little Walnut Creek Tributary 2	0.020-0.070	0.035-0.100
Little Walnut Creek Tributary 3 (Quail Creek)	0.020-0.065	0.050-0.100
Long Branch	0.035-0.065	0.060-0.085
Long Hollow Creek	n/a	n/a

Table 5 – Manning' s "n" Values *(continued)*

Stream Name	Channel "n" values	Overbank "n" values
Montopolis Tributary	0.040-0.050	0.100-0.200
North Fork West Bouldin Creek	0.020-0.043	0.060-0.090
Onion Creek	0.030-0.080	0.045-0.090
Perdenales River	n/a	n/a
Pleasant Hill Tributary	0.060-0.120	0.120-0.200
Poquito Branch	0.045-0.060	0.050-0.080
Possum Trot Branch	0.020-0.070	0.070-0.090
Rinard Creek	n/a	n/a
Shoal Creek	0.017-0.150	0.015-0.150
Slaughter Creek	0.015-0.045	0.040-0.120
Slaughter Creek Tributary 1	0.015-0.045	0.050-0.100
Slaughter Creek Tributary 2	0.035-0.060	0.040-0.120
Slaughter Creek Tributary 3	0.035-0.045	0.040-0.080
Slaughter Creek Tributary 4	0.035-0.060	0.055-0.080
Slaughter Creek Tributary 5	0.045-0.060	0.060-0.090
South Boggy Creek	0.020-0.080	0.040-0.100
St. Edward's Branch	0.080-0.090	0.050-0.065
Stream Bear-1	0.055-0.060	0.070-0.080
Sunset Valley Tributary	0.045-0.065	0.010-0.200
Tar Branch	0.040-0.085	0.040-0.070
Unnamed Tributary to Barton Creek	n/a	n/a
Unnamed Tributary to Dry Creek 3	n/a	n/a
Unnamed Tributary to Gilleland Crk	n/a	n/a
Unnamed Tributary to Lake Austin	n/a	n/a
Upper Decker Creek	0.045-0.05	0.07-0.12
Waller Creek	0.020-0.200	0.020-0.200
Walnut Creek	0.040-0.065	0.040-0.120
Walnut Creek Tributary 1	0.030-0.060	0.038-0.120
Walnut Creek Tributary 10	0.040-0.060	0.035-0.100
Walnut Creek Tributary 2	0.030-0.070	0.060-0.080
Walnut Creek Tributary 3	0.040-0.080	0.050-0.090
Walnut Creek Tributary 4	0.040-0.070	0.050-0.100
Walnut Creek Tributary 5	0.050-0.080	0.050-0.100
Walnut Creek Tributary 6	0.045-0.070	0.040-0.100
Walnut Creek Tributary 7	0.030-0.070	0.045-0.120
Walnut Creek Tributary 7A	0.030-0.070	0.045-0.120
Walnut Creek Tributary 8	0.035-0.060	0.035-0.100
Walnut Creek Tributary 9	0.030-0.060	0.040-0.100
Wells Branch	0.030-0.060	0.050-0.090
West Bouldin Creek	0.035-0.043	0.050-0.090
Williamson Creek	0.012-0.200	0.012-0.200

Table 5 – Manning' s "n" Values *(continued)*

Stream Name	Channel "n" values	Overbank "n" values
Williamson Creek Tributary 1	0.035-0.065	0.12
Williamson Creek Tributary 2	0.035-0.065	0.120-0.200
Williamson Creek Tributary 3	0.060-0.060	0.060-0.200
Williamson Creek Tributary 4	0.035-0.065	0.035-0.200
Williamson Creek Tributary 5	0.035-0.200	0.045-0.200
Williamson Creek Tributary 6	0.065	0.065-0.120
Yaupon Creek	n/a	n/a

This Physical Map Revision

Boggy Creek Watershed

Water surface elevations were computed using HEC-RAS, version 4.1.0 (Reference 60). Culverts were surveyed to include upstream and downstream inverts, railing, and road deck elevations. Approximately 200 feet of road deck was surveyed. Bridges were surveyed to document piers, abutments, and low chord elevations. For both bridges and culverts, a channel cross section was taken within about 50 feet of the upstream and downstream face of the structure.

Cross sections were placed in the model at 500 foot intervals based on LiDAR where survey was not available (Reference 57). The channel geometry and top of bank elevations were based on ground survey; the overbank data was taken from the digital elevation model.

The Fort Branch Reach 6&7 Channel Rehabilitation Project, which was completed by City of Austin Watershed Protection Department in April 2014, reduced the overtopping of Fort Branch Boulevard Bridge was incorporated.

Stream Name	Channel "n" values	Overbank "n" values
Boggy Creek Watershed (All Streams)	0.015 - 0.08	0.025 - 0.120

Bull Creek Watershed

Water surface elevations were computed using HEC-RAS, version 4.1.0 (Reference 60). Default hydraulic modeling computation settings were used during this analysis. All studies were computed using steady flow analysis with a subcritical flow regime. Calculation tolerances were not modified from the default tolerances and all final modeling was performed using the default root search method of computing critical depth.

Stream Name	Channel "n" values	Overbank "n" values
Bull Creek	0.023 - 0.060	0.023 - 0.120
Bull Creek Tributary 1	0.050 - 0.060	0.070 - 0.120
Bull Creek Tributary 1.1	0.050 - 0.060	0.050 - 0.100
Bull Creek Tributary 1A	0.040 - 0.050	0.070 - 0.120
Bull Creek Tributary 2	0.015 - 0.065	0.015 - 0.120

Stream Name	Channel "n" values	Overbank "n" values
Bull Creek Tributary 2.1	0.050 - 0.070	0.065 - 0.120
Bull Creek Tributary 2.2	0.040 - 0.050	0.060 - 0.120
Bull Creek Tributary 4	0.040 - 0.055	0.070 - 0.120
Bull Creek Tributary 4.3	0.055 - 0.055	0.090 - 0.120
Bull Creek Tributary 4A	0.045 - 0.045	0.060 - 0.090
Bull Creek Tributary 4B	0.055 - 0.055	0.070 - 0.120
Bull Creek Tributary 5	0.050 - 0.070	0.060 - 0.100
Bull Creek Tributary 6	0.050 - 0.070	0.100 - 0.120
Bull Creek Tributary 6.1	0.065 - 0.065	0.100 - 0.120
Cow Fork West Bull Creek	0.060 - 0.060	0.070 - 0.120
Long Hog Hollow	0.015 - 0.070	0.040 - 0.120
West Bull Creek	0.015 - 0.060	0.045 - 0.120
West Bull Creek Tributary 1	0.070 - 0.070	0.070 - 0.100
West Bull Creek Tributary 5	0.013 - 0.060	0.013 - 0.120

Carson Creek Watershed

HEC-RAS, version 4.1.0 (Reference 60), was used to compute water surface elevations for streams in the Carson Creek Watershed. The downstream channel slope was used to establish the normal depth boundary conditions. Cross-sections were developed using GeoRAS and LiDAR topography (Reference 57). Field surveys of the channel and bridges and culverts of Cottonmouth Creek were conducted. Manning's "n" values were assigned by visual inspection and analysis of digital orthophotos.

Stream Name	Channel "n" values	Overbank "n" values
Carson Creek	0.020 - 0.050	0.020 - 0.110
Carson Creek Montopolis Tributary	0.045 - 0.050	0.045 - 0.080
Carson Creek Tributary 1	0.040 - 0.050	0.045 - 0.080
Carson Creek Tributary 2	0.015 - 0.050	0.050 - 0.080
Carson Creek Tributary 3	0.013 - 0.050	0.050 - 0.080
Carson Creek Tributary 4	0.045 - 0.070	0.050 - 0.120
Carson Creek Overflow Channel	0.050 - 0.060	0.050 - 0.060

Colorado River (LOMR 11-06-4564P)

The hydraulic model for the revised portion of the Colorado River was revised to incorporate updated cross section geometry. The updated geometry took into account the addition of fill in order to elevate structures that were previously mapped within the floodplain.

Cottonmouth Creek

HEC-RAS, version 4.1.0 (Reference 60), was used to compute water surface elevations for Cottonmouth Creek. The downstream channel slope was used to establish the

normal depth boundary conditions. Cross-sections were developed using GeoRAS and LiDAR topography (Reference 57). Field surveys of the channel and bridges and culverts of Cottonmouth Creek were conducted. Manning's "n" values were assigned by visual inspection and analysis of digital orthophotos.

Stream Name	Channel "n" values	Overbank "n" values
Cottonmouth Creek	0.045 - 0.080	0.045 - 0.080

Dry Creek East Watershed

Field surveys of bridges, culverts, cross sections, and the channel of Dry Creek East were conducted. For Berdoll Tributary and Berdoll Tributary 1, water surface elevations were computed using HEC-RAS, version 4.1.0 (Reference 60).

For the portion of Dry Creek East affected by LOMR 12-06-3962P, from just downstream of Elroy Road to approximately 700 feet upstream of Farm to Market Road 812, new cross-sections were developed to conform to the City of Austin's 500 foot maximum spacing regime. Digital topographic data was used to develop the cross-sections. HEC-RAS, version 4.1.0 was used to compute water surface elevations the streams affected by this LOMR, including Dry Creek East Tributary 7A, Dry Creek East Tributary 8A, Dry Creek East Tributary 8B, and Dry Creek East Tributary 8C (Reference 60).

For all other streams in the Dry Creek East watershed, HEC-RAS 3.1.3 was used to compute water surface elevations (Reference 61). Bridges and culverts were modeled using field surveys, field measurements, and State Highway 130 construction plans. Manning's "n" values were assigned by visual inspection and analysis of digital orthophotos.

Stream Name	Channel "n" values	Overbank "n" values
Berdoll Tributary	0.040-0.070	0.050-0.120
Berdoll Tributary 1	0.040-0.040	0.060-0.120
Dry Creek East	0.050-0.070	0.040-0.150
Dry Creek East Tributary 5	0.050-0.065	0.040-0.120
Dry Creek East Tributary 6	0.050-0.070	0.030-0.100*
Dry Creek East Tributary 7	0.050-0.065	0.060-0.100
Dry Creek East Tributary 7A	n/a	n/a
Dry Creek East Tributary 8	0.040-0.055	0.040-0.120
Dry Creek East Tributary 8A	n/a	n/a
Dry Creek East Tributary 8B	n/a	n/a
Dry Creek East Tributary 8C	n/a	n/a
Dry Creek East Tributary 9	0.050-0.050	0.040-0.090
Dry Creek East Tributary 10	0.050-0.055	0.070-0.085
North Fork Dry Creek East	0.040-0.060	0.055-0.120
South Fork Dry Creek East	0.040-0.070	0.040-0.120

Stream Name	Channel "n" values	Overbank "n" values
South Fork Dry Creek East Tributary 1	0.045-0.070	0.050-0.120
South Fork Dry Creek East Tributary 2	0.045-0.045	0.060-0.080
South Fork Dry Creek East Tributary 3	0.030-0.055	0.040-0.080

Onion Creek (LOMRs 08-06-1041P, 11-06-0223P, and 12-06-1380P)

Hydraulic analysis of the subject reach of Onion Creek was conducted using the U.S. Army Corps of Engineers HEC-2 hydraulic modeling software (Reference 63). LiDAR data with a 2-foot contour interval was used to build the hydraulic model. The downstream boundary condition is based on the known water surface elevation set at the profile elevation of the parent stream. Manning's "n" values used in the hydraulic computations were based on "Open Channel Hydraulics" as well as engineering judgment, and field observation of the creek and floodplain (Reference 62).

Shoal Creek Watershed

Water surface elevations were computed using HEC-RAS, version 4.1.0 (Reference 60). Manning's channel "n" values were assigned by visual inspection and analysis of the 2009 digital orthophotos.

Stream Name	Channel "n" values	Overbank "n" values
Shoal Creek	0.015 - 0.070	0.020 - 0.120
Shoal Creek Hancock Branch	0.016 - 0.070	0.030 - 0.120
Shoal Creek Grover Tributary	0.012 - 0.080	0.012 - 0.120
Shoal Creek Foster Branch	0.015 - 0.060	0.015 - 0.120

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the completion of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are now prepared using NAVD88 as the referenced vertical datum.

Flood elevations shown in this FIS report and on the FIRM are referenced to the NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the NGVD29 and NAVD88, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMCS, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS report provides 1-percent-annual-chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent-annual-chance floodplains; and a 1-percent-annual-chance floodway. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS report as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps with a contour interval of 2 feet (Reference 27).

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM. On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, and AO), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations, but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM.

Approximate 1-percent-annual-chance floodplain boundaries in some portions of the study area were taken directly from the Flood Hazard Boundary Map for Travis County.

August 18, 2014 Physical Map Revision

For the August 14, 2014 revision, the 1 and 0.2 percent annual chance floodplain boundaries for Gilleland Creek, Gilleland Creek Tributaries: 1, 1A, 1B, 1C, 2 & 3, Decker Creek, Upper Decker Creek, Decker Creek Tributaries: 1, 1A, 2, Elm Creek, Elm Creek Tributary 1, and Walnut Creek were delineated using the flood elevations determined at each cross section. Between the cross sections, the boundaries were interpolated using the topographic data obtained from the City of Austin 2007 LiDAR (Reference 41) and City of Austin 2006 two-foot topography (Reference 40). In addition, the 1 and 0.2 percent annual chance floodplain boundaries associated with LOMRs 08-06-1153P, 08-06-3201P, and 10-06-1752P were incorporated into the existing floodplain boundaries.

This Physical Map Revision

Floodplain boundaries for all revised streams were delineated between cross-sections using 2-foot contour interval LiDAR topographic data (Reference 57).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the base flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 6, Floodway Data). In cases where the floodway and 1-percent-annual- chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface

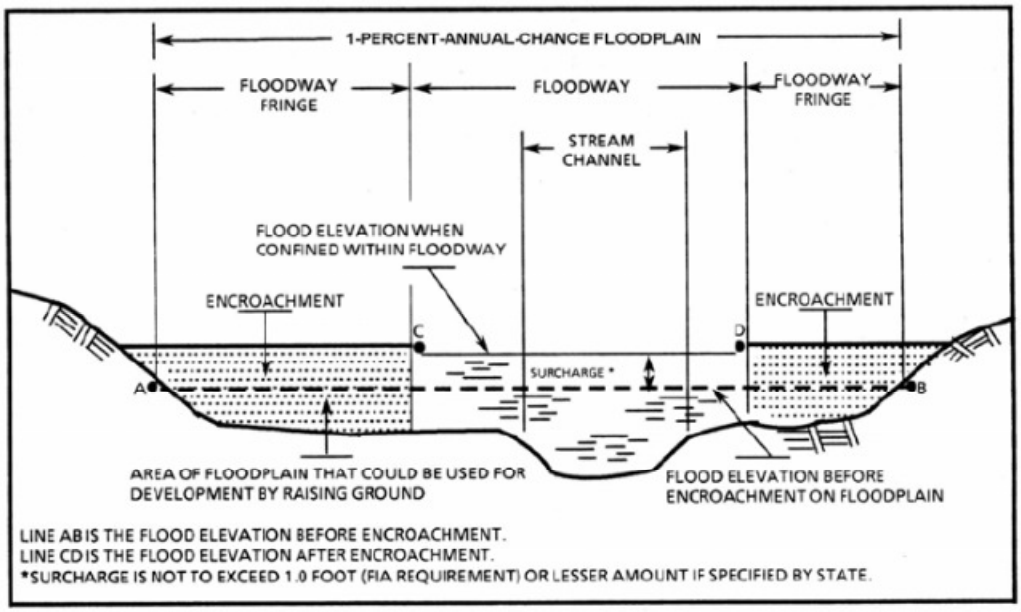
elevation (WSEL) of the base flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

For new detailed studies of streams with designated floodways delineated on the FIRM, the floodway was removed within the city limits of the City of Austin. For redelineated streams with designated floodways delineated on the FIRM, the floodway was removed within the city limits of the City of Austin.

No floodways were computed for streams within the city limits of the City of Austin. The City of Austin regards the 1-percent-annual-chance floodplains as the minimum standard and uses it to prohibit development within the floodplain.

In the case of redelineation, effort was made to maintain the effective regulatory floodway width and shape. However, due to updated topographic data, some modifications were made to contain the floodway within the limits of the 1-percent-annual-chance floodplain. Most modifications to the effective regulatory floodway boundaries are due to topographic changes that have occurred along the streams.

Figure 1 – Floodway Schematic



5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS report by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (1-percent-annual-chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS report by detailed methods. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to areas of 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile (sq. mi.), and areas protected from the base flood by levees. No BFEs or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The current FIRM presents flooding information for the entire geographic area of Travis County. Previously, separate Flood Hazard Boundary Maps and/or FIRMs were prepared for each incorporated community with identified flood hazard areas and the unincorporated areas of the county. Historical map dates relating to pre-countywide maps prepared for each community are presented in Table 7.

7.0 OTHER STUDIES

This FIS report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting Federal Insurance and Mitigation Division, FEMA Region VI, Federal Regional Center, Room 206, 800 North Loop 288, Denton, Texas 76201-3698.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Austin, City of	September 13, 1974	May 31, 1977	September 2, 1981	September 5, 1984 September 27, 1985 May 15, 1986
Bee Cave, Village of	March 7, 1978 (Travis County)	None	April 1, 1982 (Travis County)	September 27, 1985 January 2, 1987 (Travis County)
Briarcliff, Village of	June 16, 1993	None	June 16, 1993	None
Cedar Park, City of	November 15, 1977	None	September 27, 1991 (Williamson County)	None
Creedmoor, City of	March 7, 1978 (Travis County)	None	April 1, 1982 (Travis County)	September 27, 1985 January 2, 1987 (Travis County)
Elgin, City of	March 7, 1978 (Travis County)	None	April 1, 1982 (Travis County)	September 27, 1985 January 2, 1987 (Travis County)
Jonestown, City of	March 7, 1978	None	April 1, 1982	March 16, 1988

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

TRAVIS COUNTY, TX
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Lago Vista, City of	March 7, 1978	None	April 1, 1982	December 18, 1986
Lakeway, City of	April 16, 1978	None	November 5, 1980	None
Leander, City of	June 10, 1980	None	September 27, 1991 (Williamson County)	None
Manor, City of	June 16, 1993	None	June 16, 1993	None
Mustang Ridge, City of	March 7, 1978 (Travis County)	None	April 1, 1982 (Travis County)	September 27, 1985 January 2, 1987 (Travis County)
Pflugerville, City of	May 2, 1975	None	May 1, 1978	None
Point Venture, Village of	March 7, 1978 (Travis County)	None	April 1, 1982 (Travis County)	September 27,1985 January 2, 1987 (Travis County)
Rollingwood, City of	February 7, 1975	None	September 29, 1978	None
Round Rock, City of	September 13, 1977	September 21, 1982	September 27, 1991 (Williamson County)	None

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

TRAVIS COUNTY, TX
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
San Leanna, Village of	July 11, 1978	None	September 28, 1979	September 5, 1980
Sunset Valley, City of	November 5, 1976	None	March 1, 1979	None
The Hills, Village of	March 7, 1978 (Travis County)	None	April 1, 1982 (Travis County)	September 27,1985 January 2, 1987 (Travis County)
Volente, Village of	March 7, 1978 (Travis County)	None	April 1, 1982 (Travis County)	September 27,1985 January 2, 1987 (Travis County)
Webberville, Village of	March 7, 1978 (Travis County)	None	April 1, 1982 (Travis County)	September 27,1985 January 2, 1987 (Travis County)
West Lake Hills, City of	February 7, 1975	None	July 17, 1978	April 1, 1982 August 1, 1984
Unincorporated Areas, Travis County	March 7, 1978	None	April 1, 1982	September 27, 1985 January 2, 1987

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

TRAVIS COUNTY, TX
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

9.0 BIBLIOGRAPHY AND REFERENCES

1. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Travis County, Texas (Unincorporated Areas), Washington, D.C., January 2, 1987.

2. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, City of Austin, Travis County, Texas, Washington, D.C., May 15, 1986.

3. Federal Emergency Management Agency, Flood Insurance Study, City of Jonestown, Travis County, Texas, Washington, D.C., March 16, 1988.

4. Federal Emergency Management Agency, Flood Insurance Study, City of Lago Vista, Travis County, Texas, Washington, D.C., December 18, 1986.

5. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, City of Lakeway, Travis, County Texas, Washington, D.C., Flood Insurance Study report dated March 1980, Flood Insurance Rate Map dated November 5, 1980.

6. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, City of Pflugerville, Travis County, Texas, Washington, D.C., Flood Insurance Study report dated November 1977, Flood Insurance Rate Map dated May 1, 1978.

7. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, City of Rollingwood, Travis County, Texas, Washington, D.C., Flood Insurance Study report dated March 1978, Flood Insurance Rate Map dated September 29, 1978.

8. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Village of San Leanna, Travis County, Texas, Washington, D.C., Flood Insurance Study report dated March 1980, Flood Insurance Rate Map dated September 5, 1980.

9. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, City of Sunset Valley, Travis County, Texas, Washington, D.C., Flood Insurance Study report dated August 1978, Flood Insurance Rate Map dated March 1, 1979.

10. Federal Emergency Management Agency, Flood Insurance Study, City of West Lake Hills Travis County, Texas, Washington, D.C., August 1, 1984.

11. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Travis County, Texas and Incorporated Areas, Washington, D.C., April 15, 2002.

12. U.S. Census Bureau; Census 2000, Summary File 1 (SF 1); using American Factfinder; <http://factfinder2.census.gov/>; (2010).

13. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Travis County, Texas, 1974.

14. Dallas Morning News, Texas Almanac and State Industrial Guide, 1976 -1977.

15. U.S. Department of the Interior, Geological Survey, Water-Supply Paper 1682, Magnitude and Frequency of Floods in the United States, Part 8, by James L. Patterson, 1965.

16. Federal Emergency Management Agency, Guidelines and Specifications for Flood Hazard Mapping Partners, April 2003.

17. Natural Resources Conservation Service, Technical Release TR-55, Urban Hydrology for Small Watersheds, June 1986.

18. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-HMS Version 2.2.2, Davis, California, May 2003.

19. U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Geographic (SSURGO) database for Travis County, Texas, August 2002.

20. U.S. Department of the Army, Corps of Engineering Center, Onion Creek Interim Feasibility Study Phase I, Fort Worth District, December 2002.

21. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-5, Simulation of Flood Control and Conservation Systems, Version 8.0, Davis, California, October 1998.

22. R. Hula, U.S. Army Corps of Engineers, Southwestern Division, SUPER Computer Program, Dallas, Texas, 1973.

23. U.S. Department of the Army, Corps of Engineering Center, Computer Program NUDALLAS, Fort Worth District, revised September 2002.

24. U.S. Department of Commerce, Weather Bureau, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, Washington, D.C., 1961, Revised 1963.

25. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-RAS Analysis System, Version 3.1.2, Davis, California, April 2004.

26. Lower Colorado River Authority, Technical Support Data Notebook, Basin-wide Hydrologic and Hydraulic Analysis, Mapping the Colorado River, Austin, Texas, September 2002.

27. The Sanborn Map Company, Inc., Topographic Maps Compiled from LIDAR, Contour Interval 2 Feet, City of Austin and Travis County, Texas, January 2003.

28. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 10-06-1147P, Texas, Travis County. Washington, DC, October 25, 2010

29. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 10-06-1752P, Texas, Travis County. Washington, DC, July 29, 2010

30. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 08-06-3201P, Texas, Travis County. Washington, DC, October 21, 2008

31. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 07-06-0283P, Texas, Travis County. Washington, DC, August 23, 2007

32. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 04-06-A208P, Texas, Travis County. Washington, DC, October 8, 2005

33. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 09-06-1373P, Texas, Travis County. Washington, DC, November 30, 2009

34. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 05-06-0770P, Texas, Travis County. Washington, DC, August 3, 2006

35. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 09-06-1966P, Texas, Travis County. Washington, DC, May 29, 2009

36. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 06-06-B315P, Texas, Travis County. Washington, DC, April 6, 2006

37. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 09-06-3409P, Texas, Travis County. Washington, DC, June 11, 2010

38. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 08-06-2072P, Texas, Travis County. Washington, DC, October 30, 2008

39. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 08-06-1153P, Texas, Travis County. Washington, DC, September 27, 2008

40. Freese and Nichols, Letter Of Map Revision: Walnut Creek Case Number: 08-06-2891P, Texas, Travis County. Austin, TX, August 2008

41. City of Austin, Technical Support Data Notebook Engineering Analysis – Hydraulics, Case Number: 09-06-3280P, Texas, Travis County. Austin, TX, June, 2009

42. Federal Emergency Management Agency, FEMA Library, LOMR Case Number: 08-06- 2891P <http://www.fema.gov/library/>(August 12, 2010).

43. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Travis County, Texas (Unincorporated Areas), Washington, D.C., Flood Insurance Study report dated September 26, 2008, Flood Insurance Rate Map. September 26, 2008.

44. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 10-06-1794P, Texas, Travis County. Washington, DC, May 20, 2011

45. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 10-06-1285P, Texas, Travis County. Washington, DC, December 23, 2010

46. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 10-06-2503P, Texas, Travis County. Washington, DC, October 28, 2010

47. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 11-06-4644P, Texas, Travis County. Washington, DC, October 19, 2011

48. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 10-06-2464P, Texas, Travis County. Washington, DC, April 26, 2011

49. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 09-06-2275P, Texas, Travis County. Washington, DC, May 17, 2010

50. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 09-06-0609P, Texas, Travis County. Washington, DC, December 4, 2009

51. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 09-06-0003P, Texas, Travis County. Washington, DC, October 21, 2008

52. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 09-06-2902P, Texas, Travis County. Washington, DC, December 31, 2009

53. Federal Emergency Management Agency, Letter Of Map Revision Determination Document Case Number: 08-06-3202P, Texas, Travis County. Washington, DC, October 21, 2008

54. Natural Resources Conservation Service, Technical Release TR-55, Urban Hydrology for Small Watersheds, June 1986.

55. American Legal Publishing Corporation, City of Austin, Texas, Drainage Criteria Manual, Cincinnati, Ohio, Revised August 24, 2010.

56. Hydrologic Engineering Center, HEC-HMS, Version 3.5, U.S. Army Corps of Engineers, Davis, California, August 2010.

57. The Sanborn Map Company, Inc., Topographic Maps Compiled from LiDAR, Contour Interval 2-Feet, City of Austin and Travis County, Texas, January 2003.

58. U.S. Geological Survey, Depth-Duration Frequency of Precipitation for Texas, Austin, Texas, 1998.

59. U.S. Geological Survey, Interagency Committee on Water Data, Office of Water Data Coordination, Hydrology Subcommittee. Bulletin 17B, Guidelines for Determining Flood Flow Frequency September 1981, revised March 1982.

60. Hydrologic Engineering Center, HEC-RAS, Version 4.1.0, U.S. Army Corps of Engineers, Davis, California, January 2010.

61. Hydrologic Engineering Center, HEC-RAS, Version 3.1.3, U.S. Army Corps of Engineers, Davis, California, May 2005.

62. Chow, Ven Te. Open Channel Hydraulics, McGraw-Hill, 1959.

63. Hydrologic Engineering Center, HEC-2 Water Surface Profiles, U.S. Army Corps of Engineers, Davis, California, October 1973.