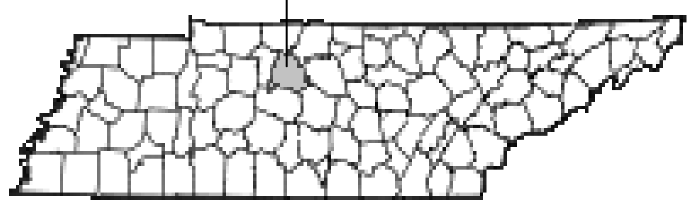
FLOOD INSURANCE STUDY

VOLUME 1 OF 5

METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY, TENNESSEE

AND INCORPORATED AREAS



Community Name	Community Number
BELLE MEADE, CITY OF	470408
BERRY HILL, CITY OF	470406
FOREST HILLS, CITY OF	470407
GOODLETTSVILLE, CITY OF	470287
NASHVILLE AND DAVIDSON COUNTY, METROPOLITAN GOVERNMENT OF	470040
OAK HILL, TOWN OF	470351
RIDGETOP, CITY OF *	470162

*No Special Flood Hazard Areas Identified

REVISED
APRIL 5, 2017

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
47037CV001B

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 may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of Flood Insurance Study. In addition, part of this Flood Insurance Study may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the Flood Insurance Study. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current Flood Insurance Study components.

Initial Countywide FIS Effective Date: April 20, 2001

First Revised Countywide FIS Date: November 21, 2002

Second Revised Countywide FIS Date: April 5, 2017

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FLOOD INSURANCE STUDY
METROPOLITAN GOVERNMENT OF NASHVILLE AND
DAVIDSON COUNTY, TENNESSEE, AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This countywide Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of the Metropolitan Government of Nashville and Davidson County, including the Cities of Bell Meade, Berry Hill, Forest Hills, Goodlettsville, Ridgetop, and Town of Oak Hill; and the Metropolitan Government of Nashville and Davidson County (referred to collectively herein as Davidson County). The City of Lakewood was dissolved in 2010 and became part of the Metropolitan Government of Nashville and Davidson County.

This FIS 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 land use and 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.

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.

The Digital Flood Insurance Rate Map (DFIRM) and FIS Report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the Federal Emergency Management Agency (FEMA) DFIRM database specifications and geographic information standards and is provided in a digital format so that it can be incorporated into a local Geographic Information System and be accessed more easily by the community.

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.

For this revision of the countywide FIS, new hydrologic and hydraulic analyses were prepared by BakerAECOM, LLC for FEMA, under Contract No. HSFEHQ-09-D-0368. This revised study was completed in September 2013. The following streams were included in this revised study:

- Belle Meade Branch
- Dry Creek
- Richland Creek

Additionally, the hydrologic and hydraulic analyses for streams in the Browns Creek, Mill Creek, Harpeth River, Richland, and Whites Watershed were studied by the U.S. Army Corp of Engineers, Nashville District in 2012. These streams include: Browns Creek Watershed (Browns Creek, East Fork Browns Creek, West Fork Browns Creek and Middle Fork Browns Creek), Harpeth River Watershed (Buffalo Creek, East Fork Creek, Flat Creek, Highway 100 Tributary, Little East Fork Creek, Little Harpeth River, Otter Creek, Poplar Creek, South Harpeth River, and Trace Creek), Whites Creek Watershed (Whites Creek, Whites Creek Tributary, Drake Branch, Ewing Creek, Ewing Creek Tributary 1, Ewing Creek Tributary 2, Bear Hollow Branch, Carney Creek, Claylick Creek, Crocker Springs Branch, Crocker Springs Branch Tributary, Cummings Branch, Dry Fork Creek, Earthman Fork, Earthman Fork Tributary 2, Earthman Fork Tributary 3, Earthman Fork Tributary 4, Eaton Creek, Johnson Hollow Creek, Little Creek, Little Creek Tributary 1, Little Creek Tributary 2, North Fork Ewing Creek, North Fork Ewing Creek Tributary 2, North Fork Ewing Creek Tributary 3, North Fork Ewing Creek Tributary 4, North Fork Ewing Creek Tributary 5, North Fork Ewing Creek Tributary 6, North Fork Ewing Creek Tributary 7, North Fork Ewing Creek Tributary 8, Shaw Branch, Trantham Creek, and Vhoins Branch), Richland Creek Watershed (Richland Creek, Sugartree Creek, Belle Meade Branch, Jocelyn Hollow Branch, Tributary to Richland Creek, and Vaughns Gap Branch), and Mill Creek Watershed (Collins Creek, Franklin Branch, Franklin Branch Tributary 1, Franklin Branch Tributary 2, Franklin Branch Tributary 3, Holt Creek, Indian Creek, Mill Creek, Sevenmile Creek, Sevenmile Creek Tributary 1, Sevenmile Creek Tributary 2, Sims Branch, Sorghum Branch, Turkey Creek, Whittemore Branch, and Whittemore Branch Tributary). Claylick Overflow, Flat Creek Overflow, Jocelyn Hollow Branch Overflow, Sorghum Branch Overflow, and Vaughns Gap Branch Overflow were also studied.

As part of USACE Nashville District's work with the City of Nashville on Flood Preparedness Phases 4A & 4AA, several tributaries to the Cumberland River were analyzed. The work involved updating the flood discharge frequency analysis as well as creating new statistical, hydrologic and hydraulic models using the latest USACE software and 2011 LiDAR data. This analysis includes approximately 34 miles of floodplains within Davidson County and includes: Cooper Creek, Copper Creek Tributary 1, Cooper Creek Tributary 2, Davidson Branch, Dry Creek, Ewin Branch, Gibson Creek, Gibson Creek Tributary 1, Gibson Creek Tributary 2, Gibson Creek Tributary, Indian Creek, Indian Creek Tributary 1, Indian Creek Tributary 2, Loves Branch, Overall Creek, Pages Branch, Pages Branch Tributary A, Pages Branch Tributary B, Tributary No. 1 to Overall Creek, Windemere Branch, and Windemere Branch Tributary. All models and floodplain boundaries have been updated to Zone AE with a designated floodway.

The original April 20, 2001, countywide FIS was prepared to include incorporated communities within Davidson County into a countywide FIS. Information on the authority and acknowledgments for each jurisdiction included in the April 20, 2001, countywide FIS, as compiled from their previously printed FIS reports, is shown below.

Goodlettsville, City of:	The hydrologic and hydraulic analyses for the FIS report dated December 15, 1980, were prepared by the U.S. Army Corps of Engineers (USACE), Nashville District, for the Federal Insurance Administration (FIA), under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 12. That work was completed in February 1979.
Nashville and Davidson County, Metropolitan Government of:	The hydrologic and hydraulic analyses for the FIS report dated June 15, 1982, were prepared by the USACE, Nashville District, for FEMA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 12. That work was completed in July 1979.
	The hydraulic analyses for the FIS report dated May 15, 1984, were prepared by the USACE, Nashville District. For the FIS report dated January 17, 1990, the hydraulic analyses for the revised portions of North Fork Ewing Creek and hydrologic analyses for Tributary No. 1 to East Fork Hamilton Creek were performed by Ragan-Smith-Murphy & Associates, Inc. The hydraulic analyses for the revised portion of the Cumberland River were performed by Aubrey L. Fly & Associates.
	For the FIS report dated June 2, 1993, the hydrologic and hydraulic analyses were prepared by Ogden Environmental and Energy Services, Inc., under Contract No. EMW-88-C-2620. The hydrologic and hydraulic analyses for the Little Harpeth River were taken from the Williamson County, Tennessee, FIS report (Reference 1).
Oak Hill, Town of:	The hydrologic and hydraulic analyses for the FIS report dated October 1979 were prepared by the USACE, Nashville District, for the FIA, under Inter-Agency Agreement No. IAA-H-1077, Project Order No. 12. That work was completed in May 1978.

The authority and acknowledgments for the Cities of Belle Meade, Berry Hill, and Forest Hills are the same as for the Metropolitan Government of Nashville and Davidson County because Special Flood Hazard Areas for these communities were mapped as part of the Nashville and Davidson County FIS prior to this countywide FIS.

For the April 20, 2001, countywide FIS, the hydrologic and hydraulic analyses for the Cumberland River, Stone Creek, and Mill Creek were prepared by the USACE, Nashville District, for FEMA, under Inter-Agency Agreement No. EMW-94-E-4432. That work was completed in December 1995. The hydrologic and hydraulic analyses for Dry Creek were prepared by the USACE, Nashville District. That work was completed in July 1993. The hydrologic and hydraulic analyses for Trace Creek were prepared by the USACE, Nashville District, for FEMA, under Inter-Agency agreement No. EMW-96-IA-0294. That work was completed in September 1997.

The hydrologic and hydraulic analyses for all other revised streams were prepared by Gresham, Smith, & Partners, for Davidson County and completed in April 1997; FEMA reviewed and accepted these data for the purpose of the April 20, 2001, countywide FIS. Hydraulic data for the J. Percy Priest Reservoir was taken from the Rutherford County FIS (Reference 2).

For the November 21, 2002, countywide revision, the hydrologic and hydraulic analyses for Mansker Creek were prepared by Arcadis Geraghty & Miller, Inc., under Contract No. EMW-97-CO0139. That work was completed in December 1998.

Base map information was provided in digital format by the Metropolitan Government of Nashville and Davidson County. This information was photogrammetrically compiled from aerial photography dated March 2008.

The coordinate system used for producing this FIRM is NAD 1983 State Plane Tennessee FIPS 4100. Corner coordinates shown on the FIRM are in latitude and longitude referenced to the UTM projection, NAD 83. Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

1.3 Coordination

An initial Consultation Coordination Officer (CCO) meeting (also occasionally referred to as the Scoping meeting) is held with representatives of the communities, FEMA, and the study contractors to explain the nature and purpose of the FIS and to identify the streams to be studied by detailed methods. A final CCO (often referred to as the Preliminary DFIRM Community Coordination, or PDCC, meeting) is held with representatives of the communities, FEMA, and the study contractors to review the results of the study.

For this revision of the countywide FIS, the initial CCO meeting was held on October 14, 2009, and attended by representatives of FEMA, BakerAECOM, LLC, Metro Government of Nashville and Davidson County, City of Goodlettsville, City of Berry Hill, City of Belle Meade, City of Forest Hills, and the Tennessee Economic and Community Development Local Planning Assistance Office.

The final CCO meeting was held on February 26, 2014 to review and accept the results of this FIS. Those who attended this meeting included representatives of BakerAECOM, LLC, FEMA, and the communities. All problems raised at that meeting have been addressed in this study.

The dates of the historical initial and final CCO meetings held for the communities within the boundaries of Davidson County are shown in Table 1, "Historical CCO Meeting Dates."

Table 1: Historical CCO Meeting Dates

Community Name	FIS Date	Initial CCO Date	Final CCO Date
Goodlettsville, City of	December 15, 1980	August 26, 1976	June 4, 1980
Nashville and Davidson County, Metropolitan Government of	June 15, 1982	August 26, 1976	June 25, 1981 June 10, 1992
Nashville and Davidson County, Metropolitan Government of	April 20, 2001	September 23, 1997	April 22, 1998
Nashville and Davidson County, Metropolitan Government of	November 21, 2002	May 21, 2001*	August 21, 2001
Oak Hill, Town of	October 1979	August 1976	February 12, 1979

* Notified by FEMA in a letter that FIS would be revised

2.0 AREA STUDIED

2.1 Scope of Study

This FIS report covers the geographic area of Davidson County, Tennessee, including the incorporated communities listed in Section 1.1. The scope and methods of this study were proposed to, and agreed upon, by FEMA and Davidson County.

For this revision, a total of 7.2 stream miles were studied by AECOM using detailed methods. In addition, floodplain boundaries of 52.68 miles of streams that had been previously studied by detailed methods were redelineated based on more detailed and up-to-date topographic mapping for this FIS report. Additionally, 187.38 miles of detailed study streams were studied by USACE Nashville District in 2012 and incorporated in this FIS report.

For the November 21, 2002, countywide revision, Mansker Creek was restudied from the confluence with the Cumberland River to a point approximately 1.15 miles upstream of Old Shiloh Road, in the City of Goodlettsville and in the Metropolitan Government of Nashville and Davidson County. In addition, water-surface elevations along Lumsley Fork and Goodlettsville Outlet Ditch have been revised due to backwater effects from Mansker Creek.

The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction. The flooding sources studied by detailed methods are presented in Table 2, "Flooding Sources Studied by Detailed Methods." Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2) where applicable.

Table 2: Flooding Sources Studied by Detailed Methods

Flooding Source	Reach Length (miles)	Flooding Source	Reach Length (miles)
Bear Hollow Branch	0.75	Mansker Creek	9.68
Belle Meade Branch	2.05	McCrory Creek	5.68
Browns Creek	4.36	Middle Fork Browns Creek	3.04
Buffalo Creek	3.05	Mill Creek	21.8
Carney Creek	0.66	North Fork Ewing Creek	3.57
Claylick Creek	0.26	North Fork Ewing Creek Tributary 2	1.29
Claylick Overflow	0.47	North Fork Ewing Creek Tributary 3	0.43
Cooper Creek	4.04	North Fork Ewing Creek Tributary 4	0.4

Table 2: Flooding Sources Studies by Detailed Methods continued

Flooding Source	Reach Length (miles)	Flooding Source	Reach Length (miles)
Cooper Creek Tributary 1	1.15	North Fork Ewing Creek Tributary 5	0.32
Cooper Creek Tributary 2	1.02	North Fork Ewing Creek Tributary 6	0.29
Crocker Springs Branch	1.96	North Fork Ewing Creek Tributary 7	0.92
Crocker Springs Branch Tributary	0.48	North Fork Ewing Creek Tributary 2	1.29
Collins Creek	1.41	North Fork Ewing Creek Tributary 3	0.43
Cumberland River	53.3	North Fork Ewing Creek Tributary 4	0.4
Cummings Branch	2.83	North Fork Ewing Creek Tributary 5	0.32
Davidson Branch	1.66	North Fork Ewing Creek Tributary 6	0.29
Drakes Branch	1.69	North Fork Ewing Creek Tributary 7	0.92
Dry Creek	3.83	North Fork Ewing Creek Tributary 8	0.29
Dry Fork Creek	3.66	Otter Creek	4.86

Table 2: Flooding Sources Studies by Detailed Methods continued

Flooding Source	Reach Length (miles)	Flooding Source	Reach Length (miles)
Earthman Fork	4.97	Overall Creek	3.65
Earthman Fork Tributary 2	0.68	Pages Branch	2.69
Earthman Fork Tributary 3	0.63	Pages Branch Tributary A	1.1
Earthman Fork Tributary 4	0.47	Pages Branch Tributary B	0.76
East Fork Browns Creek	2.27	Poplar Creek	2.58
East Fork Creek	1.51	Pulley Tributary	1.36
East Fork Hamilton Creek	1.69	Richland Creek	11.7
Eaton Creek	3.39	Scotts Creek	1.3
Elm Hill Tributary	1.35	Scotts Hollow	0.89
Ewin Branch	1.49	Sevenmile Creek	7.03
Ewing Creek	4.24	Sevenmile Creek Tributary 1	1.75
Ewing Creek Tributary 1	0.97	Sevenmile Creek Tributary 2	1.25
Ewing Creek Tributary 2	0.52	Shaw Branch	2.67
Franklin Branch	2.74	Sims Branch	2.08
Franklin Branch Tributary 1	1.65	Sorghum Branch	3.65

Table 2: Flooding Sources Studies by Detailed Methods continued

Flooding Source	Reach Length (miles)	Flooding Source	Reach Length (miles)
Franklin Branch Tributary 2	0.75	Sorghum Branch Overflow	0.19
Franklin Branch Tributary 3	0.48	South Harpeth River	11
Gibson Creek	2.23	Stoners Creek	5.54
Gibson Creek Tributary	1.04	Stones River	6.86
Goodlettsville Outlet Ditch	0.59	Sugartree Creek	3.45
Harpeth River	15.2	Trace Creek	1.02
Holt Creek	2.46	Trantham Creek	2.74
Hurricane Creek	2.28	Tributary To Richland Creek	1.54
Highway 100 Tributary	1.92	Tributary No. 1 To East Fork Hamilton Creek	1.43
Indian Creek I	2.2	Tributary No. 1 to Overall Creek	0.99
Indian Creek Tributary 1	1.67	Tributary No. 2 To East Fork Hamilton Creek	1.39
Indian Creek Tributary 2	0.36	Turkey Creek	1.8
J. Percy Priest Reservoir	11.8	Unnamed Tributary to Whittemore Branch	0.11

Table 2: Flooding Sources Studies by Detailed Methods continued

Flooding Source	Reach Length (miles)	Flooding Source	Reach Length (miles)
Jocelyn Hollow	1.55	Vaughns Gap Branch	1.96
Johnson Hollow Creek	1.58	Vaughns Gap Branch Overflow	0.44
Little Creek	3.93	Vhoins Branch	1.23
Little Creek Tributary 1	1.81	West Branch Hurricane Creek	0.73
Little Creek Tributary 2	1.06	West Fork Browns Creek	3.57
Little East Fork Creek	0.83	Whites Creek	12.8
Little Harpeth River	2.21	Whites Creek Tributary	1.15
Loves Branch	1.96	Whittemore Branch	3.52
Lumsley Fork	0.88	Whittemore Branch Tributary	1.31
Mansker Creek	9.68	Windemere Branch	1.25
Lumsley Fork	0.88	Windemere Branch Tributary	0.38

All or portions of numerous streams were studied by approximate methods, as indicated in Table 3, "Flooding Sources Studied by Approximate Methods." This revision refined and established approximate zones for all flooding sources studied by approximate methods in previous studies, a total of 78.08 miles. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards.

Table 3: Flooding Sources Studied by Approximate Methods

Flooding Source	Reach Length (miles)	Flooding Source	Reach Length (miles)
Bakers Fork	5.57	Long Creek Tributary 2	1.14
Bull Run Creek	5.07	Lumsley Fork	0.49
Cooper Creek	2.08	Mansker Creek	0.95
Cooper Creek Tributary 2	0.50	Marrowbone Creek	3.48
Cub Creek	3.79	Overall Creek	3.88
Davidson Branch	1.78	Pages Branch Tributary A	1.07
Ewin Branch	1.40	Pages Branch Tributary B	0.76
Ewing Creek Tributary 2	0.32	South Fork Sycamore Creek	8.99
Flat Creek	0.78	South Fork Sycamore Creek Tributary 1	2.03
Goodlettsville Outlet Ditch	0.55	Stoners Creek Tributary 7	0.06
Hurricane Creek	4.87	Sulphur Branch	2.87
Indian Creek	3.26	Sulphur Creek	4.60
Little Marrowbone Creek	6.63	Tributary No. 1 to Overall Creek	0.99
Little Marrowbone Creek Tributary 9	1.36	Walkers Creek	3.11
Long Creek	5.02	West Branch Hurricane Creek	0.68

This countywide FIS also incorporates the determination of letters issued by FEMA resulting in Letters of Map change as shown in Table 4, “Letters of Map Revision (LOMRs) Incorporated into Current Study.”

Table 4: Letters of Map Revision (LOMRs) Incorporated into Current Study

Case Number	Flooding Source(s)	Communities Affected	Effective Date
05-04-3100P	Overall Creek	Metropolitan Government of Nashville & Davidson County	10-27-2005
08-04-0137P	Unnamed Tributary to Whittemore Branch (Whittemore Branch portion superseded by the USACE study)	Metropolitan Government of Nashville & Davidson County	07-11-2008
08-04-0256P	McCrory Creek	Metropolitan Government of Nashville & Davidson County	09-15-2008
09-04-4992P	Tributary No. 2 to East Fork Hamilton Creek	Metropolitan Government of Nashville & Davidson County	09-30-2009
01-01-155P	Scotts Creek, Scotts Hollow	Metropolitan Government of Nashville & Davidson County	04-23-2001

2.2 Community Description

Davidson County is located in north central Tennessee and is bordered on the north by Robertson County, on the northeast by Sumner County, on the east by Wilson County, on the southeast by Rutherford County, on the southwest by Williamson County, and on the northwest by Cheatham County. In 1963 the Governments of the County and the City of Nashville consolidated to form the Metropolitan Government of Nashville and Davidson County. The estimated 2010 population of Davidson County was approximately 626,681. The county has a total land area of 502 square miles.

The climate of the county is generally mild with moderately warm summers and pleasant winters. Temperatures range from approximately 30 degrees F (°F) during winter to 90°F in summer. July is the warmest month with a mean temperature of 79.4°F. January is the coldest month having a monthly mean temperature of 38.9°F. Normal annual rainfall totals approximately 46 inches; winter snowfall averages approximately 8 inches (Reference 3).

The major drainage feature in Davidson County is the Cumberland River, which drains approximately 11,674 square miles from its mouth to Old Hickory Dam. Although this study covers parts of 66 streams in the county, only five of the principal streams are discussed in this section of the report. The vast majority of the aforementioned streams are tributaries of the Cumberland River. The Harpeth River drains approximately 866 square miles from its mouth. The majority of land use along the Harpeth River is either open land or agricultural. Richland Creek is a tributary of the Cumberland River and has a drainage area of 28.4 square miles at its mouth. Development along the creek is primarily residential. Whites Creek is a tributary of the Cumberland River and has a drainage area of approximately 63.3 square miles at its mouth. Existing land use is predominantly open land or agricultural with scattered residential development along major highways and roads. The south and southeast portions of land along the creek is urbanized.

Browns Creek is a tributary of the Cumberland River and has a drainage area of 16.8 square miles at its mouth. Existing land use is highly urbanized with industrial and commercial development and residential development in the southwest portion.

Mill Creek is a tributary of the Cumberland River and has a drainage area of approximately 108 square miles at its mouth. The existing land use is urbanized primarily residential with supporting commercial. The southeast portion is predominantly open land or agricultural.

2.3 Principal Flood Problems

The potential for damage to areas within Davidson County are greater from the Cumberland River than any other source of flooding. Also, the type of flooding experienced from the Cumberland River is more general in nature than flash flooding caused by excessive rainfall over short periods. Two outstanding historic floods that produced maximum flood heights on much of the Cumberland River were those of December 1926-January 1927 and January 1937. However, the flood of March 1975 exceeded the 1-percent-annual-chance flood elevation in existence prior to this occurrence and caused over $6.6 million dollars worth of damage in Davidson County alone. USACE Nashville District considers the May 2010 event as a historical event when computing the flood frequency discharges based on the extreme magnitude of this flood. Treating the May 2010 event as a historical event extends the period of record for the analysis (now the May 2010 flood is treated as the largest since 1926) and more accurately estimates the exceedance probability of this event.

All of the streams within Davidson County are subject to flooding and backwater flooding is significant. The primary effect of flooding on these streams appears to be inundation, although velocities will become significant to persons and structures under more extreme flooding situations. Calculated floodplain velocities range from one to five feet per second, and these are generally considered to be of dangerous magnitudes.

2.4 Flood Protection Measures

The USACE operates a number of flood control projects on the Cumberland River and its tributaries which greatly decrease the level of flooding in Davidson County.

Wolf Creek Dam, on Lake Cumberland, is located on the Cumberland River in Wayne, Russell, Pulaski, Clinton, McCreary, Laurel, and Whitley Counties, Kentucky. Its primary purpose is flood control and it controls runoff from a drainage area of 5,789 square miles. At the maximum controlled level the pool covers an area of 63,530 acres and extends 101 miles upstream from the dam to the vicinity of Cumberland Falls (Reference 4).

Dale Hollow Dam and Lake is in the Cumberland River Basin on the Obey River, approximately 7.3 miles above its mouth at Celina, Tennessee. The lake covers parts of Clay, Pickett, Overton, and Fentress Counties in Tennessee, and Clinton and Cumberland Counties in Kentucky. It controls the runoff from a drainage area of approximately 935 square miles. Above the spillway crest to the gates, a storage capacity of 35,300 acre-feet is available for retention of flood flows.

Center Hill Dam and Lake is located in the Cumberland River Basin, on the Caney Fork River, and covers parts of DeKalb, Putnam, White, and Warren Counties. It controls the runoff from a drainage area of approximately 2,174 square miles. From the spillway crest to the top of the gates, a storage capacity of 762,000 acre-feet is normally held empty for temporary retention of flood flows.

Metro Center Levee

The *Metro Center Levee Operations, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R) Manual*, published by the United States Army Corps of Engineers (USACE) Nashville District and dated April 2013, contains the following overview.

The Metro Center Levee provides flood damage reduction and recreation features along a 3-mile section of the Cumberland River. The levee protects an approximate 1000-acre business community with a value of approximately $650 Million based on a 1997 valuation.

The Federal Government’s participation in the levee’s structural improvements from 2001 to 2003 consisted of:

- Increasing the height of the existing levee to provide flood protection up to the Standard Project Flood level (approximately the 0.2% annual-chance flood, as modeled in 1994),
- Removing harmful trees and vegetation from the levee embankment near the levee’s toe,
- Repairing the riverbank with stone protection,
- Adding a secondary sluice gate in the gatewell of the existing interior drainage system.

- The removal of trees from the levee resulted in wildlife habitat loss and required mitigation that was completed prior to tree removal.
- Mitigation on the river side of the levee consisted of planting warm season grasses and installation of a bat boxes. Mitigation on the land side of the levee consisted of planting trees and placing nesting boxes along the interior lake and drainage canal system.

The Federal Government's participation in the levee's structural improvements from 2011 to 2012 consisted of:

- Removing harmful trees and vegetation from the levee embankment within 15 feet of the levee's toe subject to existing easements,
- Repair of turf grass installed on the land side of the levee,
- Re-grading, tilling, and replanting the mixture of native warm season grasses and wildflowers (no Kentucky 31 fescue) installed on the river side of the levee,
- Repairing slope damage and surface slides along the landside of the levee embankment,
- Upgrading the existing stone protection at the old Lock 1 site to make it consistent with the stone protection along the rest of the levee,
- Performed a levee shift between stations 112 and 114,
- Constructing a section of levee near the I-65 inland bridge to close a gap in flood protection,
- Replacing pervious material and filling the railroad closure structure with an impervious clay,
- Repairing the subgrade of the greenway trail with a soil-cement base material and repaving the greenway trail.

The Federal Government also stabilized the land side toe of the levee between stations 112 and 114 with a gabion retaining wall. The contract was awarded during March 2013 and construction was completed in May 2013.

Non-Federal improvements to the existing pump station are being performed in 2012-2013 under the direction of Metro Water Services, and OMRR&R related to the new pump station features are outside the scope of this Manual. The improvements consist of replacing the existing two 1973 pumps with newer electrical pumps, installing another pump house with two additional electrical pumps, and installing a backup power source.

The Federal Government's participation in the levee's recreational improvements from 2001 to 2004 consisted of:

- New side trails between the levee and the river,
- Trail head parking and plazas at both ends of the levee,
- A pavilion and several shade structures to compensate for the tree removal,
- Other public conveniences like stairs and ramps, trail head markers, benches, drinking fountains, waste receptacles and landscaping.

The Metro Center Levee improvements constructed by the Nashville Corps of Engineers between 2001 and 2003 were designed to provide the following protection from flooding of the protected area by the Cumberland River: 99% chance of protection for events up to the 100-year flood, 80% chance of protection for events up to the 0.4% annual-chance flood, and 76% chance of protection for events up to the 0.2% annual-chance flood. The stage at which the Sponsor should begin hourly monitoring of flood heights at the Shelby Street or Riverfront Park gages is 49.0 feet, which has about a 0.8% percent chance of occurring in any given year.

Opryland Levee

The Opryland levee on the Cumberland River located approximately 2.1 miles downstream of Briley Parkway meets the FEMA requirements of having a minimum of 3 feet of freeboard above the 1-percent-annual-chance flood to be considered a safe flood protection structure.

The *Operation and Maintenance Plan for the Opryland Levee System Nashville, Tennessee*, published by the Barge, Waggoner, Sumner, and Cannon, Inc. and dated May 2012, contains the following overview.

In accordance with the Jurisdictional Agreement dated 12 June 2003, by and between the Metro Government of Nashville and Davidson County, Opryland Attractions, Inc., OLH G.P., and Opry Mills Operating Company, L.L.C., the Metropolitan Government of Nashville and Davidson County assumes jurisdiction and responsibility for the operation and maintenance of the 100 year Opryland Levee System.
To the extent permissible by FEMA, the Metropolitan Government of Nashville and Davidson County will delegate this responsibility to the other parties to the Jurisdiction Agreement dated 12 June 2003.

The Opryland Levee System consists of four (4) separate levees. The first of these levees protects the Gaylord Opryland Resort Hotel & Convention Center Maintenance Complex (Lower 40). The second protects the Gaylord Opryland Resort Hotel & Convention Center and that part of Opry Mills Shopping Center which is below elevation 422 (Hotel & Mall). The protection level for these segments is to the base flood elevation or 1% annual-chance flood. The third levee protects the Opryland Resort Hotel & Convention Center to the 0.2% annual-chance flood. The fourth protects the Opry House to the 0.2% annual-chance year level.

The Lower 40 levee is generally triangular in shape and encloses the entire Lower 40 area without tying to high ground. The area is accessible through the Hotel & Mall protection via a bridge located on the south side of the Lower 40 levee. The levee is about 4,000 feet long.

The Hotel/Mall 100 year levee is generally in a U shape starting at high ground on the southeast end of the Convention Center next to Briley Parkway running south then westward then north parallel to the Cumberland River to an unnamed tributary, then in an easterly and north easterly direction tying to high ground northwest of the Hotel. The

Hotel entrance drive off McGavock Pike near Briley Parkway provides access to the site. The levee is about 8,000 feet long.

The protection for the two previously described areas consists of two types of levee: earthen berm with concrete wall and a concrete wall on a graded foundation. There are four road closures and numerous other closures that are activated at varying stages of river flooding.

The Opryland Resort Hotel & Convention Center 0.2% year annual-chance flood levee is generally in a U shape starting at high ground near the magnolia entrance running west along the drainage channel then south behind the call center building then across the Lower 40 bridge continuing south along the Cumberland River and turns eastward near PS3B towards Briley Parkway then running north tying into the concrete wall along the Ryman C loading dock.

The Opry House 0.2% year annual-chance flood levee surrounds the call center building.

The J. Percy Priest Dam and Reservoir is located in the Cumberland River Basin on the Stones River in Davidson, Wilson, and Rutherford Counties, and controls runoff from a drainage area of 892 square miles. Operation of J. Percy Priest Dam and Reservoir, Center Hill and Dale Hollow Lakes, Wolf Creek Dam, and Lake Cumberland during floods through June 1975 resulted in reductions of as much as 13.6 feet in maximum stages in Nashville. Estimates of damages prevented by these projects are: (1) J. Percy Priest - $35 million, (2) Center Hill - $46.3 million, (3) Dale Hollow - $31.2 million, and Wolf Creek Dam - $129.9 thousand.

Old Hickory Dam is located on the Cumberland River in Davidson and Sumner Counties. However, this project has no flood control storage and does not reduce peak flood flows downstream (Reference 4).

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

For this countywide study, hydrologic analyses were carried out to establish peak discharge frequency relationships for each flooding source studied by detailed and approximate methods affecting the community. A summary of peak discharge-drainage area relationships for streams studied by detailed methods is shown in Table 5, "Summary of Discharges." The stillwater elevations for the 10-, 2-, 1-, and 0.2-percent-annual-chance floods have been determined for J. Percy Priest Reservoir and are summarized in Table 6, "Summary of Stillwater Elevations."

3.1.1 Methods for Flooding Sources with New or Revised Analyses in Current Study

The discharge-frequency relationships for the Cumberland River Tributaries: Cooper Creek, Copper Creek Tributary 1, Cooper Creek Tributary 2, Davidson Branch, Dry Creek, Ewin Branch, Gibson Creek, Gibson Creek Tributary 1, Gibson Creek Tributary 2, Gibson Creek Tributary, Indian Creek, Indian Creek Tributary 1, Indian Creek Tributary 2, Loves Branch, Overall Creek, Pages Branch, Pages Branch Tributary A, Pages Branch Tributary B, Tributary No. 1 to Overall Creek, Windemere Branch., and Windemere Branch Tributary were developed by the HEC-HMS models. The initial step utilized the Geospatial Hydrologic Modeling Extension (HEC-GeoHMS) software to generate the physical parameters of the basin, such as drainage area, streams lengths, basin slopes, etc. Routing data was developed from the HEC-RAS models and terrain data. Precipitation data was generated from point gage rainfall from Metro Water Services (MWS) SCADA rain gages. Observed streamflow records and high water marks were unavailable for model calibration. High water marks were used to verify the Cooper Creek and Gibson Creek models. The 1% annual-chance flood peak discharges of Phase 4 HEC-HMS models were then compared to those calculated from the Phase 1-3 HEC-HMS models as well as those form the existing FIS and unpublished Metro studies on Cooper and Gibson Creek. Although the Phase 4 peak discharges did not compare well to FIS flows, they did compare well with the unpublished results of the Copper Creek and Gibson Creek models. The Dry Creek basin has a stream flow gage near Edenwold, TN at the Gallatin Road (HWY 31E) crossing and a stage gage at the 1-65 weir. USACE was able to achieve high confidence in the HEC-HMS model through calibration to these two gages over a wide range of events. The Clark unit hydrograph method was used to develop unit hydrographs for the Dry Creek HEC-HMS subbasins.

The discharge-frequency relationships for streams in the Harpeth Watershed including Harpeth River, Buffalo Creek, East Fork Creek, Flat Creek, Highway 100 Tributary, Little East Fork Creek, Poplar Creek, South Harpeth River, and Trace Creek using the Flood-Frequency Prediction Methods for Unregulated Streams of Tennessee, 2000 (WRIR 03-4176) for the hydrology computations

(Reference 5). The Harpeth River Watershed is located in Hydrologic Area 2 (HA2.), thereby determining the use of rural USGS regression equations for the State of Tennessee. The urban regression equations for the State of Tennessee were also analyzed for this study. In general, the urban equations matched the rural equations very well. Ultimately, the rural regression equations were selected because they had a longer period of record and corresponded to Phase II HMS peak flow results more closely than the urban regression equation results. The discharge-frequency relationships for Little Harpeth River and Otter Creek in the Harpeth Watershed were modeled using HEC-HMS 3.4.

The discharge-frequency relationships for streams in the Whites Creek Watershed including Drakes Branch, Eaton Creek, Ewing Creek, Little Creek, North Fork Ewing Creek, and Vhoins Branch were developed using the USACE HEC-1 computer program (Reference 12). The discharge-frequency relationships for additional streams in the Whites Creek Watershed including Bear Hollow Branch, Carney Creek, Claylick Creek, Crocker Springs Branch, Crocker Springs Branch Tributary, Cummings Branch, Dry Fork Creek, Earthman Fork, Earthman Fork Tributary 2, Earthman Fork Tributary 3, Earthman Fork Tributary 4, Ewing Creek Tributary 1, Ewing Creek Tributary 2, Johnson Hollow Branch, Little Creek Tributary 1, Little Creek Tributary 2, North Fork Ewing Creek Tributary 2, North Fork Ewing Creek Tributary 3, North Fork Ewing Creek Tributary 4, North Fork Ewing Creek Tributary 5, North Fork Ewing Creek Tributary 6, North Fork Ewing Creek Tributary 7, North Fork Ewing Creek Tributary 8, Shaw Branch, and Trantham Creek were developed using Flood-Frequency Prediction Methods for Unregulated Streams of Tennessee, 2000 (WRIR 03-4176) (Reference 5). The Whites Creek Watershed is located in Hydrologic Area 3 (HA3.), thereby determining the use of rural USGS regression equations for the State of Tennessee.

The discharge-frequency relationships for streams in the Browns Creek Watershed were developed using HEC-HMS Version 3.4 for Browns Creek and USACE HEC-1 computer program for West Fork Browns Creek, East Fork Browns Creek, and Middle Fork Browns Creek (Reference 12).

The discharge-frequency relationships for streams in the Mill Creek Watershed including Sims Branch, Mill Creek, and part of Sevenmile Creek, Holt Creek, Collins Creek, Indian Creek, Turkey Creek, and Franklin Branch were developed by HEC-HMS 3.4. The discharges for the remaining streams in the Mill Creek Watershed were developed by USACE HEC-1 computer program; these streams are Franklin Branch Tributary 1, Franklin Branch Tributary 2, Franklin Branch Tributary 3, part of Sevenmile Creek, Sevenmile Creek Tributary 1, Sevenmile Creek Tributary 2, Sorghum Branch, Whittemore Branch, and Whittemore Branch Tributary (Reference 12).

The discharge-frequency relationships for streams in the Richland Creek Watershed including Sugartree Creek, part of Belle Meade Branch, and Tributary to Richland Creek, Vaughns Gap Branch, and Jocelyn Hollow Branch were developed by USACE HEC-1 computer program (Reference 12). The discharge-frequency relationship for the remaining stream in Richland Creek was developed by HEC-HMS 3.4.

The discharge-frequency relationships for all new detailed study streams; part of Belle Meade Branch, Dry Creek, and part of Richland Creek in Davidson County were determined using the Flood-Frequency Prediction Methods for Unregulated Streams of Tennessee, 2000 (WRIR 03-4176) for the hydrology computations. Davidson County, TN is located in Hydrologic Area 2 and 3 (HA2 and HA3.), thereby determining the use of HA2 and HA3 regression equations in hydrologic analyses (Reference 5).

3.1.2 Methods for Flooding Sources Incorporated from Previous Studies

This section describes the methodology used in previous studies of flooding sources incorporated into this FIS that were not revised for this revision to the countywide study.

Precountywide Analyses

For Buffalo Creek, Gibson Creek, Gibson Creek Tributary, Overall Creek, Sevenmile Creek, Sorghum Branch, the Stones River, Tributary No. 1 to Mill Creek, Tributary No. 1 to Overall Creek, Whittemore Branch, and Windemere Branch, peak discharge-frequency relationships were determined by using the procedure outlined in the U.S. Geological Survey (USGS) publication, "Technique for Estimating Magnitude and Frequency of Floods in Tennessee" (Reference 6). This Multiple Regression Method uses drainage area as a parameter for deriving discharges, and is based upon relatively long-term records of flow for streams in similar hydrologic areas. The formula for the 0.2-percent-annual-chance flood, 1456A (drainage area), was derived by the same multiple regression techniques that were used to define the formula for floods of lesser magnitudes. The discharges defined in this manner agree with those used in the Cheatham County, Williamson County, Rutherford County, Wilson County, Sumner County, and Robertson County FIS reports.

Flood boundaries for areas of approximate study were based on the USGS technique for relating depth in the floodplain to the 1-percent-annual-chance flood (Reference 7).

Flood flows on the Cumberland River are regulated by a system of large flood control reservoirs. Because of varying levels of historical flood control, stream flow records exhibit a time-variant behavior. Use of a conventional log-Pearson Type III flood frequency analysis as described in Water Resources Council Bulletin No. 17 is not appropriate in this case (Reference 8). A special study was conducted to develop regulated flood frequency flows for the Cumberland River (Reference 9).

A storm rainfall generation computer program was used to develop a 0.5-percent-annual-chance (200-year) synthetic rainfall record for the Cumberland River basin. Significant flood-producing storms of the 200-year generated record were applied to a basin runoff-routing simulation model to produce streamflow discharge at central points. Results of the simulation model were analyzed to estimate discharge frequency curves. These discharge frequency curves were then combined with a graphical analysis of period of record regulated flow data developed by the USACE, Nashville District, to establish adopted discharge-frequency curves at all major river control points.

Results of the regulated frequency study were found to yield statistically reliable estimates of floods up to and including the 1-percent-annual-chance event. For events greater in magnitude than the 1-percent-annual-chance flood, such as the 0.2-percent-annual-chance flood, the statistical reliability of predicted flow was poor. Estimates of the 0.2-percent-annual-chance flood discharges from the study were found to approximate the USACE developed Standard Project Flood (SPF) for the majority of the Cumberland River. The SPF has been widely disseminated to the general public by the USACE, Nashville District, to be used for design purposes of developments adjacent to the Cumberland River. Because of the low reliability of estimates for extremely rare events and to maintain consistency with previously published information, the SPF is used in lieu of 0.2-percent-annual-chance flood for this study as shown on the Flood Profiles (Exhibit 1).

The present gages on the Harpeth River are located at Franklin (mile 87.6), at Bellevue (mile 61.2 in Davidson County), and near Kingston Springs (mile 32.3 in Cheatham County), with record periods of 4, 58, and 54 years, respectively. Since the gage at Franklin has been in place only 4 years, an insufficient record is available to allow a statistical analysis. The same methodology for frequency discharge determination and distribution that was utilized in previous USACE reports, including "Flood Plain information Report for the Harpeth River, Mouth to Franklin" was used for this FIS (Reference 10). This methodology involved prorating frequency discharges defined at Bellevue and Kingston Springs on a drainage area basis.

Peak discharge-frequency relationships for the South Harpeth River were determined by using the procedure outlined in the USGS publication, "Technique for Estimating Magnitude and Frequency of Floods in Tennessee." This Multiple Regression Method uses drainage area as a parameter for deriving discharges, and is based upon relatively long-term records of flow for streams in similar hydrologic areas. The formula for the 0.2-percent-annual-chance flood, 1559A (drainage area), was derived by the same multiple regression techniques that were used to define the formula for floods of lesser magnitudes.

Peak discharge; frequency relationships for Hurricane Creek and West Branch of Hurricane Creek were taken from the "Flood Plain Information Report for LaVergne, Tennessee" (Reference 11). Flows in the LaVergne report were determined by analysis of precipitation and an analysis of frequency discharges in adjacent basins. This method of analysis was used because the USGS regression equations had not been published at the time this study was done. However, once the USGS regression equation become available a comparison was made between the values for peak discharges obtained from this equation and those obtained from the LaVergne Flood Plain Information Report. The comparison did not show a significant difference between two sets of values and the values from the LaVergne Flood Plain Information Report were retained.

Since no useful stream gaging data exists for Dry Creek and Mansker Creek, frequency discharges for floods of the selected recurrence intervals were determined using the USGS regional regression analysis dated 1976. In the Regional Frequency Study, drainage area vs. frequency discharge curves were developed for areas in Tennessee based on a regression analysis of existing gaging stations for hydrologically similar areas.

Discharge frequency relationships for Collins Creek, Flat Creek, Hurricane Creek, the Little Harpeth River, Overall Creek, Mill Creek Tributary A, Mill Creek Tributary B, Scotts Creek, Scotts Hollow, Sims Branch, Sorghum Branch, Stoners Creek, and West Branch Hurricane Creek were developed using the USACE HEC-1 computer program (Reference 12).

Revised Analyses for the April 20, 2001, Countywide FIS

The discharge-frequency relationships for all revised streams, other than the Cumberland River and Trace Creek, were developed using the USACE HEC-1 computer program (Reference 12).

Discharge-frequency relationships for Trace Creek were determined using the procedure outlined in the publication, "Flood Frequency of Streams in Rural Basins of Tennessee" (Reference 13).

For the Cumberland River, discharges were calculated using the same methodology as referenced above under precountywide hydrologic analyses. The longer period of record was incorporated in the analysis. The study reach was extended into Cheatham County to allow a beginning and ending at a dam. This also helps prevent disconnects on the flood profiles at the county line. In updating the frequency discharges at Cheatham Dam (the downstream dam in the reach) it was necessary to first update the flows at the Clarksville gage. The method of determining flows at Cheatham Dam is to compare the discharges calculated at the Clarksville gage with RAI flows produced for that gage and apply the percent difference between the two to RAI calculated discharges at Cheatham Dam. The 1995 graphical analysis at the Clarksville gage produced flows of nearly equal magnitude to those calculated by the methods mentioned above under precountywide hydrologic analyses. Therefore, the discharges at Cheatham Dam were not changed for this countywide FIS.

Frequency discharges at the Nashville gage were computed using graphical analysis. The discharges for the 2- and 1-percent-annual-chance (50- and 100-year) events have been increased to 140,000 cfs and 155,000 cfs, respectively. The 10-year discharge in the updated analysis was of equal magnitude to the flow used in the current FIS. Because the SPF is used in lieu of the 0.2-percent-annual-chance discharge, this value was not changed.

Frequency discharges below Old Hickory Dam were computed using graphical analysis for events up to the 10-year flood event, and using a magnitude-of-order curve to relate unregulated discharges to regulated discharges for the 2- and 1-percent-annual-chance events. The natural frequency discharges were calculated using graphical analysis. The natural and regulated discharges were plotted in natural magnitude-of-order versus regulated magnitude-of-order to establish a relationship between the two. This curve was then entered with the natural frequency discharges and the corresponding regulated frequency discharges were read for use in the hydraulic model. This produced differences of between 8 percent and 13 percent in published and updated frequency discharges. Therefore, the updated discharges were adopted for use in this study.

As mentioned above under precountywide hydrologic analyses, the SPF was used in lieu of a calculated 0.2-percent-annual-chance discharge at all river control points along the study reach.

Revised Analyses for the November 21, 2002, Countywide FIS

For the November 2002 revision, flood discharges for Mansker Creek were determined using USGS regional regression analysis (References 14 and 15). This method relates drainage area to peak discharge for hydrologically similar streams.

Table 5: 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
BEAR HOLLOW BRANCH					
At a point 300 feet upstream of the confluence with Earthman Fork	2.07	1,000	1,470	1,670	2,140
At a point 555 feet upstream of the confluence with Earthman Fork	1.14	600	890	1,020	1,310
At a point 1180 feet upstream of the confluence with Earthman Fork	0.85	510	760	860	1,110
At a point 0.51 mile upstream of the confluence with Earthman Fork	0.74	460	690	780	1,010
At a point 0.75 mile upstream of the confluence with Earthman Fork	0.64	410	610	700	900
BELLE MEADE BRANCH					
At a point 275 feet downstream of Warner Place	1.28	985	*	1,780	*
At a point 125 feet upstream of Warner Place	1.03	967	*	1,680	*
BROWNS CREEK					
At Nolensville Pike	12.78	5,954	7,713	8,447	9,838
USGS Gage at Fairgrounds	11.76	5,585	7,213	7,889	9,091
Just below confluence of East Fork Browns Creek	10.81	5,196	6,695	7,309	8,329
Just below Interstate 65	7.92	3,952	4,957	5,325	5,849
Just upstream of Interstate 440 & Interstate 65 culvert	6.75	3,410	4,295	4,565	5,011

*Data not available

Table 5: 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
BROWNS CREEK (continued)					
At West Express Drive	15.06	6,727	8,757	9,600	11,402
At Hart Street	13.75	6,295	8,180	8,967	10,545
At point 100 feet downstream of Factory Street	13.20	6,087	7,903	8,656	10,128
BUFFALO CREEK					
At the confluence with Harpeth River	5.70	1,520	2,320	2,680	3,570
At a point 210 feet downstream of Newsom Station Road	5.06	1,400	2,140	2,470	3,280
At a point 1,295 feet upstream of Highway 70	2.29	800	1,220	1,410	1,880
At a point 200 feet upstream of Highway 70	1.96	710	1,090	1,260	1,690
At a point 0.44 mile upstream of Highway 70	1.55	610	930	1,080	1,440
At a point 0.80 mile upstream of Highway 70	1.30	540	820	950	1,270
At a point 0.95 mile upstream of Highway 70	1.04	460	700	810	1,090
At a point 1.0 mile upstream of Highway 70	0.80	380	580	680	900
At a point 1.23 mile upstream of Highway 70	0.70	350	530	620	820
At a point 1.35 mile upstream of Highway 70	0.59	310	470	550	730
At a point 1.65 mile upstream of Highway 70	0.47	260	400	470	620
CARNEY CREEK					
At a point 130 feet upstream of Drive Fork Road	0.88	520	780	890	1,140
At a point 1345 feet upstream of Drive Fork Road	0.80	490	730	830	1,060
At a point 150 feet downstream of Stenberg Road	0.69	440	650	740	960

Table 5: 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
CARNEY CREEK (continued)					
At a point 700 feet upstream of Stenberg Road	0.44	310	470	530	690
CLAYLICK CREEK					
At the confluence with Whites Creek	4.23	1,720	2,510	2,850	3,630
At a point 0.73 mile upstream of Lickton Pike	3.79	1,590	2,310	2,630	3,350
At a point 0.56 mile downstream of Interstate 24	3.32	1,440	2,100	2,380	3,040
At a point 775 feet downstream of Interstate 24	2.91	1,300	1,900	2,160	2,750
At a point 760 feet downstream of Claylick Road	2.53	1,170	1,710	1,950	2,490
At a point 330 feet upstream of Interstate 24	2.08	1,010	1,480	1,680	2,150
At a point 1265 feet upstream of Interstate 24	0.99	570	850	970	1,250
COOPER CREEK					
At confluence with Cumberland River	3.81	3,090	4,035	4,440	5,395
Approximately 0.80 mile downstream of Ravenwood Drive	3.76	3,055	3,990	4,385	5,330
Approximately 0.75 mile downstream of Ravenwood Drive	3.22	2,680	3,475	3,810	4,580
Approximately 1,300 feet downstream of Ravenwood Drive	3.01	2,560	3,305	3,615	4,330
Approximately 1,200 feet downstream of Ravenwood Drive	2.76	2,390	3,070	3,355	4,000
At Ravenwood Drive	2.67	2,340	3,005	3,275	3,895

Table 5: 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
COOPER CREEK (continued)					
Approximately 350 feet downstream McGavock Pike	2.55	2,260	2,895	3,150	3,730
Approximately 250 feet downstream McGavock Pike	1.42	1,250	1,555	1,665	1,925
Approximately 1,075 feet upstream of McGavock Pike	1.32	1,175	1,455	1,560	1,800
Just US Kennedy Avenue	1.23	1,100	1,390	1,515	1,810
At Kennedy Avenue	1.23	1,100	1,365	1,465	1,690
Approximately 100 feet upstream of Kennedy Avenue	1.00	915	1,135	1,235	1,460
Approximately 1,055 feet downstream of Gallatin Pike	0.90	810	1,005	1,090	1,265
Approximately 525 feet upstream of Gallatin Pike	0.67	640	815	880	1,050
At Gallatin Pike	0.67	595	740	805	890
Approximately 600 feet upstream of Gallatin Pike	0.40	435	535	575	665
Just Upstream of Railroad	0.18	225	325	355	430
At Railroad	0.18	225	260	275	305
At Edwards Avenue	0.07	100	130	140	170
COOPER CREEK TRIBUTARY 1					
At confluence with Cooper Creek	1.14	1,025	1,370	1,520	1,875
At Stratford Avenue	1.07	965	1,290	1,430	1,760

Table 5: 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
COOPER CREEK TRIBUTARY 1 (continued)					
Just Upstream of Stratford Avenue	0.28	285	385	445	570
At Berrywood Road	0.22	215	300	350	450
Just upstream of Branch Street	0.15	190	245	270	325
Just upstream of Branch Street	0.15	145	215	250	320
At Litton Avenue	0.05	75	95	105	125
COOPER CREEK TRIBUTARY 2					
At confluence with Cooper Creek Tributary 1	0.79	695	915	1,010	1,240
At Riverside Drive	0.64	575	755	830	1,020
Approximately 825 feet upstream of Kirkland Avenue	0.44	390	510	565	695
Approximately 830 feet upstream of Kirkland Avenue	0.31	250	335	365	450
CROCKER SPRINGS BRANCH					
At a point 250 feet upstream of Lickton Pike	1.91	940	1,390	1,580	2,020
At a point 1,770 feet upstream of Crocker Springs Road	1.69	860	1,270	1,440	1,850
Just downstream of the confluence of Crocker Springs Branch Tributary	1.40	750	1,100	1,260	1,610
At a point 130 feet upstream of Crocker Springs Road	0.75	470	700	790	1,020

Table 5: 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
CROCKER SPRINGS BRANCH (continued)					
At a point 885 feet upstream of Crocker Springs Road	0.65	420	630	710	920
At a point 95 feet upstream of Crocker Springs Road	0.56	370	560	640	820
CROCKER SPRINGS BRANCH TRIBUTARY					
At the confluence with Crocker Springs Branch	0.60	390	590	670	860
At a point 900 feet upstream of the confluence with Crocker Springs Branch	0.57	380	570	650	840
At a point 0.34 mile upstream of the confluence with Crocker Springs Branch	0.40	290	440	500	640
At a point 0.48 mile upstream of the confluence with Crocker Springs Branch	0.23	190	290	330	430
COLLINS CREEK					
At a point 1,525 feet upstream of confluence with Mill Creek	4.50	3,475	4,685	5,240	6,621
At a point 900 feet downstream of Interstate 24	3.56	2,739	3,696	4,136	5,225
At a point 1275 feet upstream of Interstate 24	2.51	1,991	2,683	3,000	3,789
CUMMINGS BRANCH					
At a point 950 feet upstream of Shaw Road	2.34	1,100	1,620	1,840	2,350
At a point 0.66 mile upstream of Shaw Road	2.05	1,000	1,470	1,670	2,130
At a point 1.15 mile upstream of Shaw Road	1.58	820	1,210	1,370	1,760

Table 5: 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
CUMMINGS BRANCH (continued)					
At a point 1.27 mile upstream of Shaw Road	1.30	710	1,050	1,190	1,530
At a point 1.75 mile upstream of Shaw Road	0.87	520	770	880	1,130
At a point 1.85 mile upstream of Shaw Road	0.56	380	560	640	820
At a point 2.11 mile upstream of Shaw Road	0.42	300	450	520	670
At a point 2.26 mile upstream of Shaw Road	0.29	230	340	390	500
CUMBERLAND RIVER					
At a point 1,604 feet upstream of Stones River	12,691.4	115,000	140,000	155,000	190,000
Dam at Old Hickory Reservoir	11,673.9	115,000	173,000	198,000	255,000
DAVIDSON BRANCH					
Just upstream of confluence with Ewin Branch	1.97	1,850	2,450	2,700	3,300
Approximately 200 feet upstream of confluence with Ewin Branch	1.46	1,380	1,825	2,010	2,460
Just upstream of US Highway 70	1.45	1,365	1,800	1,985	2,430
Just upstream of Interstate 40	1.39	1,305	1,720	1,900	2,325
Just upstream of Davidson Drive	1.19	1,135	1,495	1,650	2,015
Approximately 1,950 feet upstream of Davidson Drive	1.07	1,020	1,345	1,480	1,810
Approximately 2,000 feet upstream of Davidson Drive	0.83	830	1,090	1,200	1,465
Just upstream of Brownlee Drive	0.67	665	875	960	1,175

Table 5: 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
DRAKE BRANCH					
At confluence with Whites Creek	2.07	1,700	*	2,980	*
At point 1000 feet upstream of Fairview Drive	1.74	1,420	*	2,520	*
At point 650 feet upstream of Kings Lane	1.53	1,170	*	2,150	*
At point 0.44 miles upstream of Kings Lane	1.47	1,110	*	2,060	*
At point 0.25 miles downstream of Briley Parkway	1.02	865	*	1,630	*
At point 200 feet downstream of Briley Parkway	1.02	865	*	1,630	*
DRY CREEK					
Just upstream of Myatt Drive	8.60	2,956	5,231	6,266	8,348
Just downstream of CSX railroad	8.20	2,826	5,069	6,077	8,064
0.3 miles downstream of Gallatin Road (HWY 31E)	8.00	2,734	4,957	5,939	7,867
At USGS Gage 03426470 Dry Creek near Edenwold, TN, Just downstream of Gallatin Road (HWY 31E)	7.70	2,639	4,849	5,809	7,682
Just upstream of unnamed tributary on left bank, 300 feet upstream of Gallatin Road (HWY 31E)	7.20	2,495	4,636	5,555	7,319
Just upstream of CSX railroad	7.00	2,426	4,572	5,483	7,216

* Data not available

Table 5: 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
DRY CREEK (continued)					
Just downstream of unnamed tributary on right bank, approximately RM 1.80	6.70	2,630	5,431	6,955	10,185
Just upstream of I-65	3.30	906	2,297	2,937	3,776
0.1 miles downstream of Old Dickerson Pike	2.30	1,017	1,932	2,328	3,221
Upstream limit of detailed study, 0.2 mile downstream of Hills Hollow Road	1.40	654	1,194	1,419	1,925
DRY FORK CREEK					
At a point 0.51 mile upstream of Drive Fork Road	3.98	1,760	*	3,410	*
At a point 0.95 mile upstream of Drive Fork Road	3.63	1,620	*	3,190	*
At a point 1.11 mile upstream of Drive Fork Road	3.61	1,610	*	3,170	*
At a point 1.25 mile upstream of Drive Fork Road	3.13	1,520	*	2,980	*
Just downstream of the confluence of Carney Creek	2.31	1,090	1,600	1,820	2,320
Just upstream of Drive Fork Road	1.29	700	1,040	1,180	1,510
At a point 515 feet upstream of Drive Fork Road	0.47	330	490	560	720
At a point 1,420 feet upstream of Drive Fork Road	0.36	270	400	460	590
At a point 0.38 mile upstream of Drive Fork Road	0.28	220	330	380	490
At a point 0.61 mile upstream of Drive Fork Road	0.24	200	300	350	450
At a point 0.78 mile upstream of Drive Fork Road	0.21	180	270	310	410

*Data not available

Table 5: 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
DRY FORK CREEK (continued)					
At a point 0.92 mile upstream of Drive Fork Road	0.17	150	230	260	340
EARTHMAN FORK					
At a point 115 feet upstream of Old Hickory Boulevard	5.17	2,130	3,479	4,060	5,409
At a point 0.46 mile downstream of the confluence of Earthman Fork Tributary 2	4.12	1,890	3,204	3,770	5,084
Just downstream of the confluence of Earthman Fork Tributary 2	3.94	1,760	2,580	2,940	3,790
At a point 450 feet downstream of Seymour Hollow Road	3.45	1,540	2,260	2,570	3,290
Just downstream of the confluence of Earthman Fork Tributary 4	2.59	1,190	1,740	1,980	2,530
At a point 300 feet upstream of the confluence of Bear Hollow Branch	2.07	1,000	1,470	1,670	2,140
At a point 235 feet upstream of Whites Creek Pike	1.06	600	890	1,020	1,310
At a point 235 feet upstream of Whites Creek Pike	0.59	390	580	660	850
At a point 1130 feet upstream of Whites Creek Pike	0.51	350	520	600	770
At a point 1430 feet upstream of Whites Creek Pike	0.28	150	230	260	340

Table 5: 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
EARTHMAN FORK (continued)					
At a point 0.44 mile upstream of Whites Creek Pike	0.24	200	300	340	440
At a point 0.88 mile upstream of Whites Creek Pike	0.17	150	230	260	340
EARTHMAN FORK TRIBUTARY 2					
At the confluence with Earthman Fork	0.46	330	490	550	710
At a point 0.40 mile upstream of the confluence with Earthman Fork	0.40	290	430	500	640
At a point 0.51 mile upstream of the confluence with Earthman Fork	0.30	230	350	400	510
At a point 0.68 mile upstream of the confluence with Earthman Fork	0.26	210	310	360	460
EARTHMAN FORK TRIBUTARY 3					
At the confluence with Earthman Fork	3.45	1,540	2,260	2,570	3,290
At a point 400 feet upstream of the confluence with Earthman Fork	0.68	430	640	730	950
At a point 1,275 feet upstream of the confluence with Earthman Fork	0.64	410	610	700	900
At a point 0.63 mile upstream of the confluence with Earthman Fork	0.56	370	560	630	820
EARTHMAN FORK TRIBUTARY 4					
At the confluence with Earthman Fork	0.49	340	510	580	750

Table 5: 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
EARHTMAN FORK TRIBUTARY 4 (continued)					
At a point 290 feet upstream of Whites Creek Pike	0.48	330	500	570	730
At a point 1,537 feet upstream of Whites Creek Pike	0.42	300	450	510	660
At a point 0.41 mile upstream of the confluence with Whites Creek Pike	0.37	270	410	470	660
EATONS CREEK					
At a point 345 feet downstream of Cato Court	5.78	2,590	*	4,960	*
At a point 140 feet upstream of Cato Court	5.24	2,500	*	4,800	*
At a point 440 feet downstream of Sulphur Creek Road	4.17	2,000	*	3,870	*
At a point 285 feet upstream of Sulphur Creek Road	3.26	1,860	*	3,610	*
At a point 0.38 mile upstream of Sulphur Creek Road	2.71	1,530	*	2,900	*
At a point 0.75 mile upstream of Sulphur Creek Road	2.38	1,450	*	2,800	*
At a point 0.90 mile upstream of Sulphur Creek Road	1.61	1,080	*	2,090	*

* Data not available

Table 5: 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
EAST FORK CREEK					
At the confluence with South Harpeth River	13.08	2,740	4,170	4,810	6,390
Just downstream of the confluence of Little East Fork Creek	12.78	2,700	4,110	4,740	6,290
At a point 0.89 mile upstream of the confluence of Little East Fork Creek	8.19	1,970	3,000	3,460	4,600
EAST FORK HAMILTON CREEK					
At Smith Springs Road	3.45	2,160	*	2,750	*
At a point approximately 0.36 mile upstream of Smith Springs Road	2.47	2,210	*	3,290	*
At a point approximately 0.15 mile downstream of Mossdale Drive	2.34	2,100	*	3,170	*
At Mossdale Drive	0.78	963	*	1,510	*
At a point approximately 0.13 mile downstream of Bell Road	0.37	484	*	731	*
Just upstream of a point approximately 0.07 mile upstream of Bell Road	0.24	395	*	625	*
ELM HILL TRIBUTARY					
At confluence with McCrory Creek	1.29	1,120	*	1,970	*
At a point approximately 0.10 mile downstream of Elm Hill Pike	0.97	1,030	*	1,640	*

* Data not available

Table 5: 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 HILL TRIBUTARY (continued)					
At a point approximately 0.15 mile upstream of Timber Valley Drive	0.82	904	*	1,540	*
Just upstream of a point approximately 0.26 mile upstream of Timber Valley Drive	0.48	464	*	894	*
EWIN BRANCH					
Just upstream of confluence with Cumberland River	3.63	3,350	4,400	4,840	5,950
Just downstream of confluence of Davidson Branch	3.59	3,365	4,475	4,935	6,080
Just upstream of confluence of Davidson Branch	1.62	1,580	2,095	2,310	2,845
Just upstream of Interstate 40	1.28	1,305	1,720	1,895	2,335
Approximately 300 feet downstream of Belton Drive	1.19	1,215	1,595	1,760	2,160
Just upstream of Belton Drive	1.11	1,145	1,495	1,650	2,025
Approximately 580 feet downstream of Brook Hollow Road	0.79	800	1,045	1,155	1,415
Just upstream of Brook Hollow Road	0.65	660	865	950	1,165
EWING CREEK					
At confluence with Whites Creek	13.94	6,620	*	10,500	*
At point 0.2 miles downstream of Knight Road	13.60	6,580	*	10,400	*

*Data not available

Table 5: 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
EWING CREEK (continued)					
Just downstream of confluence Vhoins Branch	13.09	6,530	*	10,200	*
At point 400 feet upstream of Vista Lane	10.33	5,970	*	8,830	*
At Gwynnwood Drive	9.90	5,970	*	8,760	*
At point 0.21 miles upstream of Gwynnwood Drive	9.34	5,840	*	8,540	*
Just downstream of confluence of North Fork Ewing Creek	9.13	5,820	*	8,530	*
At point 800 feet downstream of Brick Church Pike	3.43	2,990	*	4,490	*
At point 500 feet upstream of Brick Church Pike	3.43	2,670	*	3,970	*
Just downstream of confluence of Ewing Creek Tributary 1	2.81	2,480	*	3,630	*
At point 130 feet upstream of Richmond Hill Drive	2.23	1,960	*	2,730	*
At Dickerson Pike	1.71	1,950	*	3,200	*
At Interstate 65	1.71	1,510	*	2,100	*
EWING CREEK TRIBUTARY 1					
At the confluence with Ewing Creek	0.58	390	570	660	840
At a point 370 feet downstream of Richmond Hill Drive	0.57	380	560	640	830

*Data not available

Table 5: 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
EWING CREEK TRIBUTARY 1 (continued)					
At a point 535 feet upstream of Richmond Hill Drive	0.44	310	460	530	680
At a point 1,125 feet downstream of Spears Road	0.38	280	420	480	620
At a point 220 feet downstream of Spears Road	0.30	240	350	400	520
At a point 215 feet downstream of Briley Pkwy	0.26	210	320	360	460
At a point 565 feet upstream of Doverside Drive	0.17	150	230	260	340
EWING CREEK TRIBUTARY 2					
At a point 110 feet downstream of Ewing Drive	0.46	330	490	550	710
At a point 300 feet upstream of Interstate 65	0.43	310	460	530	680
At a point 230 feet downstream of Stanwyck Drive	0.31	240	360	410	530
Just downstream of Rich Acres Drive	0.17	150	230	260	340
FLAT CREEK					
At confluence with Harpeth River	3.26	1,020	1,570	1,810	2,410
At a point 1510 feet upstream of the confluence with Harpeth River	3.22	1,010	1,550	1,790	2,390
At a point 550 feet downstream of Bellevue Road	2.37	820	1,250	1,450	1,930
Just upstream of Moss Creek Court	2.01	730	1,110	1,290	1,720
Just downstream of Old Hickory Boulevard	1.68	640	980	1,140	1,520
At a point 260 feet downstream of Chimney Hill	0.88	410	620	720	970

Table 5: 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
FLAT CREEK (continued)					
At a point 470 feet downstream of Highway 70	0.74	360	550	640	860
At a point 435 feet upstream of Highway 70	0.54	290	440	510	690
At a point 1160 feet upstream of Highway 70	0.47	260	400	470	620
FRANKLIN BRANCH					
At a point 690 feet upstream of the confluence with Mill Creek	3.13	2,635	3,557	3,977	5,026
At a point 450 feet downstream of confluence of Franklin Branch Tributary 1	3.00	2,525	3,408	3,811	4,816
At a point 660 feet upstream of Franklin Limestone Rd	1.52	1,248	1,686	1,886	2,383
At a point 630 feet downstream of Una Antioch Pike	1.26	1,035	1,397	1,552	1,973
At a point 0.44 mile upstream of Rader Ridge Road	1.00	822	1,108	1,238	1,563
At a point 1020 feet downstream of Rural Hill Road	0.50	411	554	619	782
At a point 185 feet upstream of Hickory Highlands Drive	0.37	304	410	458	578
FRANKLIN BRANCH TRIBUTARY 1					
Just downstream of the confluence of Franklin Branch Tributary 2	1.36	1,250	1,895	2,175	2,820

Table 5: 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
FRANKLIN BRANCH TRIBUTARY 1 (continued)					
At a point 350 feet upstream of Una Antioch Pike	1.09	1,000	1,510	1,730	2,240
Just downstream of the confluence of Franklin Branch Tributary 3	0.92	885	1,310	1,500	1,935
At a point 550 feet downstream of Edge O Lake Drive	0.48	455	680	780	1,015
At a point 400 feet upstream of Edge O Lake Drive	0.18	255	335	400	500
FRANKLIN BRANCH TRIBUTARY 2					
At a point 1330 feet upstream of the confluence with Franklin Branch Tributary 1	0.27	275	410	475	615
At a point 0.77 mile upstream of the confluence with Franklin Branch Tributary 1	0.15	135	200	225	300
FRANKLIN BRANCH TRIBUTARY 3					
At a point 765 feet upstream of Oak Barrel Drive	0.44	395	575	780	935
At a point 1330 feet upstream of the confluence with Franklin Branch Tributary 1	0.27	275	410	475	615
At a point 0.77 mile upstream of the confluence with Franklin Branch Tributary 1	0.15	135	200	225	300
GIBSON CREEK					
At confluence with Cumberland River	4.25	3,715	4,745	5,190	6,295

Table 5: 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
GIBSON CREEK (continued)					
Approximately 0.9 mile downstream of Gallatin Pike	4.22	3,700	4,725	5,165	6,265
Just upstream of Gibson Creek Tributary 1	4.05	3,575	4,550	4,975	6,025
Approximately 0.77 mile downstream of Gallatin Pike	4.00	3,540	4,505	4,920	5,955
Just upstream of Gibson Creek Tributary	1.93	1,615	1,955	2,110	2,505
Approximately 0.59 mile downstream of Gallatin Pike	1.90	1,595	1,935	2,090	2,475
Approximately 0.5 mile downstream of Gallatin Pike	1.83	1,550	1,875	2,025	2,400
Approximately 950 feet downstream of Gallatin Pike	1.74	1,485	1,795	1,935	2,295
At Gallatin Pike	1.60	1,380	1,670	1,800	2,130
At railroad	1.52	1,315	1,590	1,715	2,030
Just upstream of Gibson Creek Tributary 2	0.61	610	800	880	1,085
At Norman Drive	0.42	435	570	630	770
At Linda Lane	0.37	370	490	535	655
At Marthona Road	0.31	305	400	440	353
GIBSON CREEK TRIBUTARY					
At confluence with Gibson Creek	2.07	1,930	2,570	2,845	3,525

Table 5: 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
GIBSON CREEK TRIBUTARY (continued)					
Approximately 1,275 feet downstream of Madison Blvd	2.01	1,880	2,500	2,765	3,430
Approximately 100 feet downstream of Madison Blvd;	1.88	1,790	2,375	2,625	3,245
Just upstream of Gibson Creek Tributary 1	1.43	1,345	1,775	1,960	2,420
Just downstream of Gibson Creek Tributary 2	1.31	1,245	1,640	1,810	2,230
Just upstream of Gibson Creek Tributary 2	0.80	750	990	1,095	1,345
Just downstream of Gibson Creek Tributary 3	0.77	725	960	1,055	1,300
Just upstream of Gibson Creek Tributary 3	0.52	500	660	730	890
GIBSON CREEK TRIBUTARY 1					
At confluence with Gibson Creek	0.90	900	1,180	1,310	1,615
Approximately 685 feet upstream of Gibson Drive	0.83	825	1,080	1,200	1,475
At Saunders Avenue	0.69	690	905	1,000	1,230
At the confluence with Gibson Creek	0.17	165	220	240	295
At southern edge of Rothwood Apartments property	0.08	80	105	115	140
GOODLETTSVILLE OUTLET DITCH					
At mouth	1.62	880	1,320	1,520	2,000
At Cartwright Street	0.92	590	880	1,020	1,340

Table 5: 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
HARPETH RIVER					
At a point 1.54 miles upstream of State HWY 49	966	41,528	64,392	75,066	100,536
At Paul Story Road	844	44,515	68,087	78,882	104,314
At a point 3,765 feet upstream of Ashland City Road	726	38,897	58,162	67,112	88,205
At a point 3.32 miles upstream of Cedar Hill Road	717	39,653	58,942	76,233	88,959
At a point 2.47 miles upstream of Cedar Hill Road	699	40,155	59,424	68,776	90,136
At U.S. HWY 70 (Kingston Spring Gage)	681	40,155	59,051	68,182	88,567
Just downstream of confluence of Turnbull Creek	679	40,294	59,155	68,267	88,552
At a point 1.09 miles upstream of Park Street	563	24,933	42,671	49,247	58,523
At a point 700 feet upstream of 1-40	558	24,933	36,507	42,671	58,523
At a point 1.82 miles upstream of East Kingston Springs Road	558	24,613	34,732	39,531	48,343
At a point 4,120 feet upstream of 1-40	528	22,808	33,904	39,515	54,456
At a point 570 feet upstream of Riverview Drive	444	22,055	32,522	37,759	51,582
At a point 1,630 feet upstream of McCrory Lane	437	18,148	32,810	38,036	51,904
At a point 1.31 miles upstream of CSX Railroad	433	22,257	32,793	38,008	52,037
At I-40	426	22,320	32,870	38,392	52,371
At a point 4695 feet upstream of Old Harding Pike	416	22,392	32,914	38,413	52,304
At a point 900 feet upstream of State HWY 100 (Bellevue Gage)	408	22,358	32,857	38,345	52,213

Table 5: 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
HOLT CREEK					
At a point 1330 feet upstream of Bluff Road	5.23	4,201	5,667	6,335	7,994
At a point 750 feet downstream of Redmond Lane	4.24	3,476	4,688	5,241	6,623
At a point 750 feet upstream of Redmond Lane	2.46	2,026	2,731	3,053	3,855
At a point 0.49 mile upstream of Redmond Lane	1.87	1,586	2,136	2,387	3,012
At a point 275 feet upstream of Edmondson Pike	1.04	861	1,160	1,297	1,637
HURRICANE CREEK					
At a point approximately 1.2 miles downstream of U.S. Route 41	13.35	*	*	6,915	*
At U.S. Route 41	10.85	*	*	6,175	*
At CSX Transportation	9.81	*	*	5,805	*
HIGHWAY 100 TRIBUTARY					
At the confluence with South Harpeth River	1.56	610	930	1,080	1,440
At a point 200 feet downstream of South Harpeth Road	1.38	560	860	990	1,320
At a point 235 feet upstream of Highway 100	1.21	510	780	900	1,200
At a point 365 feet downstream of Old Harding Pike	1.05	460	710	820	1,090
At a point 380 feet upstream of Old Harding Pike	0.90	410	630	730	980
At a point 525 feet upstream of Highway 100	0.77	370	570	660	880

*Data not available

Table 5: 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
HIGHWAY 100 TRIBUTARY (continued)					
At a point 780 feet upstream of Highway 100	0.57	300	460	530	710
INDIAN CREEK					
At confluence with Cumberland River	6.13	4,625	6,275	6,975	8,700
Approximately 0.5 mile upstream of the confluence with Cumberland River	5.24	3,875	5,245	5,830	7,265
Just downstream of Indian Creek I Tributary 1	4.96	3,685	4,980	5,535	6,895
Just upstream of Indian Creek I Tributary 1	3.35	2,400	3,225	3,585	4,445
At River Road Pike	3.23	2,345	3,150	3,500	4,335
Approximately 1,550 feet upstream of River Road Pike	3.05	2,230	2,990	3,320	4,095
Approximately 0.6 mile upstream of River Road Pike	2.68	1,970	2,635	2,920	3,585
Just downstream of Indian Creek I Tributary 2	2.37	1,735	2,315	2,560	3,135
Just upstream of Indian Creek I Tributary 2	1.78	1,255	1,675	1,855	2,270
Approximately 500 feet upstream of Indian Creek Road	1.66	1,160	1,555	1,715	2,100
Approximately 250 feet downstream of Indian Creek Road	1.32	895	1,195	1,320	1,625
Just DS of Indian Creek Road	0.74	520	695	765	940
Approximately 1,950 feet upstream of Indian Creek Road	0.63	420	565	625	775

Table 5: 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
INDIAN CREEK I TRIBUTARY 1					
At confluence with Indian Creek I	1.63	1,380	1,840	2,035	2,525
Approximately 1,800 feet upstream of River Road Pike	1.45	1,245	1,655	1,830	2,260
Approximately 0.75 mile upstream Of River Road Pike	1.20	1,025	1,360	1,505	1,855
Approximately 0.5 mile downstream of Dam	0.92	770	1,020	1,130	1,390
At dam	0.56	470	625	690	850
INDIAN CREEK I TRIBUTARY 2					
At confluence with Indian Creek I	0.59	515	680	755	925
At Indian Creek Road	0.45	385	505	560	690
Approximately 1,100 feet upstream of Indian Creek Road	0.40	330	435	480	595
JOCELYN HOLLOW BRANCH					
At a point 600 feet downstream of Brook Hollow Road	1.45	787	*	1,360	*
At a point 120 feet upstream of Robin Hill Road	1.24	723	*	1,360	*
At a point 1,420 feet upstream of Robin Hill Road	0.97	647	*	1,310	*
JOHNSON HOLLOW CREEK					
At the confluence with Earthman Fork	1.00	580	860	980	1,250

*Data not available

Table 5: 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
JOHNSON HOLLOW CREEK (continued)					
At a point 465 feet downstream of Old Hickory Boulevard	0.90	530	790	900	1,160
At a point 1,030 feet upstream of Old Hickory Boulevard	0.77	480	710	800	1,030
At a point 1,400 feet downstream of Shellbark Drive	0.43	310	460	520	670
At a point 205 feet downstream of Shellbark Drive	0.37	280	410	470	610
At a point 395 feet upstream of Shellbark Drive	0.30	240	350	400	520
At a point 990 feet upstream of Shellbark Drive	0.21	180	270	310	400
At a point 1,840 feet upstream of Shellbark Drive	0.17	150	230	260	340
LITTLE CREEK					
At a point 190 feet upstream of confluence with Whites Creek	5.58	3,640	*	5,200	*
At a point 0.62 mile downstream of Interstate 24	5.20	3,540	*	4,950	*
Just downstream of Interstate 24	4.64	3,370	*	4,720	*
At a point 430 feet upstream of Interstate 24	4.30	3,270	*	4,590	*
Just downstream of confluence with Little Creek Tributary 1	3.60	3,120	*	5,380	*
At a point 1100 feet downstream of Old Hickory Boulevard	1.98	1,920	*	3,190	*

*Data not available

Table 5: 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 CREEK (continued)					
At a point 1110 feet upstream of Old Hickory Boulevard	1.29	1,450	*	2,380	*
Just upstream of confluence with Little Creek Tributary 2	0.85	1,140	*	1,940	*
At a point 0.4 mile downstream of Hunters Lane	0.30	230	350	400	510
At a point 1,130 feet downstream of Hunters Lane	0.26	210	310	360	460
At a point 850 feet downstream of Hunters Lane	0.20	170	260	300	390
At a point 820 feet upstream of Hunters Lane	0.17	150	230	260	340
LITTLE CREEK TRIBUTARY 1					
At a point 700 feet upstream of Old Hickory Boulevard	1.64	840	1,240	1,410	1,810
At a point 165 feet downstream of Autumn Ridge Drive	1.55	810	1,190	1,350	1,730
At a point 200 feet downstream of Hunters Lane	1.19	660	980	1,110	1,430
At a point 1,415 feet upstream of Hunters Lane	0.98	570	850	970	1,240
At a point 0.36 mile upstream of Hunters Lane	0.74	460	690	780	1,010
At a point 0.61 mile upstream of Hunters Lane	0.58	390	570	650	840
At a point 0.72 mile upstream of Hunters Lane	0.45	320	470	540	700
At a point 0.94 mile upstream of Hunters Lane	0.19	160	350	280	360

*Data not available

Table 5: 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 CREEK TRIBUTARY 2					
At a point 500 feet upstream of the confluence with Little Creek	0.46	320	480	550	710
At a point 310 feet downstream of Hunters Lane	0.40	290	430	490	630
At a point 210 feet upstream of Hunters Lane	0.33	250	370	430	550
At a point 1,190 feet upstream of Hunters Lane	0.28	220	330	380	490
At a point 0.72 mile upstream of Hunters Lane	0.17	150	230	260	340
LITTLE HARPETH RIVER					
At Vaughn Road	43.14	10,535	16,133	18,471	24,232
At the confluence with Harpeth River	46.43	10,744	16,627	19,114	25,474
LOVES BRANCH					
At the confluence with Cumberland River	2.31	1,845	2,400	2,630	3,275
Approximately 0.5 mi downstream of Briley Parkway	1.62	1,435	1,815	1,965	2,455
Approximately 425 feet downstream of Briley Parkway	1.47	1,310	1,645	1,780	2,255
Approximately 250 feet upstream of Gallatin Pike	0.95	900	1,185	1,305	1,595
At Gallatin Pike	0.95	835	1,040	1,115	1,440
At Railroad	0.76	720	950	1,045	1,280
Approximately 400 feet upstream of Railroad	0.12	145	190	205	250

Table 5: 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
LUMSLEY FORK					
At mouth	3.32	1,445	2,160	2,485	3,280
MANSKER CREEK					
At mouth	46.83	10,430	15,480	17,760	23,250
At a point approximately 1.14 miles upstream of Hendersonville By-pass	33.13	8,010	11,900	13,650	17,890
Just above Goodlettsville Outlet Ditch	29.61	7,490	11,130	12,770	16,750
Just above left bank tributary	28.18	7,240	10,750	12,340	16,180
Just above Slaters Creek	19.91	5,660	8,420	9,660	12,690
Just above Lumsley Fork	16.59	4,950	7,370	8,460	11,110
Just above Walkers Creek	5.26	2,120	3,170	4,640	3,800
At U.S. Route 41	4.97	1,930	2,875	3,310	4,360
MCCRORY CREEK					
At confluence with the Stones River	9.31	2,918	4,440	5,091	6,505
At a point approximately 0.10 mile upstream of Stewarts Ferry Pike	8.48	2,530	3,855	4,433	5,671
At a point approximately 0.34 mile upstream of Stewarts Ferry Pike	7.38	2,319	3,486	3,971	5,079
At a point approximately 0.03 mile downstream of Ironwood Drive	7.16	1,955	2,827	3,186	4,003
At a point approximately 0.04 mile downstream of Elm Hill Pike	5.46	1,034	1,411	1,594	2,125

Table 5: 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
MCCRORY CREEK (continued)					
At confluence of Pulley Sub-Basin Tributary	3.72	2,663	4,294	5,042	6,741
At a point approximately 0.16 mile upstream of Pulley Road	1.80	1,403	2,225	2,586	3,380
At a point approximately 0.25 mile upstream of McCrory Creek Road	1.39	1,274	1,955	2,265	2,965
MIDDLE FORK BROWNS CREEK					
At confluence with Browns Creek	2.70	1,350	*	2,400	*
At Overbrook Drive	2.63	1,500	*	2,690	*
900 feet downstream of Battery Lane	2.03	1,500	*	2,690	*
At Battery Lane	0.62	760	*	1,180	*
At Tyne Blvd.	0.45	609	*	902	*
MILL CREEK					
At confluence with Cumberland River	107.26	19,000	26,400	31,500	43,300
Just below Sims Branch	106.41	19,000	26,300	31,500	43,300
At Elm Hill Pike	101.00	18,200	25,900	31,000	42,800
At point 0.3 miles upstream of Interstate 40	98.96	18,000	25,700	30,800	42,600
At point 0.4 miles downstream of Murfreesboro Road	96.89	17,700	25,700	30,800	42,600

* Data not available

Table 5: 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
MILL CREEK (continued)					
At point 0.52 miles downstream of Thompson Lane	96.12	17,700	25,500	30,600	42,500
At Thompson Lane (Mill Creek near Woodbine Gage)	93.20	17,700	25,500	30,400	42,500
At Briley Parkway	92.18	17,700	25,400	30,200	42,400
Just below confluence of Sevenmile Creek	91.43	17,700	25,300	30,200	42,300
Just below confluence of Sorghum Branch	73.59	16,500	24,000	28,000	37,000
At point 0.23 miles downstream of Harding Pike	69.50	16,500	24,000	28,000	37,000
Just below confluence of Franklin Branch	67.33	16,500	24,000	28,000	37,000
Just below Mill Creek near Antioch Gage	64.20	16,500	24,000	28,000	37,000
At point 200 feet downstream of Antioch Pike	63.08	16,500	24,000	28,000	37,000
Just below confluence of Whittemore Branch	62.06	16,500	24,000	28,000	37,000
Just below confluence of Collins Creek	57.31	16,500	24,000	28,000	37,000
At point 0.32 miles upstream of Bell Road	51.75	16,500	24,000	28,000	37,000
Just below confluence of Turkey Creek	50.78	16,500	24,000	28,000	37,000
Just below confluence of Indian Creek	47.95	16,500	24,000	28,000	37,000
At point 0.70 miles upstream of Old Hickory Blvd.	42.30	16,500	24,000	28,000	37,000
At Nolensville Pike just below confluence of Holt Creek	40.45	16,500	24,000	28,000	37,000
Just below confluence of Owl Creek	35.04	16,500	24,000	28,000	37,000

Table 5: 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
MILL CREEK (continued)					
At point 0.57 miles upstream of Concord Road	21.04	13,200	18,400	20,900	27,000
At point 1.0 miles upstream of Concord Road	20.07	12,900	17,900	20,300	26,200
NORTH FORK EWING CREEK					
At Interstate 24 West On-Ramp	5.70	3,700	*	6,710	*
At Briley Parkway	5.70	3,640	*	5,860	*
At Interstate 24	5.70	3,590	*	5,760	*
At confluence with Ewing Creek	5.70	3,590	*	5,470	*
At point 900 feet downstream of Brick Church Pike	4.44	3,580	*	6,540	*
At point 0.37 miles upstream of Brick Church Pike	3.62	3,090	*	5,580	*
At point 0.26 miles downstream of Bellshire Drive	3.17	2,990	*	5,340	*
At point 450 feet downstream of Bellshire Drive	2.34	2,260	*	3,910	*
At point 100 feet upstream of Bellshire Drive	1.89	2,060	*	3,420	*
At point 1000 feet downstream of Dickerson Pike	1.18	1,190	*	2,030	*
At point 500 feet upstream of Kemper Drive	1.18	1,190	*	2,030	*
NORTH FORK EWING CREEK TRIBUTARY 2					
At the confluence with North Fork Ewing Creek	0.83	500	750	850	1,090

* Data not available

Table 5: 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
NORTH FORK EWING CREEK TRIBUTARY 2 (continued)					
At a point 910 feet upstream of the confluence with North Fork Ewing Creek	0.80	490	730	830	1,060
At a point 640 feet downstream of Bellshire Lane	0.70	440	660	750	960
Just downstream of the confluence of North Fork Ewing Creek Tributary 3	0.61	400	590	680	870
At a point 250 feet downstream of Banbury Drive	0.36	270	400	460	590
At a point 550 feet downstream of Cheshire Drive	0.30	240	350	400	520
At a point 255 feet downstream of Cheshire Drive	0.26	210	320	360	470
At a point 885 feet upstream of Cheshire Drive	0.17	150	230	260	340
NORTH FORK EWING CREEK TRIBUTARY 3					
At the confluence with North Fork Ewing Creek Tributary 2	0.24	200	300	340	440
At a point 655 feet upstream of Brick Church Pike	0.21	180	270	310	400
At a point 1,370 feet upstream of Brick Church Pike	0.18	160	250	280	360
NORTH FORK EWING CREEK TRIBUTARY 4					
At the confluence with North Fork Ewing Creek	0.37	270	410	470	610
At a point 660 feet upstream of Westchester Drive	0.24	200	300	340	440
At a point 1455 feet upstream of Westchester Drive	0.21	180	270	310	400

Table 5: 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
NORTH FORK EWING CREEK TRIBUTARY 5					
At the confluence with North Fork Ewing Creek	0.71	450	660	760	970
At a point 1270 feet upstream of Westchester Drive	0.65	420	620	710	910
NORTH FORK EWING CREEK TRIBUTARY 6					
At a point 1,550 feet upstream of the confluence with North Fork Ewing Creek	0.17	150	230	260	340
NORTH FORK EWING CREEK TRIBUTARY 7					
At the confluence with North Fork Ewing Creek	0.84	510	750	860	1,100
At a point 250 feet downstream of the confluence of North Fork Ewing Creek Tributary 8	0.78	480	710	810	1,040
At a point 700 feet downstream of Mulberry Downs Circle	0.34	260	390	440	570
At a point 110 feet upstream of Mulberry Downs Circle	0.30	230	350	400	520
At a point 205 feet downstream of Dickerson Pike	0.24	200	300	340	440
Just downstream of Old Due West Ave	0.17	150	230	260	340
NORTH FORK EWING CREEK TRIBUTARY 8					
At the confluence with North Fork Ewing Creek Tributary 7	0.38	280	420	480	620
At a point 600 feet upstream of Dickerson Pike	0.36	270	400	460	590

Table 5: 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
NORTH FORK EWING CREEK TRIBUTARY 8 (continued)					
At a point 1240 feet upstream of Dickerson Pike	0.29	230	340	390	500
OTTER CREEK					
At the confluence with Little Harpeth River	6.81	1,800	2,810	3,240	4,340
At Hillsboro Pike	5.58	1,520	2,390	2,760	3,690
At Annandale Road	3.57	920	1,430	1,660	2,210
Below Radnor Lake	2.13	370	640	750	1,070
OVERALL CREEK					
At the confluence with Cumberland River	7.93	4,760	6,100	6,660	8,010
Approximately 1,750 feet DS of River Road	6.85	4,030	5,125	5,575	6,585
At River Road	6.62	3,910	4,960	5,390	6,350
Approximately 520 feet DS of River Road Pike	6.42	3,820	4,835	5,245	6,170
Just US of River Road Pike	5.18	3,880	5,150	5,710	7,055
At River Road Pike	5.18	3,040	3,830	4,155	4,725
Approximately 1,050 feet US of River Road Pike	4.92	3,690	4,895	5,430	6,700
Approximately 530 feet US of Old Charlotte Pike	4.79	3,580	4,750	5,265	6,495
Approximately 550 feet US of Old Charlotte Pike	2.60	1,835	2,455	2,725	3,315
Approximately 425 feet DS of Hulan Hollow Road	2.36	1,665	2,240	2,475	2,990

Table 5: 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
OVERALL CREEK (continued)					
Approximately 400 feet DS of Hulan Hollow Road	2.21	1,555	2,105	2,320	2,785
At Charlotte Pike	2.05	1,450	1,955	2,150	2,560
Approximately 450 feet DS of Interstate 40	1.49	1,065	1,420	1,555	1,810
Just US of Interstate 40	1.27	965	1,310	1,460	1,830
At Interstate 40	1.27	940	1,250	1,365	1,575
Approximately 675 feet US of Briksberry Court	0.96	730	990	1,105	1,380
At dam	0.83	635	855	950	1,185
Approximately 0.6 mile US of Ridgelake Parkway	0.48	385	515	565	700
PAGES BRANCH					
At the confluence with the Cumberland River	3.16	2,600	3,490	3,870	4,795
Approximately 1,120 feet upstream of Baptist World Center Drive	3.00	2,540	3,405	3,770	4,660
At Interstate 65	2.56	2,200	2,935	3,250	4,015
Approximately 675 feet upstream of Interstate 65	2.09	1,815	2,410	2,665	3,285
At Old Trinity Lane	1.83	1,625	2,160	2,385	2,940
At Gizzard Avenue	1.48	1,390	1,840	2,030	2,500
Just downstream of Dickerson Pike	1.27	1,240	1,640	1,810	2,220
At Dickerson Pike	1.22	1,195	1,575	1,740	2,135
Just upstream of Dickerson Pike	0.61	585	775	855	1,050

Table 5: 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
PAGES BRANCH (continued)					
Approximately 350 feet upstream of Donald Street	0.48	480	630	695	850
At Oakwood Avenue	0.31	310	405	445	545
Just downstream of Ellington Parkway	0.19	185	245	270	330
PAGES BRANCH TRIBUTARY A					
At confluence with Pages Branch	0.61	615	810	890	1,090
Approximately 450 feet downstream of Dellway Drive	0.51	520	685	755	920
Approximately 275 feet upstream of Brunswick Drive	0.29	300	395	430	530
At Jones Avenue	0.13	140	185	200	245
PAGES BRANCH TRIBUTARY B					
At confluence with Pages Branch	0.37	370	485	535	655
At Interstate 65 Ramp	0.30	305	400	440	540
At Brick Church Pike	0.18	180	240	265	320
POPLAR CREEK					
At the confluence with South Harpeth River	3.14	1,000	1,530	1,760	2,350
At a point 580 feet upstream of South Harpeth Road	3.04	970	1,490	1,720	2,290
At a point 0.60 mile upstream of South Harpeth Road	2.59	870	1,330	1,540	2,060

Table 5: 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
POPLAR CREEK (continued)					
At a point 860 feet upstream of Poplar Creek Road	1.69	640	990	1,140	1,520
At a point 0.56 mile upstream of Poplar Creek Road	1.44	570	880	1,020	1,360
At a point 235 feet downstream of Poplar Creek Road	1.25	520	800	920	1,230
At a point 855 feet upstream of Poplar Creek Road	0.78	370	570	660	890
At the confluence with South Harpeth River	3.14	1,000	1,530	1,760	2,350
PULLEY TRIBUTARY					
At confluence with McCrory Creek	1.92	1,340	*	2,590	*
At a point approximately 0.02 mile upstream of Pulley Road	1.46	994	*	1,920	*
At a point approximately 0.03 mile downstream of Reynolds Road	0.82	709	*	1,310	*
At a point approximately 0.22 mile upstream of Reynolds Road	0.68	652	*	1,230	*
RICHLAND CREEK					
At confluence with the Cumberland River	28.54	11,406	16,229	18,269	23,252
At point 500 feet downstream of Briley Parkway	27.01	10,988	15,627	17,586	22,370
At point 300 feet downstream of Interstate 40	25.45	10,569	15,024	16,903	21,487
At Charlotte Pike (USGS Gage)	24.27	10,331	14,673	16,505	20,967

* Data not available

Table 5: 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
RICHLAND CREEK (continued)					
At point 300 feet downstream of Knob Road	23.59	10,230	14,524	16,334	20,734
At point 250 feet upstream of Knob Road	22.91	10,040	14,257	16,031	20,343
Just below confluence of Tributary to Richland Creek	21.14	9,551	13,544	15,225	19,300
Just below confluence of Sugartree Creek	18.24	8,529	12,092	13,589	17,209
At point 900 feet upstream of Fransworth Drive	12.39	6,381	9,041	10,156	12,847
Just below confluence of Jocelyn Hollow Branch	10.99	5,828	8,253	9,268	11,713
Just below confluence of Vaughns Gap Branch	9.44	4,999	7,071	7,942	10,041
At point 200 feet upstream of Harding Place	6.25	3,256	4,596	5,164	6,534
Just below confluence of Belle Meade Branch	4.97	2,717	3,829	4,298	5,426
At point 500 feet upstream of Belle Meade Blvd.	3.73	1,996	2,819	3,166	4,002
At Lynnwood Blvd.	2.66	1,377	1,948	2,190	2,771
SCOTTS CREEK					
At mouth	3.32	*	*	3,690	*
At county boundary	1.13	*	*	1,350	*
SCOTTS HOLLOW					
At mouth	0.84	*	*	990	*
SEVENMILE CREEK					
At a point 430 feet upstream of Interstate 24	17.53	7,322	9,622	10,590	12,819

* Data not available

Table 5: 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
SEVENMILE CREEK (continued)					
At a point 560 feet upstream of Railroad	16.43	7,018	9,240	10,204	12,393
At a point 635 feet downstream of Paragon Mills	16.43	7,602	10,197	11,029	13,332
At a point 720 feet downstream of Welch Road	15.45	7,424	10,046	11,058	14,170
At a point 375 feet upstream of Nolensville Pike	14.00	6,800	9,253	10,191	13,151
At a point 760 feet upstream of Nolensville Pike	13.01	6,542	8,981	9,818	13,192
USGS gage at Blackman Road	12.05	6,335	8.697	9,810	12,955
At a point 0.46 mile downstream of Ellington Agricultural Center Entrance	10.93	5,849	8,025	9,007	11,947
At a point 915 feet upstream of Oakley Drive	7.28	4,845	6,600	7,383	9,390
At a point 1685 feet upstream of Oakley Drive	4.54	2,875	3,941	4,410	5,729
At a point 0.44 mile upstream of Oakley Drive	3.72	2,483	4,211	4,969	6,552
At a point 0.46 mile downstream of Old Hickory Blvd	3.72	2,497	4,356	5,122	6,711
At a point 0.42 mile downstream of Old Hickory Blvd	3.72	2,499	4,358	5,126	6,714
At a point 1695 feet downstream of Old Hickory Blvd	3.42	2,333	4,010	4,696	6,110
At a point 915 feet downstream of Old Hickory Blvd	3.42	2,348	4,028	4,706	6,129
Just downstream of the confluence of Sevenmile Creek Tributary 2	2.82	1,929	3,227	3,779	4,893

Table 5: 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
SEVENMILE CREEK (continued)					
At a point 185 feet upstream of Old Hickory Boulevard	2.08	1,381	2,326	2,766	3,729
Just downstream of the confluence of Sevenmile Creek Tributary 1	2.08	1,454	2,331	2,789	3,745
At a point 375 feet downstream of Chadwick Lane	1.35	1,369	2,067	2,473	3,293
At a point 135 feet downstream of Chadwick Lane	1.18	1,234	1,862	2,233	2,941
At a point 310 feet downstream of Barrington Place Drive	1.11	1,171	1,793	2,126	2,809
At a point 165 feet upstream of Barrington Place Drive	0.95	1,004	1,499	1,788	2,335
At a point 910 feet downstream of Fredericksburg Way	0.33	372	499	563	873
At a point 370 feet upstream of Fredericksburg Way	0.16	171	239	261	510
At a point 145 feet upstream of Cloverland Drive	0.16	215	271	420	577
At a point 315 feet upstream of Cloverland Drive	0.16	298	416	486	612
At a point 185 feet upstream of Church St	0.08	150	222	258	329
SEVENMILE CREEK TRIBUTARY 1					
At a point 1875 feet upstream of the confluence with Sevenmile Creek	0.57	170	380	480	766

Table 5: 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
SEVENMILE CREEK TRIBUTARY 1 (continued)					
At a point 185 feet downstream of Cloverland Drive	0.57	170	384	489	779
At a point 1310 feet upstream of Cloverland Drive	0.57	320	572	700	968
At a point 0.45 mile upstream of Cloverland Drive	0.44	296	521	621	850
At a point 0.90 mile upstream of Cloverland Drive	0.33	223	378	452	622
SEVENMILE CREEK TRIBUTARY 2					
At a point 110 feet downstream of Bonny Bridge Road	0.74	579	980	1,153	1,379
At a point 230 feet downstream of Gessner Lane	0.64	526	967	1,205	1,656
At a point 185 feet upstream of Gessner Lane	0.64	540	973	1,215	1,710
At a point 700 feet downstream of Cloverland Drive	0.38	269	545	690	1,013
At a point 480 feet upstream of Cloverland Drive	0.21	257	383	464	629
At a point 0.39 mile upstream of Cloverland Drive	0.07	112	161	186	237
SIMS BRANCH					
At confluence with Mill Creek	4.29	3,263	4,414	4,940	6,248
At a point 315 feet upstream of McGavock Pike	3.68	2,815	3,800	4,252	5,372
At a point 385 feet downstream of Perimeter Place Drive	2.15	1,557	2,106	2,358	2,982
At a point 1045 feet upstream of Interstate 40	1.01	728	978	1,094	1,379

Table 5: Summary of Discharges (continued)

		Peak Discharges (Cubic feet per second)			
Flooding Source and Location	Drainage Area (Square miles)	10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
SHAW BRANCH					
At a point 0.50 mile downstream of Shaw Road	2.38	1,120	1,640	1,860	2,380
At a point 530 feet downstream of Shaw Road	2.09	1,010	1,480	1,690	2,160
At a point 975 feet upstream of Shaw Road	1.83	910	1,350	1,530	1,960
At a point 215 feet upstream of Brick Church Pike	1.60	830	1,220	1,390	1,770
At a point 1, 625 feet upstream of Brick Church Pike	1.19	660	980	1,110	1,430
At a point 0.48 mile upstream of Brick Church Pike	0.91	540	800	910	1,170
At a point 0.87 mile upstream of Brick Church Pike	0.57	380	570	650	830
At a point 0.99 mile upstream of Brick Church Pike	0.45	320	470	540	700
At a point 1.10 mile upstream of Brick Church Pike	0.25	210	310	350	460
At a point 1.16 mile upstream of Brick Church Pike	0.19	170	250	290	370
SORGHUM BRANCH					
At a point 200 feet upstream of CSX Railroad	2.72	1,100	1,210	1,225	1,290
At a point 290 feet upstream of Harding Place	2.37	1,730	2,360	2,550	3,080
At a point 340 feet downstream of Linbar Drive	2.02	1,645	2,205	2,485	3,275
At a point 1460 feet upstream of Linbar Drive	1.69	1,425	2,205	2,485	2,840

Table 5: 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
SORGHUM BRANCH (continued)					
At a point 1285 feet downstream of Willard Drive	1.55	1,425	1,835	2,085	2,810
At a point 260 feet downstream of Haywood Lane	1.34	1,240	1,630	1,845	2,445
At a point 1375 feet downstream of Packard Drive	1.09	1,200	1,470	1,650	2,095
At a point 105 feet upstream of Tusculum Road	0.84	1,010	1,205	1,340	1,660
At a point 115 feet upstream of Park Court	0.51	685	775	860	1,075
Just downstream of Nolensville Pike	0.40	570	625	685	850
SOUTH HARPETH RIVER					
At confluence with the Harpeth River	80.88	10,020	15,120	17,380	22,940
At a point 600 feet upstream of Anderson Road	79.02	9,860	14,870	17,100	22,570
At a point 0.73 mile downstream of the confluence of Hwy 100 Tributary	68.91	8,940	13,500	15,520	20,500
Just downstream of the confluence of East Fork Creek	59.64	8,070	12,190	14,020	18,520
At a point 0.45 mile upstream of Old Harding Pike	43.77	6,480	9,800	11,270	14,910
STONES RIVER					
At mouth	9.37	22,000	27,000	28,500	87,500
STONERS CREEK					
At mouth	27.46	*	*	10,585	*
Just upstream of New Hickory Boulevard	26.07	*	*	10,525	*

* Data not available

Table 5: 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
STONERS CREEK (continued)					
At a point approximately 0.2 mile downstream of Old Hickory Boulevard	19.47	*	*	9,745	*
At Tulip Grove Road	14.21	*	*	8,975	*
SUGARTREE CREEK					
At Mouth	4.91	3,000	*	5,020	*
At point 300 feet downstream of Woodmont Lane	4.69	2,990	*	5,020	*
At point 100 feet upstream of Woodmont Lane	4.54	2,950	*	5,020	*
At point 400 feet downstream of Estes Road	4.24	2,800	*	4,720	*
At point 600 feet upstream of Estes Road	3.89	2,800	*	4,340	*
At point 950 feet upstream of Estes Road	3.68	2,590	*	4,300	*
At Hilldale Drive	3.07	2,300	*	3,150	*
At point 0.22 miles downstream of Hobbs Road	2.68	2,170	*	3,250	*
TRACE CREEK					
At the confluence with Harpeth River	6.70	1,710	6,600	3,010	4,000
At a point 700 feet upstream of Temple Road	6.53	1,670	2,560	2,950	3,920
At a point 0.65 mile upstream of Temple Road	4.20	1,220	1,870	2,160	2,880
TRANTHAM CREEK					
At the confluence with Whites Creek	1.40	750	1,100	1,250	1,610
At a point 1825 feet upstream of the confluence with Whites Creek	1.31	710	1,050	1,190	1,530

Table 5: 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
TRANTHAM CREEK (continued)					
At a point 0.39 mile upstream of Old Hickory Boulevard	1.15	640	950	1,080	1,390
At a point 0.96 mile upstream of Old Hickory Boulevard	1.00	580	860	980	1,250
At a point 0.87 mile downstream of Trantham Road	0.88	520	780	890	1,140
At a point 0.76 mile downstream of Trantham Road	0.75	470	690	790	1,020
At a point 0.47 mile downstream of Trantham Road	0.66	420	630	710	920
At a point 980 feet downstream of Trantham Road	0.56	370	550	630	810
At a point 135 feet downstream of Trantham Road	0.48	330	490	560	730
At a point 585 feet upstream of Trantham Road	0.39	290	430	490	630
TRIBUTARY NO. 1 TO EAST FORK HAMILTON CREEK					
At confluence with East Fork Hamilton Creek	1.45	1,100	*	1,600	*
At Mossdale Drive	1.23	828	*	1,420	*
At Anderson Road	1.00	659	*	1,080	*
At Hamilton Church Road	0.56	415	*	717	*

* Data not available

Table 5: 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
TRIBUTARY NO. 1 TO OVERALL CREEK					
At the confluence with Overall Creek	1.24	1,050	1,410	1,565	1,950
At Old Charlotte Pike	1.09	945	1,265	1,400	1,745
Approximately 50 feet US of Old Charlotte Pike	0.98	865	1,160	1,285	1,600
At Charlotte Pike	0.87	775	1,035	1,145	1,425
Approximately 1,000 feet US of Charlotte Pike	0.68	595	785	870	1,070
TRIBUTARY NO. 2 TO EAST FORK HAMILTON CREEK					
At confluence with East Fork Hamilton Creek	0.87	858	*	1,410	*
At Brantley Drive	0.62	808	*	1,320	*
At Anderson Road	0.23	344	*	548	*
TRIBUTARY TO RICHLAND CREEK					
At a point 450 feet downstream of Leonard Ave	2.40	1,830	*	3,050	*
At a point 930 feet upstream of Bowling Ave	1.83	1,720	*	3,030	*
At a point 1,250 feet upstream of Bowling Ave	1.46	1,420	*	2,570	*
TURKEY CREEK					
At a point 390 feet upstream of the confluence with Mill Creek	2.03	1,819	2,439	2,724	3,430
At a point 830 feet upstream of Pettus Road	1.52	1,368	1,836	2,050	2,581
At a point 575 feet downstream of Blairfield Drive	1.00	918	1,232	1,376	1,733

* Data not available

Table 5: 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
TURKEY CREEK (continued)					
At a point 250 feet upstream of Cane Ridge Road	0.50	459	616	688	866
VAUGHNS GAP BRANCH					
At a point 360 feet upstream of Harding Pike	3.05	2,070	*	3,740	*
At a point 225 feet upstream of Percy Warner Boulevard	2.71	2,040	*	3,480	*
At a point 515 feet downstream of St Henry Drive	2.31	1,730	*	3,000	*
At a point 1084 feet upstream of St Henry Drive	1.59	1,190	*	2,030	*
At a point 100 feet downstream of Park Lane	1.48	1,140	*	2,030	*
At a point 560 feet downstream of Percy Warner Boulevard	1.37	987	*	1,810	*
At a point 350 feet downstream of Percy Warner Boulevard	1.22	803	*	1,600	*
At a point 150 feet upstream of Vaughns Gap Road	0.94	803	*	1,520	*
VHOINS BRANCH					
At a point 550 feet downstream of Brook Manor Drive	2.76	2,340	*	4,230	*
At a point 1490 feet downstream of Brick Church Lane	1.41	1,150	*	2,120	*

* Data not available

Table 5: 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
VHOINS BRANCH (continued)					
At a point 385 feet upstream of Brick Church Lane	0.59	519	*	965	*
WEST BRANCH HURRICANE CREEK					
At mouth	2.76	*	*	1,430	*
WEST FORK BROWNS CREEK					
At confluence with Browns Creek	3.74	1,940	*	3,260	*
200 feet downstream of Lealand Lane	2.67	1,900	*	3,180	*
At Glendale Lane	1.99	1,900	*	3,180	*
At Biltmore Drive	1.39	1,670	*	2,570	*
At Battery Lane	1.06	1,400	*	2,320	*
400 feet upstream of Tyne Blvd.	0.71	862	*	1,350	*
700 feet downstream of Travelers Ridge Drive	0.34	394	*	750	*
WHITES CREEK					
At confluence with the Cumberland River	62.93	15,872	22,496	25,229	31,250
Just below confluence of Eaton Creek	60.98	16,413	22,830	25,579	31,646
At Ashland City Highway	54.75	15,554	21,558	24,158	29,754
Just downstream of confluence of Drakes Branch	54.75	16,322	22,764	25,596	31,613
At Clarksville Pike	52.73	15,945	22,228	24,985	30,832

* Data not available

Table 5: 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
WHITES CREEK (continued)					
At point 400 feet downstream of Buena Vista Pike	50.79	16,223	23,159	26,153	32,786
Just downstream of confluence of Whites Creek Tributary	50.77	16,224	23,164	26,156	32,782
Just downstream of confluence of Ewing Creek	49.62	15,954	22,753	25,683	32,144
Just upstream of confluence of Ewing Creek	35.92	11,716	16,391	18,465	23,162
Just downstream of confluence of Dry Fork Creek	33.44	11,115	15,444	17,362	21,686
At point 1000 feet downstream of Whites Creek Pike	28.89	10.058	13,795	15,467	19,069
Just downstream of confluence of Earthman Fork	27.19	9,897	13,492	15,106	18,552
Just downstream of confluence of Trantham Creek	21.01	8,085	10,831	12,074	14,457
Just downstream of confluence of Little Creek	19.39	7,693	10,221	11,371	13,527
Just downstream of Old Hickory Blvd	13.72	5,988	7,986	8,639	10,168
At Interstate 24	11.98	5,454	7,250	7,785	9,119
Just downstream of Ingram Road	11.98	5,890	8,238	9,244	11,533
Just downstream of confluence of Claylick Creek	11.11	5,496	7,681	8,613	10,730
Just downstream of confluence of Crocker Springs Branch	6.92	3,424	4,772	5,344	6,652
Just downstream of confluence of Shaw Branch	4.86	2,370	3,304	3,697	4,603
WHITES CREEK TRIBUTARY					
At Dunbar Drive	0.74	1,007	*	1,665	*

* Data not available

Table 5: 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
WHITES CREEK TRIBUTARY (continued)					
At point 200 feet downstream of Cravath Drive	0.71	978	*	1,633	*
At Cravath Drive	0.65	923	*	1,562	*
At Rowan Drive	0.55	770	*	1,308	*
At point 550 feet upstream of Rowan Drive	0.50	730	*	1,258	*
At point 0.20 miles upstream of Rowan Drive	0.40	651	*	1,104	*
At point 350 feet downstream of Malta Drive	0.38	642	*	1,091	*
WHITTEMORE BRANCH					
At a point 485 feet upstream of Interstate 24	3.62	3,142	4,132	4,414	4,979
Just downstream of confluence of Whittemore Branch Tributary	3.33	3,309	4,624	5,145	6,110
At a point 100 feet upstream of Benzing Road	2.24	2,266	3,126	3,464	4,114
At a point 870 feet downstream of Old Hickory Blvd	1.83	2,092	2,854	3,169	3,801
At a point 110 feet upstream of Old Hickory Boulevard	1.35	1,758	2,428	2,735	3,325
At a point 700 feet downstream of Nolensville Pike	0.90	1,296	1,765	1,978	2,429
At a point 185 feet upstream of Nolensville Pike	0.50	1,060	1,430	1,620	2,010
At a point 90 feet downstream of Church Access Rd	0.39	791	1,080	1,230	1,520

* Data not available

Table 5: 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
WHITTEMORE BRANCH (continued)					
At a point 450 feet upstream of Brentwood Highlands Drive	0.24	466	645	737	930
WHITTEMORE BRANCH TRIBUTARY					
At a point 1050 feet downstream of Bess Court	1.06	1,090	1,600	1,810	2,240
At a point 630 feet downstream of Brookview Estates Drive	0.70	784	1,100	1,230	1,500
At a point 135 feet upstream of Tusculum Court	0.58	659	928	1,030	1,250
At a point 140 feet upstream of Eulala Drive	0.41	500	715	811	1,010
At a point 200 feet upstream of Ocala Court	0.16	218	314	360	457
WINDEMERE BRANCH					
At confluence with Cumberland River	1.84	1,720	2,275	2,510	3,080
At the confluence with Windemere Branch Tributary 1	1.83	1,730	2,285	2,515	3,090
Approximately 590 feet downstream of Briley Parkway	1.53	1,480	1,945	2,140	2,610
At Briley Parkway	1.14	1,055	1,390	1,530	1,870
Approximately 1,450 feet upstream of Briley Parkway	1.07	985	1,295	1,425	1,745
Approximately 1,670 feet upstream of Briley Parkway	1.01	915	1,200	1,320	1,620

Table 5: 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
WINDEMERE BRANCH (continued)					
Approximately 0.4 mile downstream of Renee Drive	0.92	820	1,080	1,190	1,455
Approximately 1,410 feet downstream of Renee Drive	0.86	755	995	1,100	1,345
Approximately 790 feet downstream of Renee Drive	0.78	670	885	975	1,200
Approximately 480 feet upstream of Renee Drive	0.65	535	705	780	960
WINDEMERE BRANCH TRIBUTARY 1					
At confluence with Windemere Branch	0.29	135	175	195	235
At Brookview Drive	0.27	265	345	380	460
Approximately 680 feet downstream of Dearborn Drive	0.22	330	430	470	570
At Dearborn Drive	0.11	355	460	505	615

The J. Percy Priest Reservoir is a manually operated pool with flood elevations controlled by the USACE. The Old Hickory reservoir is controlled by the USACE as well, and the reservoir is essentially a run-or-river type without regulating storage other than for incidental flood control though surcharge operations and for pondage for power generation and lockages. The flood elevations were determined by performing a frequency analysis based on the USACE regulation schedule for the pool and on historical data for both the J. Percy Priest Reservoir and the Old Hickory Reservoir.

The stillwater elevations for the 10-, 2-, 1-, and 0.2-percent-annual-chance floods have been determined for J. Percy Priest Reservoir and Old Hickory Reservoir and are summarized in Table 6, "Summary of Stillwater Elevations."

Table 6: Summary of Stillwater Elevations

	Elevation (feet NAVD)			
Flood source and location	**10-percent-annual-chance**	**2-percent-annual-chance**	**1-percent-annual-chance**	**0.2-percent-annual-chance**
J. PERCY PRIEST RESERVOIR				
Entire shoreline within Davidson County	502.5	505.9	506.3	509.9
OLD HICKORY RESERVOIR				
Entire shoreline within Davidson County	449.3	449.8	450.0	450.1

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.

Cross sections were determined from topographic maps and field surveys. All bridges and culverts were field surveyed to obtain elevation data and structural geometry. All topographic mapping used to determine cross sections are referenced in Section 4.1. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

Roughness coefficients (Manning's “n”) were chosen by engineering judgment and based on field observation of the channel and floodplain areas Table 7, “Summary of

Roughness Coefficients," contains the channel and overbank "n" values for the streams studied by detailed methods.

Table 7: Summary of Roughness Coefficients

Flooding Source	Channel	Overbanks
Bear Hollow Branch	0.045-0.052	0.090-0.100
Belle Meade Branch	0.040-0.050	0.070-0.120
Browns Creek	0.035-0.050	0.060-0.120
Buffalo Creek	0.045-0.050	0.070-0.100
Carney Creek	0.040-0.052	0.080-0.100
Claylick Creek	0.040-0.055	0.090-0.120
Collins Creek	0.045-0.050	0.070-0.100
Cooper Creek	0.012-0.055	0.08-0.120
Cooper Creek Tributary 1	0.027-0.05	0.08-0.100
Cooper Creek Tributary 2	0.017-0.055	0.07-0.09
Crocker Springs Branch	0.045-0.050	0.080-0.120
Crocker Springs Branch Tributary	0.045-0.052	0.070-0.100
Cumberland River	0.025-0.035	0.065-0.100
Cummings Branch	0.035-0.050	0.070-0.120
Davidson Branch	0.02-0.048	0.070-0.100
Drakes Branch	0.035-0.050	0.070-0.090
Dry Creek	0.025-0.150	0.100-0.125
Dry Fork Creek	0.040-0.055	0.070-0.120
Earthman Fork	0.042-0.052	0.070-0.120
Earthman Fork Tributary 2	0.050-0.055	0.070-0.120
Earthman Fork Tributary 3	0.055	0.090-0.110
Earthman Fork Tributary 4	0.050-0.055	0.090-0.110
East Fork Browns Creek	0.020-0.050	0.070-0.130
East Fork Hamilton Creek	0.030-0.065	0.045-0.150
East Fork Creek	0.045	0.080-0.100
Eaton Creek	0.040-0.050	0.060-0.110

Table 7: Summary of Roughness Coefficients (continued)

Flooding Source	Channel	Overbanks
Elm Hill Tributary	0.035-0.055	0.040-0.095
Ewin Branch	0.035-0.045	0.080-0.100
Ewing Creek	0.035-0.050	0.060-0.080
Ewing Creek Tributary 1	0.020-0.050	0.065-0.100
Ewing Creek Tributary 2	0.015-0.050	0.070-0.100
Flat Creek	0.045-0.050	0.035-0.100
Flat Creek Overflow	0.040-0.045	0.070-0.100
Franklin Branch Tributary 1	0.035-0.055	0.080-0.120
Franklin Branch Tributary 2	0.055	0.120
Franklin Branch Tributary 3	0.055	0.120
Gibson Creek	0.030-0.050	0.060-0.120
Gibson Creek Tributary 1	0.040-0.050	0.060-0.120
Gibson Creek Tributary 2	0.045-0.050	0.070-0.100
Gibson Creek Tributary	0.050-0.050	0.060-0.100
Goodlettsville Outlet Ditch	0.030-0.050	0.100
Harpeth River	0.045-0.50	0.110
Highway 100 Tributary	0.043-0.048	0.070-0.100
Holt Creek	0.043-0.047	0.070-0.120
Hurricane Creek	0.020-0.050	0.075-0.080
Indian Creek I	0.035-0.050	0.070-0.110
Indian Creek I Tributary 1	0.050-0.050	0.050-0.120
Indian Creek I Tributary 2	0.050-0.050	0.090-0.100
Jocelyn Hollow Branch	0.045	0.080-0.100
Jocelyn Hollow Branch Overflow	0.045	0.080-0.100
Johnson Hollow	0.045-0.055	0.070-0.110
Little Creek	0.040-0.055	0.070-0.120
Little Creek Tributary 1	0.045	0.070-0.120
Little Creek Tributary 2	0.052	0.080-0.120
Little East Fork Creek	0.045-0.050	0.070-0.120

Table 7: Summary of Roughness Coefficients (continued)

Flooding Source	Channel	Overbanks
Little Harpeth River	0.045	0.080-0.100
Loves Branch	0.013-0.050	0.060-0.120
Lumsley Fork	0.040-0.060	0.080-0.150
Mansker Creek	0.040-0.060	0.080-0.150
McCrory Creek	0.025-0.050	0.045-0.095
Middle Fork Browns Creek	0.025-0.060	0.065-0.110
Mill Creek	0.030-0.050	0.055-0.140
North Fork Ewing Creek	0.040-0.050	0.065-0.100
North Fork Ewing Creek Tributary 2	0.045-0.055	0.050-0.110
North Fork Ewing Creek Tributary 3	0.035-0.055	0.070-0.120
North Fork Ewing Creek Tributary 4	0.050	0.090
North Fork Ewing Creek Tributary 5	0.045	0.080-0.090
North Fork Ewing Creek Tributary 6	0.050	0.090-0.100
North Fork Ewing Creek Tributary 7	0.042-0.049	0.060-0.120
North Fork Ewing Creek Tributary 8	0.038-0.040	0.050-0.110
Otter Creek	0.035-0.051	0.055-0.120
Overall Creek	0.035-0.055	0.035-0.120
Pages Branch	0.035-0.050	0.065-0.120
Pages Branch Tributary A	0.030-0.050	0.070-0.120
Pages Branch Tributary B	0.050-0.050	0.060-0.110
Poplar Creek	0.045	0.065-0.120
Pulley Tributary	0.035-0.045	0.045-0.075
Richland Creek	0.045-0.050	0.060-0.120
Scotts Creek	0.020-0.050	0.080-0.125
Scotts Hollow	0.020-0.050	0.080-0.125
Sevenmile Creek	0.035-0.055	0.070-0.120
Sevenmile Creek Tributary 1	0.035-0.045	0.065-0.150
Sevenmile Creek Tributary 2	0.045-0.055	0.080-0.100
Shaw Branch	0.040-0.050	0.060-0.120

Table 7: Summary of Roughness Coefficients (continued)

Flooding Source	Channel	Overbanks
Sims Branch	0.035-0.045	0.060-0.100
Sorghum Branch	0.040-0.045	0.080-0.120
Sorghum Branch Overflow	0.040-0.045	0.080-0.120
South Harpeth River	0.035-0.050	0.070-0.120
Stoners Creek	0.020-0.035	0.045-0.160
Stones River	0.044-0.052	0.080
Sugartree Creek	0.025-0.045	0.070-0.120
Trace Creek	0.045	0.090-0.100
Trantham Creek	0.040-0.050	0.075-0.110
Tributary No. 1 to East Fork Hamilton Creek	0.025-0.085	0.045-0.200
Tributary No. 1 to Overall Creek	0.050-0.050	0.080-0.120
Tributary No. 2 to East Fork Hamilton Creek	0.030-0.065	0.040-0.150
Tributary to Richland Creek	0.045-0.055	0.080-0.120
Turkey Creek	0.045-0.050	0.06-0.120
Vaughns Gap Branch	0.045-0.048	0.100
Vaughns Gap Branch Overflow	0.045-0.048	0.100
Vhoins Branch	0.045-0.055	0.080-0.120
West Branch Hurricane Creek	0.020-0.050	0.075-0.080
West Fork Browns Creek	0.025-0.055	0.060-0.130
Whites Creek	0.045-0.050	0.060-0.100
Whites Creek Tributary	0.040-0.080	0.070-0.120
Whittemore Branch	0.045-0.075	0.080-0.120
Whittemore Branch Tributary	0.045	0.080-0.090
Windemere Branch	0.015-0.050	0.080-0.090
Windemere Branch Tributary 1	0.030-0.045	0.060-0.100

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.

3.2.1 Methods for Flooding Sources with New or Revised Analyses in Current Study

Analyses of the hydraulic characteristics of flooding from the sources studied by enhanced approximate, approximate and detailed methods were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Hydraulic modeling was performed using the Hydrologic Engineering Center's analysis model HEC-RAS version 4.1.0. GeoRAS, the HEC's ArcGIS extension, was utilized for the development and analysis of model geometry and floodplain mapping. The Cumberland River Tributaries: Cooper Creek, Copper Creek Tributary 1, Cooper Creek Tributary 2, Dry Creek Davidson Branch, Ewin Branch, Gibson Creek, Gibson Creek Tributary 1, Gibson Creek Tributary 2, Gibson Creek Tributary, Indian Creek, Indian Creek Tributary 1, Indian Creek Tributary 2, Loves Branch, Overall Creek, Pages Branch, Pages Branch Tributary A, Pages Branch Tributary B, Tributary No. 1 to Overall Creek, Windemere Branch., and Windemere Branch Tributary were modeled using the Standard Step Method which is a computational technique utilized to estimate one-dimensional surface water profiles in open channels with gradually varied flow under steady state conditions. Cross-sections were initially placed to match existing cross-sections from the FIS and/or local studies, where available. The additional survey data was incorporated into the HEC-RAS models using the graphical cross-section editor. A detailed description of model geometry development was provided in each HEC-RAS model at each cross-section. Dry Creek was modeled using gradually varied steady flow simulation.

Water-surface profiles were computed for detailed study streams performed by USACE, in the Browns Creek Watershed (Browns Creek, East Fork Browns Creek, West Forks Brown Creek and Middle Fork Brown Creek), Harpeth River Watershed (Buffalo Creek, East Fork Creek, Flat Creek, Highway 100 Tributary, Little East Fork Creek, Little Harpeth River, Otter Creek, Poplar Creek, South Harpeth River, and Trace Creek), Whites Creek Watershed (Whites Creek, Whites Creek Tributary, Drake Branch, Ewing Creek, Ewing Creek Tributary 1, Ewing Creek Tributary 2, Bear Hollow Branch, Carney Creek, Claylick Creek, Crocker Springs Branch, Crocker Springs Branch Tributary, Cummings Branch, Dry Fork Creek, Earthman Fork, Earthman Fork Tributary 2, Earthman Fork Tributary 3, Earthman Fork Tributary 4, Eaton Creek, Johnson Hollow, Little Creek, Little Creek Tributary 1, Little Creek Tributary 2, North Fork Ewing Creek, North Fork Ewing Creek Tributary 2, North Fork Ewing Creek Tributary 3, North Fork Ewing Creek Tributary 4, North Fork Ewing Creek Tributary 5, North Fork Ewing Creek Tributary 6, North Fork Ewing Creek Tributary 7, North Fork Ewing Creek Tributary 8, Shaw Branch, Trantham Creek, and Vhoins Branch), Richland Creek Watershed (Richland Creek, Sugartree Creek, Belle Meade Branch, Jocelyn Hollow Branch, Tributary to Richland Creek, and

Vaughns Gap Branch), and Mill Creek Watershed (Collins Creek, Franklin Branch, Franklin Branch Tributary 1, Franklin Branch Tributary 2, Franklin Branch Tributary 3, Holt Creek, Indian Creek, Mill Creek, Sevenmile Creek, Sevenmile Creek Tributary 1, Sevenmile Creek Tributary 2, Sims Branch, Sorghum Branch, Turkey Creek, Whittemore Branch, and Whittemore Branch Tributary) through the use of the USACE HEC-RAS version 4.0.0 computer program (Reference 16). Models were also created for Claylick Overflow, Flat Creek Overflow, Jocelyn Hollow Branch Overflow, Sorghum Branch Overflow, and Vaughns Gap Branch Overflow.

USACE studied the Harpeth River and Cumberland River by HEC-RAS 4.1.0. Parts of the Harpeth River Tributaries, Richland Creek Tributaries, and White Creek Tributaries were modeled using gradually varied steady flow simulation.

Dry Creek, and parts of Belle Meade Branch and Richland creek have been studied by new detailed methods with up-to-date stream channel configurations. Water-surface profiles were computed for the detailed study streams through the use of the USACE HEC-RAS version 4.1.0 computer program (Reference 16).

Water surface profiles were produced for the 1-percent-annual-chance storms for approximate studies. Cross section and Bridge-Dada was developed from field survey and existing model studies combined with overbank data taken from the Digital Elevation Model (DEM) developed from the 2011 LiDAR dataset.

The enhanced approximate and new detailed study done by AECOM used Watershed Information System (WISE) as a preprocessor to HEC-RAS. Tools within WISE allowed the engineer to verify that the cross-section data was acceptable (Reference 17). The WISE program was used to generate the input data file for HEC-RAS. Then HEC-RAS was used to determine the flood elevation at each cross section of the modeled stream. No floodway was calculated for streams studied by approximate methods.

3.2.2 Methods for Flooding Sources Incorporated from Previous Studies

Precountywide Analyses

Cross sections for Flat Creek, Sevenmile Creek, Sims Branch, and Sorghum Branch were obtained from field surveys performed for a previous USGS study (Reference 18). Some cross sections were modified to represent conditions which have changed since the previous studies were conducted. Cross sections on other streams were obtained by land surveys performed specifically for this FIS. In addition, cross sections for Gibson Creek and Gibson Creek Tributary were obtained from aerial photographs flown in March 1977 at a scale of 1"=100 feet (Reference 19). The below-water sections were obtained by full measurement. All bridges, dams, and culverts were field checked to obtain elevation data and structural geometry.

Cross sections for Buffalo Creek, Collins Creek, Dry Creek, Hurricane Creek, the Little Harpeth River, Mansker Creek, Mill Creek Tributary A, Mill Creek Tributary B, Overall Creek, Scotts Creek, Scotts Hollow, Stoners Creek, Trace Creek, Tributary No. 1 to Overall Creek, West Branch Hurricane Creek, Whittemore Branch, and Windemere Branch were obtained from field surveys. Structural geometry and elevation data for bridges within the study reaches were obtained by field survey. Data that were available concerning physical stream changes from the Department of Public Works for Davidson County were also obtained.

For Buffalo Creek, Trace Creek, Mansker Creek, Mill Creek Tributary A, Sevenmile Creek, Tributary No. 1 to Overall Creek, Whittemore Branch, and Windemere Branch water-surface elevations of the selected recurrence intervals were computed using the USGS step-backwater computer program (Reference 20). Water-surface elevations for Collins Creek, Dry Creek, Flat Creek, the Harpeth River, Hurricane Creek, the Little Harpeth River, Mansker Creek, Mill Creek Tributary B, Overall Creek, Scotts Creek, Scotts Hollow, Sims Branch, Sorghum Branch, the South Harpeth River, Stoners Creek, and West Branch Hurricane Creek were computed using the USACE HEC-2 step-backwater computer program (Reference 21).

Starting water-surface elevations were determined as shown in the following tabulation.

Stream	**Method for Determining Starting Water Surface Elevations**
Buffalo Creek	Slope/area method
Collins Creek	Slope/area method
Cumberland River	Determined from backwater computations for Mill Creek' Since profiles were developed continuously for a 283 mile reach extending from Barkley Dam to Cordell Hull Dam, the starting elevations were established by the operating criteria for the Barkley Project
Dry Creek	Slope/area method
Flat Creek	Slope/area method
Gibson Creek	Slope/area method
Gibson Creek Tributary	Determined from backwater computations from Gibson Creek
Harpeth River	Slope/area method
Hurricane Creek	Determined from a previous study
Mansker Creek	Slope/area method

Stream	Method for Determining Starting Water Surface Elevations
Mill Creek Tributary A	Multiple step-backwater computations[2]
Overall Creek	Slope/area method
Sims Branch	Determined from backwater computations for Mill Creek[1]
Sevenmile Creek	Determined from backwater computations for Mill Creek[1]
Sorghum Branch	Determined from backwater computations for Mill Creek[1]
South Harpeth River	Slope/area method
Scotts Creek	Multiple step-backwater computations[2]
Stones River	Slope/area method
Stoners Creek	Slope/area method
Trace Creek	Slope/area method
Tributary No. 1 to Overall Creek	Determined from backwater computations of Overall Creek West Branch
Hurricane Creek	Determined from a previous study
Whittemore Branch	Multiple step-backwater computations[2]
Windemere Branch	Slope/area method

[1]This method was used when the drainage area sizes allowed the assumption of coincident peaks on the two streams for the various frequency flows. In this method, the starting water-surface elevation of the tributary is the same as the calculated backwater elevation of the receiving stream at the mouth of the tributary.

[2]Various starting water-surface elevations are used for each frequency flow until the resulting backwater profile elevations converge at some distance upstream. The line determined by this convergence is then extended back to the beginning section, where a single starting water-surface elevation is determined.

Roughness factors (Manning's "n") were assigned on the basis of previous studies done by the USACE, engineering judgment, reconstitution of known flood events, and field inspection of the floodplain areas.

A depth-area relationship, also developed by the USGS, was used for the approximate method streams to estimate the depth of the 1-percent-annual-chance flow at locations unaffected by backwater from bridge obstructions. Estimates of backwater effects from such obstructions were made by field inspection.

Revised Analyses for the April 20, 2001, Countywide FIS

Cross sections for all restudied flooding sources listed in Table 2, "Flooding Sources Studied by Detailed Methods," other than the Cumberland River, were updated using aerial surveys taken in March 1987. Cross sections for the Cumberland River were updated using topographic mapping with a contour interval of 5 feet obtained from the Metropolitan Nashville- Davidson County Department of Public Works.

Water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (Reference 22). Starting water-surface elevations for Belle Meade Branch, Browns Creek, Mill Creek, Sugartree Creek, and Tributary to Richland Creek were determined by the slope/area method. Starting water-surface elevations for all other restudied flooding sources were derived from the elevations of the parent streams at the mouth. Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Revised Analyses for the November 21, 2002, Revision

For the countywide revision, cross sections for Mansker Creek were obtained from field surveys. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry.

Water-surface elevations of floods of the selected recurrence intervals for Mansker Creek were computed using the USACE HEC-2 step-backwater computer program (Reference 22). Starting water-surface elevations were determined by the slope/area method. Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals,

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 (NGVD). With the completion of the North American Vertical Datum of 1988 (NAVD), many FIS reports and FIRMs are now prepared using NAVD as the referenced vertical datum.

Some of the data used in this revision were taken from the prior effective FIS reports and FIRMs and adjusted to NAVD. The average datum shift from NGVD 29 to NAVD 88 made for Davidson County was -0.104 feet.

All flood elevations shown in this FIS report and on the FIRM are referenced to the NAVD 88. Structure and ground elevations in the community must, therefore, be referenced to NAVD 88. It is important to note that adjacent counties may be referenced to NGVD. This may result in differences in base flood elevations across the corporate limits between the communities.

For more information regarding conversion between the NGVD and NAVD, see the FEMA publication entitled *Converting the National Flood Insurance Program to the North American Vertical Datum of 1988* (Reference 23), 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
SSMC-3, #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.

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 or limited detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section.

The boundaries between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:12,000 with contour interval of 2 feet (Reference 19). For each stream studied by approximate methods, the 1-percent-annual-chance floodplain boundaries were interpolated using topographic maps at a scale of 1: 12,000 with contour interval of 2 feet (Reference 19).

The 1- and 0.2-percent-annual-chance floodplain boundaries for streams studied by detailed methods 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 and AE), 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 streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 2).

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. In the April 20, 2001, FIS, the revised floodways for the Cumberland River and Mill Creek were adjusted from existing values using Method 1 to reflect hydrologic and geometric changes in the streams. The results of the floodway computations are tabulated for selected cross sections and provided in Table 8, “Floodway Data.”

The computed floodway is shown on the FIRM (Exhibit 2). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown on the FIRM. Floodway widths for Hurricane Creek, the Little Harpeth River, Mansker Creek, Mill Creek, and Slaters Creek extend beyond the county boundary.

Near the confluence of streams studied in detail, floodway computations were made without regard to flood elevations on the receiving water body. Therefore, “Without

Floodway" elevations presented in Table 8, "Floodway Data," for certain downstream cross sections of Browns Creek, Buffalo Creek, Collins Creek, Drake Branch, Dry Creek, Dry Fork Creek, Eaton Creek, Elm Hill Tributary, Flat Creek, Gibson Creek, Gibson Creek Tributary, Goodlettsville Outlet Ditch, Jocelyn Hollow Branch, Little Harpeth River, Mansker Creek, McCrory Creek, Middle Fork Browns Creek, Mill Creek, Mill Creek Tributary A, Overall Creek, Pages Branch, Richland Creek, Scotts Creek, Sevenmile Creek, Sims Branch, Sorghum Branch, Stones River, Stoners Creek, Sugartree Creek, Trace Creek, Tributary No. 1 to East Fork Hamilton Creek, Tributary No. 1 to Overall Creek, Tributary No. 2 to East Fork Hamilton Creek, Vaughns Gap Branch, and Vhoins Branch are lower than the regulatory flood elevations in that area, which must take into account the 1-percent-annual-chance flooding due to backwater from other sources.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage and heightens potential flood hazards by further increasing velocities. To reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

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.

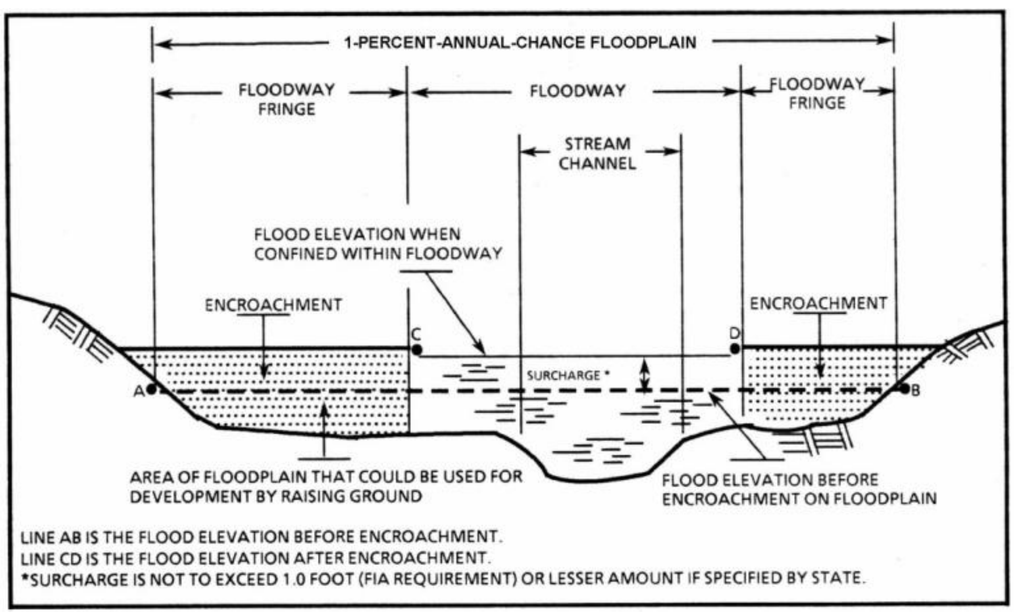

Figure 1. Floodway Schematic