

FLOOD INSURANCE STUDY



COPIAH COUNTY, MISSISSIPPI AND INCORPORATED AREAS

Copiah
County



COMMUNITY NAME	COMMUNITY NUMBER
¹ BEAUREGARD, VILLAGE OF	280086
COPIAH COUNTY, UNINCORPORATED AREAS	280221
CRYSTAL SPRINGS, CITY OF	280044
GEORGETOWN, TOWN OF	280045
HAZELHURST, CITY OF	280046
¹ WESSON, TOWN OF	280215

¹NON-FLOODPRONE COMMUNITY



Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
28029CV000

NOTICE TO
FLOOD INSURANCE STUDY USERS

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

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

Initial Countywide FIS Effective Date:

Revised Countywide FIS Dates:

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**FLOOD INSURANCE STUDY
COPIAH COUNTY, MISSISSIPPI AND INCORPORATED AREAS**

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and supersedes the FIS reports and/or Flood Insurance Rate Maps (FIRMs) in the geographic area of Copiah County, Mississippi, including the Village of Beauregard, the City of Crystal Springs, the Town of Georgetown, the City of Hazelhurst, the Town of Wesson and unincorporated areas of Copiah County (hereinafter referred to collectively as Copiah County). The Village of Beauregard and the Town of Wesson are non-flood prone communities.

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. This information will also be used by Copiah County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the 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.

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 the Town of Georgetown FIS dated August 4, 1988, and the Unincorporated Areas of Copiah County FIS, dated August 4, 1988, the hydrologic and hydraulic analyses were performed by the U.S. Geological Survey (USGS), Water Resources Division, (the Study Contractor) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-85-E-1823, Project Order No. 13. These studies were completed in February 1986.

The hydrologic and hydraulic analyses for this countywide FIS were performed by the State of Mississippi for FEMA under Contract No. EMA-2005-CA-5215. This study was completed on July 19, 2007.

The digital base map information files were provided by the State of Mississippi. This information was photogrammetrically compiled at a scale of 1:12,000 from aerial photography dated September 2004.

The digital FIRM was produced using the Mississippi State Plane Coordinate System, West Zone, FIPZONE 2302. The horizontal datum was the North American Datum of 1983, GRS 80 spheroid. Distance units were measured in U.S. feet.

1.3 Coordination

An initial Consultation Coordination Officer's (CCO) meeting is held with representatives from FEMA, the community, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied by detailed methods. A final CCO meeting is held with representatives from FEMA, the community, and the study contractor to review the results of the study.

For the Town of Georgetown FIS, dated August 4, 1988 and the Unincorporated Areas of Copeiah County FIS, dated August 4, 1988, the coordination meeting was held on February 12, 1985 between representatives of Copeiah County and FEMA to discuss potential flooding problems in Copeiah County. These problems included detailed flooding within the Town of Georgetown due to flooding from the Pearl River.

On September 8, 1987, the results of this FIS were reviewed and accepted at a final coordination meeting attended by representatives of the community and FEMA.

For this countywide FIS, an initial Pre-Scoping Meeting was held on July 7, 2005. A Project Scoping Meeting was held on August 4, 2005. Attendees for these meetings included representatives from the Mississippi Department of Environmental Quality, Mississippi Emergency Management Agency, Copeiah County, The City of Hazelhurst, and the Study Contractor. Coordination with county officials and Federal, State, and regional agencies produced a variety of information pertaining to floodplain regulations, available community maps, flood history, and other hydrologic data. All problems raised in the meetings have been addressed.

2.0 **AREA STUDIED**

2.1 Scope of Study

This FIS covers the geographic area of Copeiah County, Mississippi.

For the August 4, 1988, Town of Georgetown and Unincorporated Areas of Copeiah County FISs, flooding from the Pearl River was studied by detailed methods. The area studied was selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through February 1991.

For this countywide FIS, several flooding sources within the county were studied by approximate methods. Approximate analyses are used to study those areas having a low developmental potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and the State of Mississippi.

Floodplain boundaries of stream that have been previously studied by detailed methods were redelineated based on best available topographic information.

2.2 Community Description

Copeiah County is in southwest Mississippi and is bordered by Hinds County, Mississippi, on the north; Simpson County, Mississippi, on the east; Lincoln County, Mississippi, and Lawrence County, Mississippi on the south; and Claiborne County, Mississippi and Jefferson County, Mississippi on the west. The county covers approximately 788 square miles, and has

2 strong municipalities. The county is served by Interstate Route 55, U.S. Highway 51, and State Highways 4, 18, 27, 28, 472, 547, 801, and 844. The county is also served by the Canadian National Railroad.

The 2006 population of Covich County was reported to be 29,223 (U.S. Census Bureau, 2007).

The economy of Covich County is diverse with manufacturing, retail trade, and transportation and warehousing being the largest industries (U.S. Census Bureau, 2007).

The topography of Covich County consists of rolling hills with flat areas in creek and river bottoms. The climate of the county is generally mild and humid, with abundant rainfall that averages 60.32 inches annually. Temperatures range from monthly averages of 46.5 degrees Fahrenheit (°F) in January to 81°F in July (Mississippi State Climatologist, 2007).

2.3 Principal Flood Problems

The principle flooding source affecting Covich County is the Pearl River. The largest known flood on the Pearl River at State Highway 28 in Covich County occurred on April 19, 1979. The maximum elevation of that flood was 231.4 feet National Geodetic Vertical Datum of 1929 (NGVD) at the downstream side of State Highway 28, with a peak discharge of about 126,000 cubic feet per second (cfs). The flood is estimated to have had a recurrence interval of about 500 years. Another large flood at the same site occurred in December 1961 and crested at 226.8 feet NGVD, just downstream of the bridge, with a peak discharge of about 66,000 cfs. That flood had a recurrence interval of between 10 and 25 years. A flood in April 1974 crested at 224.4 feet NGVD, with a peak discharge of about 40,000 cfs. A discharge measurement made at the site on February 23, 1939, showed a stage of 212.2 feet NGVD, and a discharge of 20,800 cfs. The USGS operated a stream gaging station at the site from January 1 to September 30, 1939.

2.4 Flood Protection Measures

The NRCS has built one watershed dam located on Indian Creek in the Covich Creek Watershed.

3.0 **ENGINEERING METHODS**

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

reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

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

August 4, 1988, Covich County FIS and Town of Georgetown FIS

Hydraulic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community.

A comprehensive study of floodflow frequency along the Pearl River was made by the U.S. Army Corps of Engineers (USACE) and the USGS following the disastrous flood of April 1979. The magnitude of the 1% annual chance flood at State Highway 28 was determined by graphically interpolating between the 1% annual chance flood magnitudes for the Pearl River at the City of Jackson and the Town of Monticello, Mississippi, on the basis of drainage area.

This Countywide FIS Analysis

Peak discharges for the streams studied by Enhanced Approximate methods were calculated based on USGS regional regression equations.

For the discharges calculated based on regional regression equations, the rural regression values were updated to reflect urbanization as necessary.

A summary of the drainage area-peak discharge relationship for the Pearl River is shown in Table 1, "Summary of Discharges".

TABLE 1. SUMMARY OF DISCHARGES

<u>FLOODING SOURCE AND LOCATION</u>	<u>DRAINAGE AREA (sq. mi.)</u>	<u>PEAK DISCHARGES (cfs)</u>			
		<u>10-percent</u>	<u>2-percent</u>	<u>1-percent</u>	<u>0.2-percent</u>
PEARL RIVER					
At State Highway 28	3,744	*	*	101,000	*

*Data not available

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 table 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 report in conjunction with the data shown on the FIRM.

August 4, 1988, Covich County FIS and Town of Georgetown FIS

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.

An estimated stage-discharge relation was developed for the Pearl River using the elevation and estimated discharge of the 1961, 1974, and 1979 floods and the discharge measurement made on February 23, 1939. The 1% annual chance flood elevation is 230.1 NGVD for the Pearl River at the downstream side of State Highway 28. The profile slope and the hydraulic jump at the bridge for the 1% annual chance food were estimated using the 1961 (Mississippi Board of Water Commission, 1964) and 1979 (USGS, 1979) historic flood profiles.

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

This Countywide FIS Analysis

Cross section geometries were obtained from a combination of terrain data and field surveys. Bridges and culverts located within the enhanced approximate study limits were field surveyed to obtain elevation data and structural geometry.

Downstream boundary conditions for the hydraulic models were set to normal depth using a starting slope calculated from values taken from topographic data, or where applicable, derived from the water surface elevations of existing effective flood elevations or recalculated flood elevations. Water surface profiles were computed through the use of USACE HEC-RAS version 3.1.3 computer program (USACE, 2003). The model was run for the 1-percent-annual-chance storm for the enhanced approximate and approximate studies.

Manning's "n" values used in the hydraulics computations for both channel and overbank areas were based on digital orthophotography and field investigations.

Table 2, "Summary of Roughness Coefficients," shows the ranges of the channel and overbank roughness factors used in the computations for the Pearl River studied by detailed methods.

The hydraulic analyses for this study were based on unobstructed flow. Calculated flood elevations are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

TABLE 2. SUMMARY OF ROUGHNESS COEFFICIENTS

Detailed Study Streams		
<u>FLOODING SOURCE</u>	<u>CHANNEL “N”</u>	<u>OVERBANK “N”</u>
Pearl River	0.05	0.15-0.16

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 in use for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are being prepared using NAVD88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. Structure and ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities may be referenced to NGVD29. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities. The elevations shown in the FIS report and on the FIRM for Covich County are referenced to NAVD88.

Ground, structure, and flood elevations may be compared and/or referenced to NGVD29 by applying a conversion factor. To convert elevations from NAVD88 to NGVD29, subtract 0.03 feet from the NAVD88 elevation. The -0.03 feet value is an average for the entire county. The adjustment value was determined using the USACE Corpscon 6.0.1 computer program (USACE, 2004) and topographic maps (U.S. Department of the Interior, 1972). The BFEs shown on the FIRM represent whole-foot rounded values. For example, a BFE of 12.4 feet will appear as 12 feet on the FIRM, and 12.6 feet as 13 feet. Users who wish to convert the elevations in this FIS report to NGVD29 should apply the stated conversion factor to elevations shown on the Flood Profiles and supporting data tables in the FIS report, which are shown at a minimum to the nearest 0.1-foot.

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

For more information regarding conversion between the NGVD and the NAVD, see the FEMA publication entitled *Converting the National Flood Insurance Program to the North American Vertical Datum of 1988* or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (Internet address <http://www.ngs.noaa.gov>).

Qualifying bench marks within a given jurisdiction that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical and have a vertical stability classification of A, B, or C are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier.

Benchmarks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

Stability A: Monuments of the most reliable nature, expected to hold position and/or elevation well (e.g., mounted in bedrock)

Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)

Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monuments below frost line)

Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS benchmarks, the FIRM may also show vertical control monument established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

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. Interested individuals may contact FEMA to access this data.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1 % annual chance flood elevations and delineations of the 1 % annual chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data Table and Summary of Stillwater Elevations Table. Users should reference the data presented in the FIS report as well as additional information that may be available at the local 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 % annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes. For each stream studied by detailed methods, the 1 % annual chance floodplain boundary has been delineated using the flood elevations determined at each cross section.

The 1-percent-annual-chance floodplain boundary only is shown on the FIRM (Exhibit 2), on this map, the 1 % annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by enhanced approximate and approximate methods, only the 1 % annual chance floodplain boundary is shown on the FIRM (Exhibit 2). Floodplain boundaries

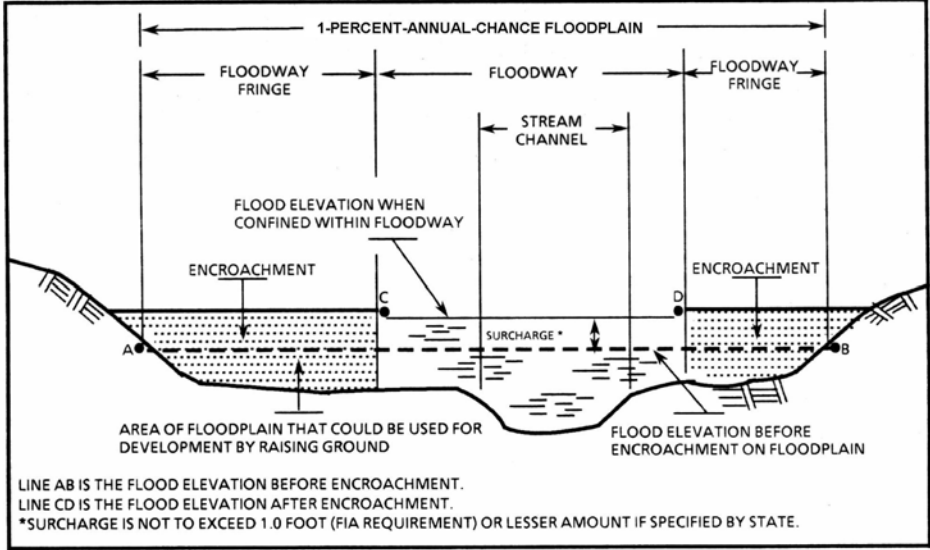
for these streams, as well as those streams that have been previously studied by detailed methods, were generated using USGS 10-meter Digital Elevation Models (USGS), then refined using detailed hydrographic data.

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 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 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.

Floodways have not been shown or computed for this community. Along streams where floodways have not been computed, the community must ensure that cumulative effects of development in the floodplain will not cause more than a 1.0 foot increase in the base flood elevations at any point within the community.

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 of the 1-percent-annual-chance flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.



FLOODWAY SCHEMATIC

Figure 1

5.0 INSURANCE APPLICATION

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

Zone A

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

Zone AE

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

Zone X

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

6.0 FLOOD INSURANCE RATE MAP

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

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

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

The countywide FIRM presents flooding information for the entire geographic area of Copiah County. Previously, FIRMs were prepared for incorporated communities and the unincorporated areas of the County identified as flood-prone. This countywide FIRM also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community, up to and including this countywide FIS are presented in Table 3 “Community Map History.”

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Copiah County (Unincorporated Areas)	August 26, 1977	NONE	August 4, 1988	----
Crystal Springs, City of	June 7, 1974	February 20, 1976	March 18, 1986	----
Georgetown, Town of	August 2, 1974	October 3, 1975	August 5, 1985	August 4, 1988
Hazlehurst, City of	February 27, 1976	NONE	January 1, 1986	----

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
COPIAH COUNTY, MS
 AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 **OTHER STUDIES**

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Copeiah County has been compiled into this FIS. Therefore, this FIS supersedes all previously printed FIS reports, FIRMs, and/or FBFMs for all of the incorporated and unincorporated jurisdictions within Copeiah County.

8.0 **LOCATION OF DATA**

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting Federal Insurance and Mitigation Division, FEMA Region IV, Koger-Center — Rutgers Building, 3003 Chamblee Tucker Road, Atlanta, Georgia 30341.

9.0 **BIBLIOGRAPHY AND REFERENCES**

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U.S. Geological Survey, Floods of April 1979, Mississippi, Alabama, and Georgia, George W. Edelen, Jr., K.V. Wilson, Joe R. Harkins, John F. Miller, and Edwin H. Chin, 1983.

