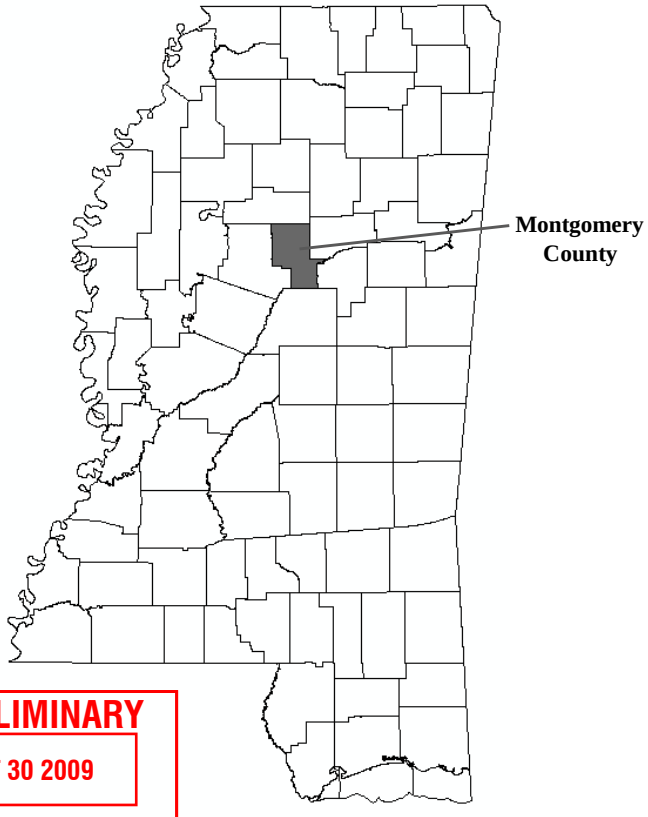
FLOOD INSURANCE STUDY

MONTGOMERY COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
DUCK HILL, TOWN OF	280118
KILMICHAEL, TOWN OF	280250
MONTGOMERY COUNTY (UNINCORPORATED AREAS)	280212
WINONA, CITY OF	280119



PRELIMINARY

OCT 30 2009

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Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
28097CV000A

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.

Selected Flood Insurance Rate Map panels for the community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g., floodways, cross sections). In addition, former flood hazard zone designations have been changed as follows:

Old Zone	New Zone
C	X

This preliminary revised Flood Insurance Study contains profiles presented at a reduced scale to minimize reproduction costs. All profiles will be included and printed at full scale in the final published report.

Part or all of this Flood Insurance Study may be revised and republished at any time. 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.

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FLOOD INSURANCE STUDY
MONTGOMERY COUNTY, MISSISSIPPI AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Montgomery County, Mississippi, including the City of Winona; the Towns of Duck Hill and Kilmichael; and the unincorporated areas of Montgomery County (referred to collectively herein as Montgomery County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

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 Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

This FIS was prepared to include the unincorporated areas of, and incorporated communities within, Montgomery County in a countywide format. A FIS report has not been previously published for Montgomery County, Mississippi or any incorporated areas within Montgomery County.

For this countywide FIS, new hydrologic and hydraulic analyses were prepared by AECOM Water, for FEMA, under Contract No. EMA-2007-CA-5774. This study was completed in July 2009.

Base map information shown on the FIRM was provided in digital format by Mississippi Department of Environmental Quality (MDEQ) and Mississippi Emergency Management Agency (MEMA). Base mapping aerial photography was captured in March 2006 and is at a scale of 1:400.

The digital FIRM was produced using the Mississippi State Plane Coordinate system, West Zone (FIPS ZONE 2302). The horizontal datum was the North American Datum of 1983, GRS80 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 communities, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied. A final CCO meeting is held with representatives from FEMA, the communities, and the study contractor to review the results of the study.

For this countywide FIS, the project Scoping Meeting was held on April 17, 2008 in Winona, Mississippi and attended by representatives from the FEMA, MDEQ, MEMA, Montgomery County, the City of Winona 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 Flood Insurance Study covers the geographic area of Montgomery County, Mississippi, including the incorporated communities listed in Section 1.1.

No new detail studies have been performed for this countywide study.

An enhanced approximate study was performed along Hays Creek Tributary 7..

For this FIS, Table 1 lists the stream which was studied by enhanced approximate study methods.

Table 1. Scope of Study

Stream	Limits of New Enhanced Approximate Study
Hays Creek Tributary 7	Approximately 600 feet downstream of Greensboro Street to approximately 1,100 feet upstream of Westland Drive

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA, Montgomery County, and the Study Contractor.

2.2 Community Description

Montgomery County is located in central Mississippi, about 70 miles northeast of Jackson. The county is bordered on the south by Attala County; on the west by Carroll County, on the north by Grenada Counties, and on the east by Choctaw and Webster Counties.

Interstate 55, US Highways 51 and 82, State Highways 404, 407, and 413, along with the Columbus and Greenville Railway and Illinois Central Railroad are the primary transportation routes serving the county.

The population of Montgomery County is 11,266 based on the 2008 estimate of the U.S. Census Bureau (Reference 1). The land area of Montgomery County covers approximately 4072 square miles

The climate of Montgomery County is characterized by hot and humid summers, and short mild winters. Temperatures average 40.0 degrees Fahrenheit (^{O}F) in January and 77.7 °F in July. Annual precipitation over the study area averages 57.04 inches (Reference 2).

2.3 Principal Flood Problems

The history of flooding in Montgomery County indicates that flooding may occur during any season of the year. The majority of floods occur during winter and spring. Runoff from rainfall is the principal cause of flooding. Due to the relatively small size of the drainage basins, flash floods can occur from local high intensity thunderstorms.

2.4 Flood Protection Measures

Flood protection measures are not known to exist within the study area.

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 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 100-year flood (1-percent-chance of annual 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 enhanced approximate and approximate methods affecting the community.

Discharges for the 1-percent-annual-chance recurrence interval for new enhanced approximate streams were determined using the USGS seven parameter nationwide urban equation (Reference 3).

Discharges for the 1-percent-annual-chance recurrence interval for approximate study streams in Montgomery County were determined using the Rural-West Region USGS regression equations for Mississippi as described in the USGS Water-Resources Investigations report 94-4002 (Reference 4).

Drainage areas along streams were determined using a flow accumulation grid developed from the USGS 10-meter digital elevation models and corrected National Hydrologic Data (NHD) stream coverage (Reference 5). Flow points along stream centerlines were calculated using the regression equations in conjunction with accumulated area for every 10 percent increase in flow along a particular stream.

3.2 Hydraulic Analyses

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

Cross section geometries were obtained from digital terrain data developed from 10-meter Digital Elevation Models (DEMs) provided by the Mississippi Automated Resource Information System (MARIS) (Reference 6).

Water-surface profiles were computed for new enhanced approximate and approximate study streams through the use of the U.S. Army Corps of Engineers HEC-RAS version 3.1.2 computer program (Reference 7). Water surface profiles were produced for the 1-percent-annual-chance storms for enhanced approximate and approximate studies.

The enhanced approximate and approximate study methodology used Watershed Information System (WISE) (Reference 8) as a preprocessor to HEC-RAS. Tools within WISE allowed the engineer to verify that the cross-section data was acceptable. 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.

Floodplains were mapped to include backwater effects that govern each flooding source near its downstream extent. Floodplains were reviewed for accuracy and adjusted as necessary.

All qualifying bench marks within a given jurisdiction that are catalogued 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.

Bench marks 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/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 monument 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 bench marks, the FIRM may also show vertical control monuments established by a local jurisdiction; these monuments will be shown on the FIRM with the approximate 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.

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

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 (NGVD 29). With the finalization of the North American Vertical Datum of 1988 (NAVD 88), many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum. Flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88.

For information regarding conversion between the NGVD and NAVD, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

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 county, though none are mapped in Montgomery County.

For each stream studied by enhanced approximate and approximate methods, the 1-percent-annual-chance floodplain boundaries have been delineated using topographic data developed from 10 meter Digital Elevation Models (DEMs) acquired from the MARIS. These DEMs were developed from terrain data provided by the United States Geological Survey (Reference 9). For the streams studied by approximate methods, the 1 percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 1). On this map, the 1 percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A). 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.

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 National Flood Insurance Program, 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.

Floodways have not been computed for streams studied by enhanced approximate and approximate methods because of limitations in the study methodology. Along streams where floodways have not been computed, the community must ensure that the cumulative effect 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.”

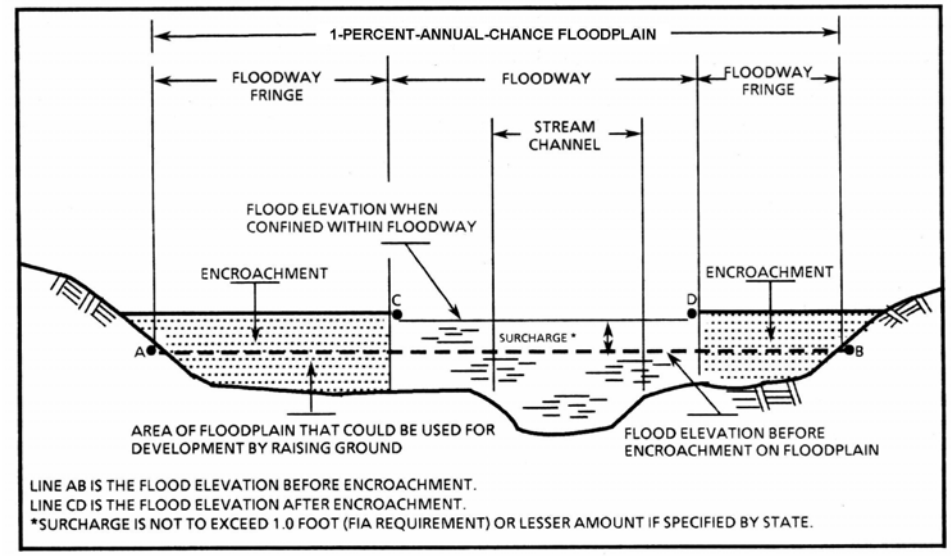

Figure 1. Floodway Schematic

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

Zone X

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

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map (FIRM) is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0. 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-percent-annual-chance floodplains calculated by the hydraulic analyses.

The countywide Flood Insurance Rate Map presents flooding information for the entire geographic area of Montgomery County. Previously, Flood Insurance Rate Maps were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide Flood Insurance Rate Map also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps, where applicable. Historical data relating to the maps prepared for each community are presented in Table 2, "Community Map History."

COMMUNTIY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Duck Hill, Town of	June 7, 1974	June 25, 1976	April 2, 1986	-
Kilmichael, Town of	-	None	-	-
Montgomery County (Unincorporated Areas)	January 6, 1978	None	September 1, 1987	-
Winona, City of	August 23, 1974	June 18, 1976 July 18, 1980	July 2, 1987	-

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONTGOMERY COUNTY, MS

AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

There are no previously published FIS reports for Montgomery County or its communities. There were FIRMs previously produced for the Unincorporated Areas of Montgomery County and the City of Winona. The Flood Insurance Studies published for Grenada, Choctaw, Attala, and Carroll Counties, Mississippi are in agreement with this study. No previous FIS has been published for Webster County.

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Montgomery County has been compiled into this FIS. Therefore, this FIS report supersedes or is compatible with all previously printed FIS reports, FIRMs, and Flood Hazard Boundary Maps (FBFMs) for al jurisdictions within Montgomery County, and should be considered authoritative for the purposed of the NFIP.

8.0 LOCATION OF DATA

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

Future revisions may be made that do not result in the republishing of the Flood Insurance Study report. To ensure that any user is aware of all revisions, it is advisable to contact the map repository of flood hazard data located in the community.

9.0 BIBLIOGRAPHY AND REFERENCES

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