FLOOD INSURANCE STUDY

TUNICA COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
TUNICA COUNTY (UNINCORPORATED AREAS)	280236
TUNICA, TOWN OF	280196

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
28143CV000A

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 Date:

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FLOOD INSURANCE STUDY
TUNICA 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 Tunica County, Mississippi, including the Town of Tunica and unincorporated areas of Tunica County (hereinafter referred to collectively as Tunica 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. This information will also be used by Tunica 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.

This FIS was prepared to include all jurisdictions within Tunica County in a countywide FIS. The authority and acknowledgments prior to this countywide FIS have been compiled from the previously printed FIS reports fro the previously identified floodprone jurisdictions within Tunica County and are shown below.

July 3, 1990, FIS Tunica County (Unincorporated Areas)

The hydrologic and hydraulic analyses from the FIS report dated July 3, 1990 (FEMA, 1990), were performed by the U.S. Department of the Interior, Geological Survey (the Study Contractor) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-85-E-1823, Project Order No. 13. This study was completed in February 1988. Data for the Mississippi River were obtained from the U.S. Army Corps of Engineers (USACE), Memphis District (USCE, October 1978, unpublished).

March 1977, FIS Town of Tunica

The hydrologic and hydraulic analyses from the FIS report dated March 1977 (FEMA, 1977), were performed by Michael Baker, Jr., Inc. for the Federal Insurance

Administration, under Contract No. H-3800. This work, which was completed in April 1977, covered all significant flooding sources affecting the Town of Tunica.

This Countywide FIS

The hydrologic and hydraulic analyses for this countywide FIS were performed by the State of Mississippi for the Federal Emergency Management Agency, under Contract No. EMA-2004-CA-5028. This study was completed in September 2006.

The digital base map information files were provided by the U.S. Army Corps of Engineers—Vicksburg District, 4155 East Clay Street, Vicksburg, MS 39183, phone number (601) 631-5053. The digital orthophotography was acquired in February 2004, with the imagery processed to a 2-foot pixel resolution. The digital topographic data model was based on Light Detection and Ranging (LiDAR) products, also provided by U.S. Army Corps of Engineers—Vicksburg District, and collected in February and April, 2004.

The digital FIRM was produced using the State Plane Coordinate System, Mississippi West, FIPSZONE 2301. 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. The dates of the precountywide initial and final CCO meeting held for Tunica County and the Town of Tunica are shown in Table 1, "CCO Meeting Dates for Precountywide FISs."

TABLE 1 – CCO MEETING DATES FOR PRECOUNTYWIDE FISs

Community	Initial CCO Date	Final CCO Date
Tunica County (Unincorporated Areas)	*	August 15, 1989
Tunica, Town of	March 6, 1975	September 22, 1976

*Data Not Available

For this countywide FIS, a Project Scoping Meeting was held on July 21, 2004. A Post-Scoping Meeting was held on February 16, 2005 in order to clarify some of the areas of study. Attendees for these meetings included representatives from the Mississippi Department of Environmental Quality, Mississippi Emergency Management Agency, FEMA National Service Provider, Tunica County, Tunica Soil and Water Conservation District, U.S. Army Corps of Engineers, and the State 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 Tunica County, Mississippi. Several flooding sources within the county were studied by approximate methods. Approximate analyses are used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and the State of Mississippi.

TABLE 2 – FLOODING SOURCES STUDIED BY DETAILED METHODS

Stream	Panel
Buck Island Bayou	Panel 01P-02P
Jack Lake Bayou	Panel 03P-04P
Jerry's Bayou	Panel 05P
Minton Bayou	Panel 06P
Mississippi River	Panel 07P
White Oak Bayou	Panel 08P-10P
White Oak Bayou Tributary	Panel 11P

For this countywide FIS, some detailed streams were studied by limited detailed methods. This study type entails collecting basic field measurements of hydraulic structures and channel geometry. Vertical control for the measurements is established using the LiDAR-based digital terrain model. Generalized roughness values are estimated from land-use data, aerial photography, and photographs collected during survey. Channel and overbank reach lengths are computed using GIS methods. Model results are calibrated to known stage values, as they are available and deemed reliable. The following table lists the flooding sources, which were revised or newly studied by detailed methods:

TABLE 3 – SCOPE OF REVISION

Stream	Limits of Revised or New Detailed Study
Buck Island Bayou	From a point approximately 0.6 mile upstream of the confluence with Coldwater River to a point approximately 350 feet downstream of Woolfolk Road
Jack Lake Bayou	From the confluence with Buck Island Bayou to a point approximately 2.3 miles upstream of Verner Road
Minton Bayou	From the confluence with Jack Lake Bayou to a point approximately 400 feet downstream of Woolfolk Road
White Oak Bayou	From a point approximately 2.7 miles downstream of Highway 4 to a point approximately 3,700 feet upstream of Cobb Road

Limits of the detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

Stream 1 within the Town of Tunica has been renamed White Oak Bayou Tributary.

No Letters of Map Revision were incorporated in this FIS.

2.2 Community Description

Tunica County, which is named for a native American Indian tribe, is located in northwest Mississippi and is bordered by DeSoto County on the north; Tate County and Panola County on the east; Coahoma County and Quitman County on the south; and by the Mississippi River on the west. The county covers approximately 455 square miles. U.S. Highway 61 and State Highways 3, 4, and 304 serve the county. The county is also served by the Illinois Central Railroad.

The 2005 population estimate of Tunica County was reported to be 10,321 (U.S. Census Bureau, 2006). At one time reputed to be the poorest county in the entire U.S., the population of Tunica County declined by 22.2% during the last three decades of the 1900's. The recent influx of the aquaculture and, in particular, gaming industries has provided a significant boost to the local economy.

Tunica County lies entirely within the Mississippi Delta. The terrain can be described as gently undulating to level, and land use is dominated by agriculture. The climate of the county is generally mild to hot, with abundant rainfall that averages 54.18 inches annually (Mississippi State Climatologist, 2006). Temperatures range from monthly averages of 39 degrees Fahrenheit (^{o}F) in January to 82 ^{o}F in July (Mississippi State Climatologist, 2006).

2.3 Principal Flood Problems

The principle flooding sources affecting Tunica County are the Mississippi River, Coldwater River, Jerry's Bayou, White Oak Bayou and tributaries, and Buck Island Bayou and tributaries. Based on historical records, the largest flood of consequence occurred in March 1973, when the Coldwater River gage at Prichard recorded a crest of 32.00 feet. A more recent flood occurred in November and December of 2001, which affected the Buck Island Bayou area. Backwater flooding of low-lying areas is prevalent in the county due to the low topographic relief.

2.4 Flood Protection Measures

FEMA specifies that all levees must have a minimum of 3-foot freeboard against 1-percent annual chance flooding to be considered a safe flood protection structure. The criteria used to evaluate protection against the 1-percent annual chance flood are 1) adequate design, including freeboard, 2) structural stability, and 3) proper operation and maintenance. Levees that do not protect against the 1-percent annual chance flood are not considered in the hydraulic analysis of the 1-percent annual chance flood.

Tunica County is protected from the 1-percent annual chance flood of the Mississippi River by a levee that runs near the western boundary. This levee is maintained by the U.S. Army Corps of Engineers. Another levee is located along the east side of the

county. This levee is intended to protect from flooding effects of the Coldwater River, from approximately State Highway 4 to the downstream county boundary. At the time of this FIS preparation, this levee is provisionally accredited for providing protection from the 1-percent annual chance flood of the Coldwater River. This levee is also maintained by the U.S. Army Corps of Engineers.

Arkabutla Reservoir, completed in 1943, is located on the Coldwater River along the Tate and DeSoto County boundary, about 6 miles upstream of the river's entry into Tunica County. The reservoir was built as part of the Yazoo Headwaters Project, aimed at reducing flood damage in the Yazoo River basin, and it is operated by the Vicksburg District of the U.S. Army Corps of Engineers. The reservoir greatly affects 1-percent annual chance discharges on the Coldwater River downstream.

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 a 100-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. This event, commonly termed the 1-percent annual chance flood, has a 1-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.

Precountywide Analyses

The Town of Tunica and the unincorporated areas of Tunica Count have previously published FIS reports. The hydrologic analysis described in those reports have been compiled and are summarized below.

The magnitude of the 1-percent annual chance flood for Jerry's Bayou, White Oak Bayou, and White Oak Bayou Tributary was estimated by regional regression equations (U.S. Department of the Interior, 1986)

Jerry's Bayou watershed has several irregularities, which make the hydrology uncertain. The storage effects of a large swamp in the upper half of the watershed would probably reduce the peak flow rate of a large flood by roughly one-third at Prichard Road. Also, based on topographic maps, the mean channel slope is 1.5 feet per mile and mean channel elevation changes only about 6 feet from the headwater to the downstream study limit

(about 3.4 miles). This flat slope will probably make backwater and channel storage effects from the Prichard Road embankment particularly significant during flood events. At an elevation of about 190 feet National Geodetic Vertical Datum 1929 (NGVD), floodwaters would begin to flow into adjacent Jack Lake Bayou basin at a point 2.3 miles upstream of Prichard Road. Discharge calculations for the 48-inch pipe culvert under Prichard Road at Jerry's Bayou indicate that this culvert could only pass about one-half of the estimated 1-percent annual chance flood discharge. The rest of the flow would go into storage or be diverted to adjacent basins. Thus, the discharge used for Jerry's Bayou is the equivalent discharge for a basin of equal size in this region.

Countywide Analyses

Peak discharges for the streams studied by either detailed methods or approximate methods were calculated based on U.S. Geological Survey (USGS) regional regression equations (U.S. Department of the Interior, 1991). Exceptions include Coldwater River, which had base flood discharges estimated directly from stream gage data (U.S. Army Corps of Engineers, 2004).

For the discharges calculated based on regional regression equations, the rural regression values were modified to reflect stream gage weighting, flood control, and urbanization as necessary.

A summary of the drainage area-peak discharge relationships for all the streams is shown in Table 4, "Summary of Discharges."

TABLE 4 – SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. mi.)	PEAK DISCHARGES (cfs) 10-percent	2-percent	1-percent	0.2-percent
BUCK ISLAND BAYOU					
At confluence with Coldwater River	40.71	*	*	2,873	*
Approximately 350 feet downstream of Woolfolk Road	20.72	*	*	2,812	*
JACK LAKE BAYOU					
At the confluence with Buck Island Bayou	15.98	*	*	1,106[1]	*
Above the confluence of Minton Bayou	10.48	*	*	1,126[1]	*
At Verner Road	6.59	*	*	1,149[1]	*
JERRY'S BAYOU					
Approximately 2,000 feet downstream of Prichard Road	2.20	*	*	350	*
MINTON BAYOU					
At the confluence with Jack Lake Bayou	4.46	*	*	747	*
Approximately 400 feet downstream of Woolfolk Road	0.30	*	*	112	*

* Data Not Available

TABLE 4 – SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. mi.)	PEAK DISCHARGES (cfs) 10-percent	2-percent	1-percent	0.2-percent
MISSISSIPPI RIVER					
At upstream county boundary	*	*	*	1,970,000	*
WHITE OAK BAYOU					
At Highway 4	25.72	*	*	1,731[1]	*
Approximately 500 feet upstream of Henderson Road	20.83	*	*	2,221[1]	*
At Highway 61	7.16	*	*	1,373[1]	*
WHITE OAK BAYOU TRIBUTARY					
At confluence with White Oak Bayou	1.35	*	*	330	*
At Fairyland Avenue	0.85	*	*	310	*

[1] The upstream discharge is higher than the downstream discharge due to significant natural storage effects

* 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 Flood Insurance Rate Map (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.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

Areas of the community protected by levees are subject to potential risk due to possible failure or overtopping of the levee. These areas were delineated by applying the 1-year percent annual chance flood elevation determined from the "levee in place" analysis.

The hydraulic analyses for this countywide FIS 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.

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/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 bench marks, 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.

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.

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.

Precountywide FIS Analyses

The Town of Tunica and the unincorporated areas of Tunica Count have previously published FIS reports. The hydraulic analysis described in those reports have been compiled and are summarized below.

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.

Cross sections for Jerry’s Bayou and White Oak Bayou Tributary were field surveyed. Structural geometry and elevations for bridges, culverts, stream overbanks, and road sections were also obtained from field surveys.

The Mississippi River elevations were obtained from the U.S. Army Corps of Engineers (USACE, October 1978, unpublished).

Roughness coefficients for Jerry’s Bayou and White Oak Bayou were chosen by engineering judgment and based on field observation of the streams and floodplain areas.

On Jerry's Bayou, stage-discharge relations were estimated from slope-conveyance computations and from culvert computations (USGS, August 1983). The water-surface elevations for the 1-percent annual chance flood were determined from a comparison of these ratings, flood history from local residents, and elevations at which flow would be diverted into storage and to adjacent watersheds.

On White Oak Bayou Tributary, slope conveyance computations were used to determine the water-surface elevations for the 1-percent annual chance flood. A slope at each site was determined from a comparison of channel, valley, and water-surface slopes. Upstream of Fairyland Avenue, water-surface elevations were computed using the HEC-2 step-backwater computer program (USACE, April 1984).

Countywide Analyses

Cross section geometries were obtained from a combination of digital terrain data developed from LiDAR products, and field surveys. Bridges and culverts located within the detailed 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. Water-surface profiles were computed through the use of the U.S. Army Corps of Engineers (USACE) HEC-RAS version 3.1.2 computer program (USACE, 2002). The model was run for the 1-percent annual chance storm for the detailed and approximate studies.

For the study of Buck Island Bayou, Jack Lake Bayou, and Minton Bayou, water-surface profiles were also determined by elevations at which flood flow would be diverted into adjacent watersheds.

Channel roughness factors (Manning's "n" values) used in the hydraulic computations for both channel and overbank areas were based on recent digital orthophotography and field investigations.

Table 5, "Summary of Roughness Coefficients," shows the ranges of the channel and overbank roughness factors used in the computations for all of the streams studied by detailed and limited detail methods.

TABLE 5 – SUMMARY OF ROUGHNESS COEFFICIENTS

FLOODING SOURCE	CHANNEL "N"	OVERBANK "N"
Buck Island Bayou	0.04	0.1
Jack Lake Bayou	0.045	0.1
Jerry's Bayou	0.041-0.057	0.12-0.23
Minton Bayou	0.04	0.1
Mississippi River	*	*
White Oak Bayou	0.045	0.12
White Oak Bayou Tributary	0.041-0.057	0.12-0.23

* Data Not Available

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 Tunica 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 NGVVD29, add 0.09 feet to the NAVD88 elevation. The 0.09 feet value is an average for the entire county. 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.

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 (FEMA, June 1992), 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).

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-percent annual chance flood elevations and delineation of the 1-percent annual chance floodplain boundary 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-percent annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 1-percent annual chance floodplain boundary is shown on the FIRM (Exhibit 2. 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). 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 this study, a digital terrain model produced from LiDAR bare-earth points data from the U.S. Army Corps of Engineers (USACE, February 2004) was used to delineate the floodplain boundaries for the detailed and approximate studies.

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.

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. In order to reduce the risk of property damage in areas where the stream velocities are high, the county 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 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.

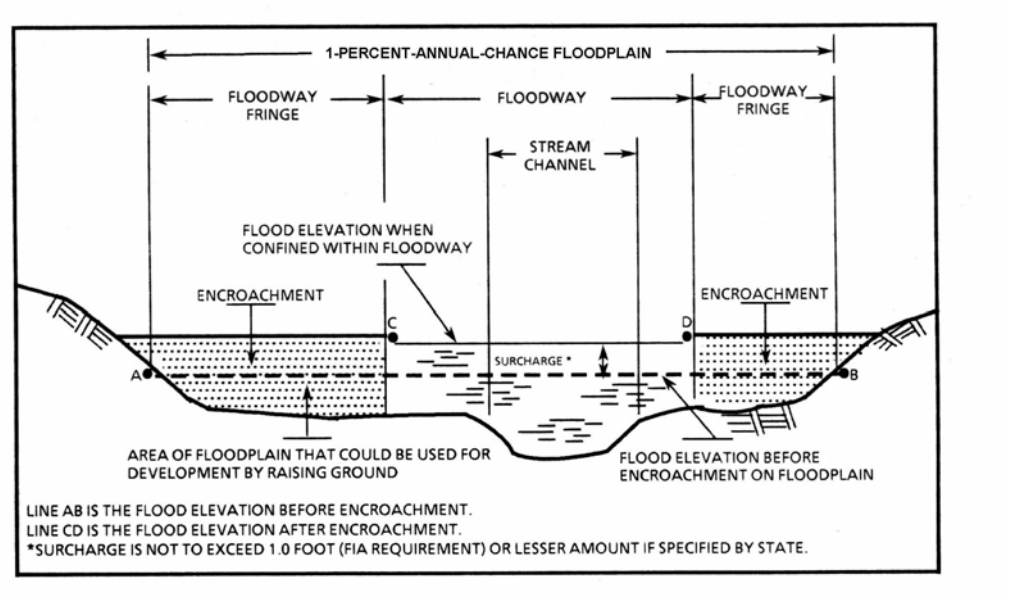

Figure 1 -- Floodway Schematic

No floodways were computed as part of this countywide FIS.

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.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

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-percent annual chance floodplain 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 Tunica County. Previously, FIRMs were prepared for each incorporated community 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 6, "Community Map History."

7.0 OTHER STUDIES

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

8.0 LOCATION OF DATA

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

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Tunica County (Unincorporated Areas)	January 10, 1975	December 9, 1977	July 3, 1990	N/A
Tunica, Town of	June 14, 1974	N/A	January 5, 1978	April 18, 1980

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

9.0 BIBLIOGRAPHY AND REFERENCES

Federal Emergency Management Agency (July 3, 1990), Flood Insurance Study, Tunica County, Unincorporated Areas, Mississippi, Washington, D.C.

Federal Emergency Management Agency (January 5, 1978), Flood Insurance Study, Town of Tunica, Mississippi, Washington, D.C.

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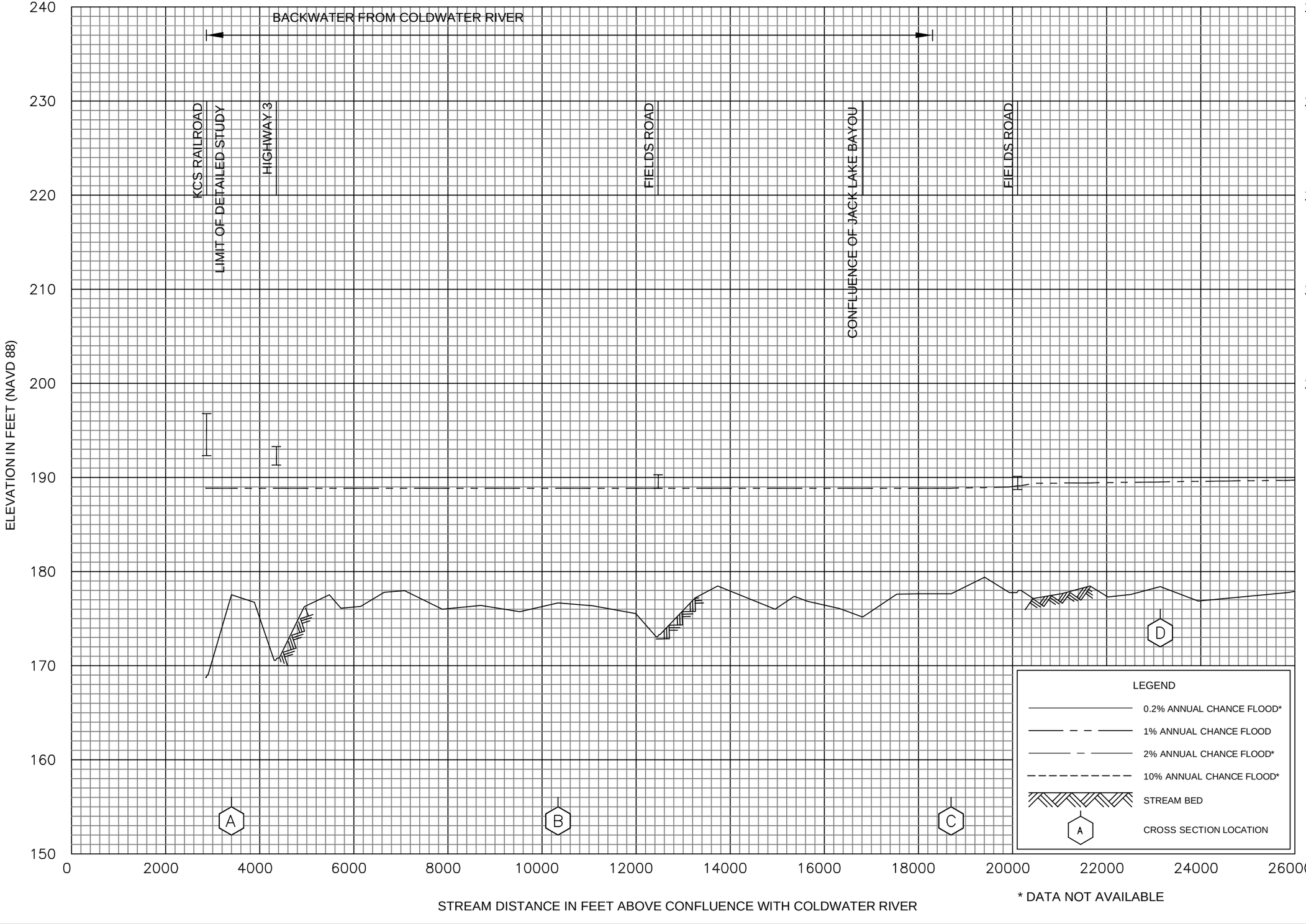


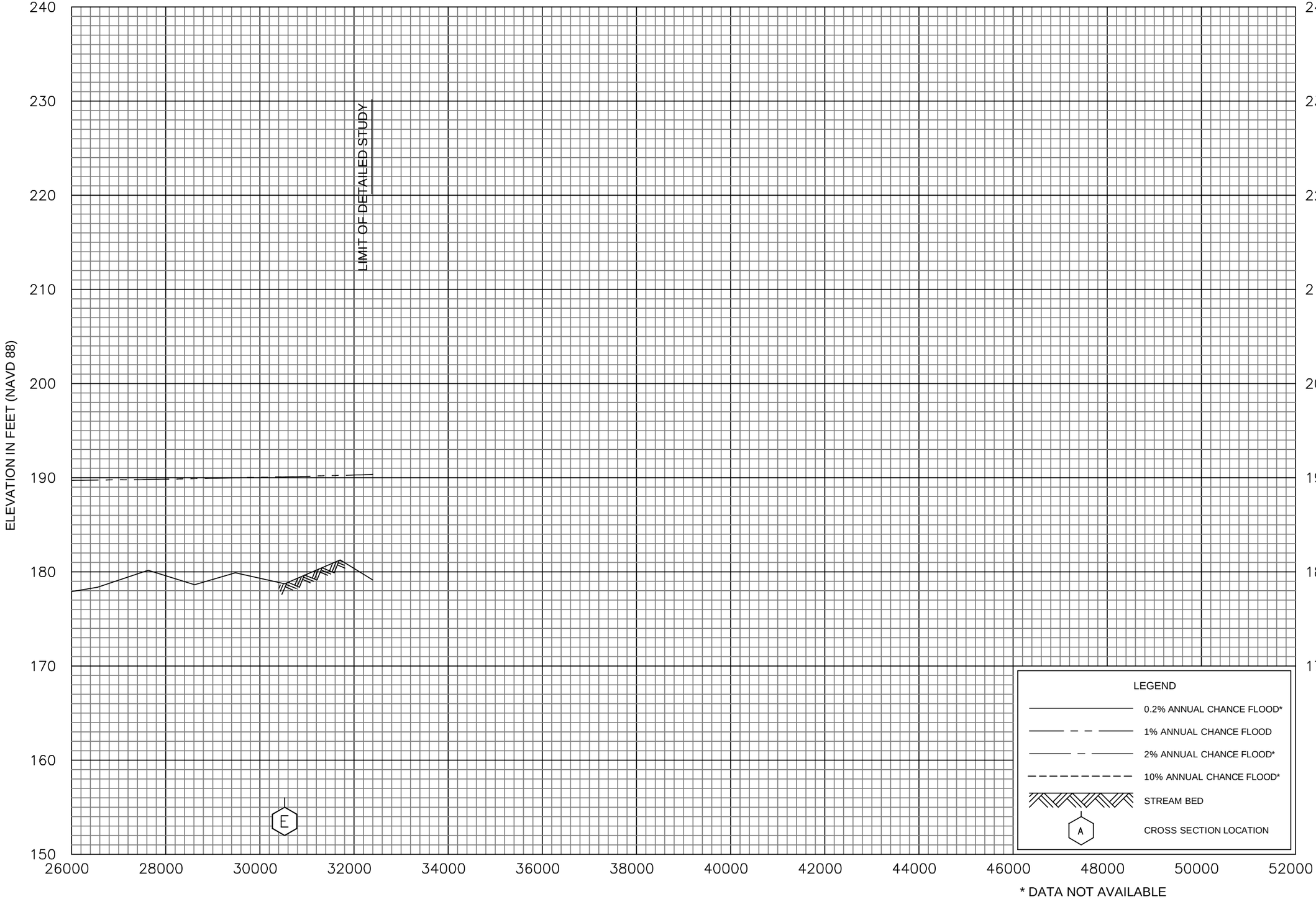
FLOOD PROFILES

BUCK ISLAND BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS
AND INCORPORATED AREAS

01P



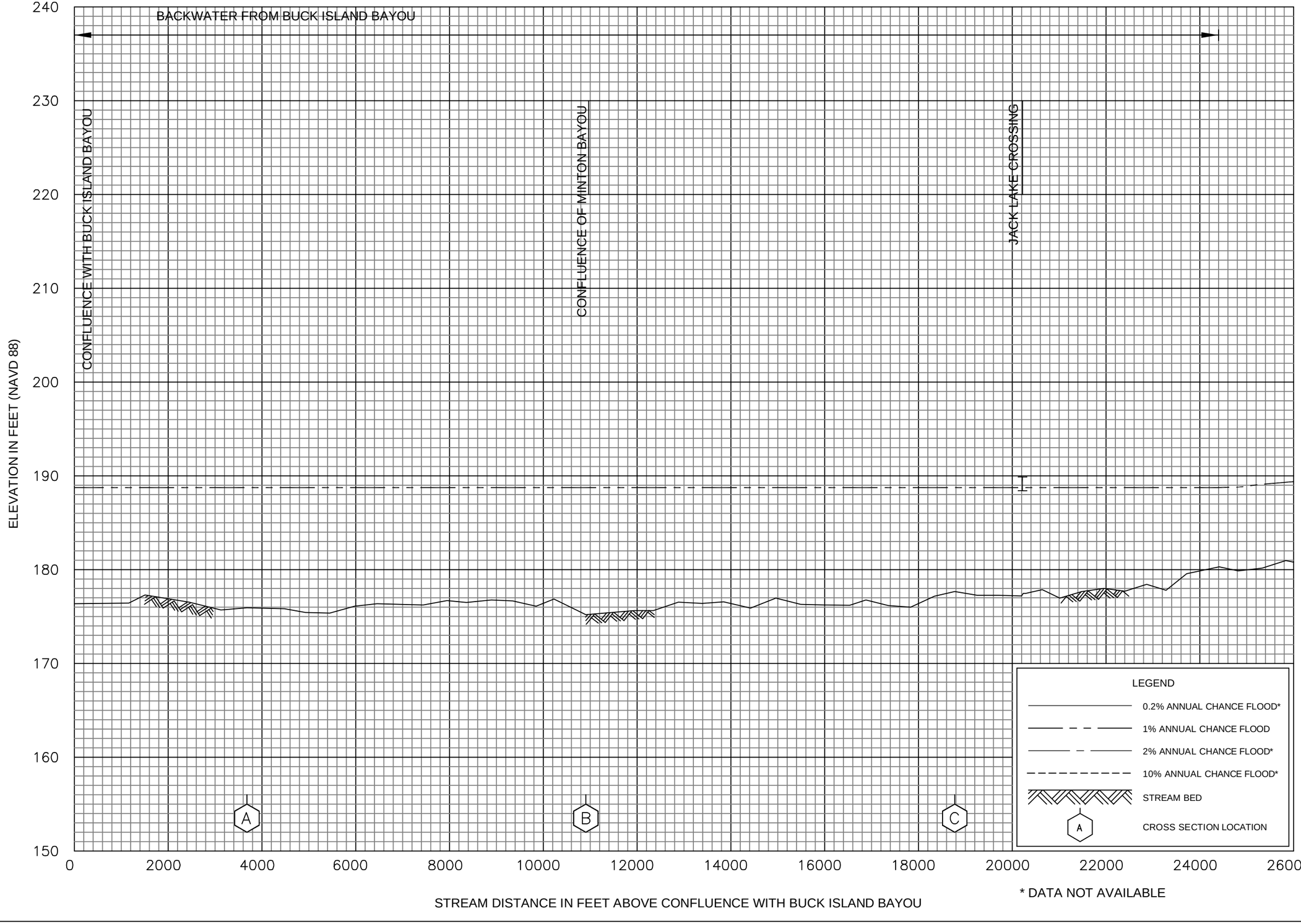
FLOOD PROFILES

BUCK ISLAND BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS
AND INCORPORATED AREAS

02P



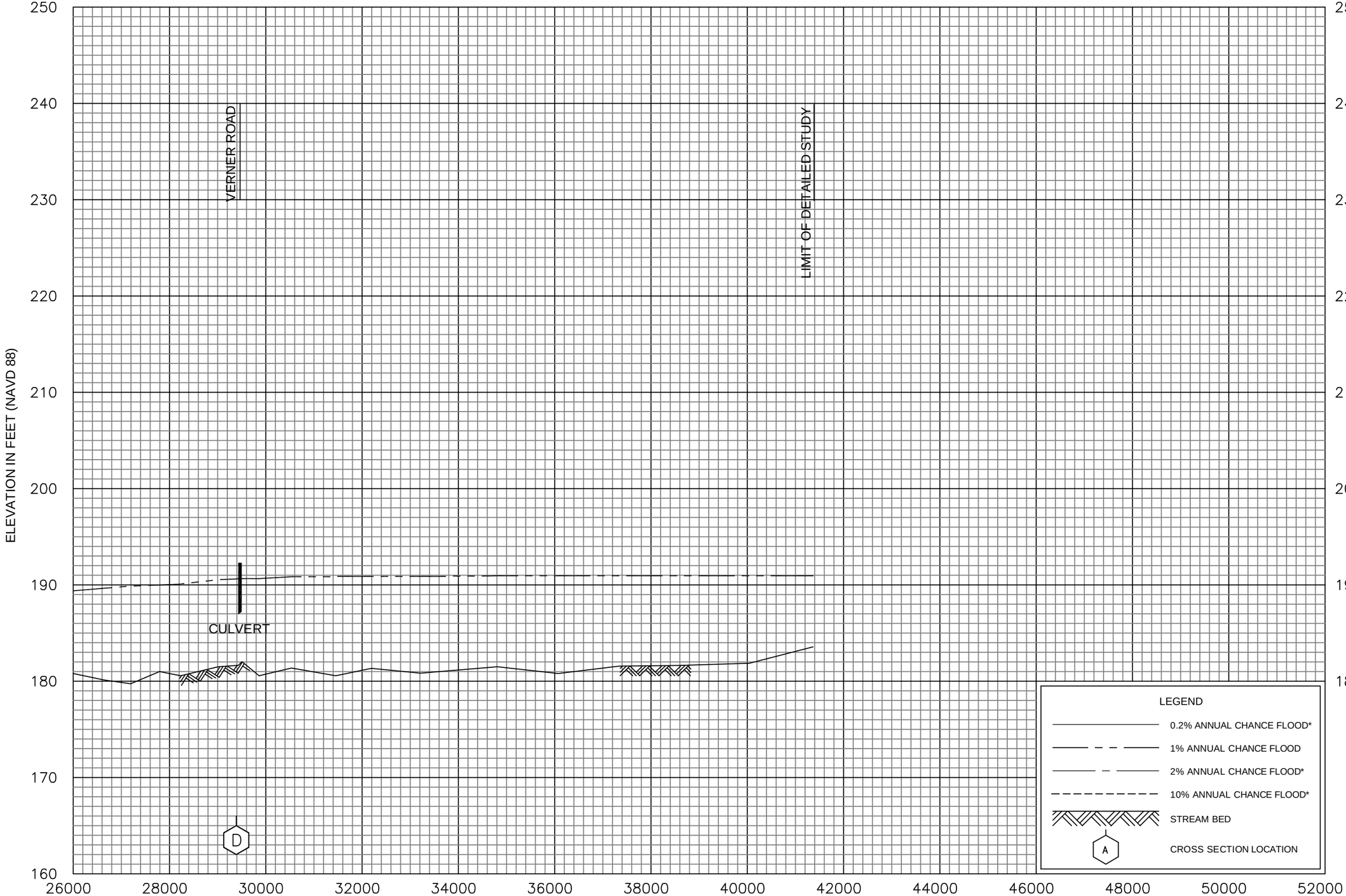
FLOOD PROFILES

JACK LAKE BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS
AND INCORPORATED AREAS

03P



FLOOD PROFILES

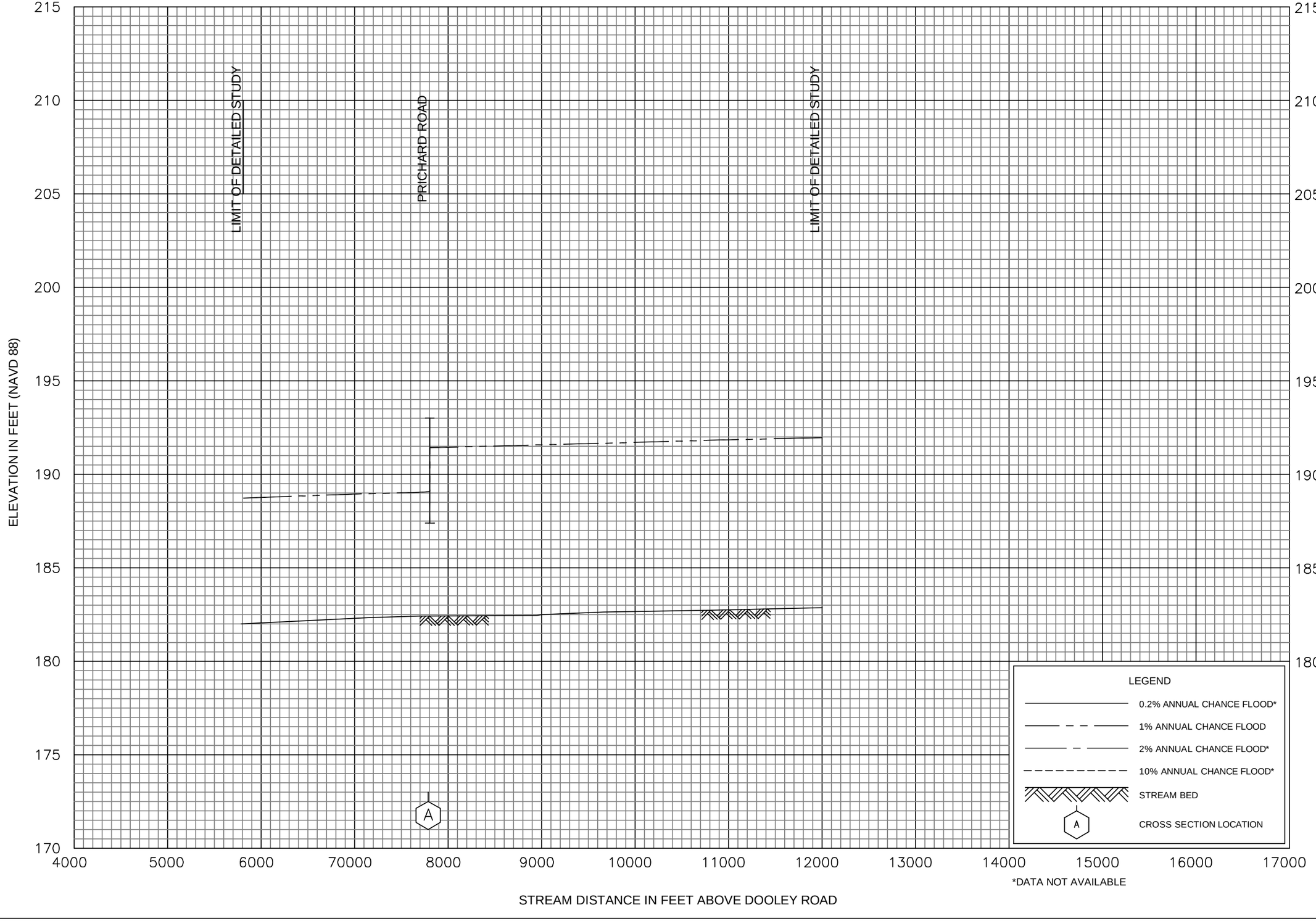
JACK LAKE BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS

AND INCORPORATED AREAS

04P



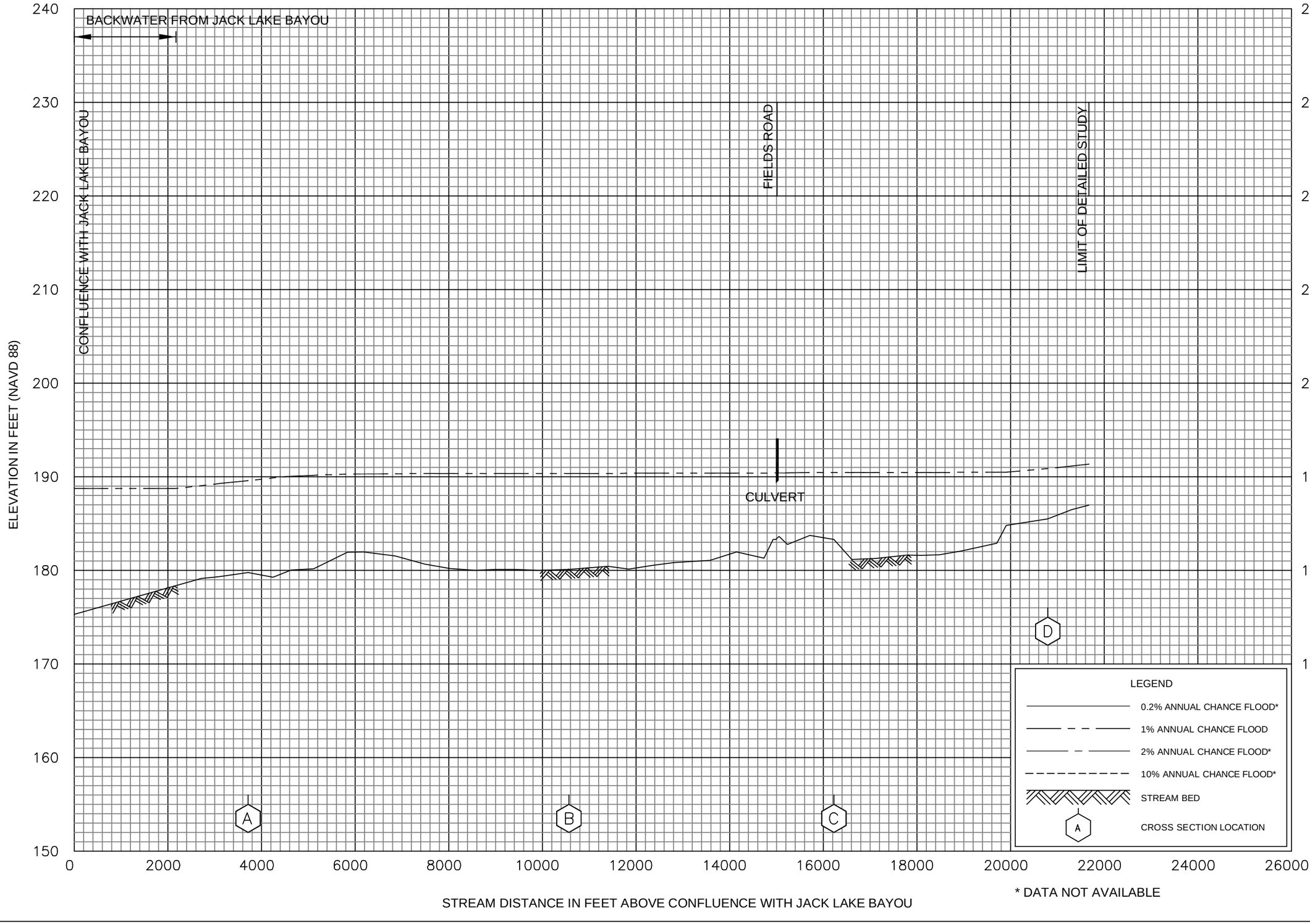
FLOOD PROFILES

JERRY'S BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS
AND INCORPORATED AREAS

05P



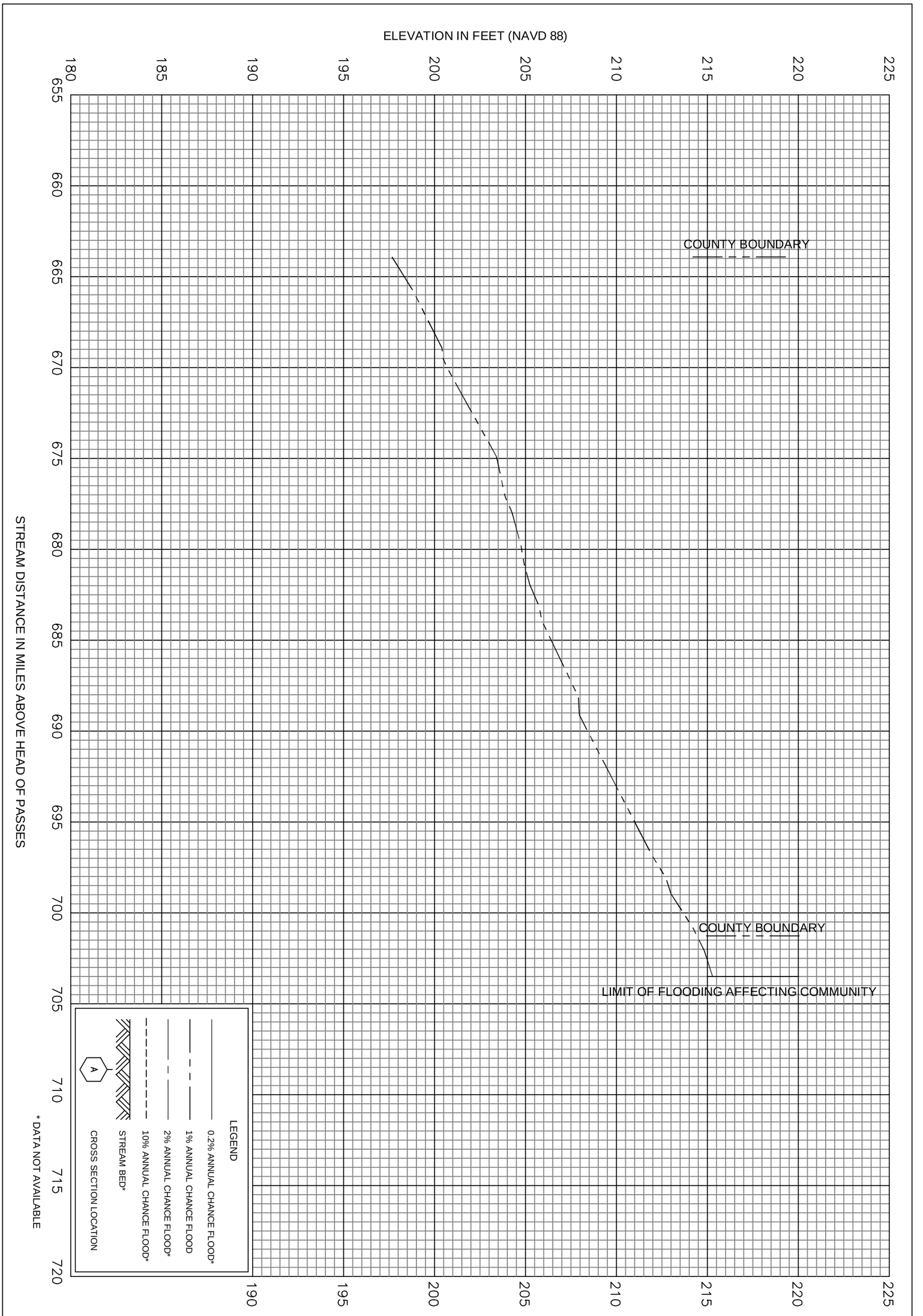
FLOOD PROFILES

MINTON BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS
AND INCORPORATED AREAS

06P



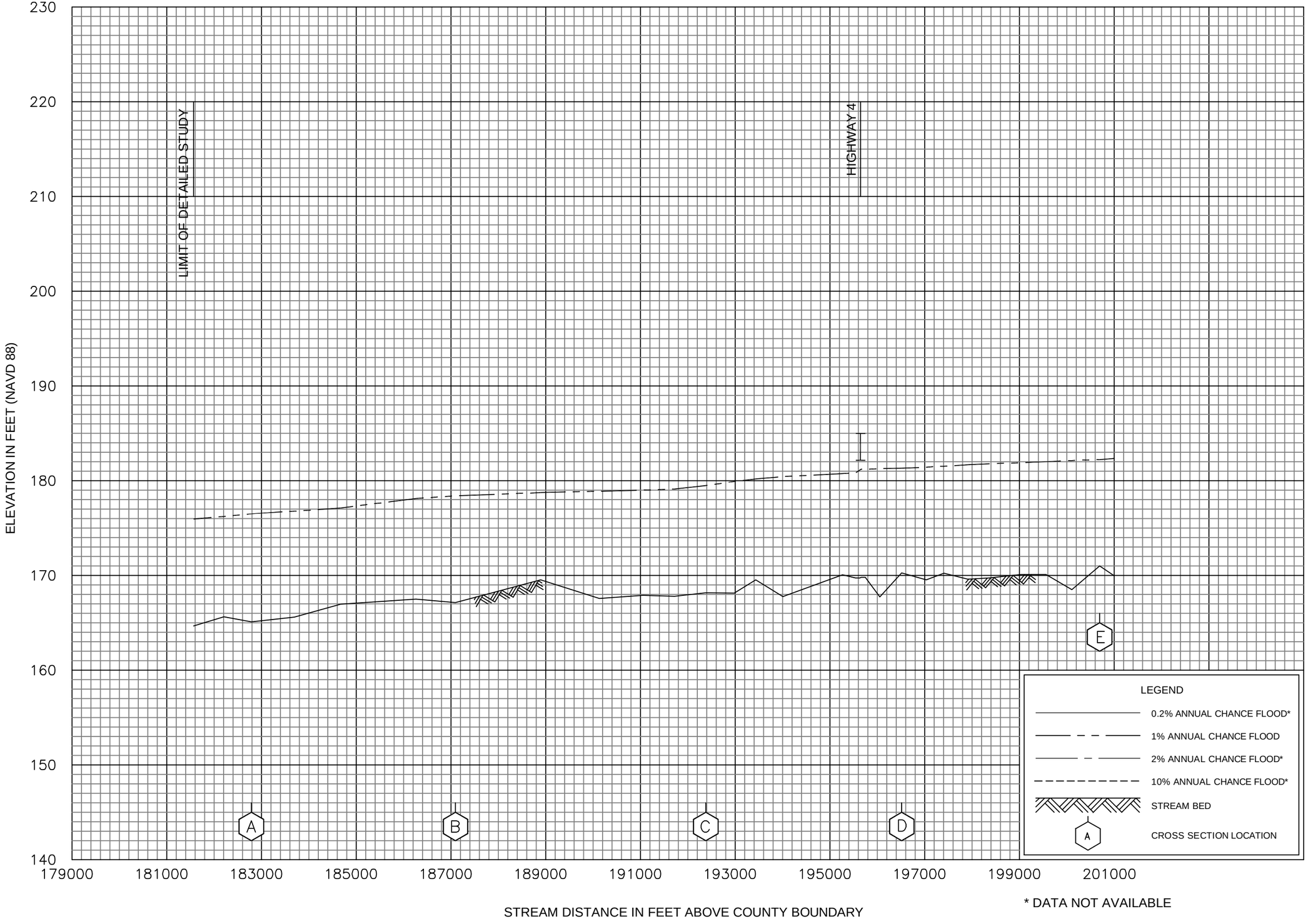
07P

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS
AND INCORPORATED AREAS

FLOOD PROFILES

MISSISSIPPI RIVER



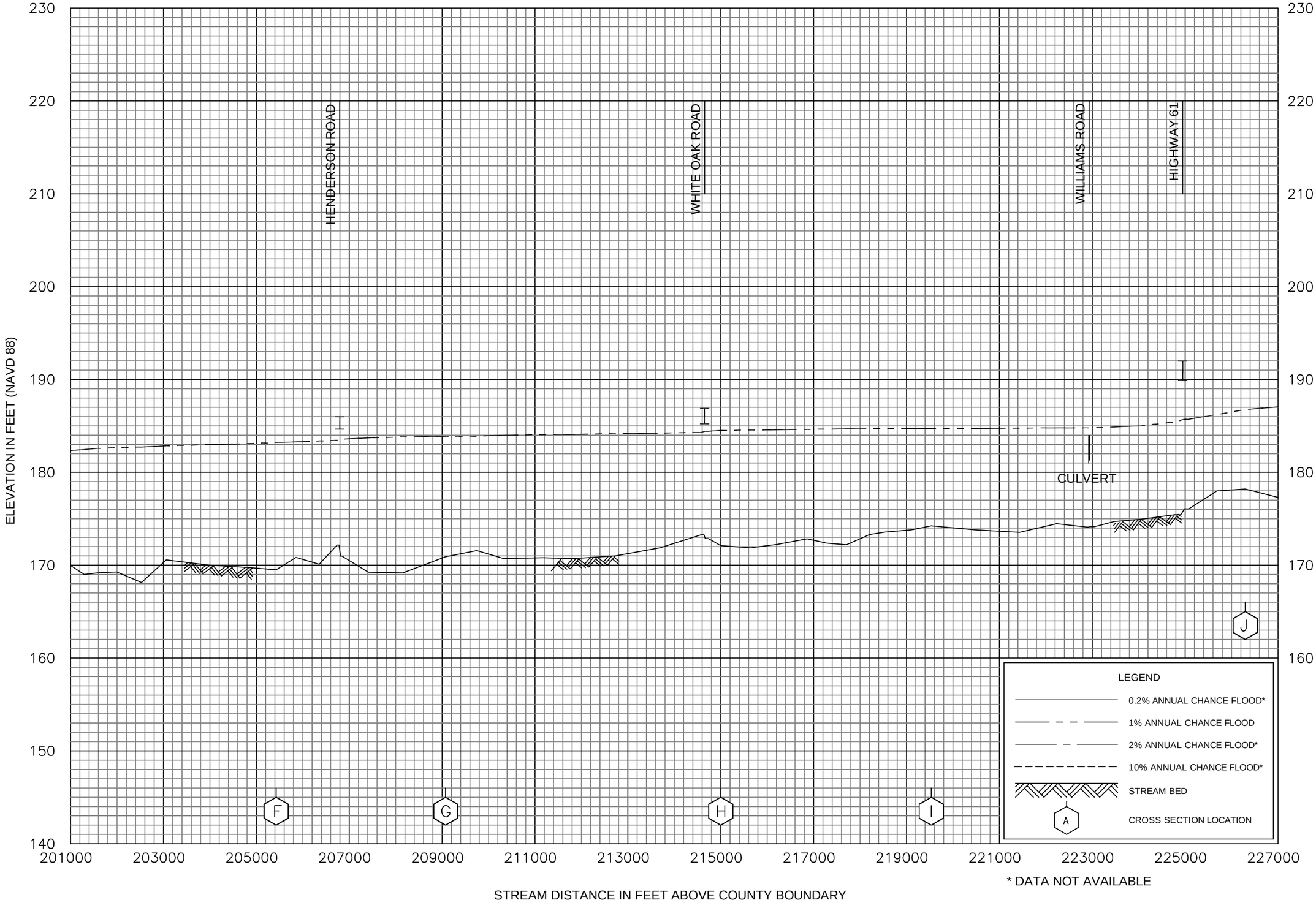
FLOOD PROFILES

WHITE OAK BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS
AND INCORPORATED AREAS

08P



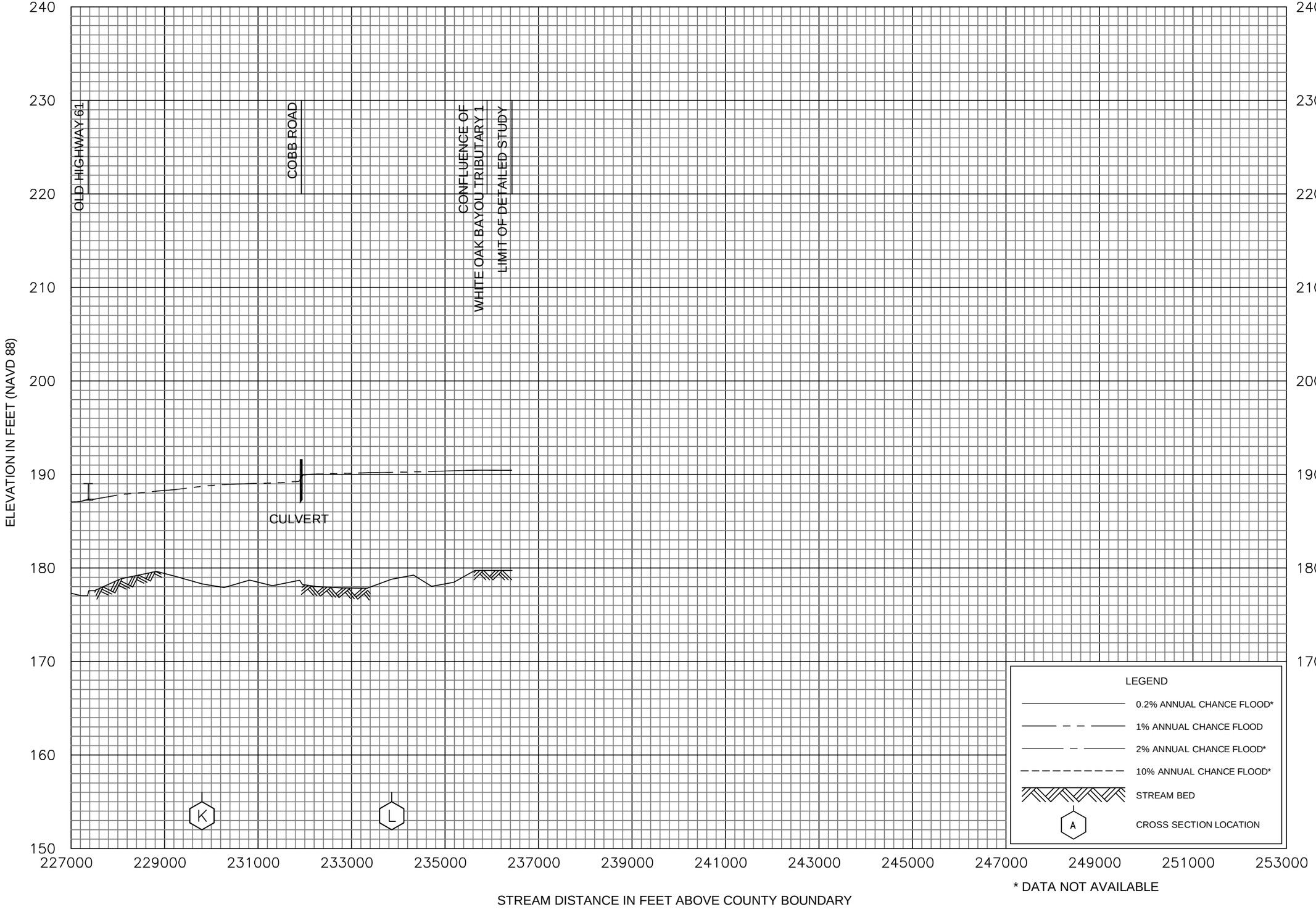
FLOOD PROFILES

WHITE OAK BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS
AND INCORPORATED AREAS

09P



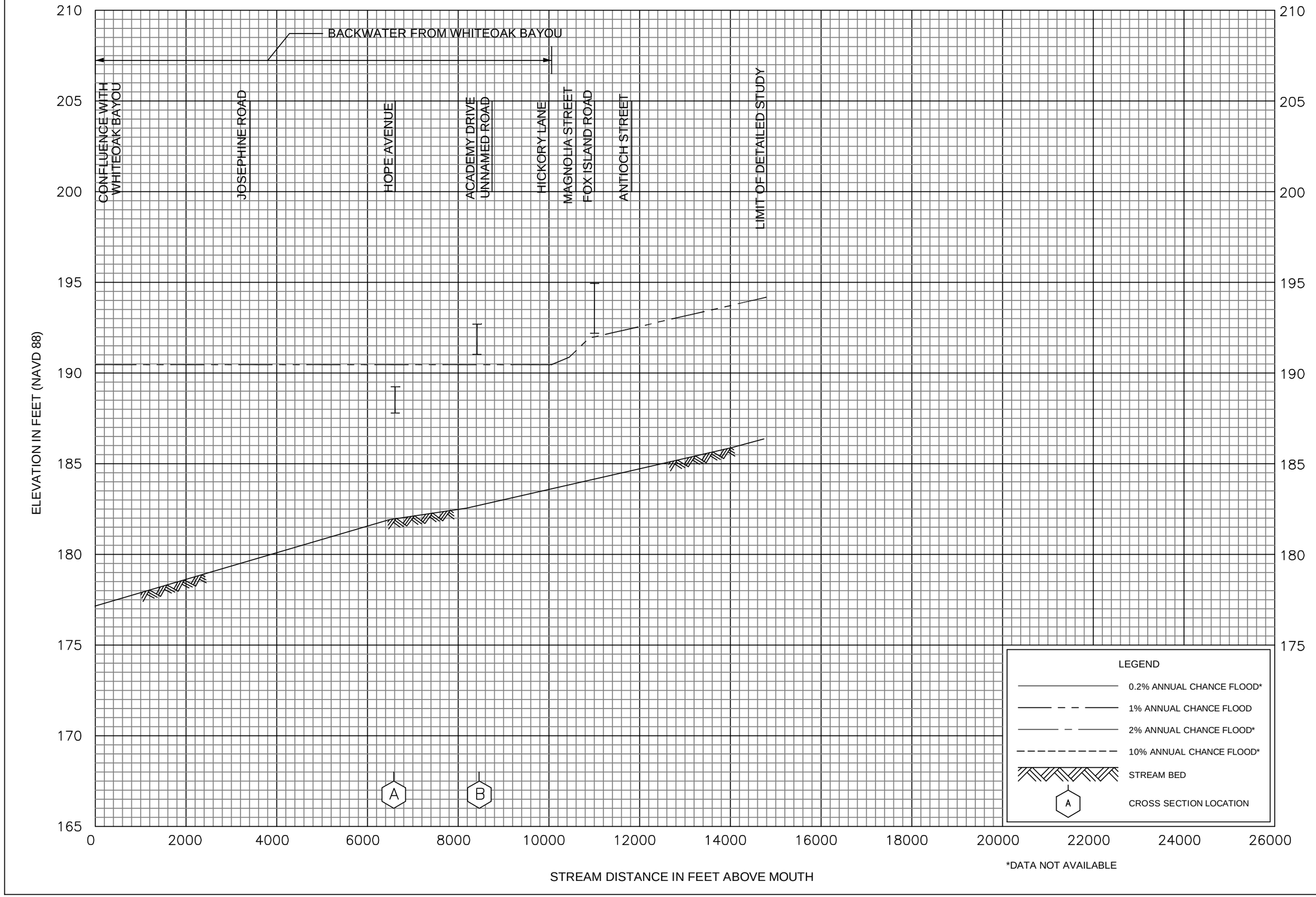
FLOOD PROFILES

WHITE OAK BAYOU

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS
AND INCORPORATED AREAS

10P



FLOOD PROFILES

WHITE OAK BAYOU TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

TUNICA COUNTY, MS

AND INCORPORATED AREAS

11P