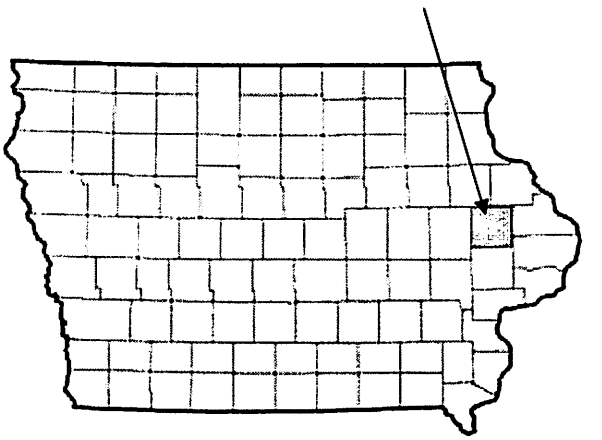
FLOOD INSURANCE STUDY

JONES COUNTY, IOWA
AND INCORPORATED AREAS

Community Name	Community Number
ANAMOSA, CITY OF	190174
CENTER JUNCTION, CITY OF	190433
JONES COUNTY (UNINCORPORATED AREAS)	190919
*MARTELLE, CITY OF	190775
MONTICELLO, CITY OF	190175
MORLEY, CITY OF	190770
OLIN, CITY OF	190176
*ONSLOW, CITY OF	190791
OXFORD JUNCTION, CITY OF	190177
WYOMING, CITY OF	190434

*NO SPECIAL FLOOD HAZARD AREAS IDENTIFIED

Jones County



REVISED: May 18, 2015

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
19105CV000B

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.

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.

Initial Countywide FIS Effective Date: April 4, 2011

Revised Countywide FIS Date: May 18, 2015

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Flood Insurance Rate Maps (Published Separately)

FLOOD INSURANCE STUDY
JONES COUNTY, IOWA, AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and supersedes the FIS reports, Flood Insurance Rate Maps (FIRMs) and/or Flood Boundary and Floodway Maps (FBFM) in the geographic area of Jones County, Iowa, including the Cities of Anamosa, Center Junction, Martelle, Monticello, Morley, Olin, Onslow, Oxford Junction and Wyoming; and the Unincorporated Areas of Jones County (hereinafter referred to collectively as Jones County) and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR. 60.3.

Please note that the City of Cascade is geographically located in Jones and Dubuque Counties. The City of Cascade will not be included in this FIS report.

Please note that the Cities of Martelle and Onslow have no identified special flood hazard areas.

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 completed for the Federal Emergency Management Agency (FEMA) by the Iowa Department of Natural Resources (DNR) under Cooperative Agreement EMK-2012-CA-1208. The work was completed by AECOM under Contract No. ESD7385SRals120187 for the Iowa DNR. This revised study was completed in May 2013.

The following streams were included in the study:

- Kitty Creek
- Maquoketa River

Table 1, "Summary of Flooding Sources Presented in Current Study," provides a summary of the flooding sources within Jones County included in this current study, the contract number under which they were performed, and the communities affected by each.

Table 1: Summary of Flooding Sources Presented in Current Study

Flooding Source	Completion Date	Study Contractor(s)	Contract or Inter-Agency Agreement No.	Communities Affected
Kitty Creek*	May 2013	Iowa DNR	EMK-2012-CA-1208	Monticello, City of
Maquoketa River*	May 2013	Iowa DNR	EMK-2012-CA-1208	Jones County, Monticello, City of
All Zone A Streams	May 2007	Stantec Consulting Services Inc. (Stantec)	EMK-2001-CO-2018, Task Order No. 32	Jones County
Unnamed Stream	July 1977	Stanley Consultants, Inc.	H-4005	Monticello, City of

*Flooding source restudied as part of the current revision

The digital floodplain data was merged into a single, updated DFIRM. The DFIRM includes 2010 orthophotography, political boundaries, and road centerlines with street names, railroads with names, rivers, lakes, streams, and elevation reference marks. The base map information was obtained from the Jones County GIS Department, U.S. Geologic Survey (USGS) and National Geodetic Survey.

The coordinate system used for producing this FIRM is NAD 1983 State Plane Iowa North, FIPS 1401, Feet. 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 August 20, 2013, and attended by representatives of FEMA, AECOM, community officials, and the State NFIP Coordinator.

The final CCO meeting was held on January 8, 2014 to review and accept the results of this FIS. Those who attended this meeting included representatives of Iowa DNR, AECOM, community officials, and the State NFIP Coordinator. Any questions or comments raised at that meeting have been addressed.

The dates of the historical initial and final CCO meetings held for the communities within the boundaries of Jones County are shown in Table 2, "Historical CCO Meeting Dates."

Table 2: Historical CCO Meeting Dates

Community Name	Initial CCO Date	Final CCO Date
Jones County, Anamosa, City of, Wyoming, City of, Olin, City of, and Monticello, City of.	November 8, 2006	July 7, 2009
Monticello, City of	June 15, 1977	May 11, 1978

2.0 AREA STUDIED

2.1 Scope of Study

This FIS report covers the geographic area of Jones County, Iowa, 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 Jones County.

For this revision, a total of 4.9 additional stream miles were studied using detailed methods.

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 3, "Flooding Sources Studied by Detailed Methods."

Table 3: Flooding Sources Studied by Detailed Methods

Flooding Source	Reach Length (miles)	Study Limits
Kitty Creek*	1.5	From the confluence with the Maquoketa River to approximately 0.7 mile downstream of Oak Street (State Highway 38)
Maquoketa River*	3.4	From approximately 1.0 mile downstream of U.S. Highway 151 (Eastbound) to approximately 1,040 feet downstream of State Highway 38.
Unnamed Stream	0.7	From 0.2 mile downstream of U.S. Highway 151 Business Route to 1.1 miles upstream of the Chicago Milwaukee, St. Paul and Pacific Railroad.

*Flooding source with new or revised analyses incorporated as part of the current study update

The previous countywide FIS incorporated the determination of letters issued by FEMA resulting in LOMCs. All LOMCs in Jones County for which information could be found are summarized in the Summary of Map Amendment (SOMA) included in the Technical Support Data Notebook (TSDN) associated with the previous FIS update. Copies of the SOMA may be obtained from the Community Map Repository.

2.2 Community Description

Jones County encompasses approximately 577 square miles and is located in the eastern part of Iowa. It is bounded on the north by the Counties of Dubuque and Delaware, east by the Counties of Jackson and Clinton, south by Cedar County, and west by Linn County. U.S. Census Bureau's 2008 population estimate for Jones County is 20,346 persons (Reference 1). The county seat is the City of Anamosa.

The following section is a compilation of previously published community description information from earlier FIS reports.

City of Monticello

The City of Monticello is located in the upper third of the Maquoketa River basin in north-central Jones County, in eastern Iowa. The population of Monticello has increased by 10 percent or more in each of the four decades preceding 1970, reaching 3,509 in 1970. Population growth is expected to continue as in the past, increasing to approximately 5,700 by the year 2020. The estimated 2007 population for the City of Monticello was 3,710 (Reference 1). The city is a service and trading center for the surrounding agricultural area and supports considerable light manufacturing. More than 20 industrial establishments are engaged in manufacturing, the chief items being steel buildings, hydraulic equipment containers, and farm equipment (Reference 1).

The Maquoketa River originates in Fayette County, and flows about 115 miles in a southeasterly direction through gently rolling farmland, cutting through the northeast corner of Monticello on its course to the Mississippi River in Jackson County. The drainage basin is long and narrow with the majority of the land used for agricultural purposes. Scattered large limestone formations outcrop the glacial till throughout the basin. The basin receives 33 inches of normal annual precipitation, about 90 percent of which falls as rain. Temperatures range from about -30 degrees Fahrenheit (°F) to 108°F (Reference 2).

Kitty Creek, a sizable tributary of the Maquoketa River, flows in a northerly direction through Monticello and joins the river just east of the corporate limits. The unnamed stream provides drainage for agricultural land west of the community and much of southwestern Monticello. Several small transitory streams drain central Monticello and flow into Kitty Creek.

2.3 Principal Flood Problems

Low-lying areas of Monticello are subject to periodic flooding from the Maquoketa River and Kitty Creek. The most severe flooding has occurred as a result of heavy rainfall. The maximum flood of record on the Maquoketa River occurred in July 1947, causing damage estimated at $13,500 (Reference 3). Severe flooding also occurred in July 1951 and March 1960. Damage from the Maquoketa River affects primarily the local golf course and a portion of the Kitty Creek floodplain. About 34 residencies, nine commercial, and three industrial establishments located on the west bank of Kitty Creek, are subject to periodic flooding (Reference 3). Recent Kitty Creek floods occurred in 1951, 1954, and twice in 1969. Damage in 1969 was estimated at $20,000 for each occurrence (Reference 3).

2.4 Flood Protection Measures

No flood protection measures were identified in Jones County.

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-, 25-, 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-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-, 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 and approximate methods. Peak discharge-drainage area relationships for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance floods of each flooding source studied in detail in the community are presented in Table 4, "Summary of Discharges."

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

Hydrologic analyses were carried out to establish revised peak discharge frequency relationships for the Maquoketa River.

In the absence of flow records for the Maquoketa River at Monticello, the original hydrologic analysis completed by the USACE developed a synthetic frequency curve using the frequency statistics of the Little Maquoketa River at Durango, and the Maquoketa River at both Manchester and Maquoketa. The means and standard deviations of these stations were plotted against drainage area and corresponding values were interpolated for Monticello. These values were compared with a regional plot of the same for neighboring streams (Reference 3).

For this revision, an updated frequency statistical analysis is warranted due to longer periods of record since the original analysis. Following similar methodologies, discharges were computed by a log-Pearson Type III distribution as outlined in the Hydrology Subcommitee Bulletin 17B Report (Reference 4) for the Little Maquoketa River at Durango, and the Maquoketa River at both Manchester and Maquoketa. The statistical analyses were developed using the software package PKFQWin (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 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.

The frequency curve for Kitty Creek was also developed by the USACE, and was synthetically estimated using regional characteristics of neighboring streams of similar nature (Reference 3). These values were checked with regression equations developed for east-central Iowa by USGS (Reference 3), and the thesis, "Regional Flood Frequency Determinations in Iowa," (Reference 6).

The 10-, 2-, and 1-percent-annual-chance peak discharges for the unnamed stream in southwest Monticello were developed using the Iowa Natural Resources Council regional relationships relating basin characteristics to streamflow data (Reference 7). These relationships were developed by computing frequency curves from gaging station data in the region using a log-Pearson Type III distribution analysis. The regional equations were then derived by regressing each set of the frequency discharges on several basin and climatic parameters. The 0.2-percent-annnual-chance frequency discharge was developed by fitting lower frequency discharges to a log-Pearson Type III curve.

For the previously revised approximate studies included in this FIS, 1-percent annual-chance discharges were calculated using regression equations presented in United States Geological Survey (USGS) Water Resource Investigation Report (WRIR) 00-4233 (Reference 8).

Table 4: Summary of Discharges

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second)				
		10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
KITTY CREEK						
Confluence with Maquoketa River	51.0	5,100	8,608	11,000	14,500	25,500
MAQUOKETA RIVER						
Approximately 75 feet downstream of confluence with Tibbetts Creek	678.8	19,322	26,139	31,858	38,163	55,502
Approximately 943 feet downstream of Main Street – Old U.S. Highway 151 (Below Confluence with Kitty Creek)	666.1	19,163	25,951	31,655	37,951	55,301
Approximately 0.5 mile upstream of Main Street – Old U.S. Highway 151 (Above confluence with Kitty Creek)	610.3	18,464	25,123	30,759	37,016	54,415
Approximately 365 feet downstream of confluence with Silver Creek	572.4	17,990	24,562	30,152	36,382	53,814
Approximately 2.1 miles upstream of confluence with Silver Creek	532.5	17,492	23,972	29,513	35,716	53,183
UNNAMED STREAM						
Confluence with Kitty Creek	2.2	970	N/A	1,960	2,510	4,000

N/A = 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 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.

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the FIRM (Exhibit 2).

Roughness coefficients (Manning's "n") were chosen by engineering judgment and based on field observation of the channel and floodplain areas. Table 5, "Summary of Roughness Coefficients," contains the channel and overbank "n" values for the streams studied by detailed methods.

Table 5: Summary of Roughness Coefficients

Flooding Source	Channel	Overbanks
Kitty Creek	0.035-0.050	0.045-0.110
Maquoketa River	0.023-0.030	0.052-0.100
Unnamed Stream	0.030-0.070	0.035-0.040

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

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

For the Maquoketa River and Kitty Creek, cross section data, bridge and roughness coefficients (Manning's "n") were obtained from the leveraged hydraulic study initially developed by the Rock Island District USACE. The Summary of Roughness Coefficients can be found in Table 5, "Summary of Roughness Coefficients."

Chanel cross-section data was collected on January 26 to 29, February 23 to 26, and April 5, 2010, with a Trimble R8 GNSS receiver utilizing the Iowa RTN network and a survey level rod. Bridge data were furnished by the State of Iowa

Department of Transportation and augmented by field observations and photographs on July 26 and 27, 2010, by the Rock Island District USACE. After the July 24, 2010 Lake Delhi Dam breach, additional channel cross-section data was collected at selected locations on September 27 and 28, 2010. Overbank elevation were obtained from digital elevation LiDAR data developed by the State of Iowa.

For the downstream boundary starting conditions the leveraged hydraulic model uses a normal depth slope for both the Maquoketa River and Kitty Creek. A normal depth slope value of 0.0007 was selected for Kitty Creek and slope value of 0.000965 was selected for the Maquoketa River for use in all HEC-RAS models as it produced a representative water-surface elevation profile for the observed 2010 and 2002 flood events.

Water surface profiles were produced for the 10-, 2-, 1-, & 0.2-percent-annual-chance events for the detailed streams through the use of the U.S. Army Corps of Engineers HEC-RAS version 4.1.0 (Reference 9).

3.2.2 Methods for Flooding Sources Incorporated from Previous Studies

Streams studied by detailed methods that were not re-studied as part of this map update may include a "profile base line" on the maps. This "profile base line" provides a link to the flood profiles included in the FIS report. The detailed-study stream centerline may have been digitized or redelineated as part of this revision. The "profile base lines" for these streams were based on the best available data at the time of their study and are depicted as they were on the previous FIRMs. In some cases where improved topographic data was used to redelineate floodplain boundaries, the "profile base line" may deviate significantly from the channel centerline or may be outside the Special Flood Hazard Area (SFHA).

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

Unnamed Stream starting water-surface elevation was determined by like-frequency flooding from Kitty Creek. Water-surface profiles for Unnamed Stream were developed using a step-backwater model developed by Stanley Consultants, Inc. (Reference 10). Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

Flood elevations can be raised by debris or ice jams. The hydraulic analyses for this study are based only on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail, and if the channel and overbank conditions remain essentially the same as ascertained during the study.

For streams studied by approximate methods in this updated in the previous FIS, hydraulic analyses for the 1-percent-annual-chance flood event were performed using the USACE Hydrologic Engineering Center River Analysis Software (HEC-RAS) model, version 3.1.3 (Reference 11).

Modeled approximate-study reaches contained un-surveyed cross-sections with an average spacing of approximately 0.4 miles and did not include structures, such as bridges and culverts. Cross-section geometry data was created using the USGS 1/3 arc second National Elevation Dataset (NED) Digital Elevation Model (DEM) (Reference 12).

Aerial imagery was used to determine a Manning's roughness coefficient for the approximate hydraulic models. Field reconnaissance was not performed for approximate studies. A representative overbank and channel Manning's roughness coefficient was selected for each study reach. Roughness values range from 0.030 to 0.075 for the overbanks and 0.030 to 0.054 for the channel.

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 NGVD29. With the finalization of the 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. In 2011, effective information for this FIS report was converted from NGVD29 to NAVD88 using a countywide average conversion of -0.1 feet (NAVD88 = NGVD29 – 0.1 feet). Structure ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent counties may be referenced to NGVD29. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities.

For more information on NAVD88, 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 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
(301) 713-4172 (fax)

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.

4.1.1 Boundaries with New or Revised Analyses in Current Study

For each stream studied by detailed methods, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated for detailed streams using two-foot contours developed from LiDAR data gathered for Jones County in 2010 (Reference 13).

4.1.2 Boundaries Incorporated from Previous Studies

The small unnamed transitory stream draining northeast through northern Monticello and an area along the railroad tracks from Kitty Creek were added but these were not previously shown on the Flood Hazard Boundary Map (FHBM) (Reference 14).

For streams studied by approximate methods, only the 1-percent annual chance floodplain boundary is shown on the DFIRM. Approximate 1-percent annual chance floodplain boundaries were delineated using digital basemap information, including 1999 orthophotography (Reference 15) and the USGS 1/3 arc second

NED from the DEM (Reference 12). Approximate flood boundaries in some portions of the study area were digitized from the previous FHBMs (Reference 16).

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM. On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE); and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of moderate flood hazards (Zone X). 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.

4.2 Floodways

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

The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections and provided in Table 6, "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.

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.

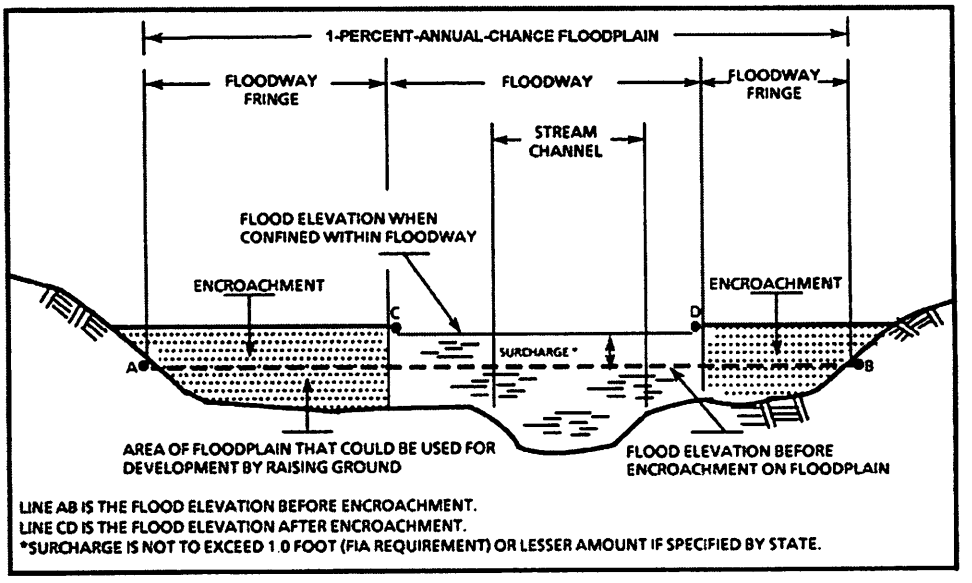

Figure 1. Floodway Schematic

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
KITTY CREEK								
A	244	950	6,290	2.3	804.1	801.0[2]	801.7	0.7
B	1,001	465	3,201	4.5	804.1	801.8[2]	802.5	0.7
C	1,697	625	4,388	3.3	804.2	804.2	805.0	0.8
D	2,967	670	4,430	3.3	806.0	806.0	806.8	0.8
E	3,929	325	2,441	5.9	807.5	807.5	808.4	0.9
F	4,489	342	3,489	4.2	812.4	812.4	812.5	0.1
G	4,928	450	4,039	3.6	812.6	812.6	812.9	0.3
H	5,359	602	6,226	2.3	813.1	813.1	813.4	0.3
I	6,178	705	6,666	2.2	813.4	813.4	813.8	0.4
J	7,048	691	5,268	2.8	813.6	813.6	813.9	0.3
K	7,689	580	4,302	3.4	814.0	814.0	814.4	0.4

[1] Stream distance in feet above confluence with Maquoketa River
[2] Elevation computed without consideration of backwater effects from Maquoketa River

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY
JONES COUNTY, IA
AND INCORPORATED AREAS

FLOODWAY DATA

KITTY CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
MAQUOKETA RIVER								
A	67,382	953	11,967	3.2	797.5	797.5	798.4	0.9
B	69,036	480	6,524	5.8	798.0	798.0	798.8	0.8
C	71,449	296	4,175	9.1	799.3	799.3	799.7	0.4
D	72,837	385	6,428	5.9	800.8	800.8	801.6	0.8
E	73,235	430	6,793	5.6	802.0	802.0	802.2	0.2
F	73,886	552	8,894	4.3	803.0	803.0	803.2	0.2
G	74,499	701	9,810	3.9	803.1	803.1	803.3	0.2
H	75,273	830	8,721	4.4	803.6	803.6	803.9	0.3
I	77,584	521	4,904	7.6	803.9	803.9	804.2	0.3
J	78,453	1346	15,642	2.4	806.5	806.5	806.8	0.3
K	80,496	1654	14,242	2.6	806.7	806.7	807.1	0.4
L	82,350	1959	14,112	2.6	807.1	807.1	807.4	0.3
M	82,676	1575	12,185	3.0	807.1	807.1	807.4	0.3
N	82,746	1370	11,002	3.3	807.1	807.1	807.4	0.3
O	83,758	931	8,128	4.5	807.2	807.2	807.5	0.3
P	84,498	1110	9,992	3.6	807.7	807.7	808.2	0.5
Q	85,810	211	3,022	12.0	808.2	808.2	808.5	0.3

[1] Stream distance in feet above Ebys Mill Road

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JONES COUNTY, IA

AND INCORPORATED AREAS

FLOODWAY DATA

MAQUOKETA RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
UNNAMED STREAM								
A	2,420	46	321	7.8	819.7	819.7	820.7	1.0
B	2,568	384	1,793	1.4	823.1	823.1	824.1	1.0
C	2,768	417	1,836	1.4	823.2	823.2	824.2	1.0
D	2,880	424	2,211	1.1	823.7	823.7	824.7	1.0
E	4,020	233	1,039	2.4	824.3	824.3	825.3	1.0
F	5,584	67	378	6.6	827.2	827.2	828.2	1.0

[1] Stream distance in feet above confluence with Kitty Creek

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

JONES COUNTY, IA

AND INCORPORATED AREAS

FLOODWAY DATA

UNNAMED STREAM

5.0 INSURANCE APPLICATIONS

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

Zone A

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

Zone AE

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

Zone X

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

6.0 FLOOD INSURANCE RATE MAP

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

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

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

The current FIRM presents flooding information for the entire geographic area of Jones 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 are presented in Table 7, "Community Map History."

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Anamosa, City of	June 28, 1974	February 27, 1976	August 19, 1987	N/A
Center Junction, City of [2]	N/A	N/A	N/A	N/A
Jones County Unincorporated Areas	April 22, 1977	N/A	September 30, 1988	N/A
Martelle, City of [1, 2]	N/A	N/A	N/A	N/A
Monticello, City of	June 28, 1974	January 9, 1976	April 2, 1979	N/A
Morely, City of [2]	N/A	N/A	N/A	N/A
Olin, City of	August 30, 1974	March 26, 1976	February 1, 1987	N/A
Onslow, City of [1, 2]	N/A	N/A	N/A	N/A
Oxford Junction, City of	June 21, 1974	January 16, 1976	August 19, 1985	N/A
Wyoming, City of	November 12, 1976	September 28, 1982	September 4, 1985	N/A

[1] No Special Flood Hazard Areas Identified
[2] This community does not have map history prior to first countywide mapping

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

JONES COUNTY, IOWA
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

This FIS incorporates all previously published FIS reports and FIRMs for the incorporated and unincorporated areas within Jones County.

This FIS report 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 Flood Insurance Mitigation Division, FEMA, Region VII, 9221 Ward Parkway, Suite 300, Kansas City, Missouri 64114-3372.

9.0 BIBLIOGRAPHY

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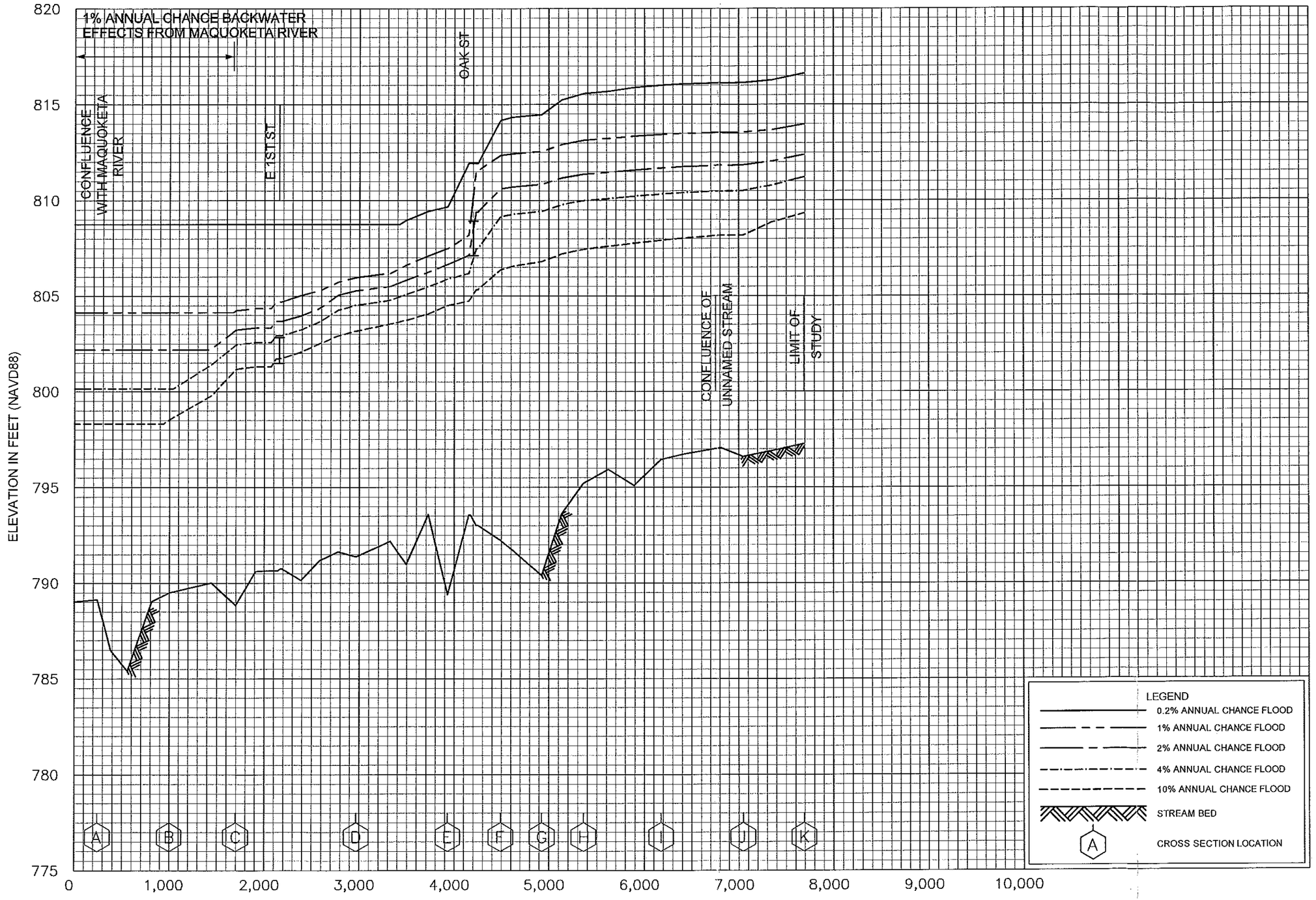


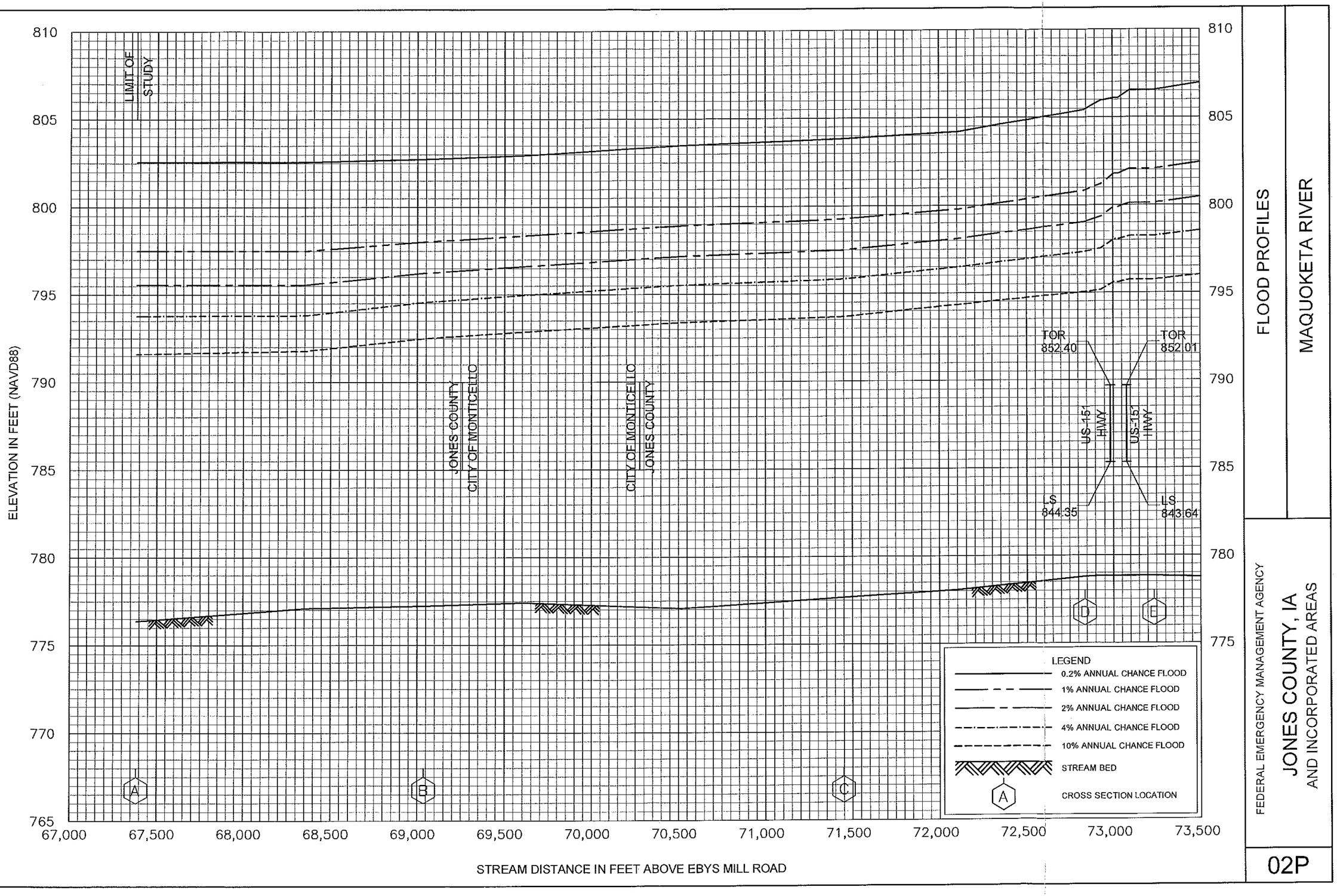
FLOOD PROFILES

KITTY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

JONES COUNTY, IA
AND INCORPORATED AREAS

01P



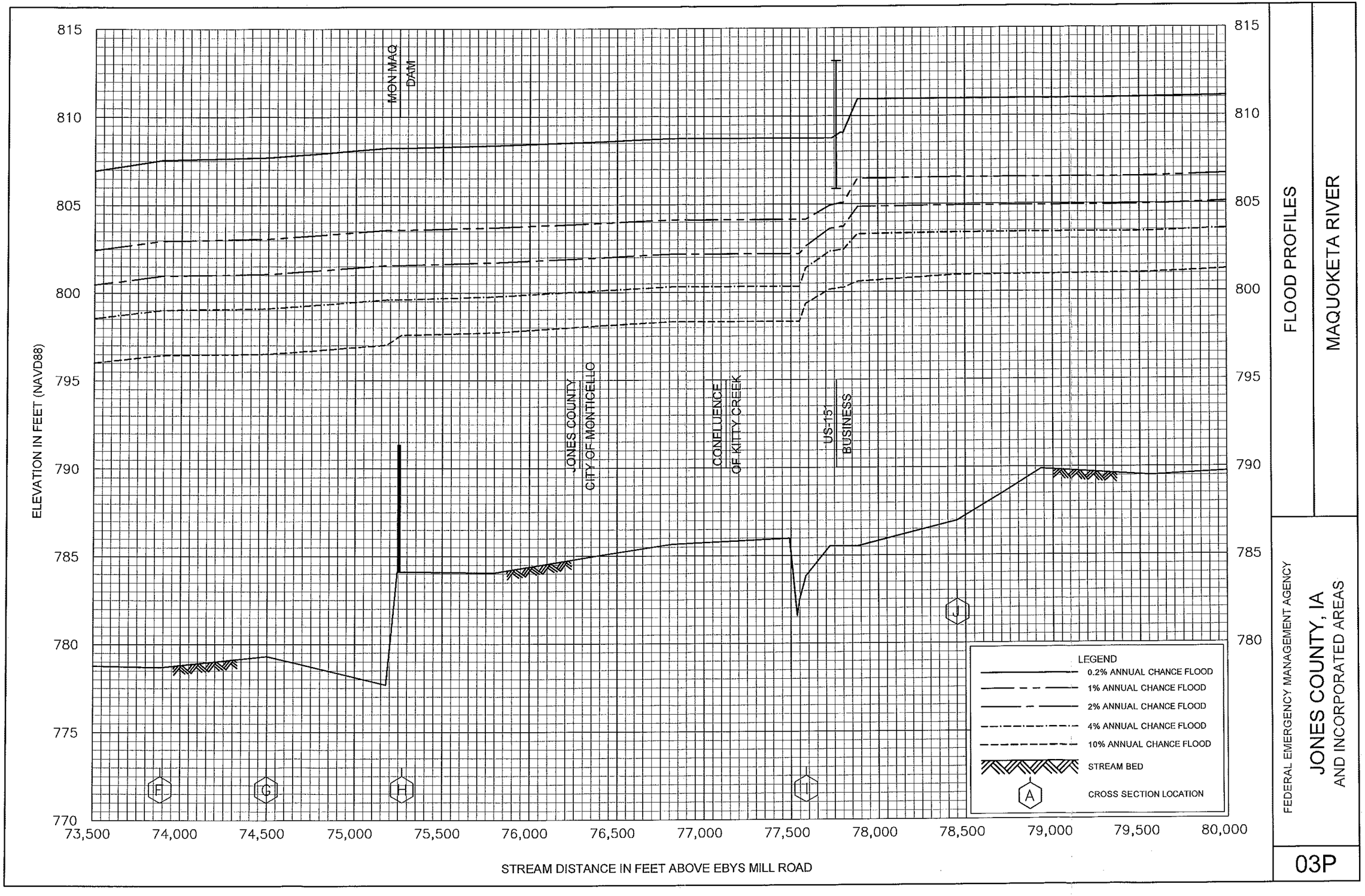
FLOOD PROFILES

MAQUOKETA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JONES COUNTY, IA
AND INCORPORATED AREAS

02P



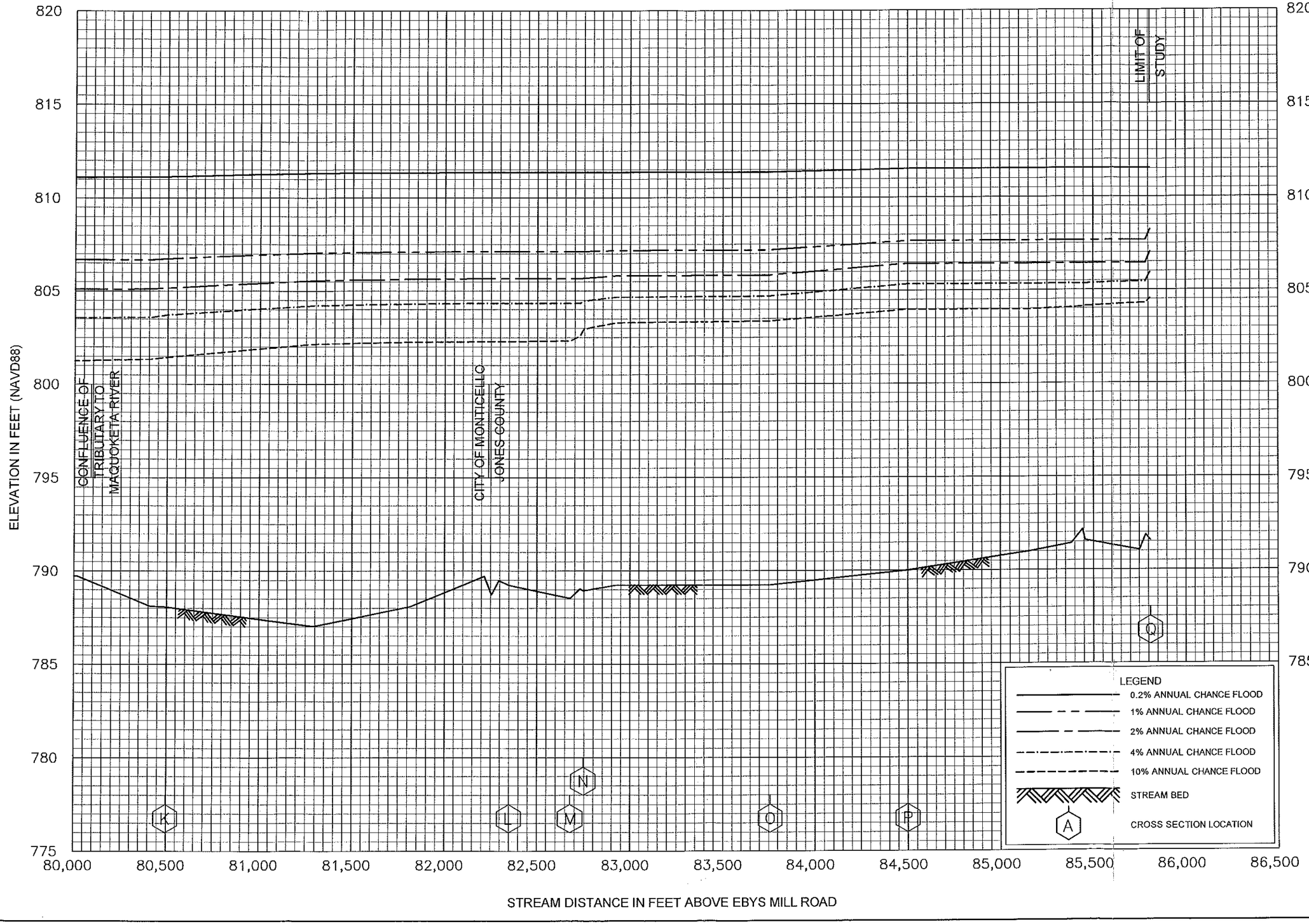
FLOOD PROFILES

MAQUOKETA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JONES COUNTY, IA
AND INCORPORATED AREAS

03P



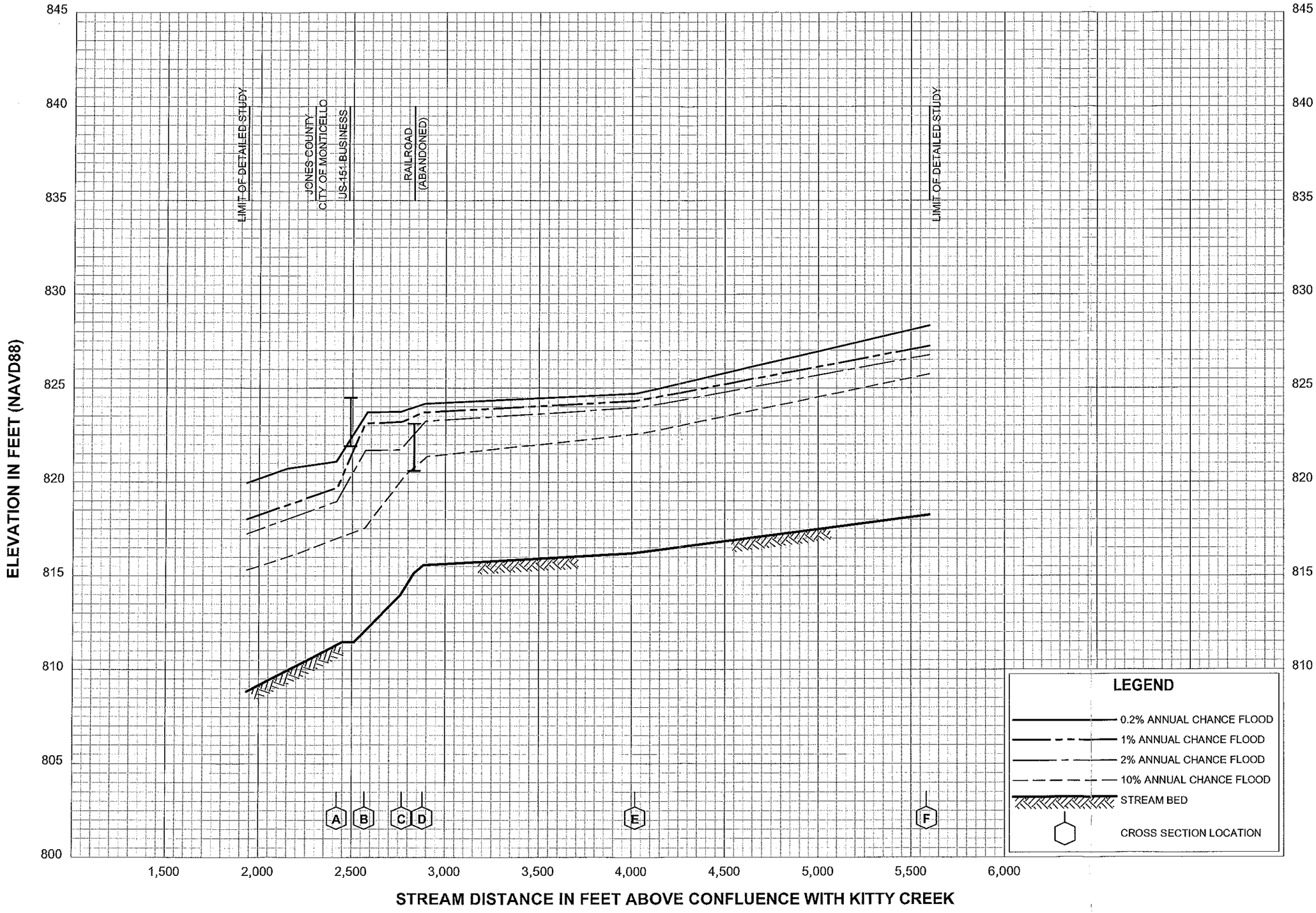
FLOOD PROFILES

MAQUOKETA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

JONES COUNTY, IA
AND INCORPORATED AREAS

04P



FLOOD PROFILES

UNNAMED STREAM

FEDERAL EMERGENCY MANAGEMENT AGENCY

JONES COUNTY, IA

AND INCORPORATED AREAS

05P