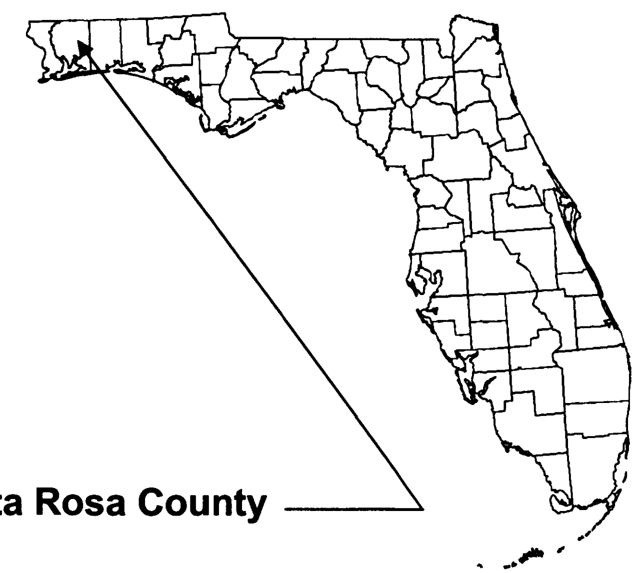
FLOOD INSURANCE STUDY

SANTA ROSA COUNTY, FLORIDA
AND INCORPORATED AREAS



Santa Rosa County

COMMUNITY NAME	COMMUNITY NUMBER
GULF BREEZE, CITY OF	120275
JAY, TOWN OF	120339
MILTON, CITY OF	120276
SANTA ROSA COUNTY (UNINCORPORATED AREAS)	120274

DECEMBER 19, 2006

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
12113CV000A

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 (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: December 19, 2006

Revised Countywide FIS Date:

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FLOOD INSURANCE STUDY
SANTA ROSA COUNTY, FLORIDA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This countywide Flood Insurance Study (FIS) investigates the existence and severity of flood hazards in, or revises and updates previous FISs/Flood Insurance Rate Maps (FIRMs) for the geographic area of Santa Rosa County, Florida, including: the Cities of Gulf Breeze and Milton, the Town of Jay, and the unincorporated areas of Santa Rosa County (hereinafter referred to collectively as Santa Rosa County).

This FIS aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This FIS has developed flood risk data for various areas of the county that will be used to establish actuarial flood insurance rates. This information will also be used by Santa Rosa County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and will also be used 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 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, Santa Rosa County in a countywide format. Information on the authority and acknowledgments for each jurisdiction included in this countywide FIS, as compiled from their previously printed FIS reports, is shown below.

Gulf Breeze, City of	the hydrologic and hydraulic analyses for the FIS report dated November 1, 1985, were performed by Stottler Stagg & Associates and GKY & Associates, Inc., for the Federal Emergency Management Agency (FEMA) under Contract No. EMW-C-0969. That work was completed in August 1984. For the FIS report dated January 19, 2000, the hydrologic and hydraulic analyses were performed

by Woodward-Clyde under Contract No. EMW-95-C-4678/TO043. The coastal 100-year stillwater elevations and analyses were reviewed by Dewberry & Davis, under subcontract to Woodward-Clyde. All work was completed in April 1998.

Milton, City of	for the FIS report dated May 15, 1985, the hydrologic analysis of the Blackwater River was performed by Stottler Stagg & Associates and GKY & Associates, Inc., for FEMA under Contract No. EMW-C-0969. The hydraulic analysis for the Blackwater River was performed by FEMA. The storm surge elevations for Blackwater Bay were performed by Stottler Stagg & Associates and GKY & Associates, Inc., while FEMA performed the wave-height analysis for Blackwater Bay. This study was completed in August 1984.
Santa Rosa County (Unincorporated Areas)	for the original FIS report dated November 1, 1985, the riverine hydrologic and hydraulic analyses of the East Bay River and the hydrologic analyses of the Blackwater River, the Escambia River, and the Yellow River were performed by Stottler Stagg & Associates and GKY & Associates, Inc., for FEMA under Contract No. EMW-C-0969. The hydraulic analyses for the Blackwater River, the Escambia River, and the Yellow River were performed by FEMA. The storm surge elevations for Escambia Bay, Pensacola Bay, Blackwater Bay, and East Bay were obtained by Stottler Stagg & Associates and GKY & Associates, Inc. All work was completed in August 1984. For the FIS report dated January 19, 2000, the coastal flood studies of the Florida Panhandle were performed by Woodward-Clyde for FEMA under Contract No. EMW-95-C-4678/TO043. The coastal 100-year stillwater elevations and analyses were revised by Dewberry & Davis, under subcontract to Woodward-Clyde. All work was completed in April 1998. For the FIS report dated July 17, 2002, the corporate limits for Santa Rosa County were updated to reflect a 1991 decision by the Florida State Legislature that transferred jurisdiction of Navarre Beach from Escambia County to Santa Rosa County.

The authority and acknowledgments for the Town of Jay are not available because no FIS report was ever published for this community.

For this countywide FIS, revised hydrologic and hydraulic analyses for Pace Mill Creek and Pond Creek were prepared for FEMA by Dewberry & Davis LLC, as a sub-consultant to URS Corporation under contract with the Northwest Florida Water Management District (NFWMD), a FEMA Cooperating Technical Partner (CTP).

The digital base map files were derived from U.S. Geological Survey (USGS) Digital Orthophoto Quadrangles, produced at a scale of 1:12,000 from photography dated 1996 or later.

The coordinate system used for the production of the digital FIRM is State Plane in the Florida North projection zone, referenced to the North American Datum of 1983.

1.3 Coordination

Consultation Coordination Officer's (CCO) meetings may be held for each jurisdiction in this countywide FIS. An initial CCO meeting is held typically with representatives of 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 typically with representatives of FEMA, the community, and the study contractor to review the results of the study.

The dates of the initial and final CCO meetings held for Santa Rosa County and the incorporated communities within its boundaries are shown in Table 1, "Initial and Final CCO Meetings."

TABLE 1 - INITIAL AND FINAL CCO MEETINGS

Community	For FIS Dated	Initial CCO Date	Final CCO Date
Gulf Breeze, City of	November 1, 1985	August 8, 1979*	December 4, 1984
	January 19, 2000	July 14, 1997*	February 12, 1999
Milton, City of	May 15, 1985	August 8, 1979*	December 5, 1984
Santa Rosa County	November 1, 1985	August 8, 1979*	December 5, 1984
(Unincorporated Areas)	January 19, 2000	July 14, 1997*	February 12, 1999
	July 17, 2002	June 12, 2001**	None

*Notification letter from FEMA
**Revision request from county

For this countywide FIS, a final CCO meeting was held on November 10, 2005. This meeting was attended by representatives of the NFWMD, Santa Rosa County, the Town of Jay, the State of Florida, and FEMA.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Santa Rosa County, Florida.

All or portions of the flooding sources listed in Table 2, "Flooding Sources Studied by Detailed Methods," were studied by detailed methods. Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

TABLE 2 - FLOODING SOURCES STUDIED BY DETAILED METHODS

Blackwater Bay	Gulf of Mexico
Blackwater River	Pace Mill Creek
East Bay	Pensacola Bay
East Bay River	Pond Creek
Escambia Bay	Santa Rosa Sound
Escambia River	Yellow River

As part of this countywide FIS, updated analyses were included for the flooding sources shown in Table 3, "Scope of Revision."

TABLE 3 - SCOPE OF REVISION

Stream	Limits of Revised or New Detailed Study
Pace Mill Creek	From Escambia Bay to State Route 197
Pond Creek	From Blackwater River to State Route 191

This FIS also incorporates the determinations of letters issued by FEMA resulting in map changes (Letter of Map Revision [LOMR], Letter of Map Revision - based on Fill [LOMR-F], and Letter of Map Amendment [LOMA], as shown in Table 4, "Letters of Map Correction."

TABLE 4 - LETTERS OF MAP CORRECTION

Community	Flooding Source(s)/Project Identifier	Date Issued	Type
Santa Rosa County (Unincorporated Areas)	Santa Rosa Sound/Gulf of Mexico	December 31, 2002	LOMR
	Santa Rosa Sound/Gulf of Mexico	May 28, 2003	LOMR
	Escambia River	August 23, 2006	LOMR

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

All or portions of numerous flooding sources in the county were studied by approximate methods. 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 and Santa Rosa County.

2.2 Community Description

Santa Rosa County is located in the northwestern panhandle of Florida. It shares its western border with Escambia County, Florida across the Escambia River. Escambia County, Alabama is the northern border while Okaloosa County is the eastern border. The southern border is the shoreline on the Gulf of Mexico. The main highways serving the area are Interstate 10; U.S. Routes 90 and 98; and State Routes 87, 89, 4, and 191. The Louisville & Nashville Railroad and a cross-country bus line serve the City of Milton and Santa Rosa County. The population of Santa Rosa County in 2000 was 117,743, according to the U.S. Census Bureau. The City of Milton is the largest city and the county seat (U.S. Department of Commerce, 2000).

Industry in the county is located in the greater Milton area. Milton is not a tourist resort or a retirement community, unlike some of the other coastal communities. Rather, it is the business and agricultural center for Santa Rosa County. Water-oriented recreational activities are served by a small craft marina (Stottler Stagg & Associates, 1977). Milton also has a barge service for carrying grains and petroleum products. Other industries in the county include forestry and agriculture.

The terrain of Santa Rosa County is varied. The southern part is mostly sandhills and pine flatwoods with swampy areas along the rivers. The northern part is almost exclusively rolling, forested hills with elevations reaching 300 feet. Eglin Air Force Base, in the southeastern corner of the county, is mostly sandhills with swamp along the Blackwater River.

The climate of Santa Rosa County is subtropical with a moderating influence from the Gulf of Mexico. Average temperatures range from 55 degrees Fahrenheit (°F) to 82°F, while average precipitation is approximately 58 inches annually.

2.3 Principal Flood Problems

Flood problems in the county can be attributed to both riverine flooding and coastal surge. River flooding occurs as a result of both naturally occurring storm patterns and severe precipitation due to hurricanes. Some of the worst floods to occur in northwestern Florida were the result of high intensity rainfall during hurricanes. The time of concentration of runoff for large basin rivers in northwestern Florida may be several days; consequently, peak flows do not, as a rule, coincide with hurricane tides at the coast. The smaller streams, however, have a shorter period for concentration of runoff, and floodflow occurring concurrently with storm surge is more likely. This greatly increases the likelihood of inundation of low-lying areas along the coast. Maximum rainfall ordinarily occurs in the eastern half of the storm system. As the storm passes inland, its intensity decreases, but heavy rainfall continues. Total precipitation of 12 inches recorded at a single station during a hurricane is not uncommon, and in northwestern Florida, rainfall has been as high as 24 inches for the duration of the storm (Stottler Stagg & Associates, 1977).

Normal rainfall patterns are greatest during two distinct periods: 1) during summer, due to afternoon and evening thunderstorms, and 2) during late winter and early spring, due to frontal systems.

Flooding in the Blackwater River Basin is caused by stream overbank flow and hurricane storm surges, and sometimes a combination of both. Riverine flooding occurs frequently and is prevalent throughout the reach of the river where the riverbanks are low and the floodplain is wide. The flat slopes and wide, heavily vegetated floodplains aggravate the flood problem by preventing the rapid drainage of floodwaters. At flood stage, the Blackwater River covers large areas, flooding forest land, farmland, fishing resorts, and other businesses built on the floodplain.

Major floods along the Blackwater River include the 1970 and 1975 floods. In 1970, the gaging station near Baker, Florida reached a stage of 86.11 feet North American Vertical Datum of 1988 (NAVD 88), 2.64 feet higher than the next largest flood. Although this gaging station is not in the immediate study area, flows recorded there are representative of the magnitude experienced within the study area. The 1975 flood was the second largest recorded, reaching a stage of 83.47 feet NAVD. The recurrence interval of the 1970 flood is once every 53 years, while the 1975 flood is once every 23 years.

Another major flooding source in the county is the East Bay River. It runs parallel to the coastline approximately two miles inland. Because development is not intense along the river, there is minimal flooding in residential areas.

There are many problems associated with Pond Creek in the vicinity of Milton. The problems include erosion and sedimentation, debris buildup at stream crossings, and overtopping of roads along the stream. Residential development along the stream will enhance the flood problem.

The coastal areas of Santa Rosa County are subject to flooding from coastal surges associated with hurricanes. Santa Rosa County has experienced flooding from several hurricanes since 1871. Among the most severe were those of 1906, 1926, and 1995. In 1906, high tides along the center coasts from Coden, Alabama to Apalachicola, Florida were experienced, with tides of 10 to 12 feet reported at Pensacola. The 1926 hurricane covered nearly the same region with tides of close to 10 feet at Pensacola and over 14 feet at Milton. This compares with the GKY & Associates, Inc., 100-year surge prediction of 4 to 9 feet NAVD (GKY & Associates, Inc., 1982). The prediction does not incorporate the effects of wind driven waves or the tidal influences of the heavenly bodies. The October 4, 1995, Hurricane Opal produced high water elevation due to storm tides from 6 to 15 feet NAVD (USACE, 1964).

The coastline in Santa Rosa County is subject to widespread flooding resulting from storm surges that accompany hurricanes and other severe storms from one or more of the following flooding sources: the Gulf of Mexico, East Bay, Escambia Bay, Pensacola Bay, Blackwater Bay, and Santa Rosa Sound. Present conclusions about recurrent coastal flood elevations rely heavily on historical evidence from the continuous tidal records identified in Table 5. Areas near the beach may be subject to wave action and high velocity surges that can cause erosion and property damage.

TABLE 5 - HISTORICAL TIDE GAUGE DATA

AGENCY and GAUGE I.D.	SITE NAME	LATITUDE	LONGITUDE	MEAN TIDE RANGE (FT)	PERIOD of RECORD
NOS 8728690	Apalachicola	29° 43.6' N	84° 58.9' W	1.11	1967-95
USACE 02359665	Panama City	30° 09'22" N	85° 38'12" W	1.33	1935-95
NOS 8729108	Panama City	30° 09.1' N	85° 40.0' W	1.24	1975-95
NOS 8729210	Panama City Beach	~ 30.2° N	~ 85.8° W	1.25	1989-94
USACE 02366990	Destin/East Pass	30° 23'20" N	86° 30'04" W	0.58	1957-94
NOS 8729681	Navarre Beach	30° 22.6' N	86° 51.9' W	0.74	1978-89
NOS 8729840	Pensacola	30° 24.2' N	87° 12.8' W	1.19	1923-95
USACE 02376083	Gulf Beach	30° 18'50" N	87° 25'40" W	0.83	1940-95

Brief notes on the history and damages caused by hurricanes are abstracted from reports by the U.S. Army Corps of Engineers (USACE), Garriott, Sumner, and Patterson, Bailey, and Paulhus (USACE, 1964; USACE, 1972; Garriott, E.D., 1906; Sumner, Howard C., 1941; and USGS, 1972). Additional information on hurricane history and damages, particularly for recent storms, comes from papers published in the Monthly Weather Review. The following pages list the significant storms affecting the Panhandle in this century. Damage figures are those determined for values at the time of the storm, and no attempt has been made to adjust these figures to present day values.

1915 (August 31-September 6)

This storm made landfall near Port St. Joe with the heaviest damage occurring to the east near Apalachicola, Florida. Damage was estimated to cost $40,000. Tide levels of 7.8 feet mean sea level (msl) were recorded at Carrabelle, Florida.

1917 (September 21-September 29)

This storm made landfall near Fort Walton Beach with damages estimated at $270,000. Tide levels of 7.8 feet msl were recorded at Fort Barrancas, Florida.

1924 (September 13-September 19)

Crossing the shoreline near Port St. Joe, this storm caused damage estimated at $275,000. Winds of 80 mph were recorded at Panama City, Florida.

1929 (September 21-October 4)

The center of this storm entered the coast near Panama City. Damage from the storm was estimated at $500,000.

1936 (July 26-August 1)

The center of this storm passed over Fort Walton Beach and Valparaiso. Damage was estimated at $150,000. Tide levels of 7 to 8 feet msl were recorded at Destin. A high water mark of 8.4 feet msl was reported at Fort Walton Beach.

1950 Hurricane Baker (August 20-September 1)

The center of this storm entered the coast between Pensacola, Florida, and Mobile, Alabama, with damage estimated at $550,000. Tide levels recorded during the passage of this storm include: 4.5 feet msl at Pensacola and Carrabelle; 5 feet msl at Panama City; and 6.8 feet msl at Apalachicola.

1953 Hurricane Florence (September 23-September 28)

This storm made landfall between Panama City and Fort Walton Beach with damage estimated at $150,000.

1956 Hurricane Flossy (September 21-September 30)

This major hurricane caused extensive damage along the Louisiana, Mississippi, and Alabama coasts. Total damage was estimated at $25 million. Tide levels of 5.5 feet msl were recorded at Fort Walton Beach. Tides at Destin were estimated at 6 to 7 feet msl.

1972 Hurricane Agnes (June 14-June 22)

This storm hit the shoreline near Panama City. Tide levels of 8 to 9 feet msl were recorded at several points from St. George Island to Panacea, Florida.

1975 Hurricane Eloise (September 13-September 24)

Making landfall approximately 40 miles west of Panama City, this storm produced high water marks, ranging between 10 and 18 feet, between the Cities of Destin and Port St. Joe. Damage to shorefront residential structures was extensive. Over 1.08 billion dollars of damage to residential and commercial property were claimed as a result of this storm.

1979 Hurricane Frederic (August 29-September 14)

Making landfall west of Mobile Bay, in Alabama, this storm resulted in damage to shorelines, residential and commercial structures, along Mississippi, Alabama, as well as Escambia County, Florida shorelines. Dauphin Island, Alabama, sustained extensive damage, resulting from wind and the tidal surge from the Gulf of Mexico. Over 3.5 billion dollars in damage to residential and commercial property were claimed as a result of this storm.

1985 Hurricane Elena (August 29-September 2)

Crossing the shoreline near Gulfport, Mississippi, this storm resulted in damages to residential and commercial property in portions of Louisiana, Mississippi, Alabama and portions of the western panhandle of Florida. Due to the storm track running parallel to the Florida shoreline, significant damage to shorefront structures was sustained between Apalachicola and Pensacola Beach. Nearly 1.4 billion dollars in damage to residential and commercial property were claimed as a result of this storm.

1985 Hurricane Kate (November 15-November 23)

The second hurricane of 1985 to affect the Florida panhandle was a category 2 hurricane that made landfall near the City of Port St. Joe. With sustained winds approaching 100 miles an hour, this storm resulted in damage to shoreline residential and commercial structures. Storm related damage was reported along eastern portions of the Florida panhandle, as well as in the City of Tallahassee, Florida and northward. Over 300 million dollars in damage to residential and commercial property were claimed as a result of this storm.

1994 Tropical Storm Alberto (June 30-July 7)

This storm, although never reaching hurricane intensity, made landfall near Pensacola Beach with only minor beach and structural damage being reported. This slow moving storm stalled over portions of Alabama and Georgia resulting in extensive flooding, due to excessive rainfall, over portions of the Florida panhandle, as well as portions of Alabama and Georgia. Storm related damages exceeded 500 million dollars.

1995 Hurricane Erin (July 31-August 6)

This storm made its second Florida landfall, as a weak Category 2 storm, near Fort Walton Beach on August 3. Moderate beach erosion was sustained between Navarre Beach and Pensacola Beach. Storm surges varied from 3 feet in Pensacola Beach to 7 feet in Navarre Beach. Damage to residential and commercial structures, resulting from hurricane force winds, affected over 2000 structures within portions of the Cities of Pensacola and Mary Esther, as well as Pensacola Beach and Navarre Beach. Storm related damages to residential and commercial property, within the State of Florida, approached 350 million dollars.

1995 Hurricane Opal (September 27-October 5)

After briefly reaching Category 4 intensity in the Gulf of Mexico, Hurricane Opal made landfall as a Category 3 hurricane near Pensacola Beach on October 4. Hurricane force winds were reported between Pensacola Beach and Cape San Blas, with sustained winds exceeding 100 miles an hour in an area between the Cities of Destin and Panama City Beach. Beaches and dune systems, already weakened by Hurricane Erin, sustained extensive erosion and wash over as a result of the storm. Storm surges varied between 5 and 14 feet depending on location. Breaking waves in some areas added approximately 10 feet to the reported storm surge. High water marks above mean sea level varied from 10 feet in Pensacola Beach, to 18 feet in Panama City Beach, to over 21 feet in Walton County. Beach and dune erosion, as well as damage to commercial and residential structures, was reported to be extensive for shoreline areas of the Gulf of Mexico, as well as portions of shoreline areas of Pensacola Bay, Santa Rosa Sound, and Choctawhatchee Bay. Storm related damages to residential and commercial property exceeded 3 billion dollars.

2.4 Flood Protection Measures

There are no extensive constructions for flood protection. A few individuals have built private bulkheads and some new homes are being built with a high first floor elevation.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which 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 which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, 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 Riverine Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the county. Analyses were also carried out to establish the peak elevation-frequency relationships for each coastal flooding source studied in detail.

Precountywide Analyses

Two methods were used to determine the discharges used on the streams studied in detail. For gaged sites with 10 years or more of record, historical data were fitted to a log-Pearson Type III distribution to obtain the desired discharge-frequency relationship. In this analysis, the methods established by the U.S. Water Resources Council Bulletin 17A (U.S. Water Resources Council, 1977) were followed utilizing data provided by the Tallahassee Subdistrict of the U.S. Geological Survey (USGS). For ungaged sites, regional analyses were performed using the procedures in USGS Water Supply Paper (WSP) No. 1674 Magnitude and Frequency of Floods in the United States (USGS, 1966).

To determine the accuracy of the data and curves in WSP 1674, various frequency flows at gaged sites were estimated by regional analysis and compared to the log-Pearson Type III distributions obtained from the data at the gages. The log-Pearson Type III distributions were consistently steeper than the regionally determined distributions and always provided the better fit to the actual measured data. Variations in the estimated flows by the two methods often exceeded 100 percent, particularly at the higher recurrence intervals.

To minimize the disparity between the regionally determined and log-Pearson Type III flows, it was necessary to modify the regional curves on a hydrologic subunit basis to reflect flood frequency conditions more accurately. The regional analysis methodology of WSP 1674 was developed utilizing a log-normal distribution for data through 1961. The initial modifications to the regional analysis were to include all data through the 1977 Water Year and to reconstruct the regional curves in WSP 1674 using log-Pearson Type III distributions rather than log-normal distributions. This was done by replotting the Mean Annual Flow (Q_m) vs. Drainage Area relationship, taking Q_m from the log-Pearson Type III curves at each gage. The ratio of Peak Flow (Q_p/Q_m) vs. Recurrence Interval was also replotted using log-Pearson Type III values. By incorporating skew into the regional analysis, the regionally determined distributions were made similar to the log-Pearson Type III distributions at the gages. The differences in the estimated flows at the gages by the two methods were also smaller, reflecting the fact that the flows were determined by similar distributions and that the regional analysis included an additional 16 years of record at many stations.

To further reduce the discrepancies in flows and to bring the regionally determined flows within the expected sampling error at the gages, an adjustment factor was applied to the Mean Annual Flow used in the regional analysis. This adjustment was determined in the following manner. For each gaged site in the hydrologic region, flows from the 2-, 10-, 25-, 50-, 100-, and 500-year return period floods determined by a log-Pearson Type III analysis were divided by the regional Q_p/Q_m ratios to give values that represent what Q_m should have been for the regional analysis to duplicate exactly the log-Pearson Type III values at a gage. The six values so obtained were averaged to give a single value, Q_m', for the station. Plotting Q_m' against Q_m yielded three straight lines, each representing a different hydrologically similar region. The slope of these curves provided a single adjustment factor for each region, applicable to Q_m determined from the Q_m vs. Drainage Area relationship. This procedure required only one initial correction for streams in a hydrologic subunit and yielded regionally determined flows that approximate those determined by a log-Pearson Type III analysis. Over the range of return periods of interest to this study, the regionally estimated flows fall within the 50 percent confidence interval defined by the confidence limits applicable to the log-Pearson Type III distributions at the gages.

Countywide Analyses

Information on the methods used to determine peak discharge-frequency relationships for the streams restudied as part of this countywide FIS is shown below.

HEC-HMS rainfall runoff models were developed to perform the hydrologic analyses for both Pace Mill and Pond Creeks. Watershed drainage area boundaries were delineated based on USGS 10' contour interval topography, which is the best available data for Santa Rosa County. Sub-basin outlets were located at major road crossings and at the confluences of major tributaries. The Pace Mill Creek watershed was divided into 4 sub-basins, and had a total drainage area of 6.2 square miles at its confluence in Pensacola Bay. Pond Creek has total drainage area of 94 square miles, which was divided into 7 sub-basins for the hydrologic analysis. Discharges were calculated for the 2-year, 10-year, 50-year, 100-year, and 500-year return frequencies. Rainfall values and distributions are consistent with TP-40 and Hydro-35. The NRCS Curve Number method was used to calculate storm runoff volumes. Curve Numbers were determined from land use polygons digitized and identified from the 2004 USGS DOQQs, and digital NRCS Soils Maps. The hydrologic soil type, land use, and sub-basin polygons were unioned in ArcGIS to determine composite Curve Numbers for each sub-basin. The NRCS TR-55 method was used to determine time of concentration (converted to lag times) values for each sub-basin. The flow paths and parameters for time of concentration were based on the DOQQs, USGS topography, field survey data, survey photos, and field observation. Muskingkum-Cunge 8-point cross sections were developed for reach routing of hydrographs through each sub-basin based on the field survey cross section used in the hydraulic analyses. No reservoir routing was performed in either watershed, as there did not appear to be any structures providing substantial flow attenuation or storage.

USGS regression equations were used to estimate discharge values at several locations along both Pace Mill Creek and Pond Creek, as a check and source of comparison with the discharges determined in the HEC-HMS rainfall-runoff models. In addition, one USGS gauge site exists at the upstream limit of study for Pond Creek, and both an unweighted and weighted statistical analysis following Tehcnical Bulletin 17-B was performed as a check and for comparison with the HEC-HMS results. Because only 24 years of record were available for this gauge, and due to some limited development and change in agricultural land use in the watershed during that period, it was determined that the statistical analysis was not reliable enough to be used as the primary hydrologic method for Pond Creek, but was suitable for comparison and confidence limits evaluation. The calculated peak 100 year flood discharge values from the HEC-HMS model were moderately higher than the USGS regression equation and statistical analysis results. However, the HEC-HMS results were within the standard error of the regression flow values, and within the 95-percent confidence limit values of the Bulletin 17-B analysis.

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 6, "Summary of Discharges."

TABLE 6 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs)			
		10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
BLACKWATER RIVER					
Just downstream of the Louisville and Nashville Railroad	747.4	35,900	69,900	89,900	152,900
Just upstream of the confluence of Big Juniper Creek	690	33,500	65,400	84,000	143,000
EAST BAY RIVER					
Approximately 0.5 mile upstream of the confluence of Panther Creek	83	5,069	8,563	10,385	15,576
ESCAMBIA RIVER					
Just upstream of U.S. Route 90	4,084	83,665	163,110	209,605	356,680
At State Route 184	4,147	82,153	134,177	161,087	237,286
At State Route 4	3,817	76,322	121,929	145,039	208,946
PACE MILL CREEK					
Approximately 2000 feet Downstream of U.S. Route 90	6.2	1,838	3,540	4,091	5,881
POND CREEK					
Just upstream of the Confluence of the Blackwater River	94	10,947	20,548	24,112	36,088
Just upstream of State Route 191	57.1	8,925	15,079	17,356	25,537
YELLOW RIVER					
Just upstream of the confluence of the Shoal River	647	30,100	58,700	75,500	128,400

*cubic feet per second

3.2 Riverine Hydraulic Analyses

Precountywide Analyses

Analyses of the hydraulic characteristics of flooding from the riverine sources studied were carried out to provide estimates of the elevations of the 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. For construction and/or floodplain management purposes, users are encouraged to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

Cross sections, dams, and culverts for the backwater analysis of the streams studied in detail were obtained by field survey. The surveys were tied into USGS benchmarks. Cross sections for the Yellow River were obtained from USGS topographic maps (USGS, 1970, et cetera).

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 FBFM or the revised FIRM (Exhibit 2).

Water-surface elevations of floods of the selected recurrence intervals were computed through use of the USACE HEC-2 step-backwater computer program (USACE, 1976). Starting water-surface elevations were calculated using the slope-area method. Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Channel roughness factors (Manning's "n") used in hydraulic computations were chosen by engineering judgment and based on field observations of the streams and floodplain areas. The channel roughness values ranged from 0.035 to 0.045 while the floodplain values ranged from 0.15 to 0.18.

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

Countywide Analyses

Information on the methods used to determine peak discharge-frequency relationships for the streams restudied as part of this countywide FIS is shown below.

Pace Mill Creek has been studied from its confluence at Pensacola Bay upstream to its crossing of State Route 197, for a total reach studied of about 5.1 miles. Pond Creek has been studied from its confluence with the Blackwater River upstream to its crossing of State Route 191, for a total reach studied of approximately 13.1 miles. There is mostly low to medium density residential development along the Pace Mill Creek corridor, with some undeveloped areas as well. The watershed is primarily residential and undeveloped land, with smaller amounts of commercial development and agricultural areas. Adjacent to Pond Creek is mostly undeveloped dense forest in the upper reaches, with scattered residential and commercial development in the lower reaches. Similarly, the Pond Creek watershed contains large areas of Paper company-owned Forests, with some agricultural, residential, and commercial areas. The topography of the floodplain areas for both creeks provide relief, and the average slope of Pace Mill Creek is about 24 feet per mile, while Pond Creek averages a slope of approximately 4 feet per mile. There are no substantial lakes or reservoirs in these basins.

Twelve regular cross section surveys along with five culvert crossing surveys were conducted on Pace Mill Creek. For Pond Creek, 29 regular cross sections and six bridges were field surveyed. All field survey was established with horizontal control in Florida North Zone (903) State Plane coordinates, and vertical control in NAVD 1988 datum. Bridge and culvert structure surveys included the top of road profile. In some cases a regular cross section was field surveyed on the upstream side of a road crossing, and the cross section geometry was copied and used for the downstream side of the crossing in the HEC-RAS models. Field survey was conducted by Southeastern Surveying & Mapping Corporation.

Manning's "n" values were determined from field observation, surveyor photographs, and DOQQs, in accordance with the HEC-RAS hydraulic reference manual. The overbanks of the floodplains for both creeks were consistently in heavy vegetative cover. The channel of Pond Creek was relatively clear and clean in the lower reaches where it is very wide, but is somewhat covered by vegetation from the banks in the middle and upper reaches. Pace Mill Creek has a fairly straight but overgrown channel. The starting water-surface elevations in both HEC-RAS models were determined using the normal depth method. Normal depth produced WSELs greater than mean high tide, but lower than the coastal Stillwater surge elevations from the effective FEMA maps. Floodways were determined for both streams using method 4 encroachment initially, then method 1 to refine the floodway and fix the encroachment stations. All surcharge values are between 0.0 and 1.0, and floodway contains the channel and is within the 100-year floodplain at all cross sections.

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and were based on field observations of the streams and floodplain areas. For Pace Mill Creek, the channel "n" value was 0.05 and the overbank "n" value was 0.12. For Pond Creek, the channel "n" value ranged from 0.035 to 0.05 and the overbank "n" value was 0.12.

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.

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 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 bench marks shown on the FIRM for this jurisdiction, please contact the Information Services Branch of the NGS at (301) 713-3191, or visit their Web site at www.ngs.noaa.gov.

It is important to note that 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 this FIS and FIRM. Interested individuals may contact FEMA to access this data.

3.3 Coastal Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail affecting the county. Establishing appropriate relationships has been an iterative process, and the following material describes successive stages of analyses reaching present conclusions.

Inundation from the Gulf of Mexico, Pensacola Bay, Escambia Bay, Blackwater Bay, East Bay, and Santa Rosa Sound caused by passage of storms (storm surge) was determined by the joint probability method (U.S. Department of Commerce, 1970). The storm populations were described by probability distributions of 5 parameters that influence surge heights. These were central pressure depression (which measures the intensity of the storm), radius to maximum winds, forward speed of the storm, shoreline crossing point, and crossing angle. These characteristics were described statistically based on an analysis of observed storms in the vicinity of Santa Rosa County. Primary sources of data for this were obtained from Some Climatological Characteristics of Hurricanes and Tropical Storms, Gulf and East Coasts of the United States (U.S. Department of Commerce, 1975) by the National Oceanic and Atmospheric Administration (NOAA) and Meteorological Considerations Pertinent to Standard Project Hurricane, Atlantic and Gulf Coasts of the United States (U.S. Department of Commerce, 1959).

For areas subject to flooding directly from the Gulf of Mexico, Pensacola Bay, Escambia Bay, Blackwater Bay, East Bay, and Santa Rosa Sound, the FEMA standard storm surge model was previously used to simulate the coastal surge generated by any chosen storm (that is, any combination of the 5 storm parameters defined previously). By performing such simulations for a large number of storms, each of known probability, the frequency distribution of surge height can be established as a function of coastal location. These distributions incorporate the large-scale behavior, but do not include an analysis of the added effects associated with much finer scale wave phenomena, such as wave height, wave runup, or wave setup. As the final step in the calculations, the astronomic tide for the region is then statistically combined with the computed storm surge to yield recurrence intervals of total water level (Tetra Tech, Inc., 1981).

The investigations for the 2000 FIS (FEMA, 2000), assembled and reviewed available reports and extensive data relating to storm surge and wave effects along the Florida Panhandle coast from Hurricane Opal on October 4, 1995. Existing data and studies include the report on Opal's basic meteorology by the National Hurricane Center (NHC), a hindcast for Gulf of Mexico wave action by the Coastal Engineering Research Center (CERC), and a National Oceanographic and Atmospheric Administration (NOAA) simulation of coastal storm surge using the numerical Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model. Other primary data comprised of long-term and Opal-related measurements of wave characteristics at offshore sites (over 25 total years of wave records) by the National Data Buoy Center (NDBC); historical tide gauge data for water levels at coastal sites (over 275 total years of tide records) by the National Ocean Service (NOS) and the USACE (Table 1); post-Opal coastal dune erosion assessments recorded by the Florida Department of Environmental Protection (FDEP); and post-Opal high water mark surveys and coastal inundation mapping performed by FEMA and the USACE, Mobile District.

Wave setup has been previously determined to be a significant contributor to the total stillwater flood levels along the Gulf of Mexico open ocean coastline along Santa Rosa Island. For the January 19, 2000, revision, the 100-year stillwater elevations for the open ocean areas along Gulf of Mexico coastline were modified to include the effects of 2.5 feet of wave setup (equal to 0.07 times 11 meters wave height, following the lower-bound USACE guidance given in the Shore Protection Manual) (USACE, 1984).

The revised storm surge elevations for the 100-year flood for the Gulf of Mexico, Santa Rosa Sound, and Pensacola Bay are shown in Table 7, "Summary of Coastal Stillwater Elevations." The analyses reported herein reflect the stillwater elevations due to tidal and wind effects, and include the contributions from wave action effects. The 10-, 50-, 100-, and 500-year flood elevations for other coastal flood sources, areas such as Escambia Bay and East Bay, which did not change as a result of the investigations conducted for the 2000 FIS (FEMA, 2000), are also shown in Table 7.

TABLE 7 - SUMMARY OF COASTAL STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet NGVD*) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
BLACKWATER BAY				
Along shoreline from Eagle Point Northeast to Bay Point	3.4	6.4	7.6	9.4
Along shoreline from Grassy Point North to Skim Lake	3.3	6.4	7.4	9.3
Along shoreline in the vicinity of confluence of the Blackwater River	3.7	7.0	8.2	10.3
Along shoreline of Blackwater River from Interstate 10 to the southern corporate limits of Milton	4.0	7.7	9.0	11.3
In the vicinity of Whiteoak Bayou	2.9	5.6	6.5	8.2
In the vicinity of Eagle Point	3.3	6.2	7.3	9.2
Along shoreline in the vicinity of Fundy Bayou at Blackwater Bay	3.0	5.8	6.8	8.5
EAST BAY				
Along shoreline from Escribano Point southeast to Miller Point	2.8	5.4	6.3	7.9
In the vicinity of Miller Point and Holley Point	3.1	5.9	6.9	8.6
Just north of White Point	2.6	4.9	5.7	7.1
Shoreline segment in the vicinity of Wilson Memorial Church	2.7	5.2	6.1	7.7
In the vicinity of Escribano Point	2.9	5.6	6.5	8.2
From Miller Point to Redfish Point	2.9	5.5	6.5	8.1
	2.7	5.2	6.1	7.6
	2.6	4.8	5.7	7.1
	2.2	4.2	5.0	6.2
	2.1	3.9	4.6	5.7
	1.9	3.6	4.2	5.3

*North American Vertical Datum of 1988

TABLE 7 - SUMMARY OF COASTAL STILLWATER ELEVATIONS - continued

FLOODING SOURCE AND LOCATION	ELEVATION (feet NGVD*)			
	10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
ESCAMBIA BAY				
Along shoreline from Trout Bayou to Liveoak Point	3.0	5.9	6.8	8.6
Along shoreline from Liveoak Point to Floridatown	3.4	6.6	7.7	9.7
Along shoreline just south of confluence of Bannahassee River	3.7	7.1	8.3	10.4
SANTA ROSA SOUND				
Entire shoreline within community	3.8	6.6	7.8	10.6
Along shoreline at confluence of Bannahassee River	3.8	7.3	8.5	10.7
Just west of the U.S. Route 90 bridge along the Escambia and Simpson Rivers	3.8	7.3	8.5	10.6
Just north of Interstate 10 in the vicinity of Mulatto Bayou	3.2	6.2	7.3	10.1
From the Trout River south to Hernandez Point	2.6	4.9	5.8	7.2
GULF OF MEXICO				
Entire shoreline within community	3.8	6.6	10.3[1]	10.6
PENSACOLA BAY				
Along shoreline from Hernandez Point to White Point	2.5	4.7	5.5	6.9
Along shoreline from Redfish Point to Gulf Breeze - Santa Rosa corporate limits	2.1	4.0	4.7	5.8

[1]Includes wave setup of 2.5 feet
*North American Vertical Datum of 1988

3.4 Coastal Hydraulic Analyses

Users of the FIRM should be aware that coastal flood elevations are provided in the Summary of Stillwater Elevations table in this report. If the elevation on the FIRM is higher than the elevation shown in this table, a wave height, wave runup, and/or wave setup component likely exists, in which case, the higher elevation should be used for construction and/or floodplain management purposes.

Hydraulic analyses, considering storm characteristics and the shoreline and bathymetric characteristics of the flooding sources studied, were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of the shorelines.

The methodology for analyzing the effects of wave heights associated with coastal storm surge flooding is described in a report prepared by the National Academy of Sciences (National Academy of Sciences, 1981). This method is based on the following major concepts. First, depth-limited waves in shallow water reach a maximum breaking height that is equal to 0.78 times the stillwater depth. The wave crest is 70 percent of the total wave height above the stillwater level. The second major concept is that wave height may be diminished by dissipation of energy due to the presence of obstructions, such as sand dunes, dikes and seawalls, buildings, and vegetation. The amount of energy dissipation is a function of the physical characteristics of the obstruction and is determined by procedures prescribed in the User's Manual for Wave Height Analysis (FEMA, 1981). The third major concept is that wave height can be regenerated in open fetch areas due to the transfer of wind energy to the water. This added energy is related to fetch length and depth.

For the 2000 FIS (FEMA, 2000), the FIS includes a technical wave height analysis using the revised 100-year flood elevations as described in Section 3.1 above. The analysis was performed as specified in FEMA's Guidelines and Specifications for Wave Elevation Determination and V Zone Mapping (FEMA, 1995). The 2000 FIS (FEMA, 2000) updates the existing FIS on the basis of the post-Hurricane Opal investigations and FEMA's updated definition of "coastal high-hazard areas" and "primary frontal dune," field investigations, and development of topography and aerial photography.

For the 2002 FIS (FEMA, 2002), Escambia County transects 14 and 15 were transferred from the Escambia County and incorporated areas FIS text, dated February 23, 2000, to the Santa Rosa FIS text, and renumbered as transects 18 and 19 to reflect the annexation of Navarre Beach.

As of 1989, FEMA defines a "coastal high hazard area" as an area of special flood hazards extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action (i.e., wave heights greater than or equal to 3 feet) from storms or seismic sources. The "primary frontal dune" is defined as a continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms, such as hurricanes. The inland limit of the primary frontal dune occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.

Some dunes in Santa Rosa County were found to be sufficient enough in size to sustain wave attack, while others were subjected to failure due to wave attack, erosion and overtopping. Therefore, using standard erosion analysis procedures as outlined in the Guideline and Specifications for Wave Elevation Determination and V Zone Mapping, dune erosion and retreat were used in developing the eroded profiles.

Wave heights were computed along transects (cross-section lines) that were located along coastal and inland Santa Rosa Sound areas of Santa Rosa County, as illustrated in Figure 1, "Transect Location Map". The transects were located with consideration given to existing transect locations and to the physical and cultural characteristics of the land so that they would closely represent conditions in the locality. Transects were spaced close together in areas of complex topography and dense development. In areas having more uniform characteristics, they were spaced at larger intervals. It was necessary to locate transects in areas where unique flooding existed and in areas where computed wave heights varied significantly between adjacent transects.

The wave height transects for the 2000 FIS (FEMA, 2000) were located along the barrier island coastline of the Gulf of Mexico, from the westernmost county limits with Escambia County (near Pensacola Beach/Santa Rosa Island Authority) to the easternmost county limits with Okaloosa County, and along Santa Rosa Sound to the City of Gulf Breeze, and up in Escambia Bay and Pensacola Bay. For the barrier islands, the FEMA erosion treatment (540 square foot method) was performed to adjust the wave transect profiles to an eroded condition before conducting the wave height or wave runup analyses using the FEMA wave height analysis models (WHAFIS 3.0 and RUNUP 2.0). For each coastal transect without overtopping by the 100-year stillwater elevation, wave runup analyses were conducted using the FEMA wave runup model (RUNUP2.0). After analyzing the wave heights and wave runup along each transect, wave elevations were interpolated between transects.

Each transect was taken perpendicular to the shoreline and extended inland to a point where wave action ceased. Along each transect, wave heights and elevations were computed considering the combined effects of changes in ground elevation, vegetation, and physical features. The stillwater elevations for the 100-year flood were used as the starting elevations for these computations. Wave heights were calculated to the nearest 0.1 foot, and wave elevations were determined at whole-foot increments along the transects. The location of the 3-foot breaking wave for determining the terminus of the V zone (area with velocity wave action) was also computed at each transect. Table 8, "Transect Descriptions," provides a listing of the transect locations and stillwater starting elevations, as well as initial wave crest elevations. Dune erosion was taken into account along the Gulf Coast shoreline of Santa Rosa Island.

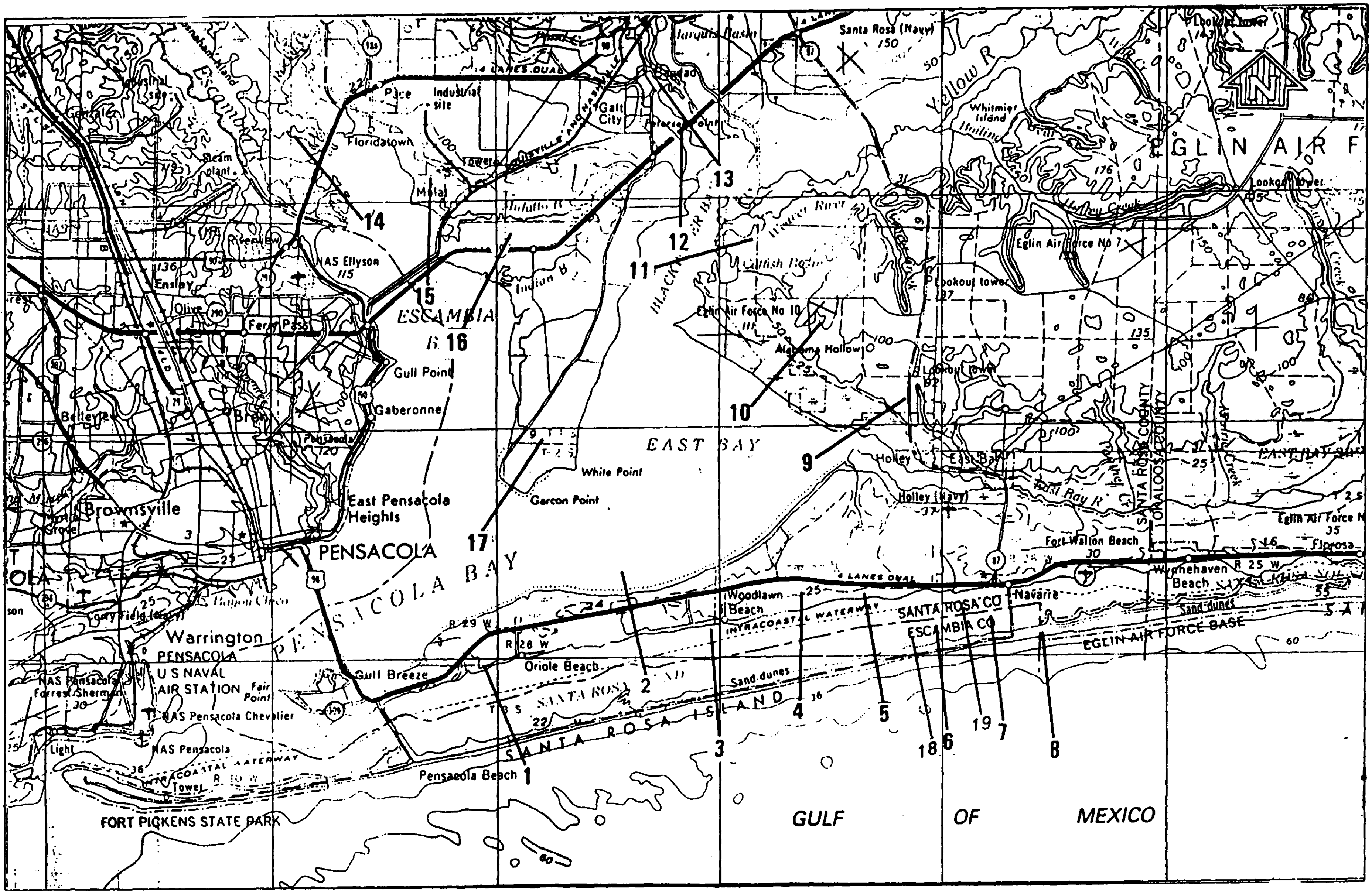


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL AND INCORPORATED AREAS

APPROXIMATE SCALE

4 0 4 8 12 MILES

TRANSECT LOCATION MAP

Various source data were used in the interpolation, including topographic maps, aerial photographs, FDEP aerial photography and surveys, and engineering judgment. The transect data is presented in Table 8, "Transect Descriptions," which describes the location of each transect. In addition, Table 8 provides the Gulf of Mexico 100-year stillwater and maximum wave crest elevations for each transect along with the corresponding inland bay or soundside 100-year stillwater and maximum wave crest elevation. In Table 9, "Transect Data," the flood hazard zone and base flood elevations for each transect flooding source is provided, along with the 100-year stillwater elevation for the respective flooding source.

TABLE 8 - TRANSECT DESCRIPTIONS

		ELEVATION (feet NAVD*)	
TRANSECT	LOCATION	1-PERCENT STILLWATER	MAXIMUM 1-PERCENT WAVE CREST[1]
1	Approximately 1,550 feet southwest of the intersection of Woodlore Circle and Fawn Lane, extending northwest through Oriole Beach from Santa Rosa Sound	7.8	12.1
2	Approximately 2,450 feet southwest of the intersection of Thomas Street and Central Parkway West, extending northwest, west of Woodlawn Beach from Santa Rosa Sound	7.8	11.8
3	Approximately 400 feet south of the intersection of Nanthala Road and Nanthala Beach Road, extending northwest into Woodlawn Beach from Santa Rosa Sound	7.8	11.8
4	Approximately 4,680 feet south of the intersection of Bergen Street and U.S. Route 98, extending northwest into incorporated areas of Santa Rosa County from Santa Rosa Sound	7.8	12.1

[1]Because of map scale limitations, the maximum wave elevation may not be shown on the FIRM.
*North American Vertical Datum of 1988

TABLE 8 - TRANSECT DESCRIPTIONS - continued

TRANSECT	LOCATION	ELEVATION (feet NAVD*) 1-PERCENT STILLWATER	MAXIMUM 1-PERCENT WAVE CREST[1]
5	Approximately 2,500 feet south of the intersection of Pelican Lane and Water Street, extending northwest into incorporated areas of Santa Rosa County from Santa Rosa Sound	7.8	12.1
6	Approximately 2,400 feet south of the intersection of Bayou Street and Sandstone Road, extending northwest into incorporated areas of Santa Rosa County from Santa Rosa Sound	7.8	12.1
7	Approximately 1,700 feet south of the intersection of 4th Street and San Paolo Place, extending northwest into incorporated areas of Santa Rosa County from Santa Rosa Sound	7.8	12.0
8	Approximately 3,800 feet southeast of the intersection of State Route 399 and State Route 87, extending northwest across Santa Rosa Island	10.3[2]	15.9
	Approximately 950 feet southeast of the intersection of Blessed Lane and U.S. Route 98 extending northwest into Navarre from Santa Rosa Sound	7.8	12.0

[1]Because of map scale limitations, the maximum wave elevation may not be shown on the FIRM.
[2]Includes wave setup of 2.5 feet
*North American Vertical Datum of 1988

TABLE 8 - TRANSECT DESCRIPTIONS - continued

TRANSECT	LOCATION	ELEVATION (feet NAVD*) 1-PERCENT STILLWATER	MAXIMUM 1-PERCENT WAVE CREST[1]
9	At the confluence of Poplar Creek with East Bay, just east of Miller Point	6.9	10.3
10	Approximately 3.2 miles northwest of Miller Point at East Bay	6.3	9.0
11	Approximately 1.3 miles northeast of Grassy Point at Blackwater Bay	7.4	10.7
12	Just west of Robinson Point at Blackwater Bay	7.5	11.0
13	At the confluence of Blackwater River with Blackwater Bay	8.2	11.9
14	At the confluence of the Bannahassee River with Escambia Bay	8.3	13.0
15	Approximately 2,500 feet northwest of Mulatto Bayou at Escambia Bay	7.7	11.2
16	At the inlet of Indian Bayou at Escambia Bay	6.8	9.7
17	Approximately 2,500 feet northwest of Garcon Point at Pensacola Bay	5.5	7.9
18[2]	Located approximately 3.21 miles west of the Escambia-Santa Rosa Island at the Gulf of Mexico	10.3[3]	15.9

[1]Because of map scale limitations, the maximum wave elevation may not be shown on the FIRM.
[2]Formerly shown on Escambia County and Incorporated Areas FIS and FIRM (Transects 15 and 16)
*North American Vertical Datum of 1988

TABLE 8 - TRANSECT DESCRIPTIONS - continued

TRANSECT	LOCATION	ELEVATION (feet NAVD*) 1-PERCENT STILLWATER	MAXIMUM 1-PERCENT WAVE CREST[1]
19[2]	Located approximately 1.95 miles west of the Escambia-Santa Rosa county boundary on Santa Rosa Island at the Gulf of Mexico	10.3[3]	15.9

[1]Because of map scale limitations, the maximum wave elevation may not be shown on the FIRM.
[2]Formerly shown on Escambia County and Incorporated Areas FIS and FIRM (Transects 15 and 16)
[3]Includes wave setup of 2.5 feet
*North American Vertical Datum of 1988

TABLE 9 - TRANSECT DATA

FLOODING SOURCE	STILLWATER ELEVATIONS (feet NAVD*) 10-PERCENT	5-PERCENT	1-PERCENT	0.2-PERCENT	ZONE	BASE FLOOD ELEVATION (feet NAVD*)[1]
PENSACOLA BAY						
Transect 17	2.5	4.7	5.5	6.9	VE	6
					AE	4-5
GULF OF MEXICO						
Transects 18[2]-19[2]	3.8	6.6	10.33	10.8	VE	9-14
					AE	6-10
GULF OF MEXICO/ SANTA ROSA SOUND						
Transect 8	3.8	6.6	10.3[3]	10.6	VE	11-14
					AE	9-11
SANTA ROSA SOUND						
Transect 1	3.8	6.6	7.8	10.6	VE	8-10
					AE	6-8

[1]Because of map scale limitations, the maximum wave elevation may not be shown on the FIRM.
[2]Formerly shown on Escambia County and Incorporated Areas FIS and FIRM (Transects 15 and 16)
[3]Includes wave setup of 2.5 feet
*North American Vertical Datum of 1988

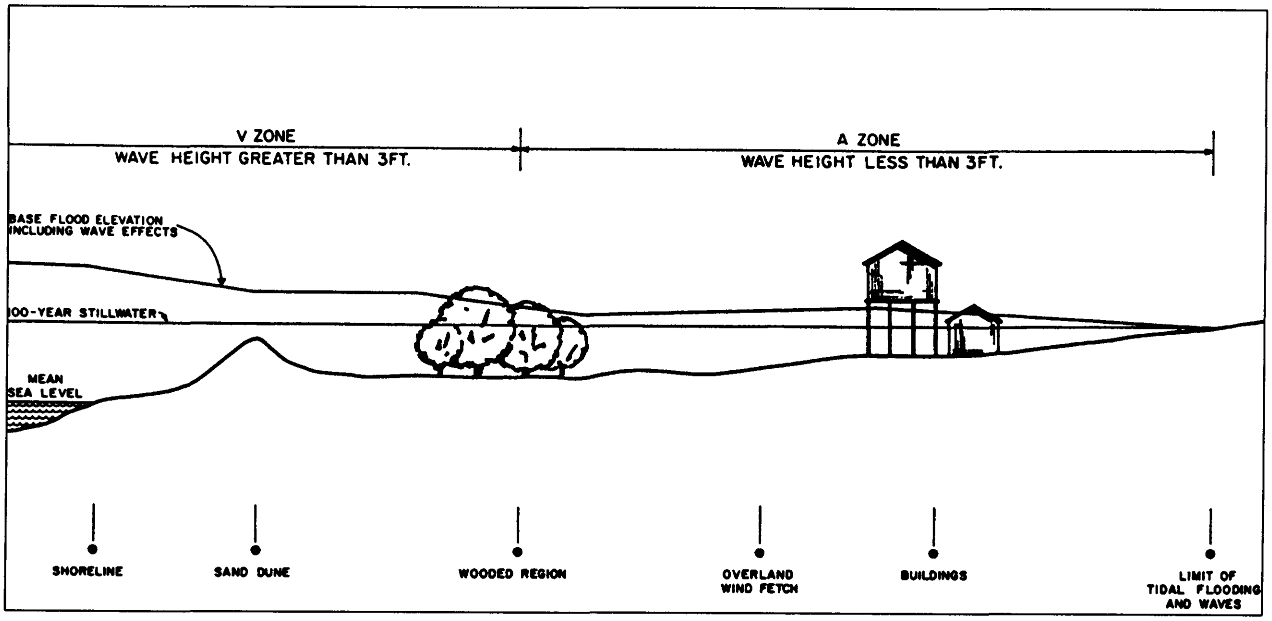
TABLE 9 - TRANSECT DATA - continued

FLOODING SOURCE	STILLWATER ELEVATIONS (feet NAVD*) 10-PERCENT	5-PERCENT	1-PERCENT	0.2-PERCENT	ZONE	BASE FLOOD ELEVATION (feet NAVD*)[1]
EAST BAY						
Transect 9	3.1	5.9	6.9	8.6	VE	6-9
					AE	5-7
Transect 10	2.8	5.4	6.3	7.9	VE	7
					AE	4-7
BLACKWATER BAY						
Transect 11	3.4	6.4	7.4	9.3	VE	8-9
					AE	7-8
Transect 12	3.4	6.4	7.6	9.4	VE	8-9
					AE	6-8
Transect 13	3.7	7.0	8.2	10.3	VE	9-12
					AE	7-9
ESCAMBIA BAY						
Transect 14	2.6	5.0	5.9	7.3	VE	9-11
					AE	7-9
Transect 15	3.4	6.6	7.7	9.7	VE	9
					AE	6-8
Transect 16	3.0	5.9	6.8	8.6	VE	7-8
					AE	5-7

*North American Vertical Datum of 1988

Figure 2 represents a sample transect that illustrates the relationship between the stillwater elevation, the wave crest elevation, the ground elevation profile, and the location of the A/V zone boundary.

After analyzing wave heights along each transect, wave elevations were interpolated between transects. Various source data were used in the interpolation, including topographic maps (USGS, 1978, et cetera), aerial photographs (Florida Department of Natural Resources, 1981), and engineering judgement. Controlling features affecting the elevations were identified and considered in relation to their positions at a particular transect and their variation between transects.



TRANSECT SCHEMATIC Figure 2

3.5 Vertical Datum

All FISs 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 FISs 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.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88. Structure and ground elevations in the community must, therefore, be referenced to NAVD 88. It is important to note that adjacent communities may be referenced to NGVD 29. This may result in differences in base flood elevations across the corporate limits between the communities.

Prior versions of the FIS report and FIRM were referenced to NGVD 29. When a datum conversion is effected for an FIS report and FIRM, the Flood Profiles, and Base Flood Elevations (BFEs) reflect the new datum values. To compare structure and ground elevations to BFEs shown in the FIS report and on the FIRM, the structure and ground elevations must be referenced to the new datum values.

As noted above, the elevations shown in the FIS report and on the FIRM for Santa Rosa County are referenced to NAVD 88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD 29 by applying a standard conversion factor to the NAVD 88 values. The conversion factor is -0.19.

The BFEs shown on the FIRM represent whole-foot rounded values. For example, a BFE of 102.4 will appear as 102 on the FIRM and 102.6 will appear as 103. Therefore, the datum conversion should be applied to the BFEs 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 on NAVD 88, see Converting the National Flood Insurance Program to the North American Vertical Datum of 1988, FEMA Publication FIA-20/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).

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 provides 100-year floodplain data, which may include a combination of the following: 10-, 50-, 100-, and 500-year flood elevations; delineations of the 100-year and 500-year floodplains; and 100-year floodway. This information is presented on the FIRM and in many components of the FIS, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS 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 (100-year) 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 in detail, 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 using topographic maps at a scale of 1:24,000 with a contour interval of 5 or 10 feet (USGS, 1970, et cetera; USGS, 1978, et cetera). For each coastal flooding source studied in detail, the 1- and 0.2-percent annual chance flood boundaries have been delineated using the flood elevations determined at each transect. Between transects, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 10 feet (USGS, 1978, et cetera).

For the streams studied by approximate methods, only the 1-percent annual chance floodplain boundary is shown on the FIRM (Exhibit 2).

The 1- and 0.2-percent annual chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, and VE), and the 0.2-percent annual chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent annual chance floodplain boundaries are close together, only the 1-percent annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces the flood-carrying capacity, increases the 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 100-year 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 100-year flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this FIS 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 (Table 10). The computed floodways are 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.

Portions of the floodway of the Escambia River lie outside the county boundary.

The area between the floodway and the 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe thus encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year 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 3.

FLOODING SOURCE		FLOODWAY			BASE 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
Blackwater River								
A	9,000	1,470	13,642	6.	10.8	3.8[2]	4.8	1.0
B	11,900	2,030	21,226	4.2	10.8	6.8[2]	7.4	0.6
C	14,450	1,453	22,470	4.0	9.8	7.9[2]	8.6	0.6
D	16,300	780	16,145	5.6	9.0	8.5[2]	9.1	0.6
E	17,500	2,840	41,981	2.1	13.3	13.3	13.6	0.3
F	21,250	2,488	39,293	2.3	13.9	13.9	14.2	0.3
G	26,600	2,563	41,789	2.2	14.7	14.7	15.0	0.3
H	32,100	2,017	34,725	2.6	16.1	16.1	16.6	0.5
I	36,400	4,053	59,673	1.5	17.2	17.2	17.8	0.6
J	38,900	4,450	47,870	1.9	17.7	17.7	18.3	0.6
K	43,900	5,530	67,041	1.3	19.3	19.3	20.1	0.8
L	48,900	3,609	52,105	1.7	20.5	20.5	21.3	0.8
M	50,900	2,727	52,898	1.7	21.0	21.0	21.8	0.8
N	54,900	3,918	58,215	1.4	22.4	22.4	23.3	0.9
O	76,100	2,190	39,313	2.1	30.6	30.6	31.5	0.9
P	80,100	2,455	46,101	1.8	32.6	32.6	33.4	0.8
Q	84,300	3,004	52,528	1.6	33.9	33.9	34.8	0.9
R	87,800	2,906	57,919	1.5	35.8	35.8	36.7	0.9
S	90,600	2,236	41,801	2.0	36.6	36.6	37.5	0.9
T	93,600	2,213	37,034	2.3	38.3	38.3	39.2	0.9

[1]Feet above Interstate 10
[2]Elevation computed without consideration of coastal surge effect from Blackwater Bay

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL AND INCORPORATED AREAS

FLOODWAY DATA

BLACKWATER RIVER

FLOODING SOURCE		FLOODWAY			BASE 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
East Bay River								
A	700	200	1,912	5.4	6.8	2.1[2]	3.1	1.0
B	2,900	200	1,862	5.6	6.8	2.5[2]	5.1	0.6
C	5,050	260	3,121	3.3	6.8	5.8[2]	6.3	0.5
D	5,192	260	3,130	3.3	6.8	5.8[2]	6.3	0.5
E	12,392	1,072	7,834	1.3	7.0	7.0	7.6	0.6
F	17,192	1,971	17,802	0.6	7.8	7.8	8.6	0.8
G	21,492	806	5,254	2.0	8.3	8.3	9.1	0.8
H	25,902	801	6,718	1.5	10.4	10.4	11.4	1.0
I	28,892	941	8,686	1.2	11.9	11.9	12.9	1.0
J	33,392	820	8,455	1.2	13.2	13.2	14.2	1.0
K	36,492	1,324	11,577	0.9	14.0	14.0	15.0	1.0
L	38,842	1,346	10,788	1.0	14.5	14.5	15.5	1.0

[1]Feet above confluence with East Bay
[2]Elevation computed without consideration of coastal surge effect from East Bay

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL AND INCORPORATED AREAS

FLOODWAY DATA

EAST BAY RIVER

TABLE 10

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Escambia River								
A	260	11,754	36,963	5.7	10.1	1.3[3]	2.2	0.9
B	9,610	13,210	130,016	1.6	9.1	8.2[3]	8.5	0.3
C	14,210	11,092	138,573	1.5	10.6	10.6	11.1	0.5
D	23,510	8,356	139,970	1.5	15.1	15.1	16.0	0.9
E	30,970	9,500	179,667	1.2	17.9	17.9	18.8	0.9
F	39,920	10,890	191,767	1.1	20.1	20.1	20.9	0.8
G	50,110	12,510	244,300	0.9	22.2	22.2	23.1	0.9
H	56,790	9,645	181,617	1.2	23.3	23.3	24.2	0.9
I	64,350	8,944	167,470	1.3	25.0	25.0	25.8	0.8
J	66,500	5,607	72,627	2.2	25.8	25.8	26.8	1.0
K	73,520	13,330	287,920	0.6	26.5	26.5	27.5	1.0
L	80,602	11,236	221,985	0.7	27.0	27.0	28.0	1.0
M	87,632	12,431	233,338	0.7	27.7	27.7	28.7	1.0
N	97,812	11,363	229,219	0.7	28.7	28.7	29.7	1.0
O	111,852	13,812	274,559	0.6	29.5	29.5	30.5	1.0
P	125,662	15,659	279,608	0.6	30.2	30.2	31.2	1.0
Q	143,062	9,964	142,340	1.1	31.7	31.7	32.7	1.0
R	150,242	9,397	154,267	1.0	33.6	33.6	34.6	1.0
S	163,342	11,869	204,753	0.8	35.8	35.8	36.8	1.0
T	173,042	10,237	150,152	1.0	37.5	37.5	38.5	1.0
U	179,742	5,863	98,286	1.6	39.6	39.6	40.6	1.0
V	193,392	7,136	118,512	1.3	44.4	44.4	45.4	1.0
W	200,492	10,827	198,320	0.8	45.8	45.8	46.8	1.0
X	211,172	15,785	267,611	0.6	46.9	46.9	47.9	1.0
Y	217,572	10,560	166,225	0.9	47.6	47.6	48.6	1.0
Z	222,972	7,733	102,943	1.5	48.8	48.8	49.8	1.0

[1]Feet above U.S. Route 90
[2]Width extends beyond county boundary
[3]Elevation computed without consideration of coastal surge effect from Escambia Bay

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL AND INCORPORATED AREAS

FLOODWAY DATA

ESCAMBIA RIVER

TABLE 10

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Escambia River (continued)								
AA	235,122	8,844	130,894	1.2	52.4	52.4	53.4	1.0
AB	243,542	8,008	133,538	1.1	54.4	54.4	55.4	1.0
AC	253,392	8,617	150,661	1.0	56.4	56.4	57.4	1.0
AD	261,042	8,022	142,296	1.1	57.6	57.6	58.6	1.0
AE	269,291	8,694	94,530	1.5	58.9	58.9	59.9	1.0

[1]Feet above U.S. Route 90
[2]Width extends beyond county boundary

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL AND INCORPORATED AREAS

FLOODWAY DATA

ESCAMBIA RIVER

FLOODING SOURCE		FLOODWAY			BASE 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
Pace Mill Creek								
A	5,801	513	2,058	4.5	10.0	10.0	11.0	1.0
B	7,987	349	1063	5.4	14.6	14.6	15.0	0.4
C	8,153	363	2,276	3.2	17.8	17.8	18.3	0.5
D	11,417	108	638	10.1	38.2	38.2	39.0	0.8
E	14,183	290	1,354	6.0	52.4	52.4	53.3	0.9
F	15,654	175	784	5.6	61.1	61.1	61.6	0.5
G	15,727	175	1,425	3.2	64.3	64.3	65.3	1.0
H	19,068	149	831	6.3	75.4	75.4	76.4	1.0
I	21,167	170	880	5.8	86.3	86.3	87.1	0.8
J	21,241	170	1,390	5.0	89.5	89.5	90.4	0.9
K	22,711	103	361	3.4	91.0	91.0	91.8	0.8
L	23,571	95	266	5.7	95.1	95.1	95.2	0.1
M	23,656	100	874	1.8	100.3	100.3	101.2	0.9
N	24,586	50	132	9.2	101.5	101.5	101.8	0.3
O	25,725	93	262	4.7	110.0	110.0	110.3	0.3
P	25,836	86	445	3.0	113.3	113.3	114.3	1.0
Q	27,111	32	137	8.9	127.2	127.2	127.5	0.3

[1]Feet above confluence with Escambia Bay

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL AND INCORPORATED AREAS

FLOODWAY DATA

PACE MILL CREEK

FLOODING SOURCE		FLOODWAY			BASE 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
Pond Creek								
A	1,179	1,168	7,497	5.9	10.6	5.0[2]	5.8	0.8
B	1,280	1,164	7,610	5.8	10.6	5.4[2]	5.9	0.5
C	4,370	481	6,327	4.3	10.6	6.9[2]	7.6	0.7
D	6,775	286	3,372	10.0	10.6	7.7[2]	8.5	0.8
E	6,889	256	3,405	9.5	10.6	8.9[2]	9.5	0.6
F	10,108	1,564	10,773	3.8	12.2	12.2	12.7	0.5
G	13,133	404	4,992	9.5	13.3	13.3	14.0	0.7
H	13,268	431	5,678	8.6	14.9	14.9	15.1	0.2
I	14,352	1,286	10,598	7.2	15.7	15.7	16.7	1.0
J	15,669	1,537	18,269	4.2	16.8	16.8	17.8	1.0
K	18,389	1,210	12,295	5.1	18.0	18.0	19.0	1.0
L	23,254	778	9,372	5.9	22.1	22.1	23.1	1.0
M	25,016	1,359	11,129	6.0	24.1	24.1	25.0	0.9
N	30,373	1,070	10,383	5.5	29.1	29.1	30.0	0.9
O	32,268	973	12,088	4.0	30.4	30.4	31.2	0.8
P	33,216	1,151	13,349	4.3	30.8	30.8	31.6	0.8
Q	35,720	1,222	15,925	3.3	31.7	31.7	32.5	0.8
R	39,348	1,071	9,717	5.6	33.5	33.5	34.3	0.8
S	39,427	1,071	9,959	5.5	33.7	33.7	34.6	0.9
T	40,496	1,250	8,221	8.9	35.5	35.5	36.3	0.8
U	44,985	812	9,725	6.1	42.3	42.3	43.0	0.7
V	45,461	850	11,927	4.6	42.6	42.6	43.4	0.8
W	48,988	707	8,896	3.9	44.7	44.7	45.7	1.0
X	51,399	809	9,254	5.2	46.8	46.8	47.8	1.0
Y	53,324	565	5,208	6.1	48.8	48.8	49.6	0.8
Z	53,463	545	5,377	5.9	49.3	49.3	50.2	0.9

[1]Feet above confluence with Blackwater River

[2]Elevation computed without considering backwater effect from Blackwater River

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL AND INCORPORATED AREAS

FLOODWAY DATA

POND CREEK

TABLE 10

FLOODING SOURCE		FLOODWAY			BASE 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
Pond Creek (continued)								
AA	54,091	400	4,825	9.1	50.4	50.4	51.1	0.7
AB	54,639	669	7,530	5.9	51.4	51.4	52.3	0.9
AC	55,245	653	6,954	6.6	52.1	52.1	52.9	0.8
AD	58,228	761	7,121	7.2	56.2	56.2	57.2	1.0
AE	61,641	710	8,201	5.8	60.1	60.1	61.0	0.9
AF	65,620	1,199	11,040	5.0	63.7	63.7	64.6	0.9
AG	66,421	1,511	9,341	6.5	64.6	64.6	65.3	0.7
AH	69,258	1,046	7,590	4.0	67.0	67.0	67.7	0.7
AI	69,388	1,046	8,514	3.7	67.7	67.7	68.6	0.9

[1]Feet above confluence with Blackwater River

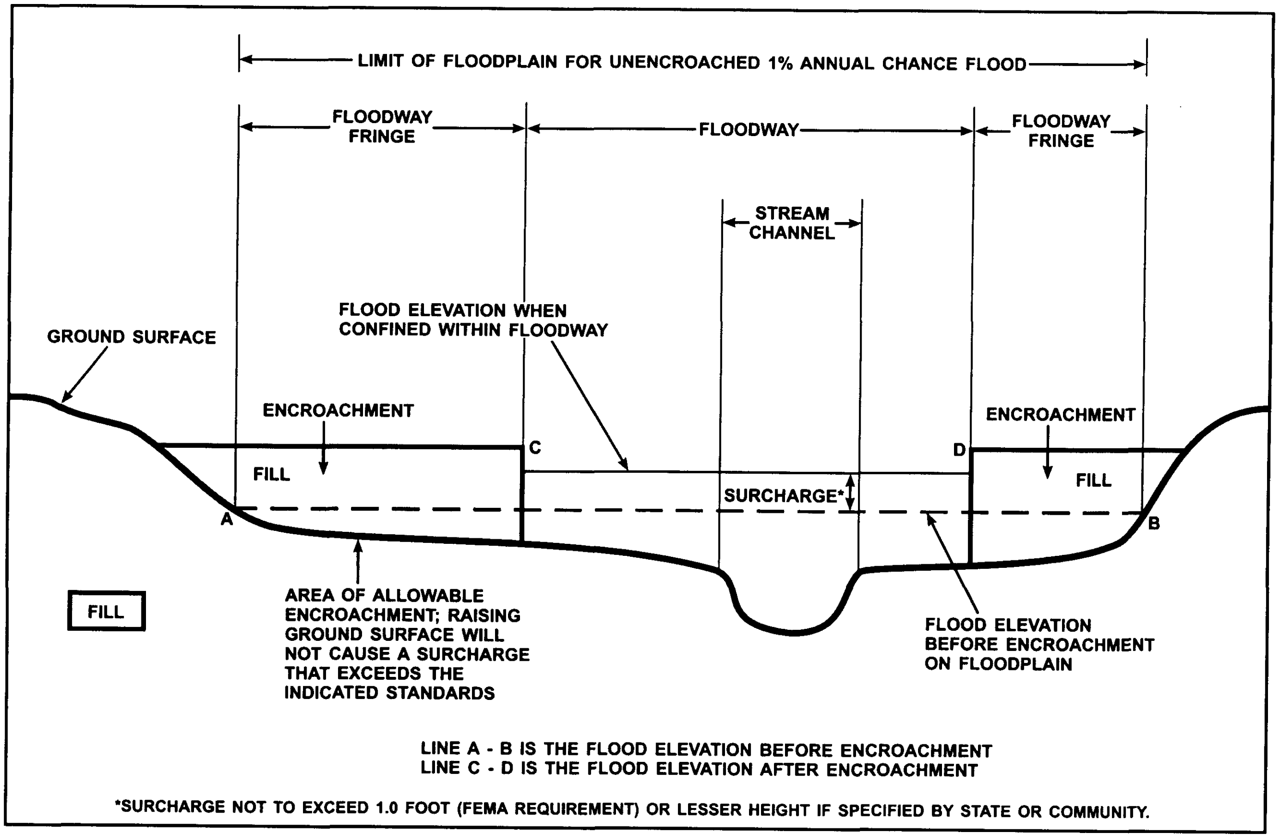
TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL AND INCORPORATED AREAS

FLOODWAY DATA

POND CREEK



FLOODWAY SCHEMATIC Figure 3

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. The 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 by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations 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 by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 1-percent annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 1-percent annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone AR

Area of special flood hazard formerly protected from the 1-percent annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1-percent annual chance or greater flood event.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 1-percent annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 1-percent annual chance coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 1-percent annual chance coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations 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, and 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 1-percent annual chance flood by levees. No base flood elevations 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 rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations 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 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

The current FIRM presents flooding information for the entire geographic area of Santa Rosa County. Previously, separate Flood Hazard Boundary Maps and/or FIRMs were prepared for each identified flood-prone incorporated community and the unincorporated areas of the county. This countywide FIRM 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 11, "Community Map History."

7.0 OTHER STUDIES

FISs have been prepared for Okaloosa County and incorporated areas (FEMA, 2002) and Escambia County and incorporated areas (FEMA, 2006).

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Gulf Breeze, City of	June 28, 1974	January 30, 1976	September 1, 1977	November 1, 1985 August 3, 1992 June 16, 1995 January 19, 2000 December 19, 2006
Jay, Town of	October 10, 1975	None	May 15, 1986	December 19, 2006
Milton, City of	May 24, 1974	None	June 1, 1977	July 18, 1985 December 19, 2006
Santa Rosa County (Unincorporated Areas)	January 24, 1975	None	October 14, 1977	November 1, 1985 August 3, 1992 July 20, 1998 January 19, 2000 July 17, 2002 December 19, 2006

TABLE 11

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

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

8.0 LOCATION OF DATA

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

9.0 BIBLIOGRAPHY AND REFERENCES

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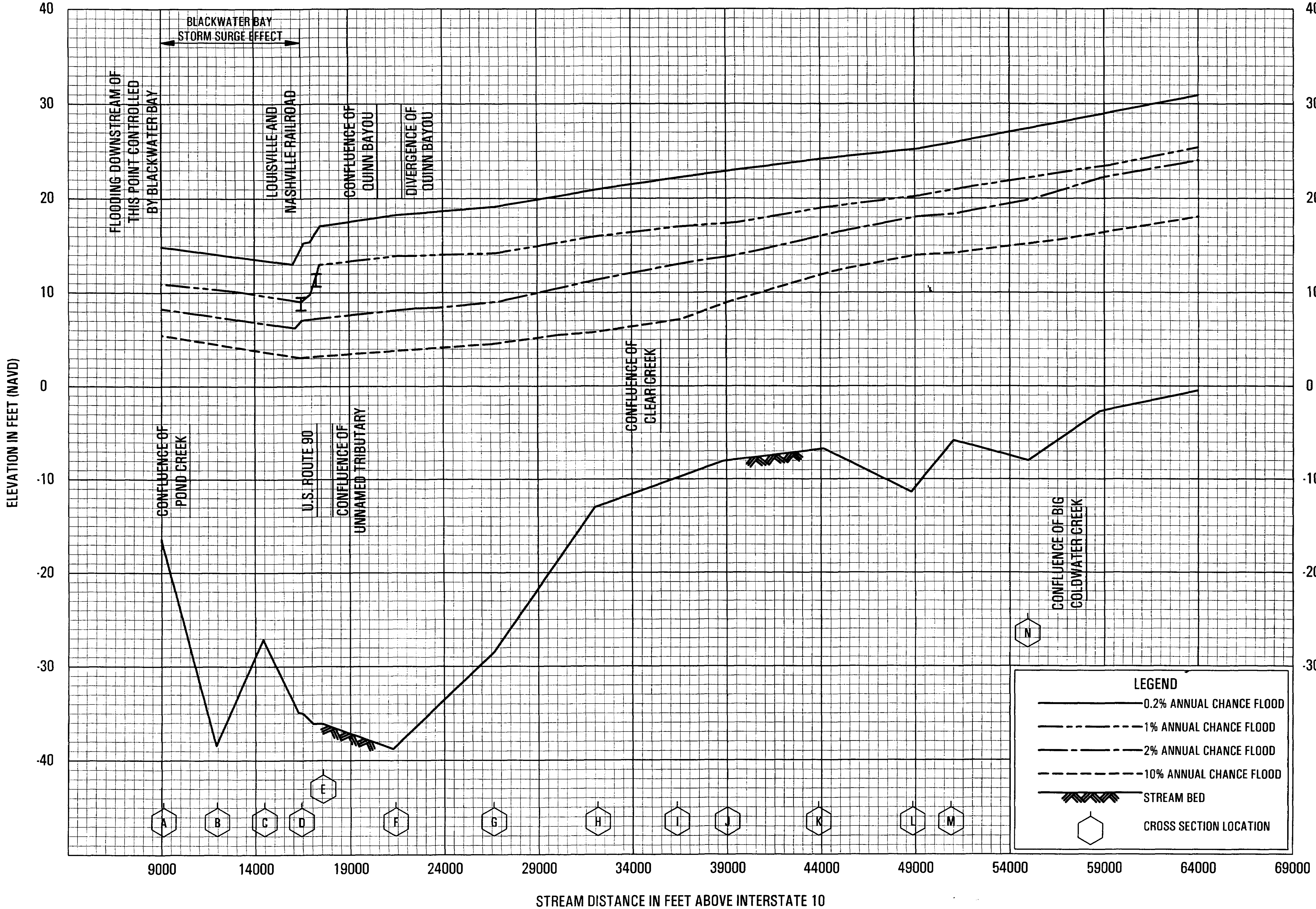


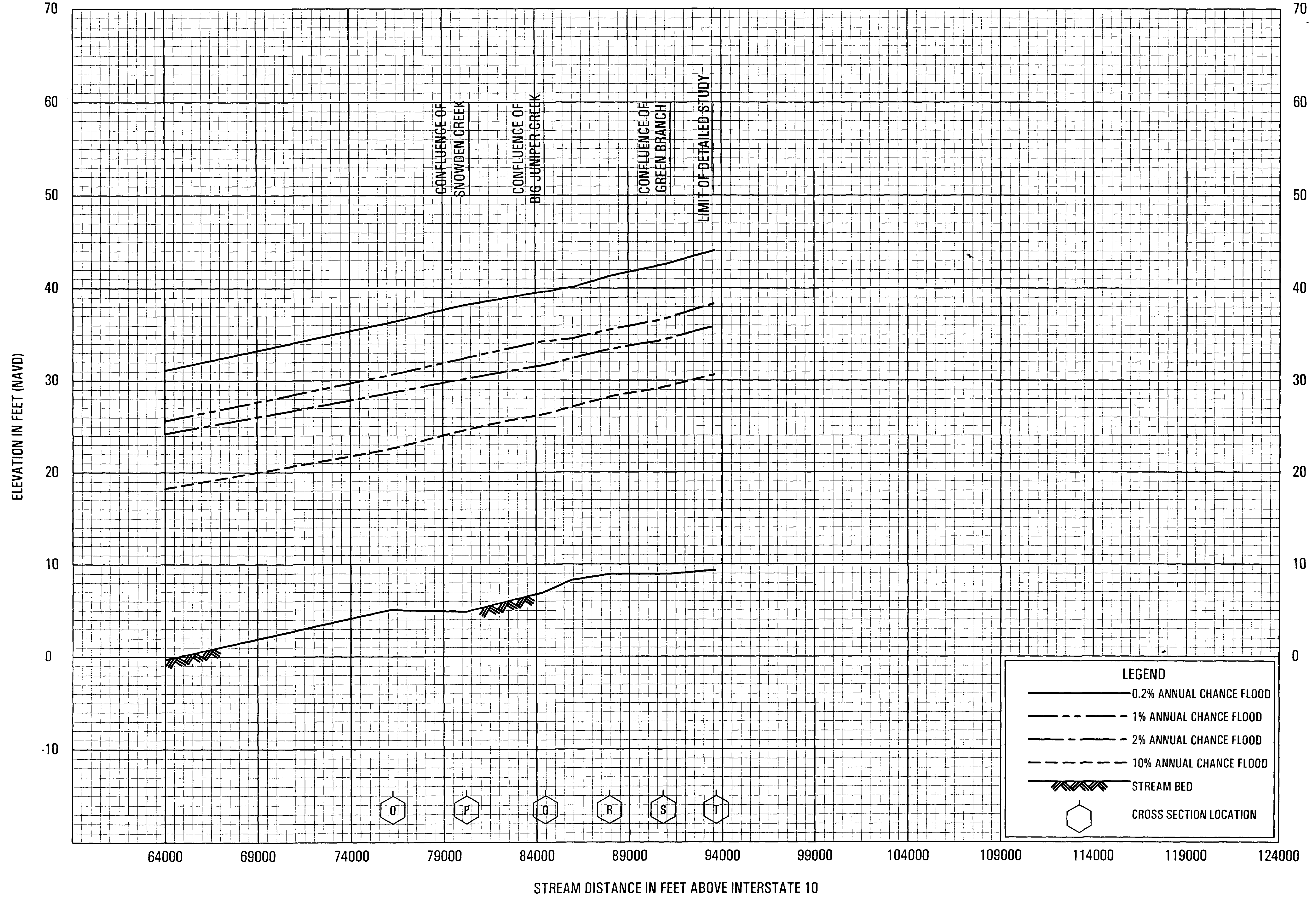
FLOOD PROFILES

BLACKWATER RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL AND INCORPORATED AREAS

01P



FLOOD PROFILES

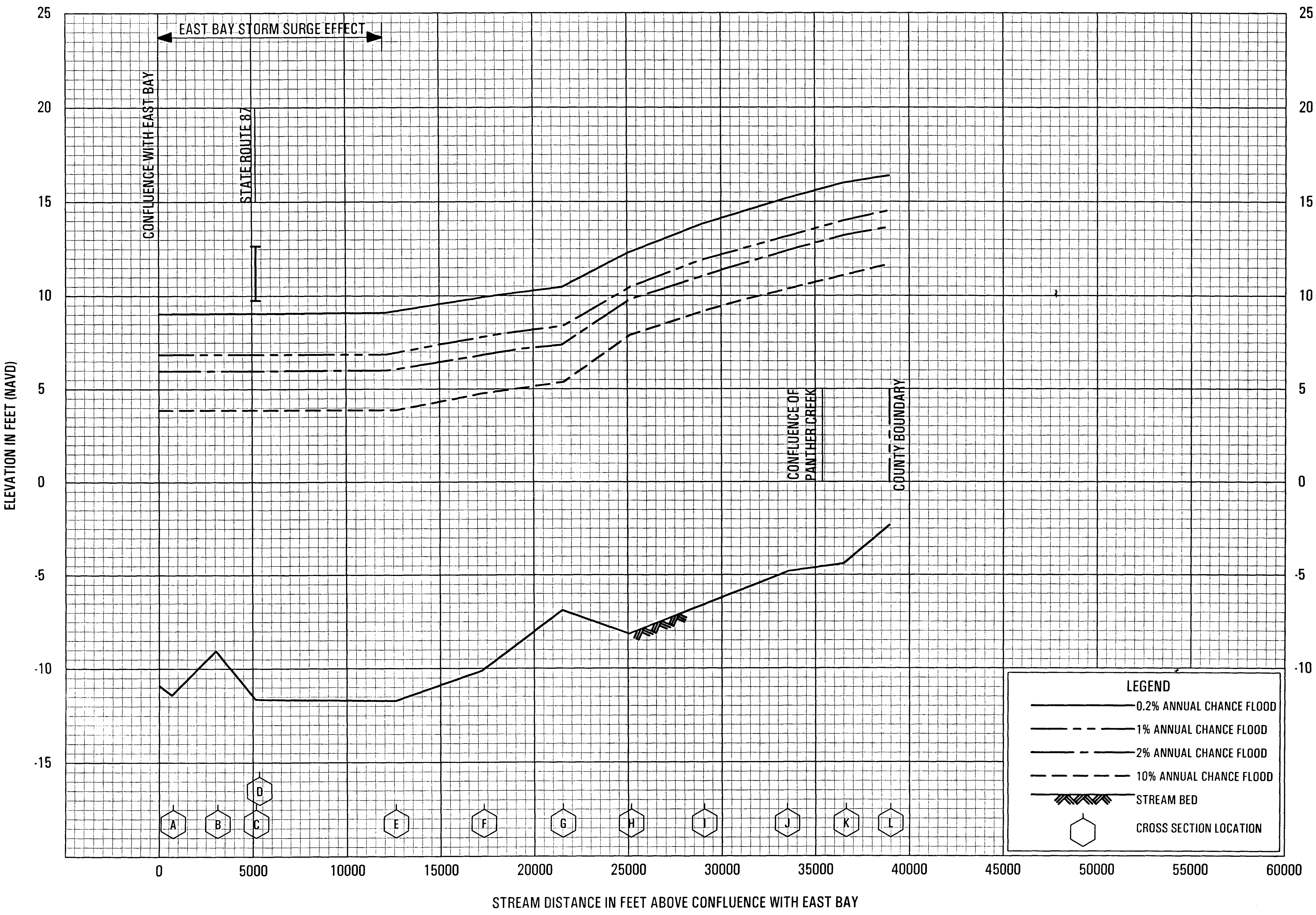
BLACKWATER RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

AND INCORPORATED AREAS

02P



FLOOD PROFILES

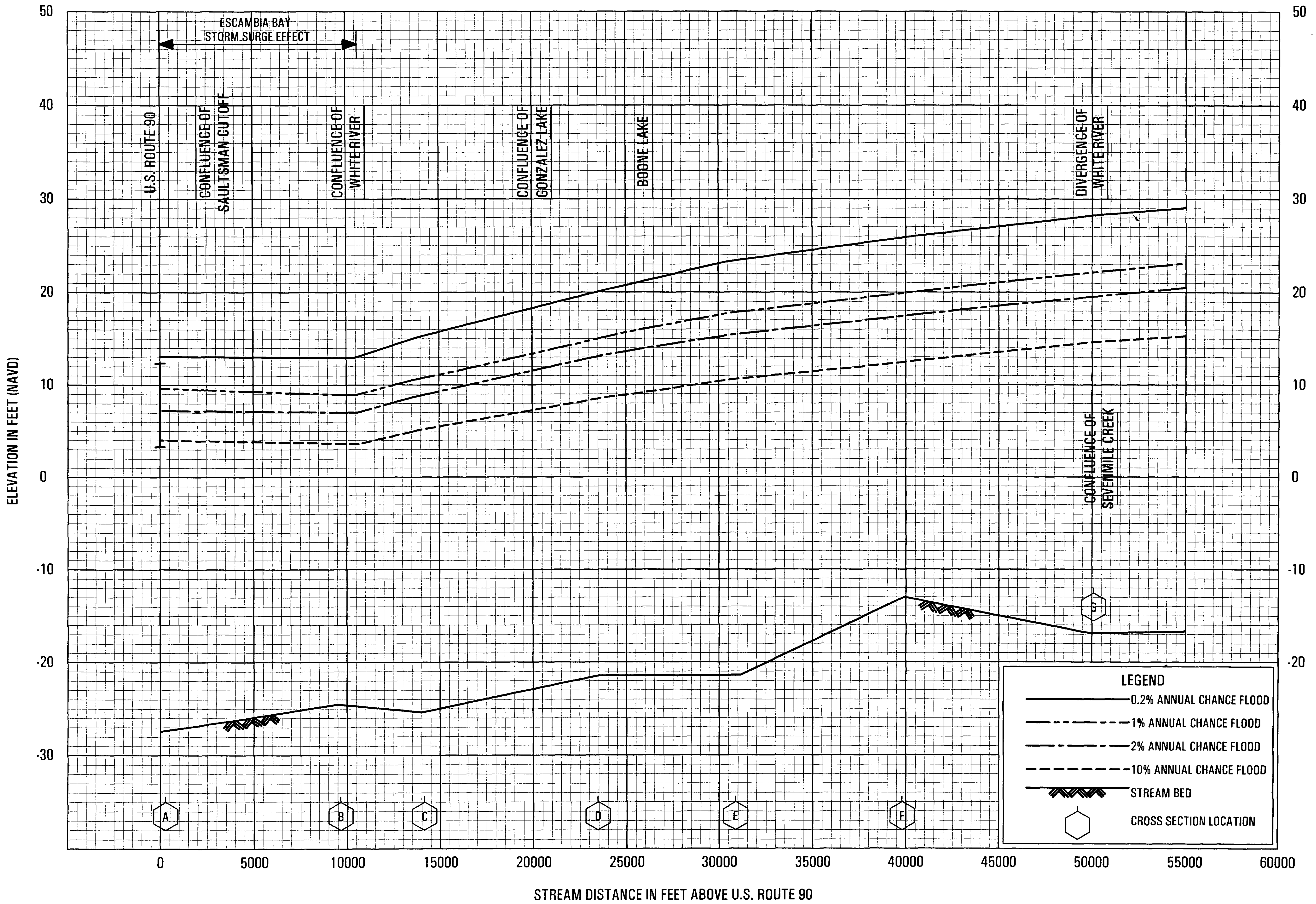
EAST BAY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

AND INCORPORATED AREAS

03P



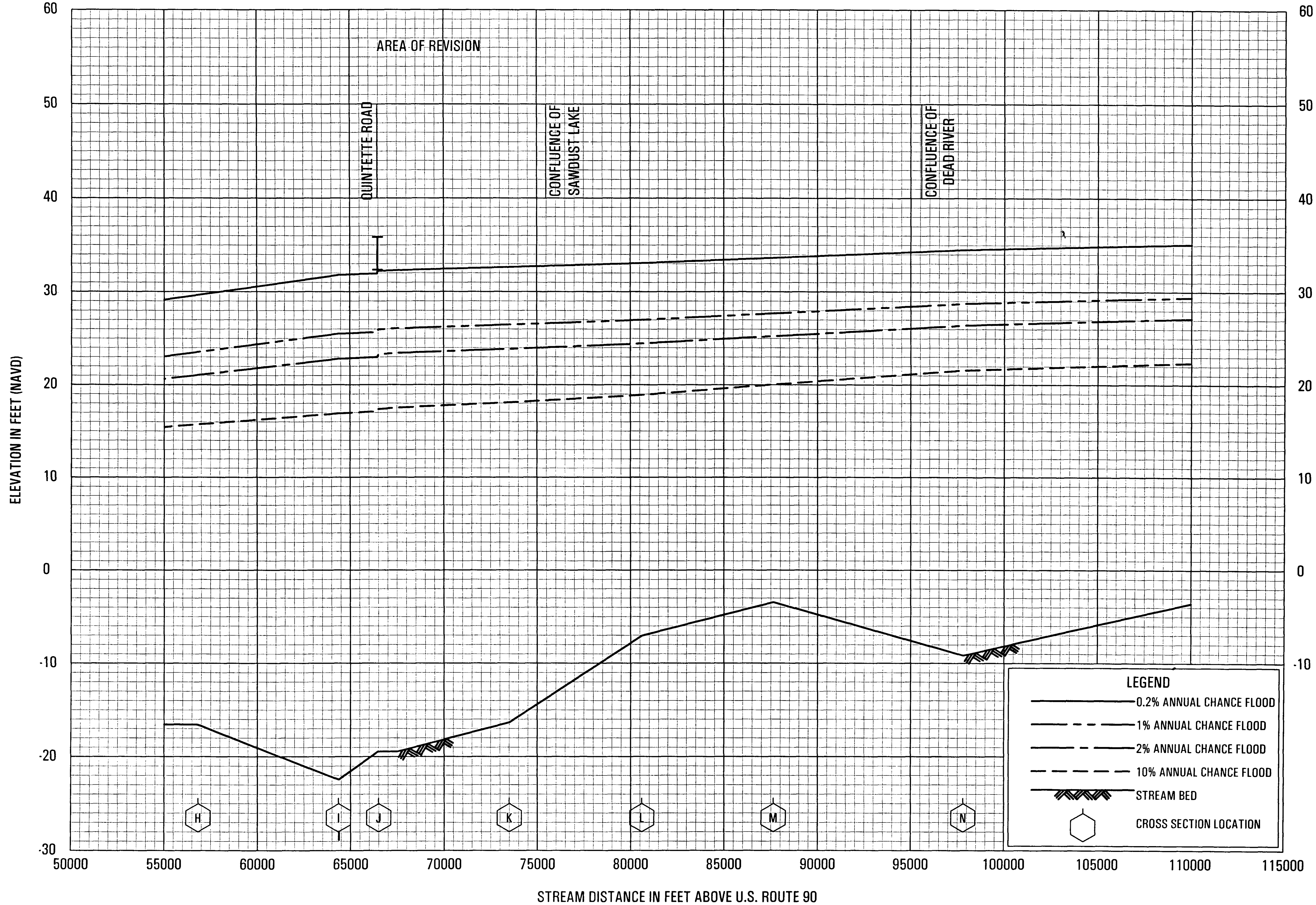
FLOOD PROFILES

ESCAMBIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

AND INCORPORATED AREAS



FLOOD PROFILES

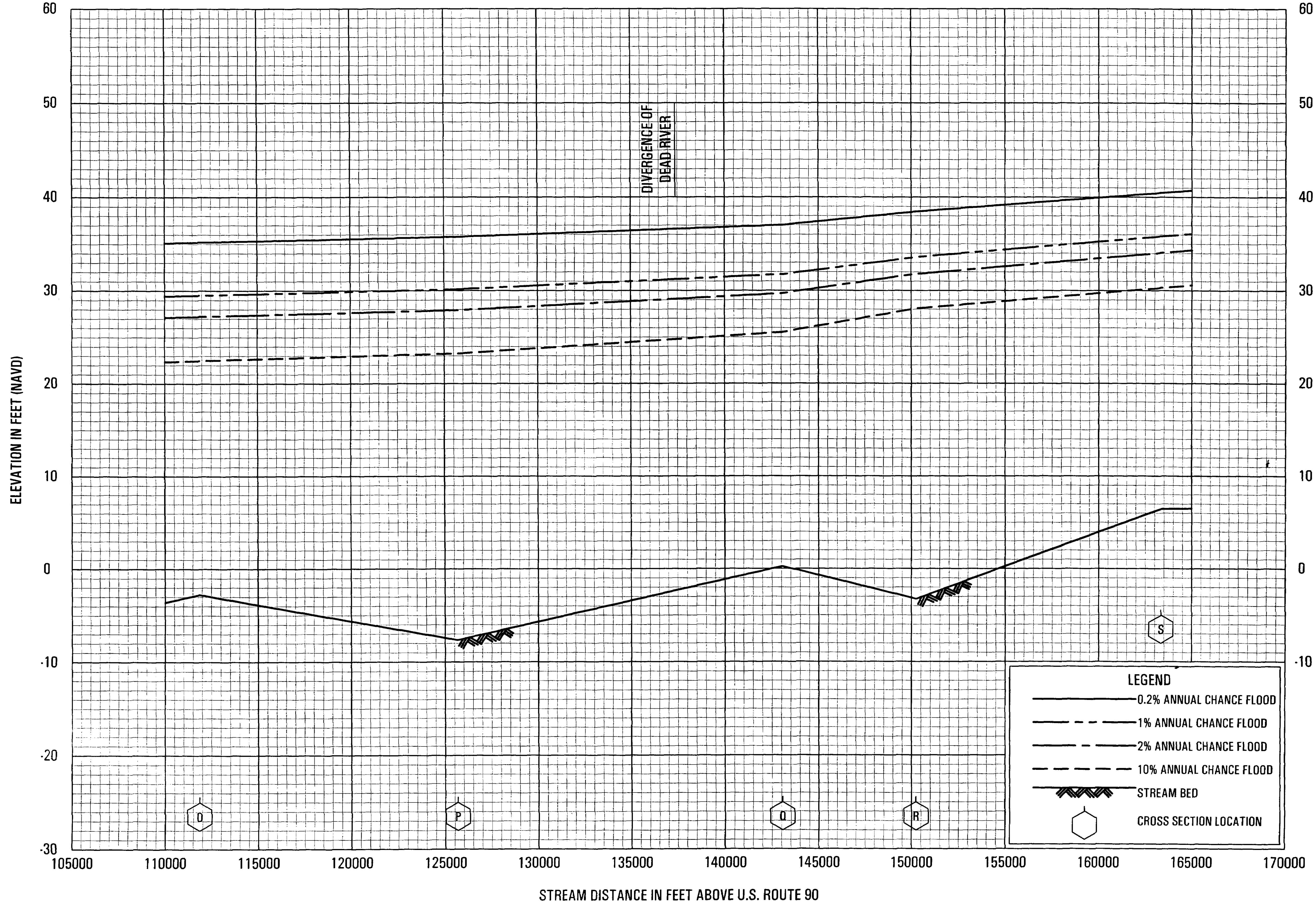
ESCAMBIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

(UNINCORPORATED AREAS)

05P



FLOOD PROFILES

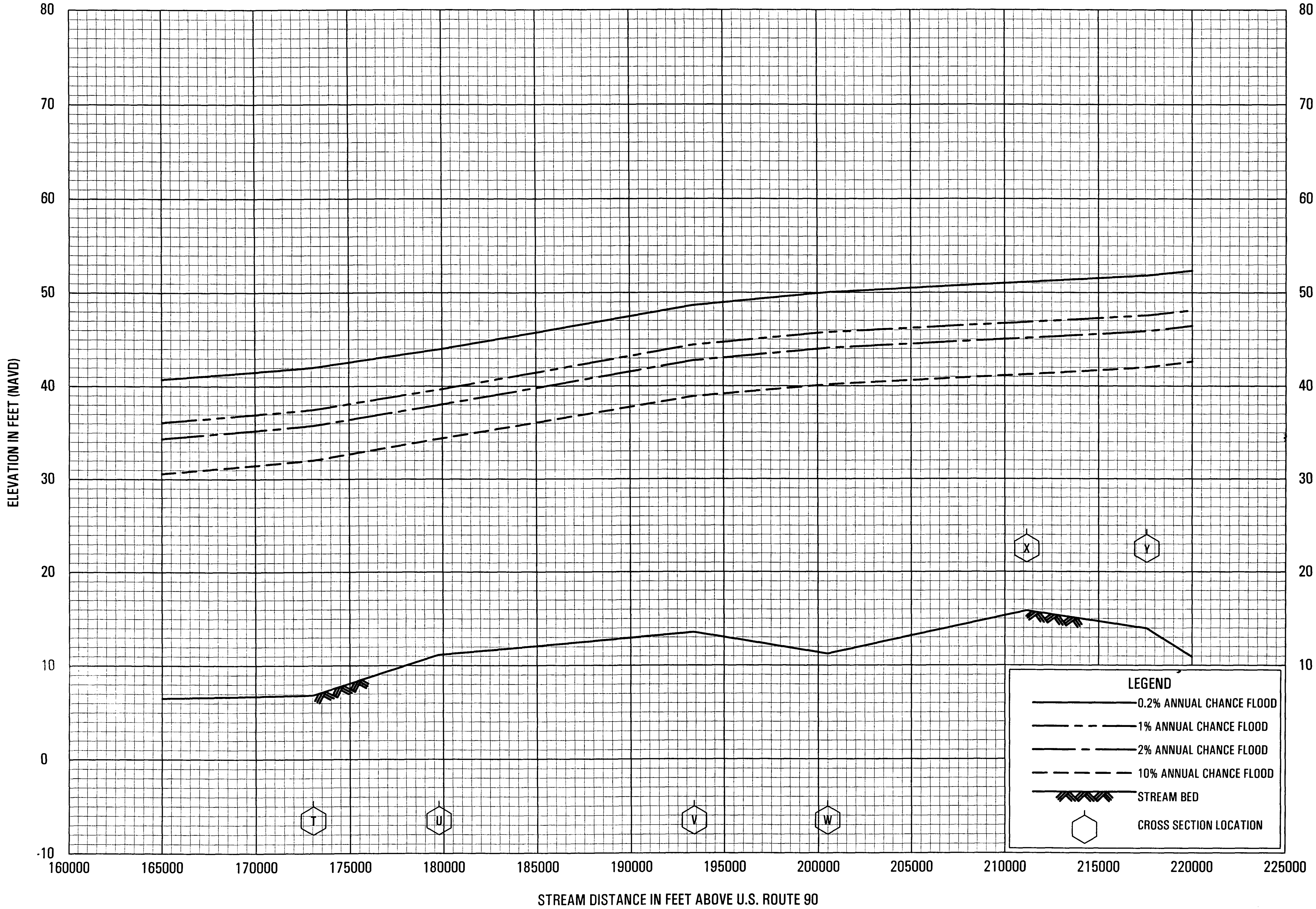
ESCAMBIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

(UNINCORPORATED AREAS)

06P



FLOOD PROFILES

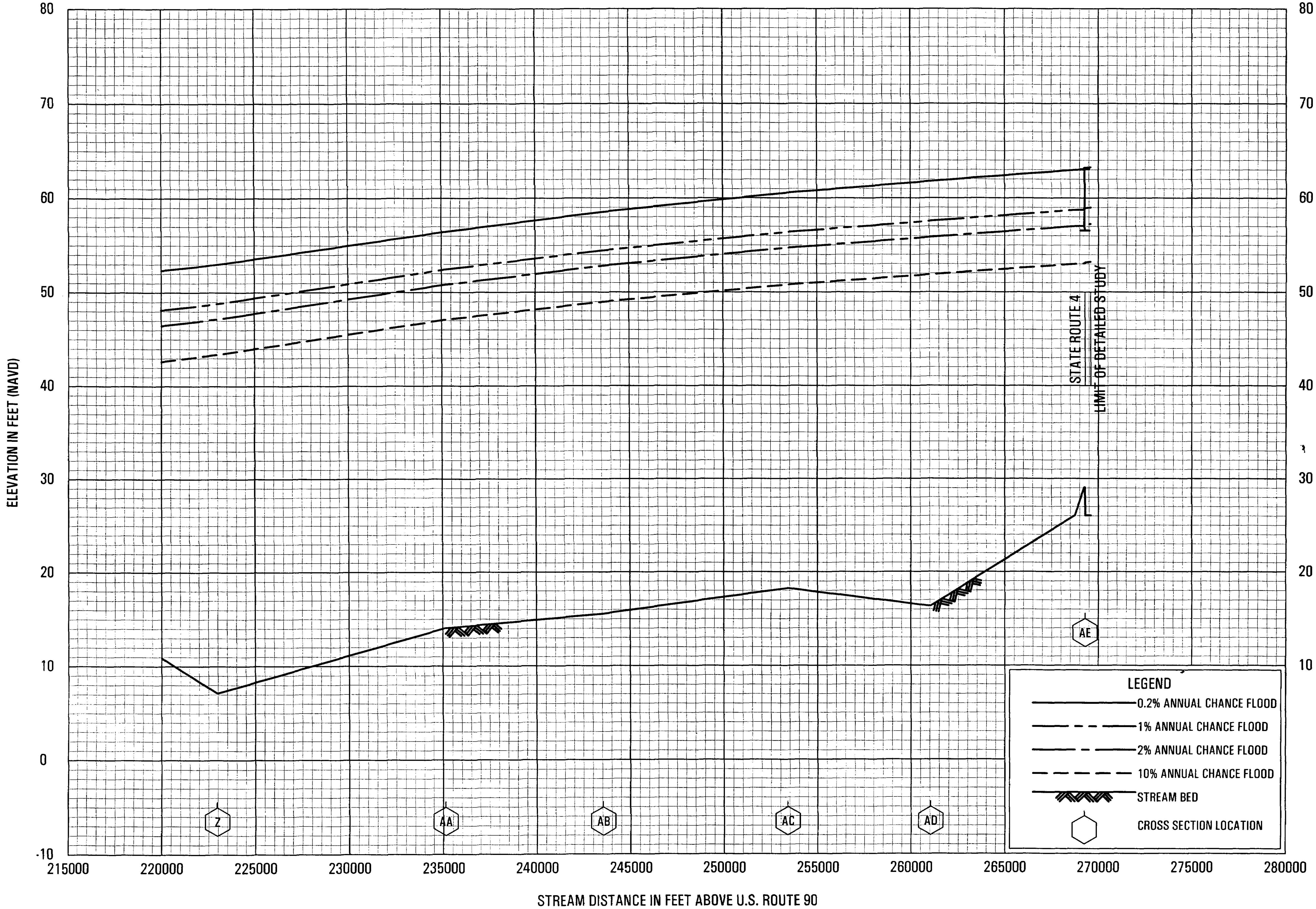
ESCAMBIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

(UNINCORPORATED AREAS)

07P



FLOOD PROFILES

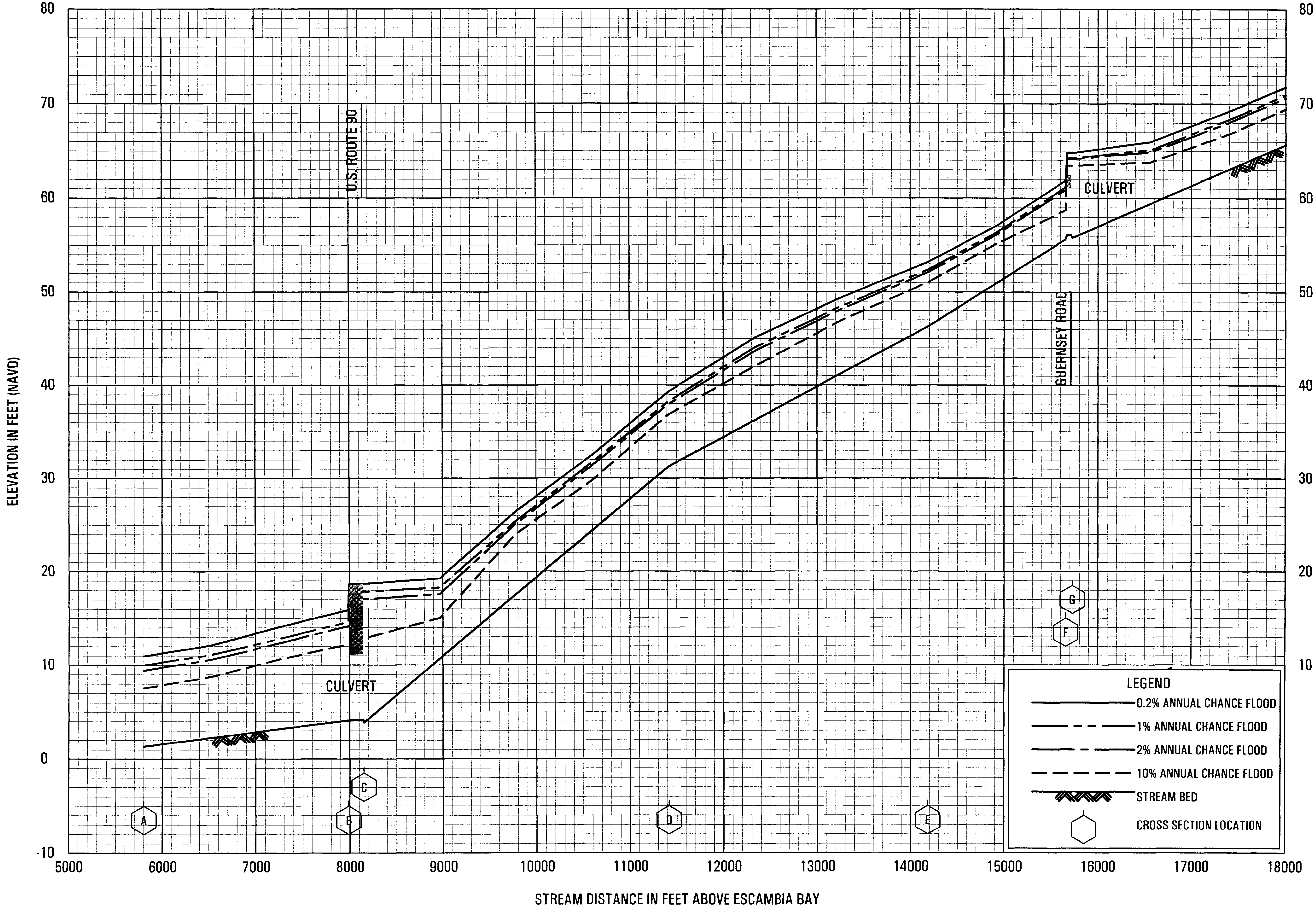
ESCAMBIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

(UNINCORPORATED AREAS)

08P



FLOOD PROFILES

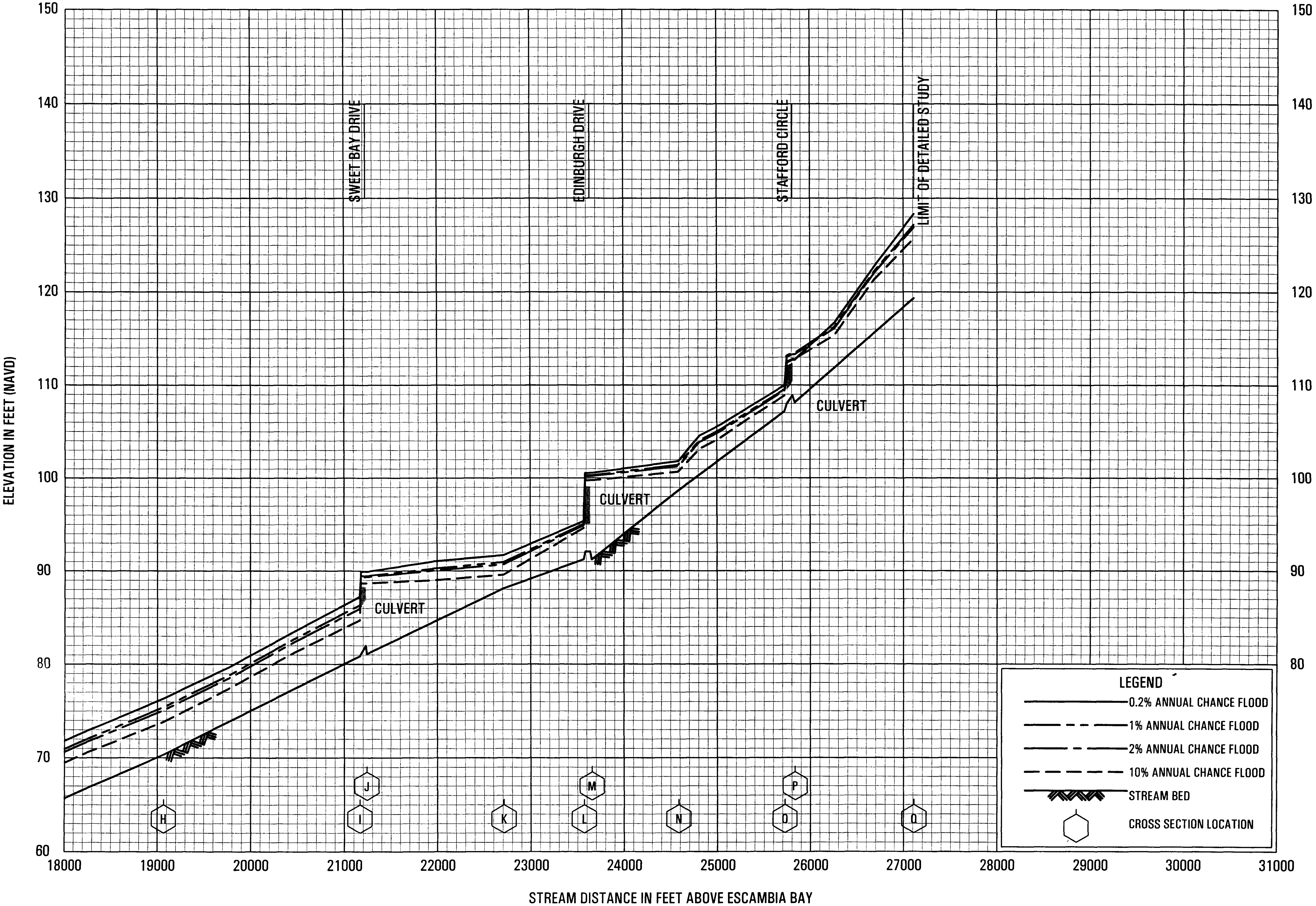
PACE MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

AND INCORPORATED AREAS

09P



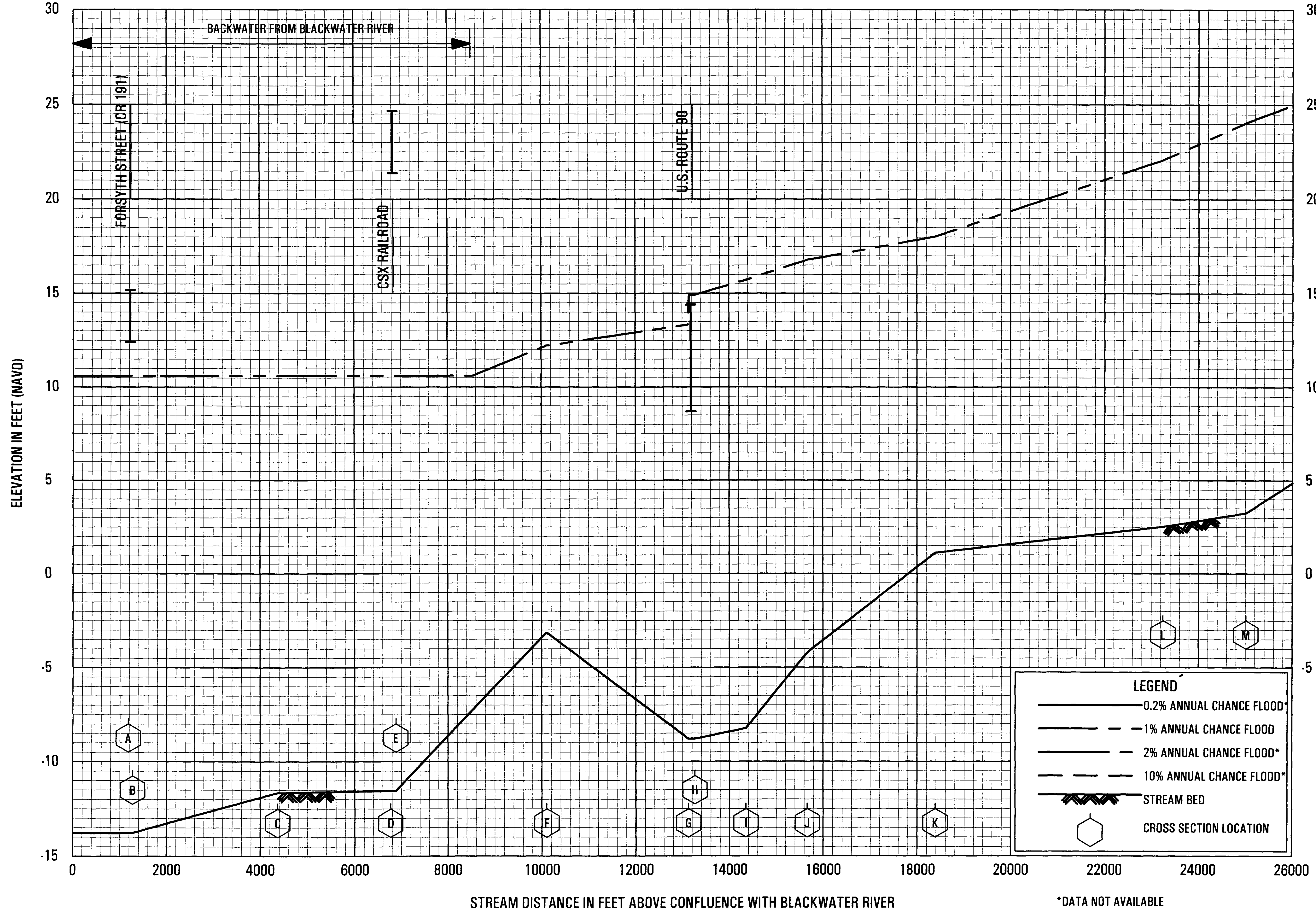
FLOOD PROFILES

PACE MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

AND INCORPORATED AREAS



FLOOD PROFILES

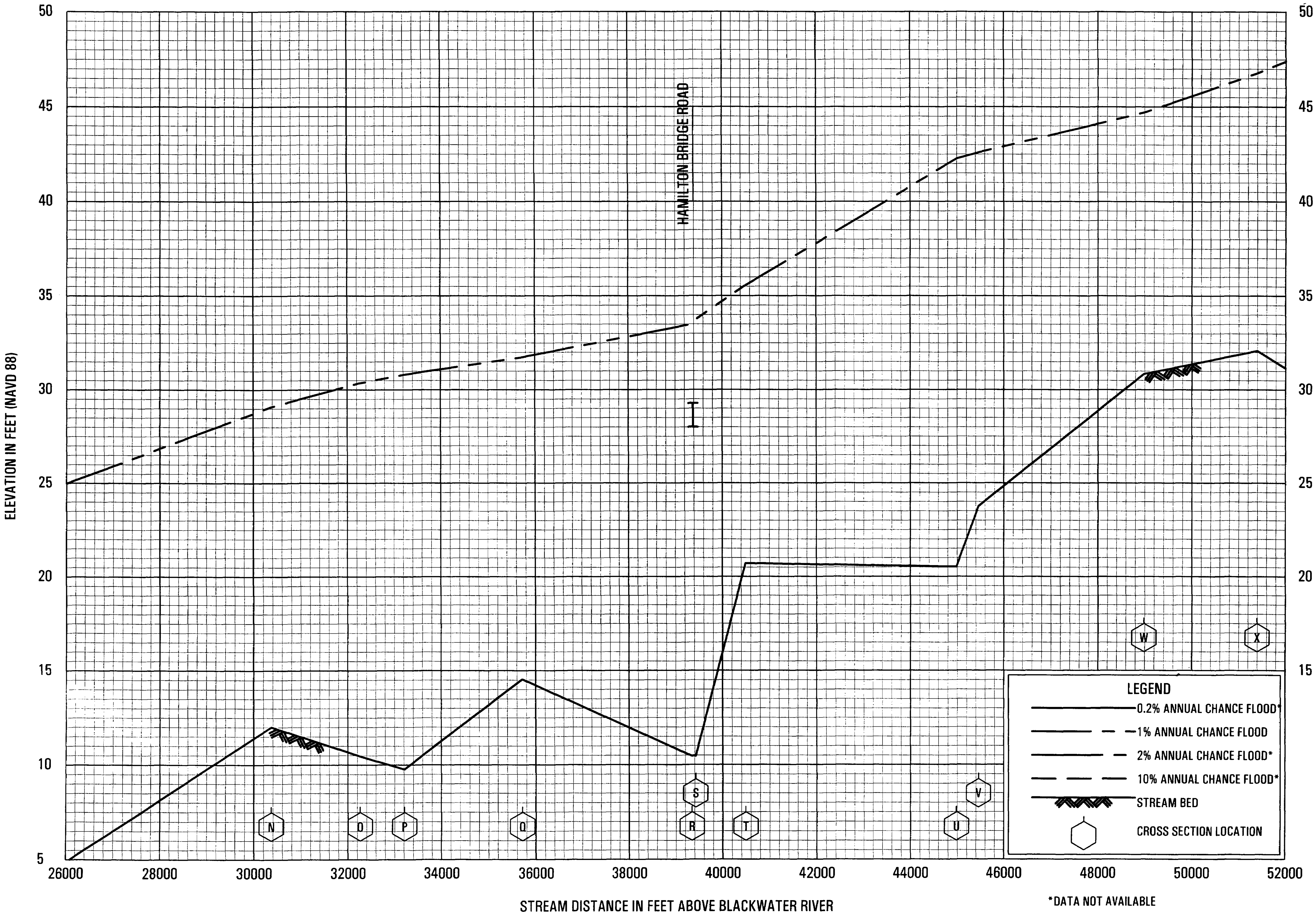
POND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

AND INCORPORATED AREAS

11P



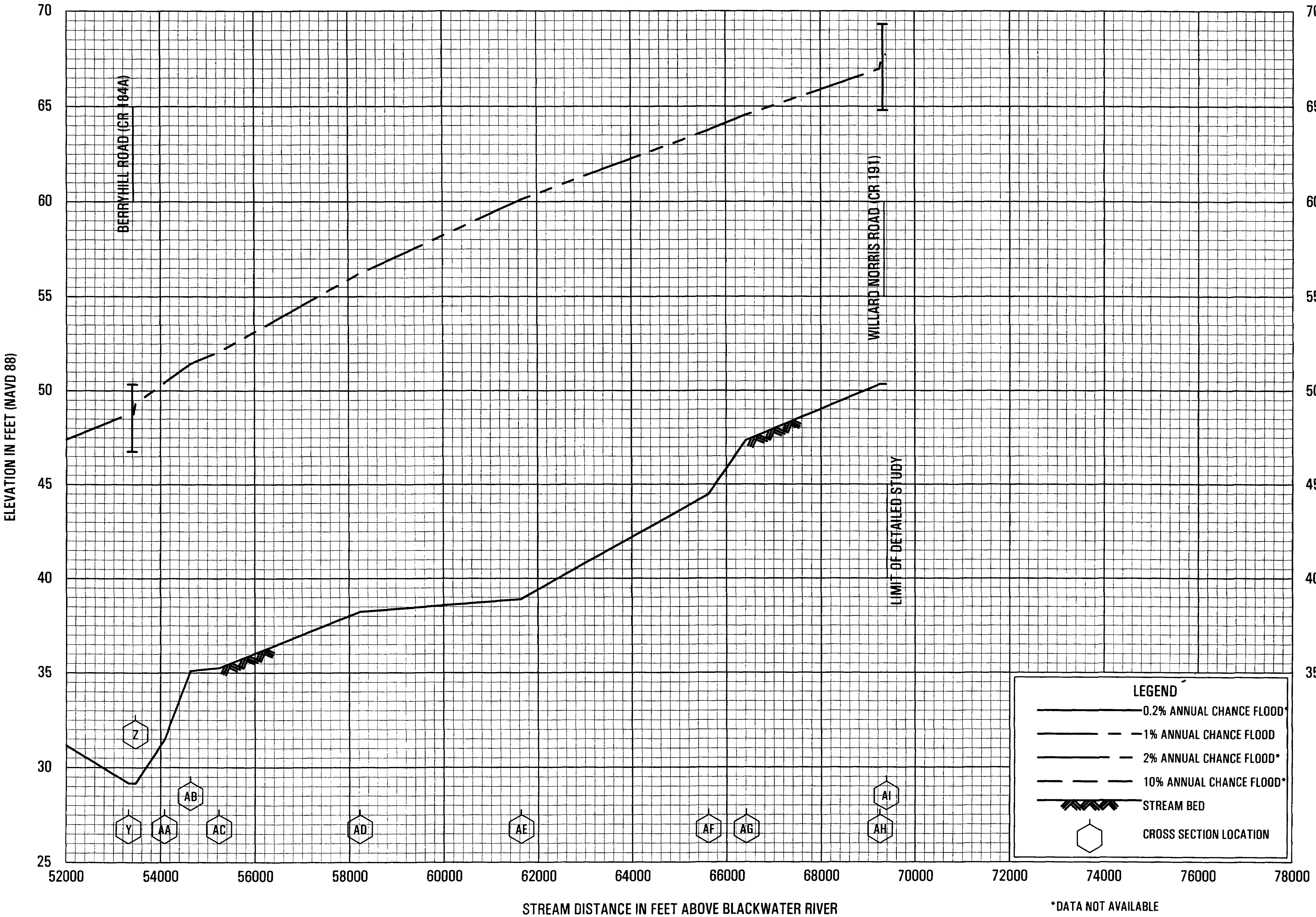
FLOOD PROFILES

POND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

AND INCORPORATED AREAS



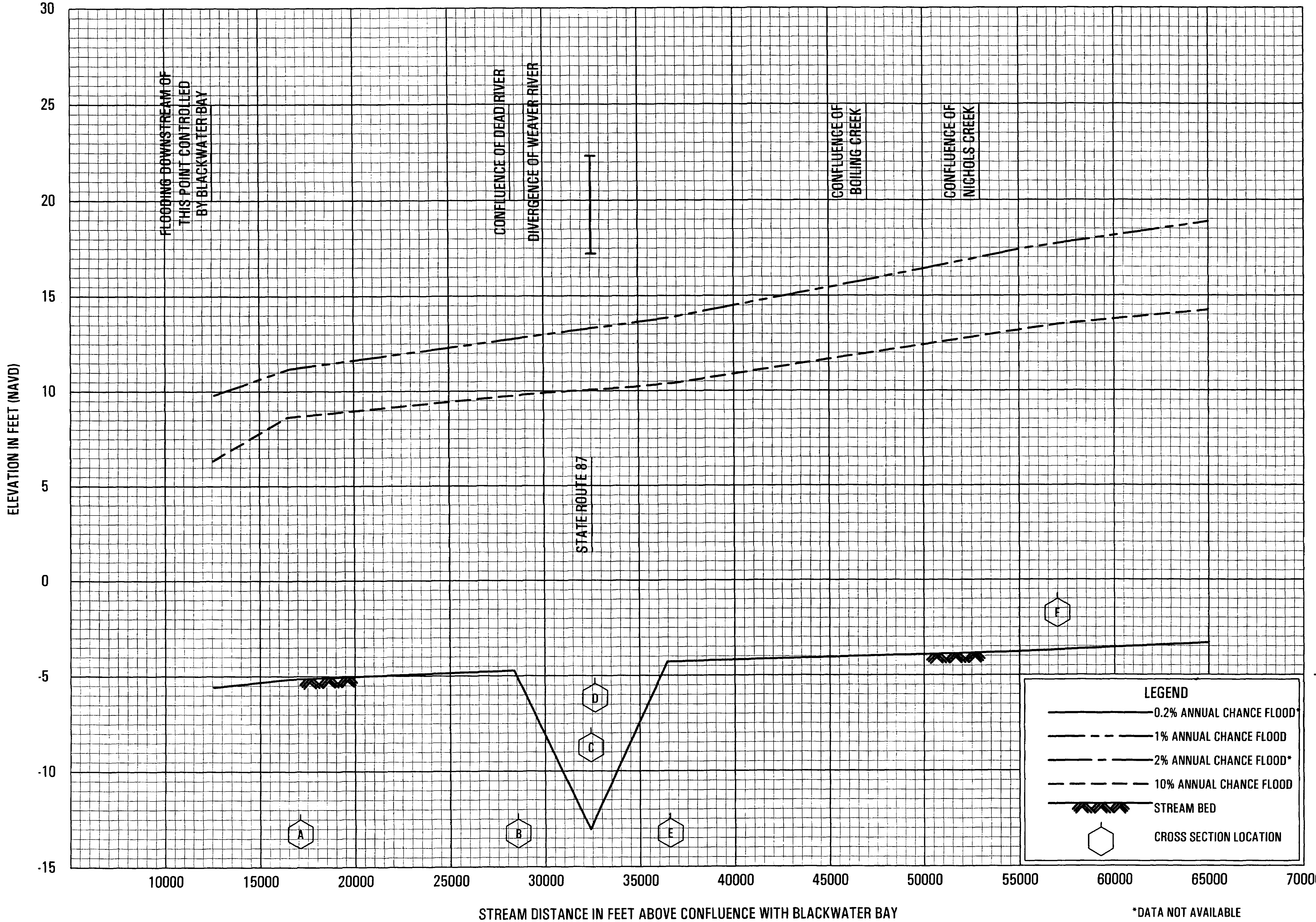
FLOOD PROFILES

POND CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

AND INCORPORATED AREAS



*DATA NOT AVAILABLE

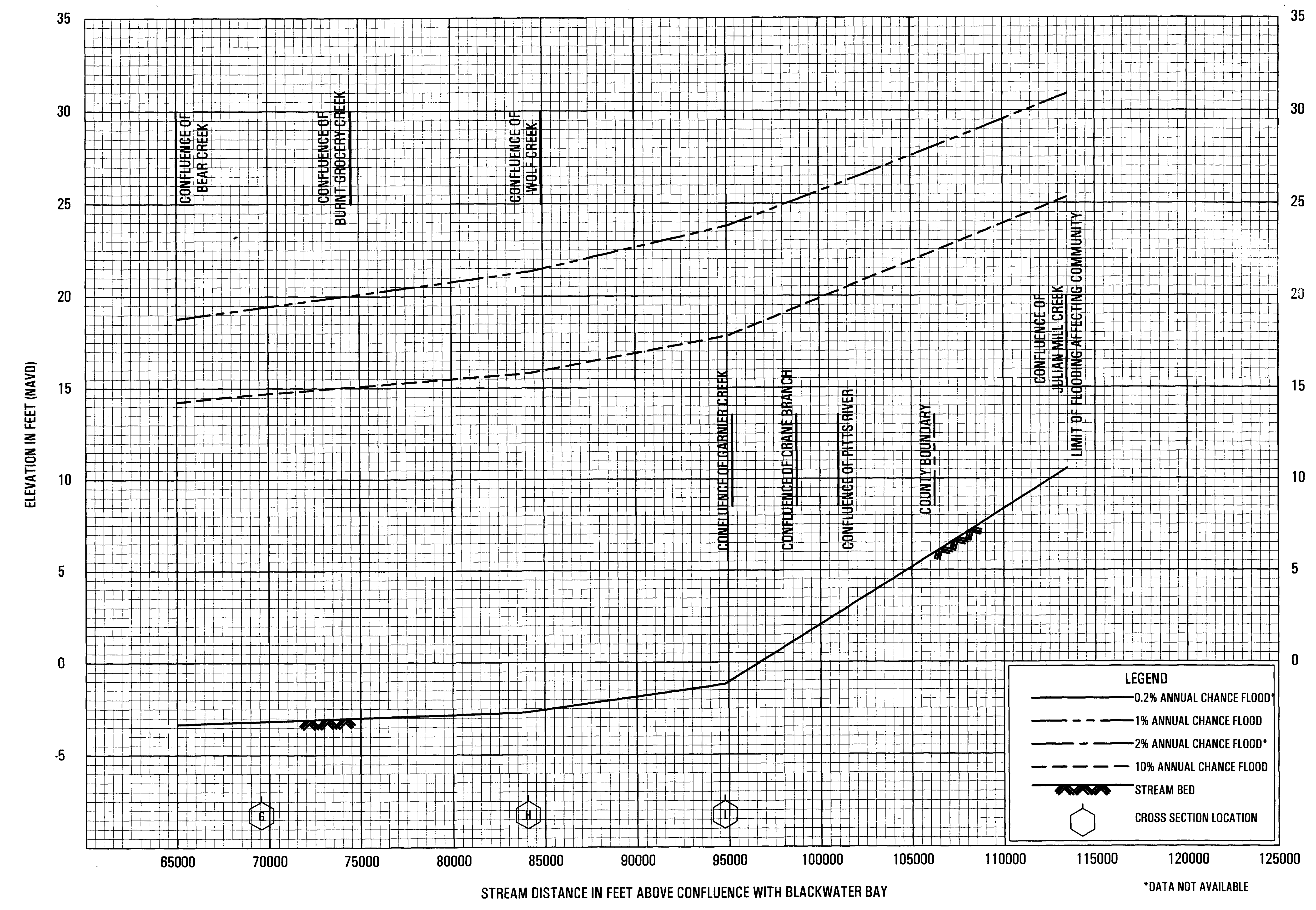
FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

AND INCORPORATED AREAS

FLOOD PROFILES

YELLOW RIVER



FLOOD PROFILES

YELLOW RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

SANTA ROSA COUNTY, FL

AND INCORPORATED AREAS