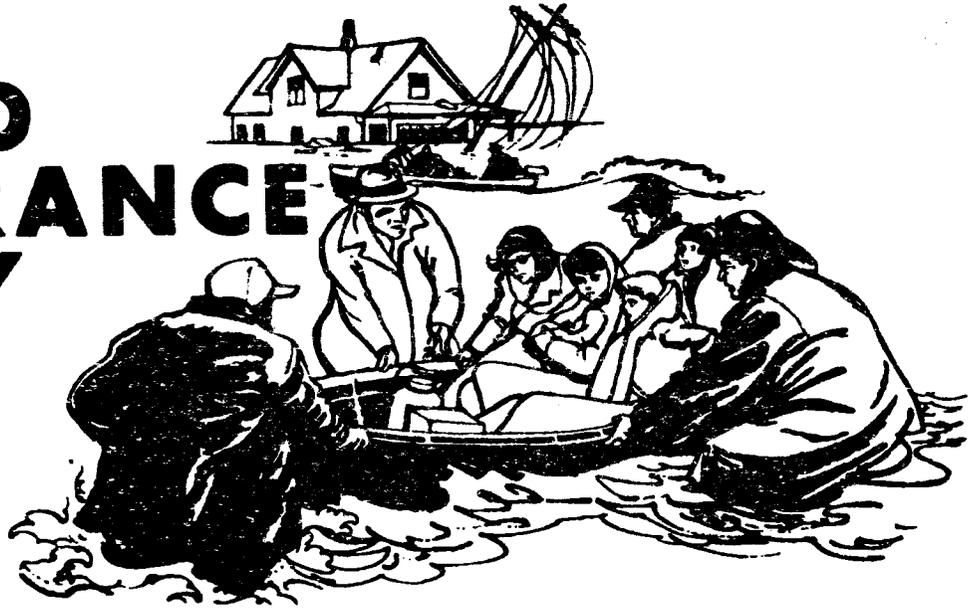


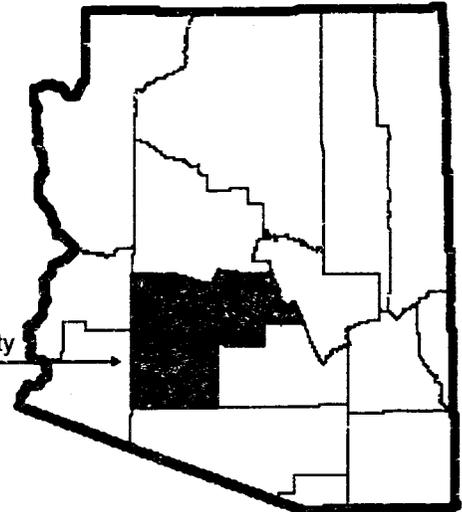
FLOOD INSURANCE STUDY



MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS VOLUME 4 OF 17

COMMUNITY NAME	COMMUNITY NUMBER
AVONDALE, CITY OF	040038
BUCKEYE, TOWN OF	040039
CAREFREE, TOWN OF	040126
CAVE CREEK, TOWN OF	040129
CHANDLER, CITY OF	040040
EL MIRAGE, CITY OF	040041
FOUNTAIN HILLS, TOWN OF	040135
GILA BEND, TOWN OF	040043
GILBERT, TOWN OF	040044
GLENDALE, CITY OF	040045
GOODYEAR, CITY OF	040046
GUADALUPE, TOWN OF	040111
LITCHFIELD PARK, CITY OF	040128
MARICOPA COUNTY (UNINCORPORATED AREAS)	040037
MESA, CITY OF	040048
PARADISE VALLEY, TOWN OF	040049
PEORIA, CITY OF	040050
PHOENIX, CITY OF	040051
QUEEN CREEK, TOWN OF	040132
SCOTTSDALE, CITY OF	045012
SURPRISE, CITY OF	040053
TEMPE, CITY OF	040054
TOLLESON, CITY OF	040055
WICKENBURG, TOWN OF	040056
YOUNGTOWN, TOWN OF	040057

Maricopa County



REVISED
September 30, 2005



Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
04013CV004A

**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) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult community officials and check the Community Map Repository to obtain the most current FIS report components.

Users should refer to Section 10.0, Revisions Description, for further information. Section 10.0 is intended to present the most up-to-date information for specific portions of this FIS report. Therefore, users of this report should be aware that the information presented in Section 10.0 supersedes information in Sections 1.0 through 9.0 of the FIS report.

Initial Countywide FIS Effective Date: April 15, 1988

Revised Countywide Dates: September 29, 1989
September 4, 1991
December 3, 1993
September 30, 1995
July 19, 2001
September 30, 2005

TABLE OF CONTENTS

Volume 1

	<u>Page</u>
1.0 <u>INTRODUCTION</u>	1
1.1 Purpose of Study	1
1.2 Authority and Acknowledgments	1
1.3 Coordination	2
2.0 <u>AREA STUDIED</u>	3
2.1 Scope of Study	3
2.2 Community Description.....	16
2.3 Principal Flood Problems.....	19
2.4 Flood Protection Measures	20
3.0 <u>ENGINEERING METHODS</u>	26
3.1 Hydrologic Analyses.....	26
3.2 Hydraulic Analyses.....	28
4.0 <u>FLOODPLAIN MANAGEMENT APPLICATIONS</u>	109
4.1 Flood Boundaries.....	109
4.2 Floodways.....	110

FIGURES

Figure 1 - Vicinity Map	4
Figures 2-6 - Historic Flooding.....	21-24

TABLES

Table 1 - Detailed Study Sources.....	5
Table 2 - Approximate Study Streams.....	14
Table 3 - Summary of Discharges.....	29
Table 4 - Range of Hydraulic Roughness Coefficients (Manning's "n").....	101

Volume 2

Table 5 - Floodway Data.....	111
------------------------------	-----

TABLE OF CONTENTS (Continued)

Volume 3

	<u>Page</u>
Table 5 - Floodway Data (Continued)	251

Volume 4

<u>5.0 INSURANCE APPLICATION</u>	425
<u>6.0 FLOOD INSURANCE RATE MAP</u>	427
<u>7.0 OTHER STUDIES</u>	427
<u>8.0 LOCATION OF DATA</u>	427
<u>9.0 BIBLIOGRAPHY AND REFERENCES</u>	434
<u>10.0 REVISION DESCRIPTIONS</u>	445
10.1 First Revision.....	445
10.2 Second Revision	450
10.3 Third Revision	464
10.4 Fourth Revision.....	482
10.5 Fifth Revision	491
10.6 Sixth Revision.....	494

FIGURES

Figure 7 - Floodway Schematic	426
-------------------------------------	-----

TABLES

Table 6 - Community Map History.....	428
Table 7 - Letters of Map Change	521

TABLE OF CONTENTS (Continued)

Volume 4 (Continued)

EXHIBITS

Exhibit 1 - Flood Profiles

Andora Hills Wash	Panels 01P-05P
Agua Fria River	Panels 06P-32P
Panels Not Printed	Panels 33P-34P
Buchanan Wash	Panels 35P-36P
Casandro Wash	Panels 37P-41P
South Branch Casandro Wash	Panels 42P-43P

Volume 5

Cave Creek	Panels 44P-67P
Panels Not Printed	Panels 68P-75P
Centennial Wash	Panels 76P-105P
Centennial Wash Left Overbank	Panels 106P-113P
Circle City Area Wash 1	Panels 114P-116P
Circle City Area Wash 2	Panels 117P-118P
Circle City Area Wash 2 Along Atchison, Topeka and Santa Fe Railway	Panel 119P
Circle City Area Wash 3	Panels 120P-122P
Circle City Area Wash 4	Panel 123P
Circle City Area Wash 4 Along Atchison, Topeka and Santa Fe Railway	Panel 124P
Circle City Area Wash 5	Panel 125P
Circle City Area Wash 6	Panels 126P-127P
Circle City Area Wash 7	Panels 128P-129P
Dreamy Draw Wash East	Panels 130P-131P
Panel Not Printed	Panel 132P
Echo Canyon Wash	Panels 133P-137P
Panel Not Printed	Panel 138P
Flynn Lane Wash	Panels 139P-141P

Volume 6

Galloway Wash	Panels 142P-147P
Galloway Wash Middle Branch	Panels 148P-152P
Tributary to Galloway Wash Middle Branch	Panel 152P(a)
Galloway Wash South Branch	Panels 153P-156P
Gila River	Panels 157P-170P
Unnamed Tributary to Galloway Wash	Panels 171P-172P
Granite Reef Wash	Panels 173P-174P
Panel Not Printed	Panel 175P
Hassayampa River	Panels 176P-209P

TABLE OF CONTENTS (Continued)

Volume 6 (Continued)

EXHIBITS (Continued)

Exhibit 1 – Flood Profiles (Continued)

Hospital Wash	Panel 210P
Indian Bend Wash	Panels 211P-219P
Indian Bend Wash Low Flow Channel	Panels 220P-222P
Panels Not Printed	Panels 223P-225P
Martinez Wash	Panel 226P
McMicken Dam Outlet Wash	Panels 227P-230P
Mockingbird Wash	Panels 231P-232P
Moon Valley Wash	Panels 233P-234P
Myrtle Avenue Wash	Panels 235P-236P
Panel Not Printed	Panel 237P

Volume 7

New River	Panels 238P-260P
New River East Split	Panel 261P
New River Middle Split	Panel 262P
New River West Split	Panels 263P-264P
Ocotillo Wash	Panels 265P-268P
Powder House Wash	Panels 269P-270P
Panel Not Printed	Panel 271P
Rowe Wash	Panels 272P-275P
Salt River	Panels 276P-291P
Scatter Wash	Panels 292P-296P
Scatter Wash North Branch	Panels 297P-300P
Panels Not Printed	Panels 301P-304P
Skunk Creek	Panels 305P-326P
Sols Wash	Panels 327P-333P
Sweat Canyon Wash	Panels 334P-335P(c)

Volume 8

Tenth Street Wash	Panels 336P-337P
Trilby Wash	Panels 338P-344P
Panels Not Printed	Panels 345P-347P
Wash B	Panels 348P-349P
Waterman Wash	Panels 350P-361P
Panels Not Printed	Panels 362P-363P
West Split Flow Through El Mirage	Panel 364P-364P(a)
Willow Springs Wash	Panels 365P-367P
Wittmann Wash Along Atchison Topeka & Santa Fe Railway	Panel 368P

TABLE OF CONTENTS (Continued)

Volume 8 (Continued)

EXHIBITS (Continued)

Exhibit 1 – Flood Profiles (Continued)

Wittmann Wash North Split	Panel 369P
Wittmann Wash South Split	Panel 370P
Wittmann Wash Upper Reach	Panel 371P
Wittmann Wash West Split	Panels 372P-373P
Wittmann Wash - Grand Avenue to CAP 1 West Overchute	Panels 374P-377P
Aguila Farm Channel	Panels 378P-380P(b)
North Branch Centennial Wash	Panels 381P-382P
Caterpillar Tank Wash	Panels 383P-386P
Panels Not Printed	Panels 387P-389P
East Fork of Cave Creek	Panels 390P-392P
Centennial Wash	Panels 393P-395P
Cline Creek	Panels 396P-400P
Tributary X5	Panels 401P-403P
Tributary C-6	Panels 404P-406P
Tributary C-8	Panels 407P-411P
Tributary X1	Panels 412P-413P
Tributary X2	Panels 414P-415P
Tributary X3	Panels 416P-417P
Tributary X4A	Panels 418P-419P
Tributary X4B	Panel 420P
Cottonwood Creek	Panels 421P-428P
Cottonwood Creek Tributary 1	Panel 429P-430P
Cottonwood Creek Tributary 2	Panels 431P-432P
East Garambullo Wash	Panels 433P-434P

Volume 9

Flemming Springs Wash	Panels 435P-437P
Grapevine Wash	Panels 438P-440P
Galloway Wash North Tributary	Panels 441P-446P
Gila River	Panels 447P-459P
Gila Bend Canal	Panel 460P
Grass Wash	Panels 461P-463P
Jackrabbit Wash	Panels 464P-479P
Unnamed Tributary of Jackrabbit Wash	Panels 480P-490P
Morgan City Wash	Panels 491P-500P
Ocotillo Wash Tributary 1	Panels 501P-502P
Ocotillo Wash Tributary 1A	Panels 503P-504P
Ocotillo Wash Tributary 2	Panels 505P-506P
Ocotillo Wash Tributary 3	Panels 507P-509P
Ocotillo Wash Tributary 4	Panels 510P-512P
Rodger Creek	Panels 513P-518P

TABLE OF CONTENTS (Continued)

Volume 9 (Continued)

EXHIBITS (Continued)

Exhibit 1 – Flood Profiles (Continued)

Rowe Wash	Panels 519P-523P
Star Wash	Panels 524P-526P
Panel Not Printed	Panel 527P

Volume 10

Trilby Wash	Panels 528P-535P
Trilby Wash Middle Channel	Panel 536P
Trilby Wash West Channel	Panel 537P
Twin Buttes Wash	Panels 538P-542P
Wagner Wash	Panels 543P-548P
West Garambullo Wash	Panels 549P-550P
White Peak Wash	Panels 551P-553P
West Fork White Peak Wash	Panel 554P
Willow Springs Wash	Panels 555P-559P
Willow Springs Wash Tributary 1	Panels 560P-565P
Willow Springs Wash Tributary 1A	Panels 566P-567P
Willow Springs Wash Tributary 2	Panels 568P-570P
Willow Springs Wash Tributary 2A	Panels 571P-572P
Willow Springs Wash Tributary 4	Panels 573P-574P
Willow Springs Wash Tributary 5	Panels 575P-578P
Willow Springs Wash Tributary 5A	Panel 579P
Southern Pacific Railroad	Panels 580P-582P

Volume 11

191st Avenue Wash	Panels 583P-586P
Apache Wash	Panels 587P-603P(e)
Apache Wash Split Flow Area	Panels 604P-605P
Apache Wash West Fork	Panels 606P-607P(b)
Atchison Topeka & Santa Fe Railroad Channel	Panels 608P-609P
Beardsley Canal Wash	Panels 610P-612P
Bedrock Wash	Panels 613P-617P
Bedrock Wash North Fork	Panels 618P-621P
Bender Wash	Panels 622P-625P(b)
Bullard Wash	Panels 626P-631P(c)
Bulldozer Wash	Panels 632P-642P
Osborn Road Wash	Panels 643P-647P
Diversion Dike Wash	Panels 648P-649P
Cholla Wash	Panels 650P-667P
Cholla Wash North Fork	Panels 668P-672P

TABLE OF CONTENTS (Continued)

Volume 11 (Continued)

EXHIBITS (Continued)

Exhibit 1 – Flood Profile (Continued)

Daggs Wash	Panels 673P-683P
Daggs Wash West Breakout	Panels 684P-685P
Daggs Wash East Split Flow	Panel 686P

Volume 12

Desert Hills Wash	Panels 687P-691P(a)
Desert Hills Wash Tributary	Panel 692P
Desert Lake Wash	Panels 693P-693P(c)
Desert Lake Wash East Fork	Panels 694P-695P(e)
Interstate 10 Wash	Panel 696P
Jackrabbit Trail Wash	Panels 697P-700P
Dale Creek Wash	Panel 701P
Lower El Mirage Wash	Panels 702P-704P
Lower El Mirage Wash Tributary	Panels 705P-707P
Luke Wash	Panels 708P-712P
Luke Wash East Main Tributary	Panels 713P-715P
Luke Wash East Sub Tributary	Panels 716P-717P
Luke Wash Minor Tributary	Panels 718P-719P
Mesquite Tank Wash	Panels 720P-723P
Paradise Wash	Panels 724P-733P
Paradise Wash West Fork	Panels 734P-734P(a)
Perryville Road Wash	Panels 735P-738P
Powerline Wash	Panels 739P-746P
Rainbow Wash	Panels 747P-754P
Rainbow Wash Tributary	Panels 755P-756P
Panel Not Printed	Panel 757P
Ranieri Tank Wash	Panels 757P(a)-757P(b)
Sand Tank Wash	Panels 758P-764P(b)
Scott Avenue Wash	Panels 765P-769P(c)

Volume 13

Star Wash	Panels 770P-780P
Star Wash Tributary A	Panel 781P
Star Wash Tributary B	Panels 782P-784P
Star Wash Tributary C	Panels 785P-786P
Star Wash Tributary D	Panels 787P-789P
Tank Wash	Panels 790P-794P
Tank Wash South Branch	Panel 795P
Tractor Wash	Panels 796P-801P

TABLE OF CONTENTS (Continued)

Volume 13 (Continued)

EXHIBITS (Continued)

Exhibit 1 – Flood Profile (Continued)

Tuthill Dike Wash	Panels 802P-811P
Unnamed Wash No. 1	Panels 812P-817P
Unnamed Wash No. 2	Panels 818P-822P
Waterfall Wash	Panels 823P-830P
White Granite Wash	Panels 831P-834P
White Granite Wash North Fork	Panels 835P-836P
White Tank #3 Wash	Panels 837P-843P
Moon Valley Wash North Branch	Panels 844P-852P
Moon Valley Wash North Split	Panels 853P-855P
Moon Valley Wash South Branch	Panels 856P-861P
Moon Valley Wash Diversion Channel	Panels 862P-864P
Cave Creek Overflow Channel	Panels 865P-866P
Arrow Wash	Panels 867P-869P
Ashbrook Wash	Panels 870P-873P
Balboa Wash	Panels 874P-875P
Caliente Wash	Panels 876P-877P

Volume 14

Cereus Wash	Panels 878P-880P
Chukar Wash	Panel 881P
Colony Wash	Panels 882P-883P
Cyprus Point Wash	Panels 884P-885P
Emerald Wash	Panels 886P-887P
Escalante Wash	Panel 888P
Fountain Channel	Panel 889P
Greystone Wash	Panel 890P
Hesperus Wash	Panels 891P-892P
Jacklin Wash	Panel 893P
Kingstree Wash	Panel 894P
Laser Drain	Panel 895P
Legend Wash	Panel 896P
Logan Wash	Panel 897P
Malta Drain	Panel 898P
Mangrum Wash	Panel 899P
North Colony Wash	Panel 900P
Oxford Wash	Panel 901P
Powder Wash	Panels 902P-903P
Sunburst Wash	Panel 904P
Sycamore Wash	Panel 905P
Tulip Wash	Panel 906P
Amir Wash	Panels 907P-908P

TABLE OF CONTENTS (Continued)

Volume 14 (Continued)

EXHIBITS (Continued)

Exhibit 1 – Flood Profile (Continued)

Blue Tank Wash	Panel 909P
Calamity Wash	Panels 910P-911P
Cemetery Wash	Panels 912P-917P
Cemetery Wash Tributary R-1	Panels 918P-919P
Cemetery Wash Tributary R-2	Panels 920P-922P
Cemetery Wash Tributary R-3	Panel 923P
Deadman Wash	Panels 924P-928P
Deadman Wash Stream No. 4	Panel 929P
Deadman Wash Stream No. 7	Panel 930P
Deadman Wash Stream No. 12	Panel 931P
Flying E Wash	Panels 932P-936P
Hartman Wash	Panels 937P-941P
Panels Not Printed	Panels 942P-944P
Unnamed Tributary to Hartman Wash	Panel 945P
Holly Wash	Panel 946P
Iona Wash	Panels 947P-952P
Little San Domingo Wash	Panels 953P-956P
Monarch Wash	Panels 957P-960P
Ox Wash	Panel 961P
Powder House Wash Tributary 1	Panel 962P
Powder House Wash Tributary 2	Panel 963P
Rio Verde North Wash A	Panels 964P-965P
Rio Verde North Wash A South	Panel 966P
Rio Verde North Wash F	Panel 967P
Rio Verde North Wash I	Panel 968P
San Domingo Wash	Panels 969P-970P
Sols Wash Tributary AH2	Panel 971P
Sols Wash Tributary AH3	Panels 972P-975P
Unnamed Tributary to Sols Wash Tributary AH3	Panel 976P

Volume 15

Sols Wash Tributary AH4	Panels 977P-978P
Sols Wash Tributary AH5	Panels 979P-983P
Sunny Cove Wash	Panel 984P
Sunny Cove Wash Upper Reach	Panels 985P-987P
Sunset Wash	Panel 988P
Turtleback Wash	Panel 989P
Twin Peaks Wash	Panel 990P
Wash AG	Panel 991P
Wash E2	Panel 992P
Wash F	Panel 993P

TABLE OF CONTENTS (Continued)

Volume 15 (Continued)

EXHIBITS (Continued)

Exhibit 1 – Flood Profile (Continued)

Wash F2	Panel 994P
Wash G	Panel 995P
Wash H	Panels 996P-997P
Wash I	Panels 998P-999P
Wash K	Panels 1000P-1001P
Wash K1	Panel 1002P
Wash L	Panels 1003P-1004P
Wash O	Panels 1005P-1006P
Wash P	Panel 1007P
Wash Q	Panel 1008P
Wash S2	Panel 1009P
Yucca Flat Wash	Panels 1010P-1011P
Cave Creek	Panels 1012P-1023P
White Tanks Wash	Panels 1024P-1031P
White Tanks Wash Tributary 1	Panels 1032P-1035P
Skunk Tank Wash	Panels 1036P-1039P
Valley Wash	Panels 1040P-1041P
Queen Creek	Panels 1042P-1043P
Skunk Creek East Split Flow	Panel 1044P
Panels Not Printed	Panels 1045P-1046P
Wash 9	Panels 1047P-1049P
Wash 10	Panels 1050P-1055P
Wash 10 North	Panels 1056P-1058P
Wash 11	Panels 1059P-1066P
Wash 11 South	Panels 1067P-1072P
Wash 12	Panels 1073P-1077P
Wash 12 South	Panels 1078P-1080P
Wash 12 South Branch 1	Panel 1081P

Volume 16

Wash 12 South Branch 2	Panels 1082P-1083P
Prospect Wash	Panels 1084P-1085P
Rattler Wash	Panels 1086P-1087P
Skyline Wash	Panels 1088P-1090P
Granite Falls Wash	Panel 1091P
Pyrite Wash	Panel 1092P
Mountain Wash	Panel 1093P
Panels Not Printed	Panels 1094P-1103P
Wagon Wash	Panel 1104P
Apache Wash Tributary 1	Panels 1105P-1106P
Apache Wash Tributary 2	Panels 1107P-1108P

TABLE OF CONTENTS (Continued)

Volume 16 (Continued)

EXHIBITS (Continued)

Exhibit 1 – Flood Profile (Continued)

Apache Wash Tributary 3	Panel 1109P
Apache Wash Tributary 4	Panel 1110P
Apache Wash Tributary 5	Panel 1111P
Apache Wash Tributary 6	Panel 1112P
Apache Wash Tributary 7	Panel 1113P
Apache Wash West Fork Tributary 1	Panel 1114P
Apache Wash West Fork Tributary 2	Panel 1115P
Desert Hills Wash Tributary 1	Panels 1116P-1117P
Desert Hills Wash Tributary 2	Panel 1118P
Desert Hills Wash Tributary 3	Panel 1119P
Desert Hills Wash Tributary 4	Panel 1120P
Desert Hills Wash Tributary 5	Panel 1121P
Desert Hills Wash Tributary 6	Panels 1122P-1123P
Desert Lake Wash Tributary 2	Panels 1124P-1125P
Ranieri Tank Wash Tributary 1	Panel 1126P
Ranieri Tank Wash Tributary 2	Panel 1127P
Ranieri Tank Wash Tributary 3	Panel 1128P
Doe Peak Wash	Panels 1129P-1130P
Doe Peak Wash South Fork	Panels 1131P-1133P
Doe Peak Wash East Fork	Panels 1134P-1135P
Southern Pacific Railroad Ditch	Panels 1136P-1138P
Roosevelt Irrigation District Canal Split Flow	Panel 1139P
Skunk Creek Tributary 6B	Panels 1140P-1141P
Skunk Creek Tributary 6B North	Panel 1142P
Skunk Creek Tributary 6C	Panels 1143P-1144P
Skunk Creek Tributary 10A	Panel 1145P
Skunk Creek Tributary 10B	Panels 1146P-1147P
Skunk Creek Tributary 12	Panels 1148P-1149P
McCormick Ranch Lakes East Branch	Panel 1150P
McCormick Ranch Lakes West Branch	Panel 1151P
North Beardsey Wash	Panels 1152P-1155P
South Beardsley Wash	Panels 1156P-1162P
South Beardsley Wash Breakout	Panels 1163P-1164P
Dreamy Draw Wash West	Panel 1165P
Rawhide Wash	Panels 1166P-1173P
Tributary 1 to Rawhide Wash	Panels 1174P-1175P
Tributary 2 to Rawhide Wash	Panels 1176P-1177P

TABLE OF CONTENTS (Continued)

Volume 17

EXHIBITS

Exhibit 1 – Flood Profile (Continued)

Tributary 3 to Rawhide Wash	Panel 1178P
Tributary 4 to Rawhide Wash	Panels 1179P-1180P
Rock Springs Creek	Panels 1181P-1183P
Panels Not Printed	Panels 1184P-1198P
Wash B	Panels 1199P-1206P
Wash B Tributary	Panel 1207P
Flooding Along East Embankment of Eastern Canal	Panels 1208P-1210P
Andora Hills Wash Split 1	Panel 1211P
Andora Hills Wash Split 2	Panel 1212P
Andora Hills Wash	Panels 1213P-1213P(d)
Galloway Wash Split 2	Panel 1214P
Galloway Wash South Branch Split 1	Panel 1215P
Black Wash	Panel 1216P
Bender Wash North Tributary	Panels 1217P-1219P
I-8 Wash East	Panel 1220P
Pioneer Cemetery Wash	Panels 1221P-1223P
Evans Wash	Panel 1224P-1227P
Hacker Wash	Panels 1228P-1231P
Hacker Wash Diversion	Panel 1232P
Quilotosa Wash East Split	Panel 1233P
Quilotosa Wash	Panel 1234P-1235P
West Quilotosa Wash	Panels 1236P-1237P
I-8 Wash West	Panel 1238P
Sauceda Wash	Panels 1239P-1240P
Citrus Valley Wash	Panels 1241P-1242P
Tributary to Cave Creek	Panel 1243P
Tributary to Tributary to Cave Creek	Panel 1244P
Panels Not Printed	Panels 1245P-1261P
Sonoran Wash	Panels 1262P-1264P
West Tributary of Bullard Wash	Panel 1265P
Camelback Wash	Panels 1266P-1267P
Eastern Pima Wash	Panels 1268P-1269P
Unnamed Central Tributary to Cave Creek	Panels 1270P-1272P
Unnamed Tributary to Stagecoach Pass Wash	Panels 1273P-1274P
Windmill Wash	Panels 1275P-1276P
Windmill Wash North Branch	Panels 1277P-1278P
Windmill Wash South Branch	Panel 1279P

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Flood Insurance Rate Map Index
Flood Insurance Rate Map

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were computed at cross sections. Between cross sections, the boundaries were interpolated. In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary has been shown.

The floodways for Little San Domingo, Mockingbird, and Powder House Washes are shown coincident with the 100-year floodplain boundaries because of high, hazardous velocities in their respective floodplains. No floodway was computed for Wash B downstream of Granite Reef Aqueduct. Also, no floodway was computed for Cave Creek below Arizona Canal. No floodway was computed for Wittmann Drainage due to the split flow below Center Street. Floodways for Grass Wash below the U.S. Highway 60 bridge and for Aguila Farm Channel were not computed due to excessive overbank losses.

Floodways are not applicable for areas of shallow flooding; therefore, floodways were not computed for any of the canals, railroad embankments, or for Sand Tank and Bender Washes, Rodeo Wash and its tributary, Airport and Scott Avenue Washes, Lower El Mirage Wash Tributary, and Apache Creek.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by 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 7.

5.0 INSURANCE APPLICATION

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

Zone A:

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

Zone AE:

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

Zone AH:

Zone AH is the flood insurance risk 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 BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.

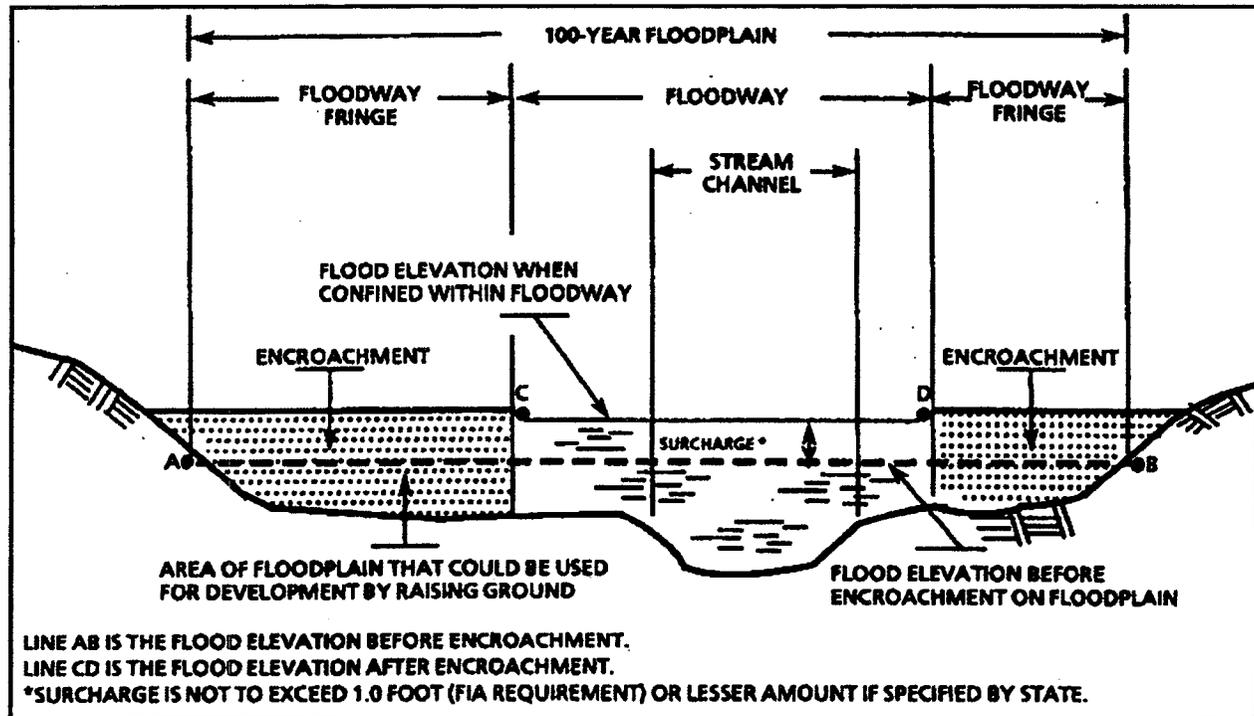


Figure 7. Floodway Schematic

Zone AO:

Zone AO is the flood insurance risk 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 base flood depths derived from the detailed hydraulic analyses are shown within this zone. In addition, for alluvial fan flood hazards shown as Zone AO on the Flood Insurance Rate Maps, average depths and velocities of flow are given. In these areas depths of the 1-percent-annual-chance flood may exceed 3 feet. Development on alluvial fans is subject to a more severe flood hazard than would normally be encountered in an AO zone due to high velocities and unpredictability of the location of the stream channel across the width of the fan. Mandatory flood insurance purchase requirements apply.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood depths are shown within this zone. Insurance purchase is not required in these zones.

Zone D

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

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications

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

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

7.0 OTHER STUDIES

Flood Insurance Studies have been published for the following: City of Apache Junction (Reference 1), City of Avondale (Reference 2), Town of Buckeye (Reference 3), Town of Carefree (Reference 4), City of Chandler (Reference 5), Town of El Mirage (Reference 6), Town of Gila Bend (Reference 7), Town of Gilbert (Reference 8), City of Glendale (Reference 9), Town of Goodyear (Reference 10), City of Mesa (Reference 11), Town of Paradise Valley (Reference 12), City of Peoria (Reference 13), City of Phoenix (Reference 14), City of Scottsdale (Reference 15), Town of Surprise (Reference 16), City of Tempe (Reference 17), City of Tolleson (Reference 18), Town of Wickenburg (Reference 19), Town of Youngtown (Reference 20), and the unincorporated areas of Maricopa County (Reference 67). Information from all of these studies has been incorporated into this study. See Table 6 for a map history of the aforementioned communities.

Flood Insurance Studies have been published for adjacent areas of La Paz County (Reference 68), Yavapai County (Reference 69), and Yuma County (Reference 70), Revised Flood Insurance Studies are being prepared for Pinal County (Reference 71) and Pima County (Reference 72). Approximate flooding areas in Yavapai and Pinal Counties were not studied in Maricopa County. All other county studies are in agreement with this study.

This FIS report either supersedes or is compatible with all previous studies on streams studied in this report and should be considered authoritative for 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 the Flood Insurance and Mitigation Division, Federal Emergency Management Agency, 1111 Broadway, Suite 1200 Oakland, CA 94607.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Avondale, City of	February 15, 1974	January 16, 1976	June 15, 1979	August 3, 1982 April 15, 1988 September 29, 1989 September 4, 1991 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005
Buckeye, Town of	February 15, 1980		February 15, 1980	April 15, 1988 September 4, 1991 September 30, 1995 July 19, 2001 September 30, 2005
Carefree, Town of	July 2, 1979		July 2, 1979	April 15, 1988 September 29, 1989 September 4, 1991 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005
Cave Creek, Town of	June 9, 1988		September 29, 1989	September 29, 1989 September 4, 1991 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005

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FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Chandler, City of	May 24, 1977	January 17, 1978	July 16, 1980	April 15, 1988 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005
El Mirage, City of	February 15, 1974		December 1, 1978	April 15, 1988 September 29, 1989 September 4, 1991 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005
Gila Bend, Town of	January 23, 1974	December 24, 1976	December 4, 1979	April 15, 1988 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005
Gilbert, Town of	April 5, 1974	October 15, 1976	January 16, 1980	September 30, 1983 April 15, 1988 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005

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FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Glendale, City of	July 26, 1974	April 9, 1976	April 16, 1979	September 22, 1981 April 15, 1988 September 29, 1989 September 4, 1991 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005
Goodyear, City of	March 15, 1974	April 30, 1976	July 16, 1979	October 18, 1983 April 15, 1988 September 29, 1989 September 4, 1991 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005
Guadalupe, Town of	April 15, 1988		April 15, 1988	December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005
Litchfield Park, City of	September 29, 1989		September 29, 1989	September 4, 1991 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005

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FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Mesa, City of	April 13, 1973	April 22, 1977	May 15, 1980	April 15, 1988 September 4, 1991 December 3, 1993 July 19, 2001 September 30, 2005
Paradise Valley, Town of	December 7, 1973	May 21, 1976	May 1, 1980	June 3, 1986 April 15, 1988 September 29, 1989 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005
Peoria, City of	January 16, 1981		January 16, 1981	April 15, 1988 September 4, 1991 December 3, 1993 July 19, 2001 September 30, 2005
Phoenix, City of	June 28, 1974	September 12, 1975	December 4, 1979	June 1, 1984 April 15, 1988 September 29, 1989 September 4, 1991 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005

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FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Queen Creek, Town of	September 4, 1991		September 4, 1991	December 3, 1993 July 19, 2001 September 30, 2005
Scottsdale, City of	September 21, 1973		December 31, 1977	December 4, 1984 April 15, 1988 September 29, 1989 September 4, 1991 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005
Surprise, City of	June 28, 1974	December 5, 1975	January 15, 1978	March 1, 1983 April 15, 1988 September 4, 1991 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005
Tempe, City of	June 28, 1974	September 5, 1975	August 15, 1980	December 14, 1982 April 15, 1988 September 4, 1991 December 3, 1993 September 30, 1995 July 19, 2001 September 30, 2005

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FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Tolleson, City of	April 12, 1974	December 19, 1975	January 16, 1980	April 15, 1988 September 4, 1991 July 19, 2001 September 30, 2005
Wickenburg, Town of	February 1, 1974	October 10, 1975	January 5, 1978	March 29, 1983 April 15, 1988 September 4, 1991 July 19, 2001 September 30, 2005
Town of Youngtown	December 28, 1973		November 15, 1978	April 5, 1988 July 19, 2001 September 30, 2005
Unincorporated Areas	July 2, 1979		July 2, 1979	April 15, 1988 September 4, 1991 December 3, 1993 December 30, 1995 July 19, 1995 September 30, 2005
T A B L E 6	FEDERAL EMERGENCY MANAGEMENT AGENCY MARICOPA COUNTY, AZ AND INCORPORATED AREAS		COMMUNITY MAP HISTORY	

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10.0 REVISION DESCRIPTIONS

This section has been added to provide information regarding significant revisions made since the original Flood Insurance Study was printed. Future revisions may be made that do not result in the republishing of the Flood Insurance Study report. To assure that any user is aware of all revisions, it is advisable to contact the community repository.

10.1 First Revision

This study was revised on September 29, 1989, to include the restudy conducted for the City of Wickenburg and surrounding unincorporated areas of Maricopa County; to include the newly incorporated Town of Cave Creek; and to include the revisions described below. As part of this revision, the conversion of the FIRM for Maricopa County, Arizona, and Incorporated Areas to the Map Initiatives Format on a panel-to-panel basis was initiated. In the Map Initiatives Format, all base flood elevations, cross sections, and floodplain and floodway boundaries are shown on the FIRM. The flood insurance zone designations were changed to reflect the Map Initiatives Format. Areas previously shown as numbered Zone A were revised to Zone AE, Zone B was revised to Zone X (shaded), and Zone C was revised to Zone X (unshaded). In addition, all Flood Insurance Zone Data Tables were removed from the Flood Insurance Study report and all zone designations and reach determinations were removed from the profiles. The FIRM Index was revised to reflect the 100-year flooding shown on all FIRM panels. In addition, the Township and Range Lines for Maricopa County and Incorporated Areas have been added to the FIRM and Flood Boundary and Floodway Map Index as requested by the FCDMC.

New River Below Skunk Creek

For the reach of the New River from the confluence with the Agua Fria River upstream to Skunk Creek, revised hydrologic and hydraulic analyses were developed by Coe and Van Loo Consulting Engineers, Inc. (CVL).

The hydrologic analysis developed by CVL for the reach of the New River between the confluence of the Agua Fria River and Skunk Creek was based on the 1984 COE study. CVL modified the COE study to reflect existing floodplain conditions, and developed the 10-, 50-, and 500-year discharges for this reach. These revised discharges are presented in Table 3 entitled "Summary of Discharges." The revised discharges reflect the construction of the Adobe, New River, and Cave Buttes Dams and the Arizona Canal Diversion Channel (ACDC). These data are presented in the technical report entitled "Hydrology Update, November 15, 1986, New River Below Skunk Creeks, Maricopa County, Arizona," prepared by CVL for the FCDMC.

The revised HEC-2 hydraulic analyses for this reach of the New River utilized cross sectional data from the original COE model for the New River based on 1982 topography. These cross sections were modified to include the following channelization projects:

- Glendale Municipal Airport
- Plaza Del Rio Development located South of Thunderbird Road
- Desert Harbor Development located from approximately 3,600 feet downstream of the Thunderbird Road Bridge to North of Greenway Road

The starting water-surface elevations were based on the slope-area method. The roughness factors ("n" values) were originally established by the COE. CVL conducted a field investigation of the river and revised these factors. Based on the field investigation, CVL utilized the values established by the COE. The revised floodway analysis was also based on the COE model and utilized Method 1 encroachment. These data are presented in the technical report entitled "Flood Insurance Study, New River Below Skunk Creek, Maricopa County, Arizona," prepared by CVL for FCDMC, dated December 30, 1986.

The 100- and 500-year floodplain and the 100-year floodway boundaries were delineated on topographic maps at a scale of 1" = 200', contour interval of 2 feet, entitled "New River Floodplain Delineation, Agua Fria River to Skunk Creek," prepared by CVL and revised July 1987. The maps were based on aerial mapping flown by Aerial Mapping Company, Inc., on November 20, 1981, at a scale of 1" = 100', contour interval of 2 feet.

New River Upstream of New River Dam

The revised 100-year hydrologic analysis for the reach of the New River upstream of the New River Dam to Rock Springs was developed by CVL using the COE HEC-1 hydrologic computer model. These data are presented in the technical report entitled "Hydrology Report, Including Approval Letters For Flood Insurance Study, New River, from New River Dam to Rock Springs, Maricopa County, Arizona," prepared by CVL for FCDMC, dated December 1987. Only the 100-year discharge was developed because the channel geometry for this reach of the New River is characterized by wide floodplains with numerous low-flow channels that are highly unstable. These channels change significantly during low-flow floods. The revised 100-year discharge is presented in Table 3.

The hydraulic analyses were conducted by CVL utilizing the COE HEC-2 hydraulic computer model. The starting water-surface elevations were based on the slope-area method. The high-water level in the New River Dam was not used due to difference in the time of peak flow. Cross sectional data were based on 1" = 200' topographic mapping prepared by Aerial Mapping Company, Inc., in March 1985 and December 1986.

Three split flow reaches of the New River and Sweat Canyon Wash were analyzed in addition to the main channel of the New River. The three split flow reaches of the New River are identified as New River East Split, New River Middle Split, and New River West Split. Roughness factors ("n" values) for the New River, the split flows of the New River, and Sweat Canyon Wash were established based on field investigation, topography, and photographs of the area. These values are presented in Table 4. No floodways were computed for these areas because of the unique topography.

The 100-year floodplain boundaries were delineated using topographic maps at a scale of 1:4,800, contour interval of 4 feet, entitled "New River Floodplain Delineation, New River Dam Reservoir to Rock Springs," and prepared by CVL.

Tables 1, 2, 3, and 4 have been revised to reflect these modifications to the flooding along the New River. The Floodway Data Table for the New River was also revised to reflect the revised hydraulic analysis. Due to the addition of cross sections for the reach between the Agua Fria River and Skunk Creek, the cross sections located upstream of Skunk Creek to the New River Dam were relabeled. Profile Panels 24P through 59P were revised to reflect these

changes and to show the split flow reaches. Profile Panels 60P and 61P for Sweat Canyon Wash were added to the Flood Insurance Study report.

East Fork Cave Creek

The SFHA along a reach of East Fork Cave Creek, east of 7th Street, was modified based on a revised hydrologic analysis of the 100-year discharge performed by NBS/Lowry Engineers and Planners (NBS/Lowry). This analysis is presented in reports prepared by NBS/Lowry entitled: "Upper East Fork Cave Creek, Area Drainage Master Study, Technical Submittals," submittal number 4, dated June 30, 1987; "Upper East Fork Cave Creek, Area Drainage Master Study, Technical Submittals" (Executive Summary), undated, and "Upper East Fork Cave Creek, Area Drainage Master Study, Technical Submittals," undated.

The revised hydrologic analysis was developed using the SCS TR-20 hydrologic computer model. The routing used in the analysis more accurately represents the existing flow conditions in the Upper East Fork Cave Creek drainage basin than that developed for the existing Flood Insurance Study. As a result of this analysis, the floodway was eliminated for the reach of East Fork Cave Creek east of 7th Street. The SFHA east of the 7th Street was revised to Zone A approximate with the floodplain boundaries remaining as shown on the April 15, 1988, FIRM. The area located between Cave Creek and East Fork Cave Creek, which was designated as Zone C on the April 15, 1988, FIRM, was revised to Zone X (shaded). These changes are reflected on FIRM Panels 1215 and 1220. The Floodway Data Table and profile panels have also been modified to reflect these changes.

The Letter of Map Amendment (LOMA) issued on August 1, 1986, for the City of Phoenix for Lots 117 to 136 of Coral Gable Estates is shown on FIRM Panels 1655 and 1255. The LOMA stated that this property was not within the SFHAs. The 100-year floodplain delineation along East Fork Cave Creek was revised to reflect this LOMA.

Buchanan Wash

Hydrologic and hydraulic analyses for Buchanan Wash from its confluence with Skunk Creek to the CAP Canal were conducted by AGK Engineers, Inc., for the FCDMC. These analyses are presented in the technical reports entitled "Hydrologic Analyses for Buchanan Wash, Maricopa County, Arizona," and "Flood Insurance Study for Buchanan Wash, from Skunk Creek to CAP Canal, Maricopa County, Arizona," both dated November 1987 and prepared by AGK Engineers, Inc. As a result of these analyses, new detailed flooding and a floodway for Buchanan Wash are shown on FIRM Panel 1185.

Discharge-frequency relationships from historical flood records could not be developed for Buchanan Wash because no gaging stations are available in the watershed. Therefore, the COE HEC-1 hydrologic computer model was utilized to develop the peak discharges, which are shown in Table 3.

Cross sectional data for the HEC-2 hydraulic analyses were obtained from topographic maps at a scale of 1" = 200', contour interval of 2 feet, prepared by Aerial Mapping Company, Inc., and flown in September 1986. Roughness factors ("n" values) were selected using engineering judgment and field observations. These values are listed in Table 4.

The COE HEC-2 hydraulic computer model was used to develop the water-surface profiles. Starting water-surface elevations were obtained from the 1981 COE study for Skunk Creek.

The floodway was computed on the basis of equal conveyance reduction from each side of the floodplain.

Floodway Data Tables and profile panels have been added to the Flood Insurance Study report to reflect this new detailed flooding information.

Andora Hills Wash

The SFHA along a reach of Andora Hills Wash located between a point north of Rancho Manana Boulevard and a point approximately 690 feet downstream of Rancho Manana Boulevard has been modified as shown on FIRM Panel 0805. This modification reflects the construction of a roadway crossing and culvert. In support of this revision, a technical report entitled "Application for Flood Plain Variance for Rancho Manana," undated, and Sheet 8 of 8 of certified "as-built" construction plans entitled "Rancho Manana Country Club Lots-Water, Sewer, Paving Plans," dated March 28, 1988, were prepared by American Engineering Company. The technical report contained a revised HEC-2 hydraulic computer model for this reach of Andora Hills Wash.

As a result of the roadway crossing and culvert construction, the base flood elevations and the floodway width increased between cross sections E and F. These modifications are reflected on the profile panel and Floodway Data Table for Andora Hills Wash.

Agua Fria River

The floodway boundary along a reach of the Agua Fria River in the vicinity of the Brookview Country Club was modified as shown on FIRM Panels 1165 and 1170. The basis for the revision was a revised HEC-2 hydraulic analysis presented in a technical report entitled "Request for Letter of Map Revision-Agua Fria River Floodway (Brookview Country Club)," prepared by Willdan Associates and dated December 1987. As a result of this analysis, the floodway boundary delineation was modified between cross sections BE and BF. The Floodway Data Table reflects this change.

Granite Reef Aqueduct

The SFHA designated as Zone A along a reach of the Granite Reef Aqueduct, part of the CAP, as shown on FIRM Panel 1475, was revised to reflect the correct alignment of the Granite Reef Aqueduct. The basis for this modification was a topographic map submitted by the FCDMC which showed the correct alignment.

Cave Creek

The Letter of Map Revision (LOMR) issued on May 12, 1988, for the City of Phoenix to reflect a channelization project along Cave Creek from 11th Avenue to Bell Road is shown on FIRM Panel 1215. In support of this request, certified "as-built" plans entitled "Grading, Drainage, Channel Grading, and Culvert Details, Bell Road Autopark," dated September 30, 1987, and a revised HEC-2 hydraulic analysis of Cave Creek were submitted by Amwest Engineering Company, Inc. As a result of this channelization project, the 100-year flood is contained within the channel for this reach of Cave Creek. The profile panels and Floodway Data Table have been revised to reflect this modification.

Arizona Canal Diversion Channel

The LOMRs issued on May 17, 1988, for the cities of Phoenix and Glendale, and the unincorporated areas of Maricopa County, to reflect the construction of the ACDC from the confluence with Skunk Creek to 47th Avenue are shown on FIRM Panels 1190, 1630, and 1635. To support this request, the following data were submitted:

- Sheets 2 and 15 through 19 of 74 of the final construction drawings, entitled "Arizona Canal Diversion Channel, 29th Avenue to 47th Drive," prepared by the COE, Los Angeles District, and dated July 19, 1987
- Sheets 2 and 4 through 8 of 30 of the final construction drawings, entitled "Arizona Canal Diversion Channel, 47th Drive to Cactus Road," prepared by the COE, Los Angeles District, and dated September 10, 1986
- Sheets 2, 6 through 19, 27, and 27A of 38 of the final construction drawings, entitled "Arizona Canal Diversion Channel, Cactus Road to Skunk Creek," prepared by the COE, Los Angeles District, and dated June 24, 1986
- A letter of certification, dated December 31, 1987, from the COE, Los Angeles District, stating that the reach of the ACDC from Skunk Creek to 47th Avenue was built in conformance with the above-referenced construction drawings

The 100-year flood is contained within the right-of-way of the ACDC in this reach. The Zone A floodplain boundaries along the north side of the ACDC have been revised to coincide with the right-of-way limits for the ACDC. The areas outside of the right-of-way limits on the north side of the ACDC have been redesignated as Zone X (shaded).

The LOMRs issued on September 15, 1988, for the cities of Peoria and Glendale to reflect the completed portion of the ACDC at the confluence with Skunk Creek are shown on FIRM Panel 1190. To support these LOMRs, Sheets 2 and 3 of 10 of work maps entitled "Lower Skunk Creek, New River and Skunk Creek Areas, Arizona," prepared by the COE and dated February 4, 1980, were submitted by the FCDMC. As a result of the construction of the ACDC, the area previously designated as Zone A at the confluence of Skunk Creek and the ACDC has been revised to Zone X (shaded).

The LOMR issued on October 4, 1988, for the City of Phoenix to reflect the construction of the ACDC from 47th Avenue to 29th Avenue is shown on FIRM Panels 1635 and 1655. In support of this request, the following data were submitted:

- Sheets 2, 4, and 5 of 30 of the final construction drawings, entitled "Arizona Canal Diversion Channel, 47th Drive To Cactus Road," prepared by the COE, Los Angeles District, and dated September 10, 1986
- Sheets 2 and 5 through 19 of 74 of the final construction drawings, entitled "Arizona Canal Diversion Channel, 29th Avenue to 47th Drive," prepared by the COE, Los Angeles District, and dated July 17, 1987

- A letter of certification, dated August 19, 1988, from the COE, Los Angeles District, stating that the reach of the ACDC from 47th Avenue to 29th Avenue was built in conformance with the above-referenced construction drawings

The 100-year flood is contained within the right-of-way of the ACDC in this reach. The Zone A floodplain boundaries for the above-referenced reach of the ACDC have been revised to coincide with the right-of-way limits for the ACDC. The areas outside the right-of-way limits on the north side of the reach of the ACDC have been redesignated as Zone X (shaded).

The construction of the ACDC from 29th Avenue East to Black Canyon Freeway is also shown on FIRM Panel 1655 based on data provided by the COE.

Indian Bend Wash

The LOMA issued on June 16, 1981, for the City of Phoenix for Phases 1 and 2 of Eagles Eye III is shown on FIRM Panel 1680. The LOMA stated that Lots 1 to 5 and 27 to 36 were not within the SFHA as shown, and that Lots 6 to 26 and 37 to 47 were determined not to be within the SFHA. The 100-year floodplain delineation along Indian Bend Wash was revised to reflect this LOMA.

Tenth Street Wash

The LOMR issued on October 13, 1983, and LOMA issued on October 31, 1983, for the City of Phoenix are shown on FIRM Panel 1660. Based on data submitted by Curtis Engineering on behalf of Villa Santa Fe Condominiums, the SFHA located along Tenth Street Wash upstream of Cheryl Drive was reduced and the floodway eliminated. The LOMA issued for Villa Santa Fe, a condominium conversion of Desert Cove Apartments, stated that the property was not within the SFHA. The 100-year floodplain delineation has been revised to reflect this LOMR and LOMA. In addition, the Floodway Data Table and Profile Panels for Tenth Street Wash have been revised to reflect the LOMR.

Skunk Creek

The LOMA issued on January 15, 1988, for the City of Glendale as shown on FIRM Panel 1190. The LOMA stated that Creekside Market Place located at 67th Avenue and Bell Road was not in the SFHA. The 100-year floodplain delineations along Skunk Creek were revised to reflect this LOMA.

10.2 Second Revision

This study was revised on September 4, 1991, to include the restudy of hydraulic conditions on Cave Creek, Galloway Wash, the Hassayampa River, Centennial Wash, Cemetery Wash, and Waterman Wash, as well as various requests for map revisions. The restudied streams flow through Maricopa County and several communities within the county including the Cities of Phoenix, Scottsdale, and Goodyear, and the Towns of Buckeye, Cave Creek, Carefree, and Wickenburg. The hydraulic analyses for the restudied streams were completed by Cella Barr Associates in 1989, under Contract No. EMW-88-C-2603. The portions of the streams now studied by detailed methods are shown in Table 1, Detailed-Study Sources.

The Town of Queen Creek, a newly incorporated community in Maricopa County, was incorporated September 5, 1989.

Since the 100-year flood is now contained within the channel, detailed flooding has been removed for this reach of Cave Creek, between the ACDC and Sweetwater Road. Flood Profiles Panels 52, 53P, and a portion of 54P have been eliminated for this reach in addition to cross sections A through S in the Floodway Data Table. Subsequent Profiles were not renumbered and the remaining cross sections for Cave Creek were not relabeled.

Discharge values used in the reanalysis for these six streams have been incorporated into Table 3, Summary of Discharges. Roughness coefficients used in this restudy have been incorporated into Table 4, Range of Hydraulic Roughness Coefficients. Revised and additional flood profiles for the reanalysis have been incorporated into Exhibit 1, Flood Profiles. Information concerning the revision of the floodways along each restudied stream has been incorporated into Table 5, Floodway Data Table. The process of converting existing FIRMs from the standard format to the map initiatives format, as described in Section 10.1, is continuing with this revision. Topographic information used in the analysis of these streams was developed in 1988 (References 73 and 74).

The topographic information along Cave Creek and a section of Centennial Wash from River Mile 22.42 to River Mile 31.61 was developed at a scale of 1:2,400, with a contour interval of 2 feet. The other streams restudied under this contract were revised using topographic information at a scale of 1:4,800, with a contour interval of 4 feet. Cross sections for all the streams were located no greater than 500 feet apart. Additional cross sections were located upstream and downstream of constrictions to flow, such as bridges. Hydraulic roughness coefficients (Manning's "n") were selected on the basis of field inspection and engineering judgment. The hydraulic analyses for this revision 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.

Water-surface elevations for the portions of the streams studied by detailed methods were computed using the COE HEC-2 step-backwater program (Reference 75). Only the 100-year profile was computed for these streams. All elevations are referenced to the NGVD. Elevation reference marks and descriptions used in this study are shown on the maps.

The floodways determined for the restudied streams were computed on the basis of equal conveyance reduction. No floodway was determined for Cave Creek.

Specifics of the hydrologic and hydraulic analyses for each of the six restudied streams are presented below.

Cave Creek

Cave Creek was restudied from just south of the ACDC to its confluence with the Salt River. The ACDC was designed to convey all of the flow upstream of it northwesterly to the New River watershed. The reanalysis, therefore, considers only the flow generated for that portion of the watershed, 25 square miles, downstream of the ACDC. The Cave Creek watershed downstream of the ACDC is highly urbanized. Street elevations and grades, storm sewers, fences, walls, buildings, railroads, canals, and the freeway system substantially impact and control drainage patterns.

The levees along Cave Creek were constructed using unconsolidated soils. It was determined that the levees would not contain the 100-year flow and were, therefore, not recognized as

flood protection structures. The Southern Pacific Railroad embankment was not considered in the hydraulic analysis because it neither contains nor diverts the 100-year flow. Peak discharges for Cave Creek south of the ACDC were computed using the COE HEC-1 computer program. Runoff for the portion of the Cave Creek watershed between the ACDC and Grand Canal does not concentrate to a single flowpath. The flow follows several parallel drainage subarea flowpaths (primarily within streets). This portion of Cave Creek was analyzed using shallow flooding methods. The reach of Cave Creek from the Grand Canal to its confluence with the Salt River was studied by the detailed methods discussed previously.

The starting water-surface elevation for the detailed hydraulic analysis was taken at the confluence of the Cave Creek and the Salt River from the effective Salt River analysis.

The Manning's "n" values established for the urban areas were calculated by methodologies developed by the USGS (Reference 76). Due to lack of a topographical low point for the Cave Creek channel, the floodplain was located in the same general area as was presented in the previously effective Flood Insurance Study report for Maricopa County. Because the entire floodplain of Cave Creek within the City of Phoenix is developed, no floodway was computed for this reach of Cave Creek.

Galloway Wash

Galloway Wash, a tributary of Cave Creek in the upstream portion of its watershed (below Ocotillo Road) in east-central Maricopa County, flows west through Maricopa County and the Town of Carefree. The tributary is formed by a middle and lower branch, which collectively drain an area of approximately 6.2 square miles. The watershed drains a mountainous area with a relatively steep gradient averaging 0.18 foot per mile. The stream was restudied from Pima Road to a point approximately 2.4 miles above Cave Creek. Peak discharges were calculated using the SCS TR-20 computer program. The starting water-surface elevations used in the reanalysis were taken from the effective Flood Insurance Study.

The Hassayampa River

The Hassayampa River is a tributary of the Gila River located in the west-central portion of the county. The Hassayampa River flows south through Maricopa County and the Town of Buckeye to the Gila River. The watershed drains approximately 1,504 square miles in Maricopa and southern Yavapai County with headwaters in the Bradshaw Mountains.

The entire reach of the Hassayampa River within Maricopa County was restudied by detailed methods. Levees have been constructed in the agricultural areas in the lower reaches of the Hassayampa River, upstream and downstream of old U.S. Highway 80. It was determined that these levees would not provide protection from the 100-year flow.

Peak discharges for the Hassayampa River were developed from analyses of historic floods and stream gage records (Reference 77). These records were then used to develop discharge-frequency relationships.

The starting water-surface elevation for the hydraulic analysis was taken at the confluence of the Hassayampa River and the Gila River from the effective Gila River analysis. In areas where levees were present, analyses were performed for conditions with and without the levees containing the 100-year flow. The Floodway Data Tables and Flood Profiles present only the most conservative elevations for the channel and overbank areas.

Centennial Wash

Centennial Wash is a tributary of the Gila River, with headwaters at an elevation of 4,500 feet located in the Date Creek Mountains near Wickenburg, Arizona, approximately 50 miles northwest of Phoenix. Runoff is generated within a 1,870-square-mile area. The Centennial drainage basin tends to flow in a southerly direction and passes through Yavapai, Maricopa, and La Paz Counties. The Centennial Wash watershed is characterized by mountain ranges of moderate elevation along the entire perimeter of the basin and by numerous poorly defined, highly dynamic, braided washes that create a poorly defined, dominant channel over the majority of the watershed. In most locations, the Centennial Wash channel is wide, shallow, and recognizable only by dense stands of native vegetation. In several other locations, the channel loses its definition and becomes part of the irrigated farmland that is prominent in several areas. The channel does not have the capacity to convey major flows. Large areas of the watershed are susceptible to shallow flooding due to the flatness of the valley floor. Channel slopes range from approximately 0.3 percent to 2.65 percent. Moderate to heavy growth of native vegetation covers most reaches of the channel and associated overbank areas.

Centennial Wash terminates at its confluence with the Gila River, at an elevation of 785 feet. The mean slope is 0.64 percent for the overall Centennial Wash drainage basin.

Flood-control structures within the Centennial Wash basin range from minor features such as spreading dikes and local diversion systems to detention structures and levees. As determined through field investigation and reconnaissance, many of these structures were not designed for, or are not capable of, storing or diverting the 100-year storm runoff. The following is a discussion regarding the more significant flood-control structures in the Centennial Wash basin.

Ritter Dam is located in the northeastern portion of the upper Centennial Wash watershed. Due to its relatively small size, it will provide flood protection only during low-flow events.

In 1956, the U.S. Department of the Interior, Bureau of Land Management, constructed seven detention structures adjacent to Centennial Wash between the Towns of Wenden and Aguila. Field investigation revealed that two of the basins on the upstream area had been breached at some time. No evidence was available to determine the design flow used for their construction. Therefore, these structures were not considered in the hydraulic analysis.

The Narrows Dam is located approximately 8 miles southeast of Salome in the Little Harquahala Mountains. This facility is under the jurisdiction of the Bureau of Land Management and of Maricopa County. As evidenced during field investigation, the dam is presently in good condition and functioning appropriately. However, its capacity to control the 100-year discharge is marginal. The Tiger Wash Detention Structure is located north of Interstate 10, in the central region of the Centennial drainage basin. This facility detains peak runoff generated by the Tiger Wash drainage basin and outlets into Centennial Wash just upstream of Interstate 10. This project provides some flood protection to Interstate 10 and the CAP Canal.

The Harquahala Flood Retention Structure is also located north of Interstate 10 and lies to the east of the Tiger Wash Detention Structure. This facility detains peak runoff generated in the Big Horn Mountains. Outflow from this structure is conveyed to the Centennial Wash by

means of the Saddleback Diversion System. This structure provides some flood protection to the downstream properties.

The 100-year peak discharges for Centennial Wash were developed using the COE HEC-1 computer program. The starting water-surface elevation for the hydraulic analysis was determined by the slope-area method at the mouth of Centennial Wash.

Cemetery Wash

Cemetery Wash is a tributary of the Hassayampa River and flows east through Maricopa County and the Town of Wickenburg. The watershed is located in northwest Maricopa County. The wash is well defined, with steep banks, except for an area that lies just upstream from its confluence with the Hassayampa River. In this area, the floodplain widens out before overtopping the Atchison, Topeka and Santa Fe Railway bridge and joining the Hassayampa River floodplain.

The levees along Cemetery Wash, located just upstream and downstream of the Atchison, Topeka and Santa Fe Railway bridge do not contain the 100-year flow. The peak discharges for the Cemetery Wash watershed were computed using the SCS TR-5S computer program. The starting water-surface elevation for Cemetery Wash was computed using the slope-area method. The levees located upstream and downstream of the Atchison, Topeka and Santa Fe Railway were considered in the hydraulic analysis. Separate models were constructed to include the levees along each bank separately. The highest elevations in the channel and each overbank were then presented on the FIRM.

Waterman Wash

Waterman Wash is a tributary of the Gila River with headwaters in the Maricopa Mountains east of Gila Bend, Arizona, approximately 45 miles southwest of Phoenix. The drainage basin is bounded on the southwest by the Maricopa Mountains and on the northeast by the Sierra Estrella and Palo Verde Mountains. The Waterman Wash in this vicinity flows in a northwesterly direction, through the Mobile and Rainbow Valleys, in Maricopa and Pinal Counties.

The Waterman Wash drainage basin is elliptical in shape, with a total basin length of approximately 37 miles and a maximum basin width of about 20 miles, and is estimated at 401.6 square miles.

The subject watershed is characterized by mountains of moderate elevation along the entire perimeter of the basin.

The lower portion of the watershed, downstream of the West Prong Waterman Wash, includes a wide, natural channel (approximately 100 to 150 feet wide) with a sandy bottom. Heavy growth of native vegetation, especially salt cedar, covers the primary channel banks and isolated sand bars within the channel. The channel slope in the lower portion is approximately 0.30 percent.

Portions of the Waterman Wash channel have been altered from its natural condition by local farmers who have excavated and widened the natural channel and built earthen dikes along the channel to protect their farms from flooding. Although this channel widening and construction of dikes may provide some protection during low-flow events, they are not

considered effective during the 100-year flood. The only area with some isolated, private residential properties located within the Waterman Wash watershed is near Mobile.

The 100-year peak discharges for Waterman Wash were developed using the COE HEC-1 computer program. The starting water-surface elevations for Waterman Wash were determined by the slope-area method at its confluence with the Gila River.

In addition to the aforementioned restudied streams, this revision presents updated information for the following flooding sources:

Agua Fria River

For the reach of the Agua Fria River from the confluence with the Gila River upstream to Waddell Dam, a revised hydraulic analysis for the riverine portions of this study and hydrologic and hydraulic analyses for ponding adjacent to the levees were developed by Jerry R. Jones & Associates, Inc. (JJA), for the FCDMC. The revised hydrology for the riverine portions of this study was developed by the FCDMC. These data are presented in the technical reports entitled "Flood Insurance Study, Agua Fria River, Maricopa County, Arizona," dated January 1989 and prepared by JJA for the FCDMC, and "Agua Fria River Hydrology," prepared by the FCDMC.

Several flood-control levees have been constructed since 1985 along the lower reaches of the Agua Fria by both the FCDMC and the COE. These are found at the following locations:

- Along both sides of the Agua Fria River from Buckeye Road (approximately River Mile 3.7) to immediately upstream of Indian School Road (approximately River Mile 8). These are soil-cement levees built by the FCDMC.
- Along the west bank of the Agua Fria River from just below Lower Buckeye Road (approximately River Mile 1.9) upstream to Buckeye Road. This levee was built by the COE.
- Along the eastern bank of the Agua Fria River just upstream of Lower Buckeye Road at the Rio Vista Subdivision. This levee was also built by the COE.

The hydrologic analysis developed by the FCDMC for the riverine portions of this study was based on modifications to the COE 1984 hydrologic analysis for the Agua Fria River from its confluence with the Gila River to the Waddell Dam site. The COE data were modified to account for the loss of channel storage resulting from channelization, and to provide more gradual attenuation of flow from one reach to the next. Modified discharges are presented in Table 3, Summary of Discharges.

The hydrologic analysis of the ponded areas behind the levees was developed by the use of the COE HEC-1 hydrologic computer model. The discharges used for the analysis of ponding areas were determined using the COE computer program HEC-1. Watershed boundaries were based on a report, prepared by Simons, Li & Associates (SLA), for the determination of the size and number of the levee outlet structures at each ponding location. The watershed boundaries were field checked and modified where necessary to conform to present conditions. SCS methods (curve numbers, lag, unit hydrographs) were used to calculate the hydrograph at each ponding location. In some cases, all or a portion of the hydrograph at an upstream ponding location was added to a downstream ponding location because no ponding

physically could occur at the upstream location. The upstream and downstream hydrographs were combined when one of the two scenarios below applied:

- There was no physical barrier to prevent the water ponding at one location from flowing along the landward side of the levee toward the next downstream ponding location;

or,

- The water was unable to discharge through the levee outlet, due to the high water level in the river, and flowed along the landward side of the levee toward the next downstream ponding location.

Level-pool routing was used to route the flow through the outlet and into the main channel of the river. The 100-year, 24-hour precipitation, as determined from the Region VIII NOAA Atlas, was used as the design storm. The following table lists the ponding elevations investigated.

<u>Water-Surface Elevation Location</u>	<u>(Feet NGVD)</u>
East levee, north of Buckeye Road	964.3
West levee, north of Buckeye Road	962.7
East levee, north of Van Buren	971.8
West levee, north of Van Buren	974.2
West levee, north of Interstate 10	*980.0
East levee, north of McDowell Road	983.9
West levee, north of McDowell Road	983.3
West levee, north of Roosevelt Irrigation District Canal	1,000.2
West levee, north of Indian School Road	1,007.9

*Does not appear on maps due to scale.

The revised hydraulic analyses utilized cross section data derived from topographic maps obtained from aerial photographs taken in 1987 and 1988. Bridge, culvert, and flume data were obtained from structural plans and field checked to verify information. Additional elevations were obtained by field survey where necessary.

The hydraulic analyses were conducted by JJA by utilizing the COE HEC-2 hydraulic computer model. The starting water-surface elevations were based on the effective water-surface elevations at the Gila River confluence. Channel and overbank roughness factors (Manning's "n" values) were chosen based on engineering judgment from field observations of the river channel and overbank areas. The channel "n" values ranged from 0.022 to 0.059, and the overbank "n" values ranged from 0.032 to 0.070, as shown in Table 4, Range of Hydraulic Coefficients (Manning's "n"). A clogging factor of 50 percent of the pier width was added to all pier widths to estimate the effects of debris accumulation on the piers.

Ponding elevations for the 100-year flood were calculated using the level-pool routing method within HEC-1. The water-surface elevation within the Agua Fria River was assumed to be the 100-year elevation and was assumed constant for the duration of the ponding. Elevation-discharge relationships were calculated for each outlet using Hydraulic Engineering Circular No. 5, entitled "Hydraulic Charts for the Selection of Highway Culverts," prepared by the U.S. Department of Commerce, Bureau of Public Roads, and dated December 1965. All outlets

have one-way flapgates, and no water was assumed to discharge from the river into the ponding area.

The 100- and 500-year floodplain and 100-year floodway boundaries were delineated on topographic maps at a scale of 1:4,800, with a contour interval of 4 feet, entitled "Flood Insurance Study, Work Map, Maricopa County, Arizona," prepared by JJA and dated February 6, 1989. These maps were based on 1:4,800 topographic mapping prepared by Cooper Aerial Survey Company from photographs taken in May 1987. The 500-year floodplain boundaries were delineated from the April 15, 1988, FIRM for Maricopa County, Arizona and Incorporated Areas.

The modeling of the flows at the Grande Avenue and Atchison, Topeka and Santa Fe Railway bridges was complex due to the inadequate capacity of the bridges to pass large flows. During a flood, water flows under the highway/railroad bridges located at the main channel and in the west overbank, and weir flow over the roadway and railway occurs near the smaller structures located in the west overbank area.

An elevated landfill (the El Mirage Landfill) was built along the west bank of the main channel downstream of the bridge. This landfill effectively separates the flows in the main channel from the flows passing through and over the bridges located in the west overbank. Several split flow analyses and backwater analyses were performed to develop a split flow rating curve.

Floodways were developed on both sides of the landfill. Because the landfill is in the middle of the combined floodplain, encroachment on the west floodplain was only from the west and encroachment on the east floodplain only from the east.

The revised floodway analysis was computed by using both Method 4 and Method 1 in the HEC-2 hydraulic computer model. Method 4, the equal-conveyance reduction method, was initially used with a target of 1.0 foot of rise allowed. After initial runs, Method 1 was used to "smooth out" the floodway and to ensure that the 1.0-foot allowable rise criteria was met.

This revision included the LOMRs issued on August 11, 1989, for the City of Avondale and the unincorporated areas of Maricopa County. These LOMRs were issued based on certification from the COE, Los Angeles District, which stated that the levee along the western bank of the Agua Fria River and the levee located along the eastern bank of the Agua Fria River just upstream of Lower Buckeye Road at the Rio Vista Subdivision can convey the designed Standard Project Flood flow of approximately 140,000 cfs.

The Floodway Data Tables, Tables 1, 3, and 4, and the Profile Panels for the Agua Fria River have been modified to reflect this revised analysis.

Wittmann Watershed Area

The hydrologic and hydraulic analyses for portions of Trilby Wash, McMicken Dam Outlet Wash, and the washes around the Circle City and Wittmann area, including the revision and extended hydraulic analysis of Wittmann Wash, were performed by The WLB Group, Inc., under contract to the FCDMC as part of the Wittmann Area Drainage Master Study (ADMS). This study was completed in December 1988.

This revised analysis included the following streams:

- Trilby Wash, which flows southeasterly from the Hieroglyphic Mountains to the Trilby Wash detention basin behind McMicken Dam in the north-central part of Maricopa County
- The McMicken Dam Outlet Wash, which flows south from the McMicken Dam Outlet channel to the Agua Fria River east of Sun City West
- Wittmann Wash, which flows through the unincorporated community of Wittmann in north-central Maricopa County
- A wash parallel to and along the Atchison, Topeka and Santa Fe Railway, which flows through the unincorporated community of Wittmann to its confluence with Wittmann Wash
- Several small washes, which flow southerly near the unincorporated community of Circle City northwest of Wittmann in Maricopa County

Trilby Wash detention basin (McMicken Dam) was completed in 1956. The detention basin was designed to contain the Standard Project Flood below the spillway with a capacity of 19,300 acre-feet. The capacity was checked with 1:4,800, 4-foot contour interval topographic mapping as part of the Wittmann ADMS. The recomputed capacity was 20,800 acre-feet below the spillway elevation of 1,353.65 feet. The detention basin was found to contain the 100-year flood.

Peak discharge-frequency relationships for the Wittmann ADMS including Trilby Wash, Circle City area washes, Wittmann area washes, and the McMicken Dam Outlet Wash were computed using the COE HEC-1 hydrologic computer model. These are presented in Table 3.

Cross section data for Trilby Wash, McMicken Dam Outlet Wash, Circle City area washes, and Wittmann area washes were taken from topographic mapping at a scale of 1:2,400, compiled for the Wittmann ADMS, prepared by The WLB Group, Inc., dated December 1988.

The hydraulic analyses were conducted by The WLB Group, Inc., by utilizing the COE HEC-2 hydraulic computer model. Channel and overbank roughness factors ("n" values) are shown in Table 4. Water-surface elevations upstream of culverts in the Wittmann and Circle City area washes were computed using the Bureau of Public Roads Hydraulic Engineering Circular Number 5. These elevations were inputted directly into the HEC-2 computer model. The 100-year floodways were computed using Method in the HEC-2 hydraulic computer model.

The 100-year floodplain on Wittmann Wash (formerly called Wittmann Drainage) was revised as a result of the Wittmann ADMS developed by The WLB Group, Inc. The 100-year floodplain and floodway boundaries were delineated on topographic maps at a scale of 1:2,400, with a contour interval of 2 feet, entitled "Flood Control District of Maricopa County, Aerial Mapping for Wittmann ADMS," prepared by The WLB Group, Inc. These maps were based on aerial topography flown by Cooper Aerial Survey Company between October 6 and December 11, 1986.

Tables 1 through 4 have been modified as a result of this revision, and Floodway Data Tables and Profile Panels have been added.

Gila River from Gillespie Dam to Bullard Avenue

For the reach of the Gila River extending from Gillespie Dam to just downstream of Bullard Avenue, a revised hydraulic analysis was developed by Dames & Moore (DM). This new analysis was performed to incorporate the results of the 1982 COE hydrologic study of the Gila River below its confluence with the Salt River. The additional 100-year discharges developed by the COE are presented in Table 3. New topographic information, including the addition of bridge structures, was also incorporated into the revised hydraulic analysis.

Cross section data for the hydraulic analysis was taken from topographic mapping derived from aerial photography. The aerial topographic mapping was developed by Aerial Mapping Company, Inc. (AMC), and by Kenney Aerial Mapping, Inc. (KAM), based on aerial photography dated March and May 1984, respectively. Selected cross sections were field verified by AMC in April and May of 1987.

Two new bridges and one expanded bridge were also included in the revised hydraulic model. New structures were built for Tuthill Road and Reems Road in 1981 and 1988, respectively. Also, the bridge over the Gila River at Arizona Highway 85 (U.S. Highway 80) was approximately doubled in length in 1982.

Water-surface elevations for the 10-, 50-, 100-, and 500-year floodplains and 100-year floodway were developed by using the COE HEC-2 water-surface profile computer program. Manning's "n" values were determined by field visit along the Gila River by DM and the FCDMC. Notes and photographs were taken and then used with stereoscopic aerial photographs to estimate the "n" values. The selected "n" values are presented in Table 4. Dames & Moore developed the revised 100-year floodway analysis utilizing Method 1 encroachment in the HEC-2 hydraulic computer model.

The 100- and 500-year floodplain and 100-year floodway boundaries were delineated on topographic maps at a scale of 1:4,800, with a contour interval of 4 feet, entitled "Floodplain Delineation, Gila River, Gillespie Dam to Bullard Avenue," prepared by DM, dated May 1988, and revised on April 20, 1989. The maps were based on the aerial mapping produced by AMC and KAM.

Tables 1 and 4, and the Floodway Data Tables, and Flood Profiles for the Gila River have been revised to reflect this revision.

Salt River Between Country Club Drive and Granite Reef Dam

For the reach of the Salt River from Country Club Drive to Granite Reef Dam, a hydraulic analysis was developed by Burgess and Niple, Inc. (B&N), for the FCDMC. This analysis is presented in the technical report entitled "Flood Control District of Maricopa County, Salt River Flood Delineation Study, Country Club Drive to Granite Reef Dam," dated October 1988, and prepared by B&N. As a result of this analysis, new detailed 100-year flooding and floodway delineations for the Salt River are shown on FIRM Panels 1750, 2180, 2185, and 2205.

Existing hydrologic data were utilized in this analysis. Cross section data for the HEC-2 hydraulic analysis were obtained from topographic maps at a scale of 1:4,800, with a contour interval of 4 feet, prepared by KAM, and flown in 1984.

The COE HEC-2 hydraulic computer model was used to develop the 100-year water-surface profiles. The starting water-surface elevation at the upstream face of the Country Club Drive bridge was obtained from the COE. The starting water-surface elevation was equal to the effective 100-year base flood elevation at this location. The floodway was computed on the basis of equal conveyance reduction from each side of the floodplain.

Data shown in Table 1, Floodway Data Tables, and Flood Profiles have been added to the Flood Insurance Study report to reflect this new detailed flooding information.

Salt River Between Scottsdale and Hayden Roads

For the reach of the Salt River between Scottsdale and Hayden Roads, a revised hydraulic analysis was developed by Futura Engineering, Inc. (FE), and Hydrodynamics, Inc. The basis for this revision was better topographic data and a new bridge at Hayden Road. This analysis is presented in the technical report entitled "Documentation for Letter of Map Revision, Salt River between Scottsdale and Hayden Roads, City of Tempe, Maricopa County, Arizona," dated May 13, 1988, and prepared by FE and Hydrodynamics, Inc. The revised 100-year floodplain and floodway delineations were shown on a topographic map entitled "Proposed Encroachments, Salt River, Section 23.398 to 24.196," at a scale of 1:2,400, prepared by FE and dated September 23, 1988.

As a result of these modifications, the base flood elevations increased in the vicinity of Hayden Road as shown on FIRM Panel 2170. These modifications are reflected on the Flood Profiles and Floodway Data Table for the Salt River.

Salt River in the Vicinity of 75th and Southern Avenues

The 100-year floodway delineation along a reach of the Salt River in the vicinity of 75th and Southern Avenues has been modified as shown on FIRM Panel 2115. This modification reflects a revised 100-year floodway analysis developed by Mathews, Kessler & Associates, Inc. (MKA). The revised delineation was submitted on a topographic map entitled "Study Map, Topography and Culture," approximate scale 1:3,600, also prepared by MKA.

As a result of this analysis, the base flood elevations increased slightly, and the floodway width was decreased between cross sections O and S. These modifications are reflected in the Floodway Data Table for the Salt River. Because the increases to the base flood elevations were only approximately 0.1 foot in this reach, no changes to the profiles were practical.

East Maricopa Floodway

The effects of the construction of the East Maricopa Floodway (EMF), an SCS channel, from the Maricopa County/Pinal County boundary north to Brown Road are shown on FIRM Panels 2205, 2215, 2680, 2685, 2690, 2695, and 3075. The EMF, which runs parallel to the Roosevelt Water Conservation District (WCD) canal located to the west of the EMF, was designed to collect floodwaters generated by the East Maricopa Watershed and the Queen Creek Watershed and convey these flows to the Gila River. In addition, the shallow ponded areas behind the Roosevelt WCD canal are collected by the EMF. To support this revision, the following data, all prepared by the SCS, were submitted:

- Sheets 2 through 15 of 24 entitled "R.W.C.P. Floodway - Reach 1," dated July 1979

- Sheets 2 through 14 of 50 entitled "R.W.C.P. Floodway - Reach 2," dated March 1982
- Sheets 2 through 16 of 50 entitled "R.W.C.P. Floodway - Reach 3," dated March 1984
- Sheets 2 through 16 of 36 entitled "R.W.C.P. Floodway - Reach 4," dated February 1986
- Sheets 1 through 14 of 30 entitled "East Maricopa Floodway Reach 5," dated May 1987
- Sheets 1 through 11 of 25 entitled "East Maricopa Floodway Reach 6," dated February 27, 1987
- A letter of certification dated July 10, 1989, from the SCS, stating that reaches 1 through 5 of the EMF, from the confluence with the Gila River (located south of the Maricopa County/Pinal County boundary) to Guadalupe Road, were built in conformance with the above-referenced construction drawings and that reach 6, from Guadalupe Road north to Brown Road, would be completed in July 1989. This letter also stated that the 100-year flood will be conveyed in the channel and no ponding will occur along the east bank of the EMF. Construction of reach 6 of the EMF was confirmed by telephone with the FCDMC on August 10, 1989.

The 100-year flood is contained within the right-of-way of the EMF from the Maricopa County/Pinal County boundary north to Brown Road. The Zone A floodplain boundaries have been revised to coincide with the right-of-way limits for the EMF. The areas outside of the right-of-way limits on the east side of the EMF have been redesignated as Zone X (shaded).

Washes 9 and 10 (Verde River Tributaries)

The LOMR issued on May 24, 1989, for the unincorporated areas of Maricopa County to reflect a channelization and relocation project along Washes 9 and 10 in the vicinity of the Rio Verde Subdivision is shown on FIRM Panel 1300. In support of this request, the following data, all prepared by Wiley and Associates, Inc., were submitted:

- A report entitled "Floodplain Study of Rio Verde, Arizona," dated May 20, 1988
- Sheets 1 through 3 of topographic maps entitled "Rio Verde Flood Study," dated May 20, 1988
- A blueprint of an aerial photograph entitled "Rio Verde Flood Study," showing the Rio Verde Subdivision limits and channel locations, dated February 1987
- A drainage map entitled "Tonto Verde, Master Drainage Map," dated November 1986
- A drainage map entitled "A Map for a Drainage Study, Rio Verde," showing floodplain boundary delineations, dated February 1987
- A report entitled "Preliminary Drainage Report, November 1986, Tonto Verde Master Plan," dated November 1986

- A topographic map entitled "McDowell Mountain Park Channel," dated July 1987

As a result of this project, the 100-year flood boundaries designated as Zone A along Washes 9 and 10 were modified.

Cave Creek

The reach of Cave Creek from its confluence with the ACDC upstream to the Sweetwater Avenue alignment was revised based on data submitted by the FCDMC. The request for the revision was made in order to incorporate the effects of a channel modification project which included a concrete-lined channel along Cave Creek and a sediment basin at the upstream end just below Sweetwater Avenue. This revision was part of a larger request submitted by the FCDMC for Cave Creek from the ACDC upstream to Cave Butte Dam and approved in a Best Available Data Letter dated February 4, 1991.

The revised hydrologic and hydraulic analyses for Cave Creek were performed by Burgess & Niple, Inc. (BN), for the FCDMC. The COE HEC-1 flood hydrograph computer model was utilized to determine the 10-, 50-, and 100-year flood discharges. The modeling was accomplished using the SCS Unit Hydrograph, Initial and Uniform Losses, and routing, combining and diversion of sub-basin hydrographs. The hydraulic analyses were performed with the use of the COE HEC-2 hydraulic computer model. Water-surface profiles were calculated for the 10-, 50-, and 100-year floods. Topographic maps, entitled "Work Map, Middle Cave Creek Floodplain Delineation Study, FCD 88-56, FCDMC," Sheets 1 and 2 of 13, prepared by BN, dated January 31, 1990, were used to determine cross sections for use in the HEC-2 hydraulic computer model and also to plot the resulting 100-year floodplain boundaries. The 100-year flood was determined to be contained within the banks of the newly constructed concrete channel along Cave Creek.

Since the 100-year flood is now contained within the channel, detailed flooding has been removed for this reach of Cave Creek, between the ACDC and Sweetwater Road. Flood Profiles Panels 52P, 53P, and a portion of 54P have been eliminated for this reach in addition to cross sections A through S in the Floodway Data Table. Subsequent profiles were not renumbered and the remaining cross sections for Cave Creek were not relabeled.

As a result of the revisions to Cave Creek, the 100-year floodplain has been greatly decreased. The 100-year floodplain boundaries have been added to the FIRM along the ACDC, from Black Canyon Highway to Dunlap Avenue. The 100-year floodplain boundaries shown for this area follow the designated right-of-way for the ACDC.

All changes previously described for Cave Creek and the ACDC are shown on FIRM Panel 1655. The Summary of Discharges Table, Floodway Data Table, and Flood Profiles have been revised to reflect the revisions to Cave Creek.

The LOMR issued on March 2, 1990, for the City of Phoenix, Arizona, to reflect a channel modification project along Cave Creek from Tierra Buena Lane to 11th Avenue is shown on FIRM Panel 1215. In support of this request, the following data were submitted by Amwest Engineering Company, Inc. (AEC):

- A copy of the effective HEC-2 hydraulic computer model including input and output listings for the study area along Cave Creek

- A copy of the revised HEC-2 hydraulic computer model including input and output listings for the study area along Cave Creek
- Sheets 1 through 5 of 8 of plans entitled "Paving Plan for Tierra Buena Lane," prepared by AEC, dated July 1987, and revised November 3, 1988
- Sheet 6 of 8 of plans entitled "Culvert Plan, Paving Plan for Tierra Buena," prepared by AEC, dated July 1987, and revised December 8, 1987
- Sheets 1 through 10 of 12 of plans entitled "Paving Plan for Greenway Parkway, 15th Avenue (alignment) to 7th Avenue," prepared by AEC and dated December 1986
- Sheets 1 and 2 of 2 of work maps entitled "Cave Creek Wash Section Location, Point Elevations and 500-Year Limit," and "Cave Creek Wash 100-Year and Floodway Limit," prepared by AEC and dated October 11, 1989
- A topographic map entitled "Channel Cross Section Locations Tierra Buena Lane," at a scale of 1:480, with a contour interval of 1 foot, prepared by AEC. and dated March 1988
- Sheet 1 and 2 of 2 of plans entitled "Shirmer Property Engineered Fill Grading Plan," prepared by AEC and dated September 1989
- A copy of FIRM Panel 04013C1215 E, scale 1:12,000, showing the revised 100- and 500-year flood boundaries and the 100-year floodway boundary
- Revised Flood Profiles
- A community acknowledgment letter

As a result of this channel modification project, the 100-year flood and floodway are contained within the channel for this reach of Cave Creek.

The Floodway Data Table and Flood Profile Panels for Cave Creek have been changed to reflect these modifications.

Skunk Creek

The LOMR issued on March 9, 1990, for the City of Phoenix, Arizona, to reflect channel improvements and grading along a reach of Skunk Creek between Pinnacle Peak Road and 35th Avenue is shown on FIRM Panel 1185. This LOMR was a reissuance of the LOMR dated June 15, 1987. In support of the LOMR, the following data were submitted:

- A request form entitled "Request for Letter of Map Revision Involving Fill," dated January 16, 1990
- A "Community Acknowledgment of Request for Letter of Map Revision" form, signed by the City of Phoenix and dated January 23, 1990
- A copy of FIRM Panel 1185 dated September 29, 1989, showing the approximate location of the North Canyon Ranch Industrial Park Subdivision

- A copy of recorded plat for North Canyon Ranch Industrial Park with an approximation of floodplain and floodway limits scaled from FIRM Panel 1185, dated September 29, 1989
- A copy of the previous LOMR, dated June 12, 1987, based on information from Collar, Williams and White (CWW)
- A copy of Sheet 7 of 9 of "Adobe Mountain Grading and Drainage," prepared by CWW and stamped June 26, 1986, showing as-built spot elevations
- A copy of Sheets 1 through 4 of 4 of "Adobe Mountain--Skunk Creek Floodplain Analysis, Water-Surface Elevations," prepared by CWW (Sheet 1 shows an approximate water-surface profile based on elevations for the 1988 and 1989 Flood Insurance Rate Maps.)
- A copy of "Exhibit: Reflecting Changes in Floodplain Limits Caused by Proposed Grading Construction of Adobe Mountain," prepared by CWW (one sheet)
- A copy of the report entitled "Adobe Mountain--Skunk Creek Floodplain Revision," dated August 1986, prepared by CWW

As a result of these modifications, the 100-year floodplain delineations and base (100-year) flood elevations (BFEs) have been revised.

The Floodway Data Table and Flood Profile Panels for Skunk Creek have been revised to reflect these modifications.

Tempe Canal

The dual zone labels (Zone A and Zone AH) for the designation of the SFHA located upslope of the Tempe Canal within the City of Mesa as shown on FIRM Panel 2635 were corrected. The incorrect zone designation of Zone AH (Elevation 1195) was removed. This zone designation was inadvertently not removed prior to final printing of the April 15, 1988, FIRM. The basis for this modification was notification by the Arizona Department of Water Resources of the dual zone labels.

10.3 Third Revision

This study was revised on December 3, 1993, to provide detailed flood hazard information for areas subject to alluvial fan flooding north of the Central Arizona Project Canal between the McDowell Mountains and Cave Creek, and to include the restudy of hydraulic conditions on Cave Creek, East Fork Cave Creek, Upper Centennial Wash, and Salt River, as well as various requests for map revisions based on newly studied streams and ponding areas. The restudied and newly studied flooding sources are located in the unincorporated areas of Maricopa County, the Cities of Peoria, Phoenix, Chandler, Mesa, Scottsdale, Tempe, and the Towns of Cave Creek, Carefree, Queen Creek, Gilbert, Gila Bend, and El Mirage.

The portions of streams studied by detailed methods were added to Table 1, Detailed-Study Sources.

The process of converting the existing FIRM panels from standard format to map initiatives format as described in Section 10.1 continues with this revision. Zone designations were revised as required by a given study. Additional reference marks and descriptions used in this study are shown on the map panels. Tables 1 through 4, Floodway Data Table 5, and the Flood Profiles have been revised to reflect the new detailed flooding information.

Specifics of the hydrologic and hydraulic analyses for all streams are presented below.

Flooding Effects from Basins 1 through 6 - Alluvial Fan Flooding North of the Central Arizona Project Canal between the McDowell Mountains and Cave Creek

Six major drainage areas were identified as the sources of flooding for the study area. The hydrologic analysis revealed that those six areas contained 13 distinct apexes (concentration points). The streams that drain the basins associated with each of those apexes are identified on the FIRM. Each stream is labeled with a number corresponding to one of the six major drainage areas, followed by a letter for streams draining areas having more than one distinct apex. A label identifying the source of flooding is provided on FIRM panels where the apex corresponding to the major drainage basin is shown on another panel.

The flood-frequency curves in this revision were taken to be log-normal. The means and standard deviations of the curves were computed from the 2- and 100-year discharge values determined at each apex using the COE HEC-1 computer program (Reference 78). Discharge values for selected recurrence intervals are presented in the Summary of Discharges (Table 3).

Floods from Basins 6B and 6C flow within a well-defined network of channel reaches until they are approximately 0.5 to 1.0 mile downslope of Scottsdale Road. There are three points in that network where one reach splits into two. The flood-frequency curves at the three outlets of the network were estimated by simulating 10,000 floods from each of the two basins. The probability density function describing the percentage of flow that takes either the right or left path below each split was taken to be uniform. Floods from each basin were treated as independent. At each outlet, the resulting flow values and their frequency of occurrence from the simulations were fit to a log- Pearson Type III distribution by the method of least squares. Floodwaters passing Apex 5 can follow three different paths to Scottsdale Road. The flood-frequency curves for each of those paths were determined in the same way as those for flows from Basins 6B and 6C.

This revision reflects flood hazards associated with runoff from the watersheds above the apexes only. Therefore, it should be noted that runoff resulting from rain falling directly on the SFHAs has not been considered. Runoff generated on the SFHAs is usually conveyed downslope as shallow overland sheetflow that eventually flows into and down the many channels on the alluvial fan surface. The flood hazards associated with that kind of runoff are usually considered minimal (because of the relatively small drainage area contributing to any one channel). However, if shallow flows, which under natural conditions are distributed over a very large area, are somehow concentrated in a few small channels, the increase in flow depths and velocities and, consequently, the associated flood hazards, may be great.

The SFHAs presented in this revision were delineated using topographic maps, aerial photographs, and soil survey maps (References 66 and 79 through 88). The 100-year flood depths and velocities were determined using the FEMA methodology for analyzing areas subject to alluvial fan flooding. The downslope limits of the SFHAs denote the boundaries,

downslope of which the probability of a given point being inundated by more than 0.5 foot of floodwater is less than 0.01 in any given year. That probability will be exceeded within well-defined washes below the limits shown on the FIRM. Because the flood hazards within a well-defined wash are self-evident and because of map scale restrictions, the SFHAs within those individual washes are not delineated on the FIRM. Obviously, sound floodplain management requires that those washes remain unobstructed.

Also note that downslope of the SFHA limits, the hazards associated with alluvial fan flooding are just as severe as those upslope of the limits. The distinction between the zone designations downslope and upslope of the limits should be regarded as a distinction between flooding potentials and not a distinction between the severity of damages to be expected in the event of a flood.

Some of the areas subject to alluvial fan flooding are designated Zone AO. Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year 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.

Cave Creek from Cave Butte Dam to the Arizona Canal Diversion Channel

The revised hydrologic and hydraulic analyses for Cave Creek, which also includes a 1.4 mile reach of East Fork Cave Creek from its confluence with Cave Creek to Central Avenue, were performed by Burgess & Niple, Inc., for the FCDMC. The results of these analyses are presented in Volumes 1 through 2 of 2 of the report entitled "Cave Creek Floodplain Delineation, Cave Buttes Dam to the Arizona Canal Diversion Channel, Final Hydrology Report," dated January 1990, and in the report entitled "Cave Creek Wash, Floodplain Delineation Study, Cave Butte Dam to Arizona Canal Diversion Channel," dated January 1990. The purpose of this revision was to reflect increased urbanization of the watershed and improvements to the Cave Creek Channel. The most distinct channel improvement is the 1.86 mile concrete-lined channel recently constructed by the COE north of the ACDC. A Best Available Data Letter was issued on February 4, 1991, for this study.

The total watershed area is 34.7 square miles, which includes two basins not considered in previous studies. The watershed was modeled using the COE HEC-1 computer model. The Muskingum method was applied in the upper and middle reaches of the watershed where the channel cross section varied substantially within the reach and for routing down urban street alignments. The Normal Depth Channel, Modified Puls Method was used in the channel reaches in the lower portion of the East Fork Cave Creek basin, and for routing of Cave Creek flows from Bell Road South to the confluence with Moon Valley Wash, an area of more uniform cross sections and large storage volume capacity.

Cross-section data for the COE HEC-2 hydraulic computer model were obtained from topographic maps at a scale of 1:2,400, with a contour interval of 2 feet, prepared in 1989 by Aerial Mapping Company, Inc. The starting elevation in the ACDC was obtained using normal depth. The floodway for this study was computed on the basis of equal-conveyance reduction from each side of the floodplain.

The revised BFEs, floodplain boundaries, and floodway boundaries are shown on FIRM Panels 1210, 1215, 1220, and 1655. The data shown in Tables 1, 3, and 4, the Floodway Data Table, and the Flood Profiles for Cave Creek and East Fork Cave Creek have been revised to reflect this revision. The revised floodplain and floodway boundaries along East Fork Cave

Creek shown on FIRM Panels 1215 and 1655 concurrently reflect the results of this revision and the determination issued in the LOMA dated November 23, 1992, for Lots 117 through 136, Coral Gables Estates Unit Six.

Cave Creek/Carefree

The hydrologic and hydraulic study for this portion of Cave Creek included Cottonwood Creek and tributaries, Flemming Springs Wash, North Tributary to Galloway Wash, Grapevine Wash, Ocotillo Wash and tributaries, Rowe Wash and tributaries, and Willow Springs Wash and tributaries. These streams are located in the unincorporated areas of Maricopa County, the Town of Cave Creek, and the Town of Carefree. The study entitled "Final Hydrologic and Hydraulic Report for Cave Creek/Carefree, Flood Delineation Study," dated March 1990, and Appendices A-C, were prepared by CH2M Hill for the FCDMC. Partial revisions to the study are dated April, September, and October of 1990, and June, July, and August of 1991. A Best Available Data Letter was issued on January 21, 1992, for this study.

Cave Creek and its tributaries drain the mountainous areas of east central Maricopa County flowing southwesterly to the confluence with the ACDC. Cave Creek flows are regulated by Cave Creek Dam located just north of Phoenix. This study area extends from Cave Creek River Mile 35.49 approximately 3.3 miles to the Tonto National Forest boundary.

Cottonwood Creek is the uppermost tributary to Cave Creek within the study area, along with two small tributaries. The Cottonwood system includes a total of 4.9 miles and flows westerly within well defined channels to Cave Creek.

The Willow Springs drainage system includes Willow Springs and Tributaries 1, 1-A, 2, 2-A, 3-A, 4, and Flemming Springs. This drainage system includes a total of approximately 14.7 miles. The channels are generally well incised, steep mountainous streams.

Ocotillo Wash and its Tributaries 1, 1-A, 2, 3, and 4 extend from the previous study limits easterly to the headwaters of the basin. A total of approximately 10.1 miles were mapped. The lower portion of Ocotillo Wash is a wide, poorly defined, braided stream system. The tributaries are generally well-defined streams draining small watersheds.

The wash shown on USGS quadrangle maps as Grapevine Wash is included in this study extending from its confluence with Rowe Wash, easterly approximately 1.4 miles. Rowe Wash and Rowe Wash Tributaries 1 and 2 study reaches begin at the study limit of the previous Flood Insurance Study. These streams extend easterly, to the Pima Road extension, totaling approximately 4.3 miles. The Rowe system is generally well incised and steep.

The North Tributary of Galloway Wash study reach extends from the confluence with Galloway Wash approximately 2.9 miles northeasterly to the Pima Road extension. The previous Flood Insurance Study included a study stream referred to as Grapevine Wash, which was a tributary to the current study reach of the North Tributary of Galloway. USGS quadrangle mapping and local anecdotal information, indicates that this small tributary, which originates at Grapevine Spring, was misnamed and should be referred to as Unnamed Tributary to Galloway.

No significant flood control levees or other control measures have been constructed within the area being studied.

The watershed was modeled using the COE HEC-1 computer model. For areas studied by detailed methods, BFEs were computed using the COE HEC-2 hydraulic computer model. Flood limits for the approximate study of Willow Springs Tributary 3-A were estimated using Manning's equation for normal depth.

The cross-section data for each of the streams were derived from topographic maps at a scale of 1:200, with a contour interval of 4 feet, prepared by Aerial Mapping Company, Inc., and from stereo topography dated August 1989. Ground control surveys and check profiles were provided by Greiner Engineering.

Starting water-surface elevations for those study reaches that are extensions of previously studied streams were taken from the effective Flood Insurance Study profiles. The starting water-surface elevations for all other streams were developed by using the slope-area method.

Floodways were modeled using Encroachment Method 6. This method was selected due to high velocities and incidence of critical and supercritical flow in the study reaches. The floodway was finalized by using Encroachment Method 1 at each cross section.

The 100-year flood boundaries were designated as Zone A for the upstream reaches of Rowe Wash and Willow Springs Wash, and for the entire reaches of Rowe Wash Tributary 1 and 2, and Willow Springs Wash Tributary 3. These boundaries were developed from approximate hydrologic and hydraulic analyses.

The reach of Ocotillo Wash from Cross Section T at mile 2.03 on the profile of Ocotillo Wash to the upstream limit of study is shown on the map panels as Zone A, because of the uncertainty of the direction of the flows. This includes the 1.10 mile braided area of Ocotillo Wash upstream of mile 2.03.

As a result of this study, the 100-year flood boundaries designated as Zone A and the detailed 100-year floodplain and floodways for all of the above-studied streams, are shown on FIRM Panels 0414, 0415, 0418, 0419, 0802, 0804, 0805, 0806, 0807, 0808, and 0809.

Data shown in Tables 1, 2, 3, and 4, the Floodway Data Table, and the Flood Profiles have been revised to reflect this new flooding information.

Centennial Wash-Grass Wash-Aguila Farm Channel

The hydrologic and hydraulic study for Centennial Wash, Grass Wash, and Aguila Farm Channel, which includes the North Branch Centennial Wash, all located within the unincorporated areas of Maricopa County, was developed by URS Consultants. The results of their study are presented in the technical reports entitled "Flood Control District of Maricopa County, Hydraulic Report for Floodplain Delineation Study of Upper Centennial Wash, Grass Wash and Aguila Farm Channel," dated May 1990, and "Flood Control District of Maricopa County, Hydrology Report for Floodplain Delineation Study of Centennial Wash, Grass Wash and Aguila Farm Channel," dated April 1990. Portions of the Aguila Farm Channel and Grass Wash study reaches are restudied areas, while this reach of Centennial Wash and the North Branch are new detailed study reaches. A Best Available Data Letter was issued on April 26, 1991, for this study.

The contributing watershed and associated basins are located within the extreme northwest corner of Maricopa County. The watershed is bounded on the north by Harcuvar and Date Creek Mountains, on the east by Sols Wash watershed (not part of this study) and the Aguila Farm Channel watershed, and on the west by the Maricopa County/La Paz County Line. The combined runoff drains in the southwesterly direction to the county line. The watershed terrain varies widely. Mountain slopes range between 5 and 60 percent. The less steep areas within the study of the major drainage channels being studied have slopes ranging from 0.2 to 0.3 percent.

U.S. Highways 60/70 and 93, and State Route 71 do not alter the natural direction of the flow. The Atchison, Topeka and Santa Fe Railroad (AT&SF) drainage structures are adequately sized to allow runoff to pass throughout the elevated railbed. The numerous man-made structures of training dikes, spreader dikes, and stock tanks located throughout the watershed, generally consisting of unprotected fill, are poorly maintained and have no erosion protection. Historically, these structures have failed during significant flow events.

The COE HEC-1 computer program was used to estimate peak discharges and channel routing of flows within the study area. Field measurements of the watershed's physical and hydrologic characteristics were applied in the HEC-1 modeling.

Cross sections were digitized from aerial topographic mapping at a scale of 1:48,000, with a contour interval of 4 feet, prepared by Cooper Aerial of Phoenix, Inc., flown in July 1989. The COE HEC-2 hydraulic computer model was used to compute the water-surface profiles.

The starting water-surface elevations for Grass Wash were estimated using an iterative approach beginning with the slope-area method. Immediately downstream (north) of the AT&SF railroad trestle over Grass Wash is an uncompacted berm or training dike without erosion protection, which serves to turn low flows to the west for several hundred feet. The HEC-2 analyses showed that the 10-year flood would not overtop the berm; however, the 50- and 100-year floods would. The analyses for the 50- and 100-year floods used the top of the berm elevation as the starting water-surface elevation.

The starting water-surface elevations for Aguila Farm Channel were taken from water-surface elevations computed in the HEC-2 model at the confluence with Centennial Wash. The starting water-surface elevations for the North Branch Centennial Wash were computed using the slope-area method.

Flood profiles and flood boundaries were not estimated for the 500-year flood for any of the detailed reaches herein.

Floodways were computed for each of the detailed study reaches on the basis of equal-conveyance. The North Branch Centennial Wash floodway and Grass Wash floodway were extended to join with the Centennial Wash/Aguila Farm Channel floodway.

The principal flood hazards within the study area result from a broad, sheetflow type of floodplain with multiple, distributary low flow channels or flow paths.

The BFEs and floodplain and floodway delineations for Centennial Wash, Grass Wash, Aguila Farm Channel, and the North Branch Centennial Wash are shown on FIRM Panels 0135, 0145, 0155, 0160, 0165, 0170 and 0190. Data shown in Tables 1, 2, 3, and 4, the Floodway Data Table, and Flood Profiles have been revised to reflect this revised flooding.

Morgan City Wash-Cline Creek-Rodger Creek

The revised hydrologic and hydraulic analyses for these streams located in the unincorporated areas of Maricopa County were developed by Michael Baker Jr., Inc., for the FCDMC. Information is presented in the following reports: "Flood Delineation Study of Cline Creek and Tributary Washes," dated April 1990, "Exhibit 5, Printout of Floodway Calculation, Flood Delineation Study of Cline Creek and Tributary Washes," dated April 1990, "Morgan City Wash, Flood Delineation Study," dated April 1990, "Exhibit 5, Printout of Floodway Calculation, Morgan City Wash," dated April 1990, "Exhibit 5, Printout of Floodway Calculation, Rodger Creek, Flood Delineation Study," dated August 1990, and separate hydrology reports for Morgan City Wash and Rodger Creek, both dated December 1989, and Cline Creek, dated January 1990, and separate floodplain delineation maps for each of these three streams, dated August 16, 1990. A Best Available Data Letter for the data provided in these reports was issued on November 5, 1990.

The Morgan City Wash watershed is comprised of approximately 23 square miles of land in the Hieroglyphic Mountains, a complex series of low hills and ridges, between 1,500 and 3,500 feet in elevation with an intricate pattern of deep washes and sharp divides. General stream flow is east-southeast on a gravel bed with near vertical banks. The only drainage structures are concrete box culverts at road crossings of the Lake Pleasant Road and Castle Hot Springs Road.

The Cline Creek watershed, an area of 16 square miles, with eight tributaries to Cline Creek, has an elevation range from 2,000 feet at the Skunk Creek confluence to 4,600 feet along the rim of New River Mesa. General stream flow is in the west to southwesterly direction. The tributaries are increasingly steep upstream from Cline Creek, with slopes ranging from 1 to 20 percent with supercritical flows in parts of the reach. Cline Creek crosses New River Road and Circle Mountain Road via dip crossings. No drainage structures exist in the watershed.

The Rodger Creek watershed has a drainage area of approximately 5.13 square miles with the land slope being generally westerly. Elevations range from 1,900 feet at the confluence with Skunk Creek to 3,600 feet on Elephant Mountain. The only drainage structure is a double 96" fiberglass pipe culvert where New River Road crosses. The steep stream slope results in subcritical and supercritical flow with high velocities predominant throughout the reach.

No structural flood protection measures exist or are planned within the watersheds of Morgan City Wash, Cline Creek, and Rodger Creek.

The hydrologic analyses for the watersheds of Morgan City Wash, Cline Creek, and Rodger Creek were performed using the COE HEC-1 computer model to establish 100-year peak flow rates for each stream and tributary delineated.

Cross-section data for the COE HEC-2 hydraulic model were stereoscopically digitized from aerial photographs. Topographic maps, at a scale of 1:200, with a contour interval of 4 feet, prepared in 1989 by McLain-Harbers Company, Inc., were also used for this study. The geometrics of Lake Pleasant Road and Castle Hot Springs Road culverts on Morgan City Wash, and the geometry for the New River Road on Rodger Creek were obtained by field survey.

The water-surface elevations for the 100-year flood were computed using the COE HEC-2 hydraulic model. The starting water-surface elevations for Morgan City Wash at the confluence with Agua Fria River were interpolated from the effective profiles for the Agua Fria River.

The starting water-surface elevations for Cline Creek and for Rodger Creek at the confluence with Skunk Creek were interpolated from the effective BFEs for Skunk Creek.

Floodways for these streams were developed from the HEC-2 hydraulic model using Encroachment Method 1.

The BFEs and floodplain and floodway delineations for the three streams studied are shown on the following FIRM panels for Morgan City Wash: 0320, 0340, 0730, and 0135; for Cline Creek: 0390 and 0395; and for Rodger Creek: 0395, 0415, 0180, and 0185. Tables 1, 3, and 4, the Floodway Data Table, and Flood Profiles for Morgan City Wash, Cline Creek, and Rodger Creek have been added to reflect this new detailed flooding information.

Gila River from north of Gila Bend to Gillespie Dam

For the 19.9 mile reach of the Gila River north of the Town of Gila Bend (at the east boundary of the Gila River Indian Reservation) upstream to Gillespie Dam, a new hydraulic analysis dated November 1990, was developed by Cella Barr Associates, for the FCDMC. The entire reach of the Gila River flows south through the unincorporated areas of Maricopa County. A Best Available Data Letter was issued on January 29, 1992, for this study.

New topographic mapping was used for this study reach at a scale of 1:400, with a contour interval of 2 feet. This served as the basis for establishing ground elevations along the modeled cross-sectional alignments. For the existing bridge crossing of the Gila River at old U.S. Highway 80 near Gillespie Dam, field surveys and measurements to determine "as-built" conditions were obtained.

The hydrologic data utilized for this study were developed by the COE, Los Angeles District, and are presented in their report entitled "Gila River and Tributaries," dated May 1982. The COE HEC-2 hydraulic model was used to develop the 100-year water-surface profile. Backwater ponding extends for roughly 2.0 miles upstream of Painted Rock Dam. The floodway delineation for this study was computed using Encroachment Method 1 in the HEC-2 hydraulic model for the entire reach.

As a result of this analysis, new data are shown in Tables 1, 3, and 4, and on FIRM Panels 2835, 2855, 2865, 3230, 3235, 3240, 3245, and 3480. Flood Profiles and the Floodway Data Table have been added for this study.

Gila Bend Canal

The 23 mile-long reach of the Gila Bend Canal floodplain located east of Gila River, between Old U.S. Highway 80 and State Route 85 in the unincorporated areas of Maricopa County and the Town of Gila Bend, was revised based on data submitted by the FCDMC, and approved in a Best Available Data Letter dated March 26, 1992. The revised hydrologic and hydraulic analyses for the Gila Bend Canal were performed by Donohue and Associates, Inc., for the FCDMC, in November 1991 (Revised March 8, 1992). The results of their analyses are presented in Volumes 1 and 2 of 2 of the reports entitled "Gila Bend Canal Floodplain

Delineation Study Gillespie Dam to Gila Bend," dated November 1991, and the reports entitled "Hydrology Report, Gila Bend Canal Floodplain Delineation Study, Gillespie Dam to Gila Bend," dated November 1991, and the report entitled "Hydraulic Analysis and Floodplain Delineation, Gila Bend Canal Floodplain Delineation Study, Gillespie Dam to Gila Bend," dated November 1991. The COE HEC-1 model was used to compute the 100-year flood discharges and flood elevations. For a 1.25 mile reach of defined channel flow, the COE HEC-2 hydraulic computer model was used to compute flood elevations.

The peak 100-year flows arriving at the canal generally exceed the capacities of the cross-drainage structures, and excess flow is stored in ponding areas adjacent to the east berm of the canal. Major floods often result in some erosion or overtopping damage to the canal berms. The only measures in place which serve to reduce flood heights in the study area are the cross-drainage structures in the canal. Representative channel cross sections at intervals of 400 and 1,200 feet were obtained electronically from the three-dimensional CAD drawings.

New detailed 100-year flood boundaries designated as Zone AE and Zone AO are shown on FIRM Panels 2855, 2865, 2870, 3235, 3245, 3480, and 3485. Data for Tables 1, 3, and 4, and Flood Profiles for the 1.25 mile reach have been added to reflect these revisions.

Gilbert-Chandler Area

The hydrologic and hydraulic analyses in the Gilbert-Chandler area developed to study the effects of the Eastern Canal, Consolidated Canal, the Southern Pacific Railroad (SPRR) Rittenhouse Branch, and the SPRR along Arizona Avenue on flooding, were prepared for the FCDMC by Franzoy-Corey Engineering Company. The results are presented in the report entitled "Gilbert-Chandler Area, Maricopa County, Arizona," revised September 1990, and in the submitted design notebooks. A Best Available Data Letter was issued on February 21, 1991.

The study area of about 98 square miles, is bounded by the Superstition Freeway (SR 360) on the north, by Hunt Highway (Maricopa County Line) on the south, the East Maricopa Floodway on the east, and the SPRR paralleling Arizona Avenue on the west. The study covers the incorporated areas of the Town of Gilbert, parts of the Cities of Chandler and Mesa, and the unincorporated areas of Maricopa County.

The hydrologic analyses of the study area were performed using the COE HEC-1 computer model modified by Haestad Methods Version 3.2c. Flow patterns in this study area, which contains no natural drainage channels, tend to develop ponds behind man-made roads, railroads, and canals. Outflow from the ponds is either by overflow of the road and canal embankments, which was computed using the weir formula, or by flows through culverts, which were computed by assuming inlet control.

Water-surface elevations at ponded locations were computed utilizing the level pool reservoir routing routines in the COE HEC-1 computer model. Water-surface elevations of flow along the hydraulic barriers between ponding sites were computed using the COE HEC-2 hydraulic computer model.

Cross-section data were compiled from topographic mapping at a scale of 1:400, with a contour interval of 2 feet. Bridges and culverts were field surveyed to obtain elevation data and structural geometry.

The Letters of Map Revision issued on August 6, 1991, for the City of Gilbert; on August 23, 1991, and January 21, 1992, for the City of Chandler; on August 27, 1991, for the City of Mesa; and on September 5, 1991, and January 21, 1992, for the unincorporated areas of Maricopa County, were based on this study.

As a result of this study, the SFHAs have increased and decreased. Previously published SFHAs designated as Zone A have been revised to Zone AH with elevations, except for the revised 100-year floodplain designated as Zone A between Superstition Freeway (SR 360) and Baseline Road and the Eastern and Consolidated Canals. These latter areas are within the City of Mesa. A new profile was added for the reach along SPRR from approximately 2,600 feet southeast of Baseline Road to Consolidated Canal. The modifications are shown on FIRM Panels 2190, 2195, 2215, 2655, 2660, 2665, 2670, 2680, 2690, and 3050. Data for Tables 1, 2, and 3, and the Flood Profile have been added to reflect these modifications.

The Letters of Map Revision issued on December 18, 1992, for the Town of Gilbert, Arizona, and the unincorporated areas of Maricopa County, Arizona, were included in this update. These two Letters of Map Revision show the effects of the construction of the Town of Gilbert's Cross Road Park Detention Basin. The basin is located at the intersection of the Eastern Canal and the SPRR in Section 21, Township 1 South, Range 6 East. As a result of the project, the SFHAs have been decreased along the SPRR, SPRR spur, the Consolidated Canal East Branch, and the Eastern Canal, except for the area located west of the intersection of McQueen Road and Western Canal. The modifications are shown on FIRM Panels 2190, 2655, 2660, 2670, and 2680.

Caterpillar Tank and Twin Buttes Washes

This study for Caterpillar Tank and Twin Buttes Wash from the Agua Fria River to the CAP Canal is for the area approximately 3 miles west of Lake Pleasant and six miles north of Deer Valley Drive, all in the unincorporated areas of Maricopa County. The watershed is 12.2 square miles, of which 3.4 miles is for Caterpillar Tank Wash, and 8.8 square miles is for Twin Buttes Wash with tributaries of White Peak Wash, West Fork of White Peak Wash, and East and West Garambullo Wash. The watershed drains generally from north to south. The study was performed by AGK Engineers, Inc., for the FCDMC, and approved in a Best Available Data Letter dated August 23, 1991. The results are presented in the report entitled "Flood Insurance Study for Caterpillar Tank and Twin Buttes Washes from Agua Fria River to C.A.P. Canal, Maricopa County, Arizona," and Appendices, dated June 1991, and the report entitled "Hydrologic Report for C.A.P. Overchutes, Agua Fria Floodplain Delineation Study, Maricopa County, Arizona," dated May 1991.

The watershed has rolling hills on the east and isolated rock hills north of the CAP Canal. There are no existing flood control structures or measures within the study area. Caterpillar Tank collects runoff from Caterpillar Tank Wash for stock grazing only.

The U.S. Bureau of Reclamation has certified the embankments associated with the CAP construction up to the top of the concrete lining. The levee analysis conclusion is that the canal is assumed to be adequate for withholding the flow resulting from a 100-year storm. However, the pipe culverts under the canal will cause backwater and ponding effects to the area immediately north of the canal during the 100-year event. A portion of the runoff from the upper watershed is shown intercepted by the canal and routed along the canal to Caterpillar Tank and Twin Buttes Washes through six pipe culverts under the canal.

Hydrologic modeling was performed by means of the COE HEC-1 computer model. For computing the 100-year water-surface elevations, the COE HEC-2 hydraulic computer model was used. Starting water-surface elevations for both Caterpillar Tank and Twin Buttes Wash were obtained from the January 1989 Agua Fria River Flood Insurance Study for the FCDMC.

The relationship among stage, storage, and outflow at the existing CAP culverts were developed from topographic maps at a scale of 1:200, with a contour interval of 2 feet, prepared in September 1990, by Aerial Mapping Company, Inc. Cross-section data for backwater analyses were also determined from the same topographic maps. Field verification supplemented mapping inadequacies in the determination of sub-area boundaries.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the floodplain.

As a result of this study, the 100-year flood boundaries designated as Zone A along the CAP Canal were modified to Zone AH. New detailed 100-year floodplain and floodway delineations for all of the above-studied streams, are shown on FIRM Panels 0740, 0745, 1155, and 1160. Data for Tables 1, 3, and 4, the Floodway Data Table, and Flood Profiles have been added to reflect this new detailed flooding information.

Jackrabbit Wash, Star Wash Tributary and Unnamed Tributary to Jackrabbit Wash

The area included in this new hydrologic and hydraulic study for Jackrabbit Wash, from the CAP Canal to Vulture Mine Road, is located within the unincorporated areas of Maricopa County. The drainage area for the watershed is approximately 442 square miles, and is bounded on the north by the Vulture Mountains, on the east by the Vulture Mountains and the Hassayampa River, on the south by Interstate 10, and on the west and southwest by the Belmont Mountains.

The watershed is characterized by steep rugged mountainous terrain along the edges of the watershed, and much flatter desert valley in the middle and southerly portion of the watershed. The study was performed by Burgess and Niple, Inc., for the FCDMC with detailed floodplains developed for Jackrabbit Wash from CAP Canal to Vulture Mine Road, along with two tributaries, Star Wash and an Unnamed Tributary. Also included were ponding areas along the CAP Canal for approximately 3.5 miles southwest and northeast of Jackrabbit Wash. A Best Available Data Letter was issued on April 25, 1991. The results of the analyses are presented in the reports entitled "Jackrabbit Wash, Floodplain Delineation Study, Technical Data Notebook, Hydraulics," dated February 1991, and "Jackrabbit Wash, Floodplain Delineation Study, Technical Data Notebook Hydrology," dated February 1991.

No flood protection measures exist upstream of the CAP Canal. The watershed was modeled utilizing the COE HEC-1 computer model. Reservoir routing where water ponds against the CAP Canal was performed using the Modified Puls Method.

Only the 100-year profile was computed for these streams using the COE HEC-2 hydraulic model. The hydraulic analysis for the 100-year flood is based upon unobstructed flow conditions. Flood elevations are valid only if the CAP Canal structures remain unobstructed and its embankment does not fail. Starting water-surface elevations were obtained using normal depth. CAP Canal structures serve to reduce downstream flood peaks by storing floodwater upstream of the canal.

Cross sections for the hydraulic analyses were digitized from aerial mapping at a scale of 1:4,800, with a contour interval of 4 feet, prepared in 1990 by Aerial Mapping Company, Inc.

The floodways determined for the studied streams were computed on the basis of equal-conveyance reduction. As a result of this study, the 100-year flood boundaries designated as Zone A along the CAP Canal were modified to Zone AH. New detailed 100-year floodplain and floodway delineations for the three streams are shown on FIRM Panels 1035, 1055, 1065, 1070, and 1510. Data have been added to Tables 1, 3, and 4, the Floodway Data Table, and Flood Profiles to reflect this new detailed flooding information.

Trilby Wash

The hydrologic and hydraulic study for Trilby Wash, from the CAP Canal for approximately 6.7 miles upstream to Grand Avenue near Circle City, was performed by P&D Technologies for the FCDMC. A Best Available Data Letter was issued for this study on May 14, 1992.

The results are presented in Books 1 through 2 of 2 entitled "Flood Insurance Study for Trilby Wash, from the CAP AQUEDUCT to Grand Avenue Near Circle City," dated February 6, 1992.

The watershed is located in the central portion in the Central Arizona Desert, approximately 30 miles northwest of Phoenix. Trilby Wash, with an elevation range from 1,543 feet at the downstream end to 1,849 feet at the upstream end, on an approximate slope of 1 percent, carries flow southeasterly into the McMicken Dam Storage Basin. There are no flood control structures. The CAP overchute and Patton Road Crossing are the two major man-made obstructions to the floodwater from the natural water courses. The Patton Road Crossing has 8-68 inch corrugated metal pipe culverts under the roadway and will cause backwater effects to the area immediately north during a 100-year event.

Hydrologic analyses were conducted using the COE HEC-1 computer model. The previous hydrologic analysis of Trilby Wash, dated August 1991, and prepared by the Hydrology Division for the FCDMC was also used as part of this study. Computations of the water-surface elevation were calculated only for the 100-year storm by the use of the COE HEC-2 hydraulic computer model. The starting water-surface elevation was assumed to be at critical depth.

Cross sections were digitized from topographic maps, at a scale of 1:200, with a contour interval of 2 feet, prepared specifically for this project by Cooper Aerial Mapping of Phoenix, Inc. The Patton Road Culvert Crossing and CAP overchute were surveyed to obtain elevation data and structural geometry.

The floodway delineation for this study was computed with the use of Encroachment Method 1 for the entire 6.7 river mile reach of Trilby Wash.

As a result of this study, new detailed 100-year floodplain and floodway delineations for Trilby Wash are shown on FIRM Panels 0679, 0687, 0689, 0695, and 1110. Data have been added to Tables 1, 3, and 4, the Floodway Data Table, and Flood Profiles to reflect this new detailed flooding information.

Queen Creek

The hydrologic and hydraulic analyses in the Queen Creek area of the unincorporated areas of Maricopa County, the City of Mesa, and the Towns of Gilbert and Queen Creek, were prepared for the FCDMC by Wood and Associates, Inc. The results are presented in the technical report entitled "Flood Insurance Study for Southern Pacific Railroad, Queen Creek Area, Maricopa County, Arizona," dated December 1989, revised February 1990, and in the Addendum No. 1 to this report, dated June 1990. A Best Available Data Letter for this study was issued on August 2.1, 1990.

The study area is traversed by a perched SPRR in a northwesterly-southeasterly direction (approximately 8.6 miles). Flows collect along the northeast side of the track and are conveyed northwesterly to the East Maricopa Floodway (EMF). Several flood control structures have been constructed which affect flooding in the study area. The SCS-sponsored Powerline and Vineyard Road Flood Retarding Structures, and the COE-sponsored Whitlow Ranch Dam were constructed for the purpose of providing flood protection to the study area.

Discharges for the flooding sources studied in detail were developed using the COE HEC-1 model. The Muskingham Flood Routing option was employed to simulate flood wave movement through stream reaches and reservoirs.

The COE HEC-2 hydraulic computer model was used to develop the water-surface elevations.

The starting water-surface elevation for the delineation shown on the work maps was based on computations started at critical depth. Cross-section data for the hydraulic analysis were obtained from topographic maps at a scale of 1:200, with a contour interval of 2 feet, prepared by Wood and Associates, Inc., dated October and November 1986.

As a result of this study, the 100-year flood boundaries designated as Zones A and AH along the perched SPRR are added to FIRM Panels 2690, 2695, and 3060. Data shown have been added to Tables 1, 3, and 4 to reflect these modifications.

Wagner Wash

The new hydrologic analyses for a reach of Wagner Wash, from its confluence with the Hassayampa River upstream 8.3 miles to the CAP Canal, and the determination of ponding of floodwaters on the north side of the CAP Canal, were performed by the FCDMC Hydrology Division Watershed Management Branch. These analyses are presented in the report entitled "Hydrology Analysis of Wagner Wash Watershed," dated April 1990, revised January 1991, prepared by the FCDMC. The hydraulic analyses were prepared by HDR Engineering, Inc., in April 1991. A Best Available Data Letter for this study was issued on September 26, 1991.

The watershed has a drainage area of 42 square miles and is located east of the Hassayampa River, all in the unincorporated area of Maricopa County. The elevation range is from 1,400 to 2,700 feet mean sea level, and is characterized with broad alluvial slopes prone to sheetflow. There are no flood protection measures, and none are planned in the foreseeable future.

The hydrologic modeling was performed using the COE HEC-1 computer model. The normal-depth routing of the HEC-1 model was used for channel routing. The two overchutes located

along the CAP allow the upper watershed to be drained to the lower watershed. The design storage capacity and peak flows obtained from the U.S. Bureau of Reclamation (design data dated 1980), were used in the model. One foot contour mapping, obtained from The Adams Group, a consulting firm, was used to obtain storage information for the contributing area behind the CAP.

Cross-section data for the hydraulic analyses were obtained photogrammetrically from aerial photographs obtained by aerial survey in September 1990. The topographic maps were prepared at a scale of 1:2,400, with a contour interval of 2 feet. All culvert crossings were field surveyed to obtain elevation data and structural geometry. Water-surface elevations were computed using the COE HEC-2 hydraulic computer model. The starting water-surface elevation for Wagner Wash was determined using the slope-area method.

The floodways shown in this study were computed on the basis of equal conveyance reduction from each side of the floodplain.

As a result of this study, the 100-year floodplain boundaries designated as Zone A along the CAP Canal were modified to Zone AH with elevations. New detailed 100-year floodplain and floodway-delineations for Wagner Wash are shown on FIRM Panels 1095, 1530, and 1550. Data have been added to Tables 1, 2, 3, and 4, the Floodway Data Table, and Flood Profiles to reflect this new detailed flooding information.

Scatter Wash

The 100-year SFHA was revised and BFEs were deleted for Scatter Wash, upstream of Interstate 17 (I-17) based on our re-examination of a determination made in a report prepared by the COE, entitled "Draft Report, Flood Insurance Study, New River and Scatter Wash, Maricopa County, Arizona," dated September 1985. In their report, the COE determined that the area upstream of I-17 should be designated as Zone B because of the numerous braided channels in the area and because no single channel could accurately be described as conveying all of the flow to I-17. The COE supported their conclusion based on their field observations of the runoff pattern in the watershed. However, the COE report acknowledged that the 100-year flood ponds behind I-17, which results in overtopping of the highway. The area of ponding upstream of I-17 is based on the elevation of the top of the I-17 roadway (elevation 1,416 feet). Accordingly, the SFHA ponded upstream of I-17, with an elevation of 1,416 feet, remains as shown on the FIRM, while the SFHAs upstream of I-17, which are above elevation 1,416 feet, have been removed. The modifications are shown on FIRM Panel 1205.

Washes 1 through 8 Downstream of Sun Valley Parkway

The new hydrologic and hydraulic analyses for Washes 1 through 8 were performed by A-N West, Inc., for the FCDMC. The results of these analyses are presented in the reports entitled "Sun Valley Parkway North Flood Insurance Study Hydrology Report," dated January 24, 1991, revised March 6, 1991; "Flood Insurance Study Sun Valley Parkway North Portion of Town of Surprise and Unincorporated Areas of Maricopa County, Arizona," dated September 1991, revised October 10, 1991; and "Technical Data Notebook for Sun Valley Parkway North Flood Insurance Study (Portion of Town of Surprise and Unincorporated Areas, Maricopa County, Arizona)," dated October 1991," all prepared by A-N West, Inc. The purpose of this revision was to develop the 100-year floodplain delineation for eight washes north of White Tank Mountains, areas not previously studied. Two Letters of Map Revision

were issued on April 15, 1993, for the unincorporated areas of Maricopa County, Arizona, and for the Town of Surprise, Arizona, to incorporate the results of this study.

The total watershed area of the study is approximately 28 square miles. The watershed is bounded on the south by the White Tank Mountains, on the west by the divide between McMicken Dam and Hassayampa River, on the north by the CAP Canal and the floodplain of Trilby Wash and its tributaries, and on the east by the McMicken Dam floodpool. The watershed is currently unpopulated and undeveloped, except for the Sun Valley Parkway.

The COE HEC-1 computer program was used to estimate peak discharges and channel routings of flow within the study area.

Cross sections were obtained from topographic maps prepared by Cooper Aerial of Phoenix, Inc., at a scale of 1:4,800 and a contour interval of 4 feet, flown September 28, 1990, and from topographic maps prepared by the WLB Group, Inc., and Cooper Aerial Survey Company, at a scale of 1:4,800 and a contour interval of 4 feet, compiled photogrammetrically from aerial photos flown on December 11, 1986.

The starting water-surface elevations were computed in the HEC-2 hydraulic computer model using the slope-area method.

As a result of this study, 100-year floodplain boundaries designated as Zone A were added to FIRM Panels 1105, 1115, 1120, and 1140.

The following Letters of Map Revision are also included in this revision:

Skunk Creek

The Letters of Map Revision issued on May 14, 1992, for the City of Peoria, Arizona, and on May 19, 1992, for the unincorporated areas of Maricopa County, Arizona, to show the effects of a channel improvement and bridge construction project along the reach of Skunk Creek from its confluence with the New River to approximately 600 feet downstream of its confluence with the ACDC. Based on a revised hydraulic analysis, submitted by the FCDMC, the SFHA has been decreased and the 100-year flood is now contained in the channel for the above-mentioned reach. The modification is shown on FIRM Panels 1190 and 1630.

Agua Fria River

The LOMR issued on February 20, 1992, for the Town of El Mirage, Arizona, to show the effects of a newly constructed levee along the western side of the Agua Fria River between Olive Avenue and Northern Avenue. Based on data submitted by the City of El Mirage, the 100-year floodplain has been modified and the SFHA located landward of the levee has been removed. This modification is shown on FIRM Panels 1605 and 1615.

New River

The LOMR issued on April 21, 1992, for the City of Peoria, Arizona, to show the effects of the COE detailed hydraulic analysis of the newly constructed levee and channelization of the New River from Olive Avenue to approximately 1,300 feet upstream of Grand Avenue. As a result of this project, the 100-year flood and floodway are now contained in the channel from Olive Avenue to approximately 1,300 feet upstream of Grand Avenue. Based on this

hydraulic analysis, the modification is shown on FIRM Panel 1610. The Floodway Data Table and Flood Profile panels from Cross Sections AV to CV have been deleted.

Arizona Canal Diversion Channel

The LOMR issued on May 5, 1992, for the City of Phoenix, Arizona, to show the effects of the ACDC, built by the COE, from Dunlap Avenue to the zone break for the Tenth Street Wash just upstream of Butler Drive. Based on the submitted data from the FCDMC, the SFHA increases in the vicinity of Central Avenue and Ruth Avenue, but flooding is still contained within the right-of-way of the ACDC for this reach. The modification is shown on FIRM Panels 1655 and 1665.

Salt River

The LOMR issued on September 4, 1991, for the City of Phoenix, Arizona, to reflect the flood control levee along the north bank of the Salt River from Interstate 10 for 4,800 feet upstream to 40th Street as shown on FIRM Panels 2145 and 2165. The revised analysis for this reach of Salt River was prepared by Cella Barr Associates on July 3, 1990, and August 22, 1990. The revised analysis shows an increase in the SFHA along the boundaries of the Salt River and a maximum increase in the BFEs of 0.63 feet at approximately 2,200 feet upstream of 32nd Street. The floodway width decreases within the entire restudied part of this reach. These modifications are shown on FIRM Panels 2145 and 2165, the Floodway Data Table, and Profile Panels 282P and 283P.

The LOMR issued on December 7, 1989, for the City of Phoenix, Arizona, for Lots 8 and 12, Arizona Industrial Park, Unit One, and Central Avenue Parcel 1, and Arizona Industrial Park Parcel 1, has been included in this update. The LOMR stated that Lot 8 and Central Avenue Parcel 1 have been removed from the SFHA based on fill. The 100-year floodplain delineation along the Salt River was revised to reflect the fill in Lot 8 and is reflected on FIRM Panel 2145. No change was made, however, to reflect the fill in Central Avenue Parcel 1, since this parcel is located on FIRM Panel 2140, a panel which is not included in this update.

The LOMR issued on March 1, 1990, for the City of Phoenix, Arizona, for Lot 12, Arizona Industrial Park, Unit One, and Arizona Industrial Park Parcel 1, has been included in this update. The LOMR stated that the property would not be inundated by a 100-year flood. The 100-year floodplain delineation along the Salt River was revised on FIRM Panel 2145 to reflect these changes.

The LOMR issued on April 3, 1991, for the City of Phoenix, Arizona, for Lots 16 and 17, Arizona Industrial Park Unit One, and Arizona Industrial Park Parcels 2 and 3, has been included in this update. The LOMR stated that the property would not be inundated by a 100-year flood. The 100-year floodplain delineation along the Salt River was revised on FIRM Panel 2145 to reflect these changes.

The LOMR issued on June 11, 1991, for the City of Phoenix, Arizona, for Lots 14 and 15, Arizona Industrial Park, Unit One, stated that the property would not be inundated by a 100-year flood. The 100-year floodplain delineation along the Salt River was revised on FIRM Panel 2145 to reflect these changes. A portion of Lot 14 is located on FIRM Panel 2140, a panel which is not included in this update. Therefore, no change was made for that portion of Lot 14.

Western Canal

The LOMR issued on October 25, 1991, for the City of Tempe, Arizona, to reflect the revised hydrologic and hydraulic analyses for the Zone A ponding SFHA located on the northern side of the Western Canal between McClintock Drive and Brice Road. Supporting data required to evaluate this request were submitted by Mr. James E. Bond, P.E., Senior Engineer, City of Tempe, and by Mr. Vincent A. Pedotto. This revision is shown on FIRM Panel 2635.

East Maricopa Floodway

The LOMR issued on January 21, 1992, for the Cities of Gilbert and Mesa, Arizona, and for the unincorporated areas of Maricopa County, to reflect the effects of a detailed hydraulic analysis of a 3-mile section of the East Maricopa Floodway channel between Guadalupe Road and Broadway Road. The East Maricopa Floodway is a joint effort between the SCS and the FCDMC. The analyses were prepared in September 1991. The modification is based on additional data regarding the alignment of flows leaving the culvert under Higley Road down to Broadway Road and the location of the East Maricopa Floodway right-of-way limits. Based on these hydraulic analyses, the SFHAs have both decreased and increased, as shown on FIRM Panels 2215, 2680, and 2685.

Highline Canal

The LOMR issued on November 13, 1992, for the City of Phoenix, Arizona, to show the effects of the removal of the Highline Canal west of 44th Street and north of Chandler Boulevard, is shown on FIRM Panel 2640. As a result of the removal of the canal, the Zone A ponding west of 44th Street has been removed.

The LOMR issued on December 5, 1991, for the City of Phoenix, Arizona, for Lots 95 through 108, Mountain Crest Subdivision, has been included in this update. The LOMR stated that the property would not be inundated by a 100-year flood. The 100-year floodplain delineation along the Highline Canal was revised on FIRM Panel 2640 to reflect these changes.

The LOMR issued on March 19, 1992, for the City of Phoenix, Arizona, for portions of Lots 85 through 94, Mountain Crest Subdivision, has been included in this update. The LOMR stated that portions of the property would not be inundated by a 100-year flood. The 100-year floodplain delineation along the Highline Canal was revised on FIRM Panel 2640 to reflect these changes.

The LOMR issued on March 19, 1992, for the City of Phoenix, Arizona, for portions of Lots 1 through 23, Monarch Subdivision, has been included in this update. The LOMR stated that portions of the property would not be inundated by a 100-year flood. The 100-year floodplain delineation along the Highline Canal was revised on FIRM Panel 2640 to reflect these changes.

Indian Bend Wash/Interceptor Channel

The LOMR issued on October 16, 1992, for the City of Scottsdale, Arizona, to show the effects of the construction of the Indian Bend Wash/Interceptor Channel from Indian Bend Wash to Pima Road, is shown on FIRM Panel 1695. This LOMR reissued the results of the

LOMR dated November 7, 1986. As a result of the project, the 100-year floodplain boundary has been revised to extend along the north side of the Interceptor Channel from Indian Bend Wash to Pima Road.

East Fork Cave Creek

The LOMR issued on October 1, 1992, for the City of Phoenix, Arizona, to show the effects of channel improvements along East Fork Cave Creek from Central Avenue to Seventh Street, construction of a six-barrel 12' x 12' reinforced concrete box culvert at Seventh Street, and the Greenway Channel improvements approximately 1,000 feet upstream of Seventh Street, has been included in this update. As a result of this project, the 100-year flood is now contained in the channel from Central Avenue to a point approximately 1,000 feet upstream of Seventh Street. The modifications are shown on the FIRM Panels 1215 and 1220, and the Flood Profiles and Floodway Data Table for East Fork Cave Creek.

The LOMR issued on May 19, 1992, for the City of Phoenix, Arizona, for portions of Coral Manor Units I and II, has been included in this update. The LOMR stated that these portions of Coral Manor Units I and II would not be inundated by a 100-year flood. The 100-year floodplain delineation along East Fork Cave Creek was revised on FIRM Panel 1215 to reflect these changes.

The LOMA issued on March 15, 1991, for the City of Phoenix, Arizona, for Lots 1 through 91, Canyon View Subdivision, has been included in this update. The LOMA stated that Lots 38 through 52 and 54 through 91 would not be inundated by the 100-year flood and were currently shown outside the SFHA. In addition, Lots 1 through 37 and 53 would not be inundated by the 100-year flood. The 100-year floodplain delineation along East Fork Cave Creek was revised on FIRM Panel 1220 to reflect these changes.

The LOMR issued on January 12, 1993, for the City of Phoenix, Arizona, for Lot 88, Greentrails Subdivision, has been included in this update. The LOMR stated that the property would not be inundated by a 100-year flood. The 100-year floodplain delineation along East Fork Cave Creek has been revised on FIRM Panel 1220 to reflect this change.

The LOMA issued on May 14, 1993, for the City of Phoenix, Arizona, for Lot 87, Greentrails Subdivision, has been included in this update. The LOMA stated that the property would not be inundated by a 100-year flood. The 100-year floodplain delineation along East Fork Cave Creek has been revised on FIRM Panel 1220 to reflect this change.

The LOMR issued on May 26, 1993, for the City of Phoenix, Arizona, for Lots 133 through 281, Moonlight Cove Two, has been included in this update. The LOMR stated that Lots 133 through 139, 173 through 176, 182, 183, 184, 204 through 219, 221 through 228, 255, 256, 263, 269, and 270 would not be inundated by a 100-year flood and are already correctly shown outside the SFHA. In addition, the LOMR stated that Lots 140 through 172, 177 through 181, 185 through 203, 220, 229 through 254, 257 through 262, 264 through 268, and 271 through 281, would not be inundated by the 100-year flood. The 100-year floodplain delineation along East Fork Cave Creek was revised on FIRM Panel 1215 to reflect these changes.

10.4 Fourth Revision

This study was revised on September 30, 1995, to include the restudy of hydraulic conditions on the Consolidated Canal East Branch, East Fork Cave Creek, Basin 5, Grand Avenue, an unnamed tributary to Cave Creek, Indian Bend Wash, Salt River, Arizona Channel, and Tenth Street Wash, as well as various requests for map revisions based on newly studied streams and ponding areas. The restudied and newly studied flooding sources are located in the unincorporated areas of Maricopa County, the Cities of Avondale, Glendale, and Litchfield Park, and the Towns of Buckeye, Goodyear, Guadalupe, Paradise Valley, and Surprise.

The portions of streams studied by detailed methods were added to Table 1, "Detailed-Study Sources."

The process of converting the existing FIRM panels from standard format to map initiatives format as described in Section 10.1 continues with this revision. Zone designations were revised as required by a given study. Additional reference marks and descriptions used in this study are shown on the map panels. Tables 1 through 4, Floodway Data Table 5, and the Flood Profiles have been revised to reflect the new detailed flooding information.

Specifics of the hydrologic and hydraulic analyses for all streams are presented below.

Gila Bend Area

The areas included in this new hydrologic and hydraulic study for Sand Tank Wash, Scott Avenue Wash, Bender Wash, Unnamed Wash No. 1, Unnamed Wash No. 2, and ponding areas upstream of the Gila Bend Canal are located within the Town of Gila Bend and the unincorporated areas of Maricopa County.

The study was performed by Burgess & Niple, Inc., for the FCDMC. A Best Available Data Letter was issued on March 5, 1993. The results of the analyses are represented in the reports entitled "Gila Bend Area Floodplain Delineation Study, Technical Data Notebook, Hydraulics," Books 1 and 2, both dated March 1992.

The hydrologic analysis for the Gila Bend Area was conducted using the COE HEC-1 hydrologic model.

Only the 100-year profile was computed for these streams using the COE HEC-2 hydraulic model. The starting water-surface elevations were obtained using normal depth. Elevations are referenced to the NGVD. Pondered flood boundaries for structures through the Gila Bend Canal not modeled above were obtained by routing the 100-year storm through the structures.

Cross sections for the backwater analysis are digitized from aerial mapping at a 1:4,800 scale with a contour interval of 4 feet and a 1:2,400 scale with a contour interval of 2 feet. Manning's "n" values were obtained during a field reconnaissance October 4, 1991. Values ranged from 0.025 to 0.08. The streams are shown on FIRM Panels 3480 F, 3485 F, 3490 E, and 3491 E.

Luke Wash

The areas included in this new hydrologic and hydraulic study for Luke Wash are located in the unincorporated areas of Maricopa County.

The study was performed by Coe & Van Loo Consultants, Inc., for the FCDMC. A Best Available Data Letter was issued on July 2, 1993. The results of the analyses are represented in reports entitled "Luke Wash Flood Insurance Study, Technical Data Notebook," dated March 19, 1993; "Luke Wash Flood Insurance Study, Survey Data," dated December 19, 1992; "Luke Wash Flood Insurance Study, Hydrologic Analysis, Technical Data Notebook Section 3," dated November 30, 1992; "Luke Wash Flood Insurance Study, Hydraulic Analysis, Technical Data Notebook Section 4," dated March 18, 1993; and "Luke Wash Flood Insurance Study, N-Value Determination Report," dated November 23, 1992.

The hydrologic analysis for Luke Wash was conducted using the COE HEC-1 hydrologic model. Portions of the Jackrabbit Wash HEC-1 model for which a Best Available Data Letter was issued on April 25, 1991, were used as a base for the Luke Wash hydrology.

Only the 100-year profile was computed for Luke Wash using the COE HEC-2 hydraulic model. Starting water-surface elevations were determined using the slope-area method. The water surface from Gila River was not used because of the difference in the time of peak flow. No floodway was delineated for this wash.

Manning's "n" values were established based on field investigations, topographic mapping, and photographs of the area.

The floodplain was delineated by interpolating between each cross section using topographic maps at a scale of 1" = 200' with a contour interval of 2 feet. Bank stations at each cross section were offset from the channel thalweg based on aerial photographs, 1" = 200' topographic maps, and field investigation.

The stream is shown on FIRM Panels 2460 F and 2470 F.

Apache Wash and Tributaries

The areas included in this new hydrologic and hydraulic study for Apache Wash, Apache Wash (West Overflow Area), Apache Wash West Branch, Desert Hills Wash, Desert Hills Wash West Branch, Unnamed Wash (tributary to Desert Hills Wash), Desert Lake Wash (Jonathan Wash), Mesquite Tanks Wash, Paradise Wash, Paradise Wash West Branch, and Ranieri Wash are located within the City of Phoenix and the unincorporated areas of Maricopa County.

The study was performed by Jerry R. Jones & Associates, Inc., for the FCDMC. A Best Available Data Letter was issued on September 8, 1993. The results of the analyses are represented in the reports entitled "Apache Wash, Flood Insurance Study, Exhibit 1," "Apache Wash, Flood Insurance Study, Contract FCD 89-66," and "Apache Wash Hydrologic/Hydraulic, Technical Data Notebook, Exhibit 4," dated August 1992.

The hydrologic analysis for Apache Wash was conducted using the COE HEC-1 hydrologic model.

Only the 100-year profile was computed for these streams using the COE HEC-2 hydraulic model. Floodways were delineated for all streams.

Cross-section data were obtained in the field. Topographic maps of the study area were generated from aerial photos flown from July to November 1990.

The streams are shown on FIRM Panels 0785 G, 0790 E, 0795 F, and 1210 F.

Rainbow Wash and Tributaries

The areas included in this new hydraulic study for Rainbow Wash and its tributaries are located within the unincorporated areas of Maricopa County.

The study was performed by Simons, Li & Associates, Inc. (SLA), for the FCDMC. A Best Available Data Letter was issued on January 10, 1994. The results of the analyses are represented in the reports entitled "Rainbow Wash, Flood Insurance Study, Gila River through S.R. 95, Hydraulics Report," Volumes 1 and 2, both dated November 1992.

The hydrologic analysis for Rainbow Wash was provided to SLA by the FCDMC. The original hydrologic analysis was performed by Donahue & Associates and presented in a report entitled "Gila Bend Canal Floodplain Delineation Study Hydrology Report." The analysis was conducted using the COE HEC-1 hydrologic model and was approved by FEMA with a Best Available Data Letter issued on March 26, 1992.

Only the 100-year profile was computed for these streams using the COE HEC-2 hydraulic model. The starting water-surface elevations for the Rainbow Wash tributaries were obtained from the 100-year water-surface elevation in the Rainbow Wash mainstem. Floodways were delineated for these washes.

Cross-section data and topographic mapping for the study reach of Rainbow Wash were developed from a digital terrain model for the aerial photography performed in October 1991.

The streams are shown on FIRM Panel 2515 E, 2855 F, 2860 F, 2865 F, and 2880 B.

Powerline Wash and Tank Wash

The areas included in this new hydraulic study for Powerline Wash and Tank Wash are located in the unincorporated areas of Maricopa County.

The study was performed by Stanley Consultants, Inc., for the FCDMC. A Best Available Data Letter was issued on April 5, 1994. The results of the analysis are represented in the report entitled "Flood Control District of Maricopa County, Powerline Wash and Tank Wash, Flood Delineation Study," dated September 1993. The hydrology for this study was approved in a previous study for Jackrabbit Wash; the hydrology for Tank Wash did, however, need to be amended to estimate the separate peak flow for the South Branch. This amendment was performed by FCD staff using the COE HEC-1 hydrologic model and the results provided to Stanley Consultants, Inc.

Only the 100-year profile was computed for these washes using the COE HEC-2 hydraulic model. Starting water-surface elevations for the two washes were taken from the Star Wash Study. The starting water-surface elevation for the South Branch of Tank Wash was analyzed using two methods: the tributary option in HEC-2 and the slope-area option in HEC-2. The slope-area method resulted in higher water-surface elevations. The study used this method. Floodways were delineated for both washes.

Cross sections were laid out by Stanley Consultants, Inc., on aerial topography provided by Kenney Aerial Mapping, Inc., and Aerial Mapping Company, Inc. The companies then digitized and compiled the cross sections into HEC-2 format. The mapping scale is 1" = 200', with a contour interval of 2 feet.

The washes are shown on FIRM Panels 1035 F, 1055 F, 1060 F, and 1065 F.

Star Wash and Tributaries

The areas included in this new hydraulic study for Star Wash and its five tributaries (Tributaries A, B, C, D, and B) are located within the unincorporated areas of Maricopa County.

The study was performed by Wood, Patel & Associates, Inc., for the FCDMC. A Best Available Data Letter was issued on March 3, 1994. The results of the analyses are represented in the reports entitled "Star Wash & Tributaries, Flood Delineation Study, Technical Data Notebook, Hydraulics," Books 1 and 2, both dated August 1993. The hydrology for this area was approved with a Best Available Data Letter issued on April 25, 1991.

Only the 100-year profile was computed for these streams using the COE HEC-2 hydraulic model. The hydraulic analysis for the 100-year flood is based on unobstructed flow conditions. Starting water-surface elevations for Star Wash match the computed water-surface elevations for the Jackrabbit Wash Study. Starting water-surface elevations for the tributaries were obtained by matching the water-surface elevations of the mainstem wash. Floodways were delineated for all streams.

Cross sections for the hydraulic analyses were digitized from aerial mapping at a scale of 1:2,400, with a contour interval of 2 feet, prepared in 1992 by Aerial Mapping Company, Inc.

The streams are shown on FIRM Panel 1060 F.

Daggs Wash

The areas included in this new hydraulic study for Daggs Wash are located in the unincorporated areas of Maricopa County. The study area is located west and northwest of the White Tank Mountains, and west of the Hassayampa River.

The study was performed by A-N West, Inc., for the FCDMC. A Best Available Data Letter was issued on March 28, 1994. The results of the analyses are represented in a report entitled "Daggs Wash Floodplain Delineation Study, FCDMC No. 92-08, Technical Data Notebook," dated August 1993.

The hydrology for Daggs Wash was performed as part of a previous study of Jackrabbit Wash that included delineating ponding along the Central Arizona Canal at Daggs Wash. It was approved with a Best Available Data Letter issued on April 25, 1991.

Only the 100-year profile was computed for these streams using the COE HEC-2 hydraulic model. The starting water-surface elevations were obtained using the slope-area method. Floodways were delineated for this wash.

Cross sections were digitized from topographic mapping that was compiled photogrammetrically from aerial photos. For the streams studied in detail, the 100-year flood boundaries were delineated using topographic maps at a scale of 1:4,800, with a contour interval of 2 feet. Water-surface elevations for floods for the 100-year recurrence interval were computed using the COE HEC-2 step-backwater computer program. Starting water-surface elevations were determined using the slope-area method.

The wash is shown on FIRM Panels 1070 F, 1080 G, 1085 G, 1090 G, 1510 G, and 1530 G.

White Tanks/Agua Fria Area

The areas included in this new hydrologic and hydraulic study for the White Tanks/Agua Fria area are located in the City of Avondale, Town of Buckeye, Town of El Mirage, City of Glendale, Town of Goodyear, City of Litchfield Park, City of Phoenix, Town of Surprise, and the unincorporated areas of Maricopa County.

The study was performed by The WLB Group, Inc., for the FCDMC. A Best Available Data Letter was issued on April 18, 1994. The results of the analyses are represented in Volumes 1 through 15 of the report entitled "Flood Study Technical Data Notebook for White Tanks/Agua Fria Drainage Master Study," dated May 28, 1992.

The hydrologic methodology incorporated in the White Tanks /Agua Fria Area Drainage Master Study (ADMS) used the new "Hydrologic Design Manual for Maricopa County, Arizona," dated April 1990. The COE HEC-1 hydrologic model was used.

Only the 100-year profile was computed using the COE HEC-2 hydraulic model. This was prepared for the following streams, which were studied in detail: Beardsley Canal Wash; Cholla Wash; North Fork Cholla Wash; Waterfall Wash; White Tank #3 Wash; Bedrock Wash; North Fork Bedrock Wash; Jackrabbit Trail Wash; Tuthill Dike Wash; Bulldozer Wash; Osborn Road Wash; Tractor Wash; Diversion Dike Wash; White Granite Wash; North Fork White Granite Wash; 191st Avenue Wash; Perryville Road Wash; Bullard Wash; Atchison, Topeka and Santa Fe (AT&SF) Railway Channel; Lower El Mirage Wash; Lower El Mirage Wash Tributary; Interstate 10; and Dale Creek Wash. Floodways were delineated for these washes.

Detailed studies of ponding areas using the HEC-1 computer model were delineated for the following areas: Roosevelt Irrigation District Canal, Southern Pacific Railroad, Buckeye Canal, Agua Fria River Dike - West Side, and Litchfield Park Detention Facility.

Approximate delineations were computed using the HEC-2 model for the following areas: Cotton Lane Wash from Indian School Road to Olive Avenue, Cotton Lane Wash from Olive Avenue to Waddell Road, Bullard Wash from Gila River to the south end of Phoenix-Goodyear Municipal Airport, Bullard Wash from the south end of Luke AFB to Reems Road, Interstate 10 from Perryville Road to Jackrabbit Trail, Interstate 10 from RID Canal to Cotton Lane, Dysart Drain from Agua River to Reems Road, and AT&SF Railroad Spur from Northern Avenue north to Waddell Road.

Approximate delineations were also computed using normal depth calculations, approximation techniques, and the HEC-1 model for the following areas: ponding behind White Tanks Flood Retarding Structures #3 and #4, ponding behind Interstate 10, ponding behind Airport Canal, conveyance corridors behind Interstate 10, behind Southern Pacific Railroad where appropriate, Bullard Wash breakout west of Estrella Parkway and south of State Route 80, breakouts along the Dysart Drain onto Luke AFB, and Reems Road from Northern Avenue to Beardsley Road.

Cross sections for each stream studied in this ADMS were constructed from topographic mapping at a scale of 1" = 400', with a contour interval of 2 feet, prepared for this study.

A section of the 100-year floodplain for Bullard Wash was not delineated because of current development in this area. A LOMR will be submitted to add flooding in this area.

The streams are shown on FIRM Panels 1145 F, 1165 G, 1560 E, 1570 E, 1580 F, 1585 F, 1590 F, 1595 F, 1605 G, 1615 H, 2035 F, 2045 F, 2050 F, 2055 E, 2060 E, 2065 F, 2070 F, 2080 G, and 2090 F.

Roosevelt Canal, Buckeye Canal, and Southern Pacific Railroad

The areas included in this new hydrologic and hydraulic study for Roosevelt Canal, Buckeye Canal, and the Southern Pacific Railroad from Hassayampa River to Dean Road are located in the Town of Buckeye and the unincorporated areas of Maricopa County.

The study was performed by McLaughlin Kmetty Engineers, Ltd., for the FCDMC. A Best Available Data Letter was issued on June 17, 1994. The results of the analyses are represented in reports entitled "Buckeye Area Flood Delineation Study, Hydrology Report," dated May 1992 and revised July 1992, and "Buckeye Area Flood Delineation Study, Hydraulic Report and Technical Data Notebook," dated September 1992 and revised December 1992.

The hydrologic analysis for Roosevelt Canal, Buckeye Canal, and the Southern Pacific Railroad was conducted using the COE HEC-1 hydrologic model.

Since flooding occurs as the result of ponding against raised embankments for the revised areas, the water-surface elevations were determined by using HEC-1 for the level-pool routing routine based on stage-storage-discharge data for each sub-basin where ponding occurs. The hydraulic analyses for this study were based on unobstructed flow through the railroad trestles, using existing conditions at the time of survey. The flood elevations shown on the profiles are considered valid only if the hydraulic structures remain unobstructed, operate properly, do not fail, and the railroad embankment does not fail. The canal roads are earthen, and the flood elevations presented are considered valid only if the canal low points remain unobstructed and the canal embankment does not fail.

The ponding for the canals and the railroad are shown on FIRM Panels 2015 F, 2020 F, 2025 F, 2040 E, 2045 F, 2480 F, 2485 F, and 2505 F.

Consolidated Canal East Branch

A LOMR was issued on October 4, 1993, for the City of Chandler to reflect updated topographic information for Cooper Road and updated hydrologic analysis of the ponding areas just east of the Consolidated Canal East Branch. It is shown on FIRM Panel 2670 F. As a result of this revision, the floodplain was reduced along the ponding area east of the Consolidated Canal East Branch from just upstream of Frye Road to just downstream of Chandler Boulevard. This LOMR was not incorporated into FIRM Panel 04013C2670 E because the revised panel was in the process of being reprinted. This LOMR was, therefore, reissued on February 7, 1994.

East Fork Cave Creek

The LOMR issued on January 11, 1994, for the City of Phoenix to reflect the construction of a detention basin and the channelization of East Fork Cave Creek, is shown on FIRM Panel 1220 G. As a result of this LOMR, the floodplain was reduced along East Fork Cave Creek from Beardsley Road to Cave Creek Road. The 100-year floodplain is now contained in the concrete, channelized portion of East Fork Cave Creek from Beardsley Road to Union Hills Drive and in the earthen, channelized portion of East Fork Cave Creek from Union Hills Drive to Cave Creek Road.

Basin 5

The LOMR issued on February 18, 1994, for the City of Scottsdale to reflect an incorrect zone designation along Basin 5, is shown on FIRM Panel 1230 F in Section 33. The SFHA designated Zone A along Basin 5 alluvial fan flooding was changed to Zone AO (depth 1 foot and a velocity of 3 feet per second). The basis for this modification was a letter submitted by the FCDMC which stated that the effective map was labeled incorrectly.

Grand Avenue

The LOMR issued on March 4, 1994, for the City of Glendale to reflect more detailed topographic information along Grand Avenue is shown on FIRM Panel 1645 E. As a result of this request, the floodplain width was decreased along Grand Avenue from approximately 4,000 feet southeast of the intersection of Bethany Home Road and Grand Avenue to approximately 3,000 feet northwest of this intersection, by a maximum of 1,000 feet. In addition, the floodplain from the intersection of Bethany Home Road and Grand Avenue to approximately 3,000 feet northwest of this intersection, was redesignated from Zone AO (depth 2 feet) to Zone AO (depth 1 foot). Street names shown on this panel were corrected based on a street map submitted by the Arizona Department of Water Resources.

Unnamed Tributary to Cave Creek

A letter was issued on March 25, 1994, for Maricopa County and Incorporated Areas. The study was performed by Gilbertson Associates, Inc. The results of the analysis are represented in the report entitled "Final Hydrologic and Hydraulic Study for Carefree Mountain Estates Unit One," dated December 23, 1992. As a result of this request, an SFHA has been added for the wash near the proposed Unit 1 of the Carefree Mountain Estates subdivision. This revision is shown on FIRM Panel 0815 G.

Indian Bend Wash

The LOMR issued on April 22, 1994, for the Town of Paradise Valley reflects the channel modifications along Indian Bend Wash from just upstream to approximately 2,000 feet upstream of Scottsdale Road. These modifications include the placement of fill in the floodway fringe along the south side of Indian Bend Wash, and excavation of the channel. As a result of this request, the BFEs, SFHA, and floodway topwidth have decreased for the revised reach of Indian Bend Wash. This revision is shown on FIRM Panel 1695 F.

The LOMRs issued on June 7, 1994, for the Town of Paradise Valley and the City of Phoenix reflect a channelization project along Indian Bend Wash from approximately 300 feet upstream to approximately 1,800 feet downstream of Shea Boulevard. As a result of this channelization project, the 100-year flood will be contained within the identified channel banks from approximately 200 feet upstream to approximately 200 feet downstream of Shea Boulevard. The SFHA has been reduced along the remainder of the revised reach. This revision is shown on FIRM Panel 1680 F.

Salt River

The LOMRs issued on May 17, 1994, for the City of Phoenix and the City of Tempe reflect a channelization project on Salt River from approximately 6,600 feet downstream of State Route 143 to the Southern Pacific Railroad bridge. As a result of this request, the BFEs have decreased along the study reach, and the SFHA reduced because the 100-year flood will be contained in the improved channel. This revision is shown on FIRM Panels 2145 F, 2155 E, and 2165 F, and Flood Boundary and Floodway Map Panel 2155.

Arizona Channel

The LOMRs issued on June 3, 1994, for the Town of Paradise Valley and the City of Phoenix reflect the ACDC project along the Arizona Canal from 17th Street to the Limit of Detailed Study of Flynn Lane Wash and from approximately 30th Street to the Limit of Detailed Study of Echo Canyon Wash (Cudia City Wash). As a result of this revision, the SFHA is reduced and is now contained within the ACDC right-of-way along the revised reach. This revision is shown on FIRM Panels 1670 E and 1690 E.

East Fork Cave Creek

The LOMA issued on May 14, 1993, for the City of Phoenix removes Lot 87, Greentrails Subdivision, 948 East Grandview Road, from the SFHA. The property is shown on FIRM Panel 1220 G.

The LOMR issued on May 26, 1993, for the City of Phoenix was based on placement of fill. This request determined that Lots 133 through 139, 173 through 176, 182 through 184, 204 through 219, 221 through 228, 255, 256, 263, 269, and 270 were located outside of the SFHA and that Lots 140 through 172, 177 through 181, 185 through 203, 220, 229 through 254, 257 through 262, 264 through 268, and 271 through 281 would not be inundated by the 100-year flood and were, therefore, removed from the SFHA. The property is shown on FIRM Panel 1215 H.

The LOMR issued on March 8, 1994, for the City of Phoenix was a reissuance of the LOMR issued on May 26, 1993.

Point Loma

The LOMR issued on February 1, 1994, for the City of Phoenix was based on placement of fill in the Point Loma subdivision. This request determined that Lots 33 through 38 were located outside the SFHA. The existing structures on Lots 9, 10, and 11 were also located outside the SFHA. Lots 15 through 32 would not be inundated by the 100-year flood and were removed from the SFHA. Finally, it was determined that the existing structures on Lots 2 and 3 would not be inundated by the 100-year flood and were, therefore, removed from the SFHA. The property is shown on FIRM Panel 1670 E.

Moon Valley Wash

The LOMR issued on January 24, 1995, for the City of Phoenix to reflect a restudy completed under the Limited Map Maintenance Program is shown on FIRM Panels 1655 H and 1660 F. The revised area, previously designated as Zone AO (depth 2), has been modified to show BFEs along the revised reaches. The revised area includes Moon Valley Wash-North Branch, Moon Valley Wash South Branch, Moon Valley Wash-North Split, and the Diversion Channel.

Discharges used in this restudy were taken from previous flood insurance studies. No floodways were determined in this restudy. The downstream limit of Moon Valley Wash-North Branch is at Thunderbird Road. The starting water surface elevation was taken from the effective Flood Profile Panel for Moon Valley Wash at Thunderbird Road.

Tenth Street Wash

During the review of a LOMR for the City of Phoenix, a discrepancy was discovered between FIRM Panel 1660 E and Flood Profile Panel 336P: the street distances did not match. After a closer look, the map was determined to be correct. We have, therefore, corrected the profile to show the correct distances between the roads.

Indian Bend Wash

During the review of a LOMR for the City of Phoenix, a discrepancy was discovered between FIRM Panel 1680 E and Flood Profile Panels 216P and 217P with regard to the street distances and the locations of the cross sections. The profiles were corrected.

Kyrene Branch Canal

The LOMR issued on July 21, 1994, for the City of Chandler was based on the effects of the construction of Ray Road and a 48-inch concrete pipe from Ray Road to approximately 1,700 feet down stream of Ray Road that conveys the flooding associated with Kyrene Branch Canal through the Warner Ranch 4 subdivision. This LOMR follows up on a February 24, 1994, CLOMR and is shown on Panel 2630 E. As a result of this revision, a portion of the 100-year flood discharge is contained within Ray Road and the remaining flood discharge continues downstream within the 48-inch pipe and along Kyrene Branch Canal. The depth of the 100-year flood within Ray Road and along Kyrene Branch Canal is less than 1 foot; therefore, the Special Flood Hazard Area, designated as Zone A, has been changed to Zone B.

Granite Reef Aqueduct

The LOMR issued on July 12, 1994, for the City of Scottsdale was based on the effects of updated hydrologic analysis to incorporate more detailed data for unnamed desert washes upstream of Granite Reef Aqueduct encompassing the area along Granite Reef Aqueduct from approximately 2,400 feet northwest of Cactus Road to approximately 3,700 feet southeast of Cactus Road. As a result of this revision, the Special Flood Hazard Area has shifted northwesterly by a maximum of 800 feet. This revision is shown on Panel 1705 E.

Cave Creek

The LOMR issued on April 12, 1994, for the City of Phoenix was based on the correction of a computational error in the determination of the shallow flooding depths along Cave Creek between Bethany Home Road and Northern Avenue. As a result of this revision, the zone designation has been changed from Zone AH to Zone X (shaded). This revision is shown on Panel 1665 G.

The LOMR issued on May 26, 1995, for the City of Phoenix was based on the effects of construction of Cave Creek Overflow Channel (also known as Bellvue Wash Channel) and lowering of 7th Avenue along Cave Creek. As a result of this revision, the BFEs decrease along Bellvue Channel. The SFHA increased and decreased along Cave Creek Overflow Channel. An area previously designated as Zone AE was redesignated as Zone X. This revision is shown on Panel 1215G, Profile Panel 57P, and the Floodway Data Table. New Profile Panels 57PA and 57PB were added.

The LOMR issued on May 26, 1995, for the City of Phoenix was based on the effects of a cut and placement of fill along Cave Creek, from approximately 200 feet upstream to approximately 800 feet upstream of Bell Road. As a result of this revision, the BFEs increased and decreased and the SFHA and floodway decreased along the revised reach. This revision is shown on Panel 1215 G, Profile Panel 57P, and the Floodway Data Table.

10.5 Fifth Revision

This study was revised on July 19, 2001, to include numerous map revision requests based on newly studied streams and ponding areas and to convert the Flood Insurance Rate Map for Maricopa County and Incorporated Areas to digital format. The newly studied flooding sources include Deadman Wash and Tributaries; Iona, Bullard, and Rio Verde North Washes; the Hassayampa River Tributaries; Sols Wash Tributaries; numerous washes in the Fountain Hills and White Tanks areas; and Skunk Tank and Valley Washes.

The process of converting the existing Flood Insurance Rate Map panels from standard to map initiatives format, as described in Section 10.1, has been completed with this revision.

The Town of Fountain Hills has been included in this revised Flood Insurance Study.

Digital Conversion

The mapping for Maricopa County and Incorporated Areas has been prepared using digital data. Previously published Flood Insurance Rate Map data produced manually have been converted to vector digital data by a digitizing process.

Locally owned digital base map data have been provided by the unincorporated areas of Maricopa County and the Cities of Chandler, Scottsdale, and Tempe.

Road and highway name and centerline data for the remaining incorporated and unincorporated areas of Maricopa County have been obtained from the Maricopa County Transportation Department Geographic Information Systems Group. The centerline data were computer plotted with the digitized floodplain data to produce the countywide Flood Insurance Rate Map.

Deadman Wash and Tributaries

The hydrologic and hydraulic study for Deadman Wash, Deadman Wash Stream No. 4, Deadman Wash Stream No. 7, and Deadman Wash Stream No. 12 was developed by Howard Needles Tammen & Bergendoff. The results of the study are presented in technical reports entitled "Deadman Wash Floodplain Delineation Study, FCD 90-65, Technical Data Notebook Hydrology," dated July 1992, revised December 1992; "Deadman Wash Floodplain Delineation Study, FCD 90-65, Technical Data Notebook Hydraulic Analysis," dated July 1992, revised December 1992; and "Deadman Wash Floodplain Delineation Study, FCD 90-65, FEMA Forms RSD-1," undated, and shown on the topographic maps entitled "Flood Control District of Maricopa County, Floodplain Delineation Study of Deadman Wash, FCD Contract No. 90-65," undated. A Best Available Data Letter was issued on February 23, 1995, for this study.

Iona Wash

The hydraulic study for Iona Wash was developed by CH2M Hill. The results of the study are presented in a technical report entitled "Iona Wash Floodplain Delineation Study, Technical Data Support Notebook," dated October 5, 1993, and shown on the topographic maps entitled "Iona Wash: From Trilby Wash to State Route 89," dated October 4, 1993. A Best Available Data Letter was issued on July 14, 1994, for this study. Hydrologic calculations for Iona Wash were taken from the Wittman Watershed Area study completed in December 1988.

Bullard Wash

The hydraulic study for Bullard Wash was developed by The WLB Group. The results of the study are presented in the HEC-2 hydraulic computer model entitled "White Tanks/Agua Fria Drainage Master Study, 100-year Storm Event Floodplain Run File: 'BULL-RID.H2I,' Bullard Wash, Wash 10, Roosevelt Irrigation District Canal (RID Canal) to Indian School Road Reach," dated January 25, 1995, and shown on the topographic maps entitled "Bullard Wash FIS Work Map," dated January 30, 1995. A Best Available Data Letter was issued on March 3, 1995, for this study.

Rio Verde North Washes

The hydraulic study for Rio Verde North - Washes A, A South, F, and I was developed by Burgess & Niple, Inc. The results of the study are presented in technical reports entitled "Rio Verde - North Floodplain Delineation Study, FCD 93-06, Technical Data Notebook Hydraulics," dated March 1995, and "Rio Verde - North Floodplain Delineation Study, FCD 93-06, Technical Data Notebook Hydrology," dated October 1994, and shown on the topographic maps entitled "Flood Control District of Maricopa County, Flood Delineation Study of Rio Verde North, FCD Contract No. 93-06," dated August 1994. A Best Available Data Letter was issued on May 9, 1995, for this study.

Hassayampa River and Sols Wash Tributaries

The hydrologic and hydraulic study for Amir, Calamity, and Blue Tanks Washes; Mockingbird Wash and tributaries; Cemetery Wash and tributaries; Little San Domingo, San Domingo, Ox, and Turtleback Washes; Flying "E" Wash and tributaries; Sunset and Sunny Cove Washes; Hartman Wash and tributaries; and several unnamed washes was developed by Black & Veatch, Inc., and Coe & Van Loo Consultants, Inc. The results of the study are presented in the technical report entitled "Wickenburg Area Drainage Master Study: Technical Documentation Report and Appendices 1.1 through 6.20," dated May 1994, updated January 4, 1995, and shown on the topographic maps entitled "Flood Control District of Maricopa County - Floodplain Delineations for Wickenburg Area Master Drainage Study - Contract FCD 89-79," dated June 1994. A Best Available Data Letter was issued on February 21, 1995, for this study.

Fountain Hills Area

The hydrologic and hydraulic study for Arrow, Ashbrook, Balboa, Caliente, Escalante, Hesperus, Legend, Oxford, and Tulip Washes was developed by George V. Sabol Consulting Engineers, Inc. The results of the study are presented in technical report volumes entitled "Fountain Hills North, Floodplain Delineation Study, FCD 92-04," dated April 1995. The hydrologic and hydraulic study for Cereus, Chukar, Colony, Cyprus Point, and Emerald Washes; Fountain Channel; Greystone, Jacklin, and Kingstree Washes; Laser Drain; Logan Wash; Malta Drain; and Mangrum, North Colony, Powder, Sunburst, and Sycamore Washes was developed by AGK Engineers, Inc. The results of the study are presented in technical report volumes entitled "Fountain Hills South, Floodplain Delineation Study FCD 92-05," dated February 1996, revised November 1996. A Letter of Map Revision (LOMR) was issued on October 21, 1997, to show the Special Flood Hazard Area (SFHA) delineations associated with these studies.

White Tanks Area

The hydrologic and hydraulic study for White Tanks Wash and White Tanks Wash Tributary Nos. 1, 2, and 3 was developed by Harding Lawson and Associates. The results of the study are presented in technical report volumes entitled "White Tanks Wash Flood Insurance Study, FCD 90-64," dated January 30, 1996. A LOMR was issued on November 18, 1997, to show the SFHA delineations associated with these studies.

Skunk Tank and Valley Washes

The hydrologic and hydraulic study for Skunk Tank and Valley Washes was developed by EEC/MKE. The results of the study are presented in a technical report entitled "Skunk Tank Wash Floodplain Delineation Study, FCD 96-05," dated December 1997. A LOMR was issued on March 12, 1998, to show the SFHA delineation associated with this study.

Queen Creek

The hydraulic study for Queen Creek was developed by Collins/Pina Consulting Engineers, Inc. The results of the study are presented in a technical report entitled "Queen Creek LOMR (Hawes Road to SPRR)," dated July 25, 1997. A LOMR was issued on April 16, 1998, to show the SFHA delineations associated with this study.

Table 3, "Summary of Discharges," Table 5, "Floodway Data," Table 6, "Community Map History," and Exhibit 1, "Flood Profiles," were revised as a result of the newly studied streams.

10.6 Sixth Revision

The preliminary version of this revision is dated January 1, 2004. This study was revised to include numerous map revision requests based on newly studied streams and ponding areas. As part of the conversion process numerous panels were split.

Conversion to DFIRM Format

All the Flood Insurance Rate Maps were converted to digital FIRMs by the Flood Control District of Maricopa County (FCDMC) through a Cooperating Technical Partner (CTP) agreement. The FIRMs were converted following the April 2003, Guidelines and Specifications for Flood Hazard Mapping Partners. The FIRMs were prepared using orthophoto base maps provided by the FCDMC. The aerial photography is dated December 2000 to December 2002. Because of the use of the orthophoto base maps the new FIRMs reflect more detailed and up-to-date stream channel configurations than those shown on the previous FIRMs. The floodplains and floodways transferred from the previous FIRMs may have been adjusted to conform to the new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the FIRMs. The corporate limits were also updated as part of the conversion process to the DFIRM format.

The elevation reference marks (ERM) shown on previous editions of the FIRM maps have all been removed and replaced with bench marks obtained from the National Geodetic Survey (NGS). To obtain elevation, description, and/or location information for any bench mark

shown on the FIRM panels contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit their website at <http://www.ngs.noaa.gov>.

Jackrabbit Trail Wash

A LOMR effective on October 9, 2001, for Maricopa County (Unincorporated Areas) reflects channelization along Jackrabbit Trail Wash from approximately 3,600 feet downstream of Interstate Highway 10 (I-10) to approximately 1,550 feet upstream of McDowell Road. This revision also included an exiting concrete channel between the eastbound off-ramp and the westbound on-ramp of I-10, five existing 10-foot by 4-foot concrete box culverts, and the eastbound off-ramp of I-10, five existing 10-foot by 5-foot CBCs at the westbound on-ramp of I-10, and five existing 12-foot by 4.5 foot CBCs at McDowell Road. The FIRM has been modified to show changes in the elevation and floodplain and floodway boundary delineations for the 1-percent chance flood along Jackrabbit Trail Wash from approximately 400 feet downstream to approximately 1,550 feet upstream of McDowell Road; from approximately 1,800 feet downstream to approximately 600 feet downstream of I-10; and from approximately 2,500 feet downstream to approximately 2,000 feet downstream of I-10. As a result of the modifications, the Base Flood Elevations (BFEs) for Jackrabbit Trail Wash along the revised reach were removed. The base flood is contained in the channel and culverts. Also, as a result of the modifications, the Special Flood Hazard Area and the regulatory floodway were removed throughout the revised reach. The centerline of the channel along the revised reach shifted to the west. Effective BFEs that previously were not shown on the FIRM were added at approximately 1,600 feet upstream and approximately 1,750 feet upstream of McDowell Road. The modifications are shown on FIRM Panel 04013C2055 F, FEMA Case No. 01-09-453P.

Sols Wash Tributaries

The LOMR effective October 15, 2001, for Maricopa County (Unincorporated Areas) shows the effects of an approximate study of Tributary to Sols Wash AH2, Tributary to Sols Wash AH3, Sols Wash AH4, Tributary to Amir Wash, Tributary to Sols Wash, Tributary to Tributary to Sols Wash, Tributary to Hartman Wash, Yucca Flat Wash, Holly Wash, Cemetery Wash, Turtleback Wash, Tributary to Mockingbird Wash, Wash 20T7R4, Wash 28T7R4, Wash 3T6R4, Wash 15T6R4, Wash G, San Domingo Wash, Tub Spring Wash, Ox Wash, Tributary to Monarch Wash, Tributary to Wash K, Monarch Wash, Tributary to Little San Domingo Wash, and Little San Domingo Wash. As a result of the modifications, SFHA's were added along Tributary to Sols Wash Tributary AH2 from approximately 2,000 feet upstream to approximately 20,000 feet downstream US 60, Tributary to Sols Wash Tributary AH3 from its confluence with Sols Wash Tributary AH3 to approximately 5,200 feet upstream; along Sols Wash AH4 from approximately 1,600 feet downstream to approximately 3,000 feet upstream of an unnamed road; along Tributary to Amir Wash from its confluence with Amir Wash to approximately 2,700 feet upstream; along Tributary to Sols Wash from its confluence with Sols Wash to approximately 4,200 feet upstream; along Tributary to Tributary to Sols Wash from its confluence with Tributary to Sols Wash to approximately 2,800 feet upstream; along Tributary to Hartman Wash from its confluence with Hartman Wash to approximately 6,500 feet upstream; along Yucca Flat Wash from approximately 4,500 feet downstream to approximately 4,400 feet upstream of the unnamed road; along Holy Wash from just upstream to approximately 4,000 feet upstream of the unnamed road; along Cemetery Wash from approximately 3,500 feet downstream to approximately 5,700 feet upstream of the unnamed road; along Turtleback Wash from approximately 17,500 feet downstream to approximately 2,000 feet upstream of the unnamed road; along Tributary to

Mockingbird Wash from approximately 1,000 feet upstream to approximately 14,000 feet upstream of its confluence with Mockingbird Wash; along Wash 20T7R4 from its confluence with the Hassayampa River to approximately 7,700 feet upstream; along Wash 28T7R4 from its confluence with the Hassayampa River to approximately 20,300 feet upstream; along Wash 3T6R4 from its confluence with the Hassayampa River to approximately 23,100 feet upstream; along Wash 15T6R4 from its confluence with the Hassayampa River to approximately 18,400 feet upstream; along Wash G from approximately 5,000 feet upstream to approximately 10,000 feet upstream of its confluence with the Hassayampa River; along San Domingo Wash from approximately 12,000 feet upstream to approximately 44,000 feet upstream of its confluence with the Hassayampa River; along Tub Spring Wash from its confluence with San Domingo Wash to approximately 13,000 feet upstream; along Ox Wash from approximately 7,000 feet upstream to approximately 26,000 feet upstream of US 60 (and US 89 and Arizona 73); along Tributary to Monarch Wash from its confluence with Monarch Wash to approximately 16,000 feet upstream; along Tributary to Wash K from approximately 4,000 feet upstream to approximately 10,500 feet upstream of its confluence with Wash K; along Monarch Wash from its upstream limit of detailed study to approximately 10,000 feet upstream; along Tributary to Little San Domingo Wash from its confluence with Little San Domingo Wash to approximately 14,000 feet upstream; and along Little San Domingo Wash from approximately 21,000 feet downstream to approximately 23,000 feet upstream of Castle Hot Springs Road. The modifications are shown on FIRM Panel 04013C0210 E, 04013C0220 E, 04013C0230 F, 04013C0235 F, 04013C0240E, 04013C0245 E, 04013C0255 G, 04013C0260 E, 04013C0265 F, 04013C0270 F, 04013C0300 D, 04013C0660 F, 04013C0675 F, and 04013C0680 F, FEMA Case No. 01-09-184P.

Tiger Wash

The LOMR effective on November 30, 2001, for Maricopa County (Unincorporated Areas) reflects a corrected zone designation on FIRM Panel 04013C0975 F, FEMA Case No. 01-09-1164X. The study was performed by JE Fuller Hydrology/Geomorphology and was entitled "Approximate Floodplain Delineation Study for Portions of Tiger Wash Piedmont, Technical Data Notebook," dated June 8, 2000. Boundary delineations for Zone D, unstudied areas where flood hazards are undetermined but possible, have been added to the panel. The basis for this modification were letters submitted by JE Fuller and the FCDMC.

Reems Road

The LOMR effective on November 2, 2001, for the City of Surprise reflects channel modifications and culvert construction along Reems Road from just upstream of Greenway Road to approximately 1,400 feet upstream of Waddell Road. The floodplain boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year along Reems Road is now contained in the channel and culvert as shown on FIRM Panel 04013C1585 G. The LOMR was performed by Clouse Engineering, FEMA Case No. 01-09-973P.

Dreamy Draw Wash West

A LOMR effective on October 15, 2001, for the City of Phoenix shows the effects of a revised hydraulic analysis and more detailed topographic information for Dreamy Draw Wash West that reflects the presence of the Arizona Canal Diversion Channel (ACDC). As a result of the modifications, Base Flood Elevations were established and the width of the SFHA decreased along the northeast side of the ACDC from the Myrtle Avenue alignment to the Griswold

Road alignment and along Dreamy Draw Wash West from the confluence with the ACDC to approximately 300 feet northeast of the intersection of 13th Street and Belmont Avenue. The SFHA previously designated Zone A, with no BFEs determined, was redesignated Zone AE, with BFEs determined. The modifications are shown on FIRM Panel 04013C1670 F, FEMA Case No. 01-09-285P. In addition, Profile Panel 1165P was added to the FIS report.

Oak Street

The LOMR effective on August 1, 2001, for the City of Scottsdale shows the effects of storm drain improvements along Oak Street from approximately 1,300 feet west of Cross Cut Canal to Indian Bend Wash. Storm drains were constructed along Oak Street from 70th Street to approximately 4,300 feet east of 58th Street, along 64th Street from Oak Street to Hubbell Street; and along 66th Street from Oak Street to Auto Park Detention Basin. Improvements were also made to the Auto Park Detention Basin. FIRM Panel 04013C2155 F, FEMA Case No. 01-09-171P was modified to reflect the width reduction in the SFHA for the 1-percent chance flood along the Cross Cut Canal from McDowell Road to approximately 100 feet upstream of Oak Street. All data required to complete the review were submitted by the City of Scottsdale, and Engineering and Environmental Consultants, Inc.

Cave Creek

The LOMR effective on April 3, 2002, for the Town of Cave Creek shows the effects of a revised hydrologic analysis and correction of the discharge value in the effective hydrologic model for Cave Creek from its confluence with Cottonwood Creek to approximately 5,300 feet downstream. This request also included revised hydraulic analysis for Cave Creek from approximately 1,000 feet north of the intersection of Spur Cross Road and Sierra Vista Road to just upstream of Morning Star Road. As a result of the modifications, the Base Flood Elevations (BFEs) for Cave Creek decreased and the widths of the Special Flood Hazard Area (SFHA) and the regulatory floodway have increased in some areas and decreased in other areas. Modifications are shown on FIRM Panels 04013C0414 F, 04013C0415 F, 04013C0802 G, and 04013C0805 G for FEMA Case No. 02-09-241X.

Lower El Mirage Wash

A LOMR effective on January 4, 2002, for the City of El Mirage reflects the construction of channels along Lower El Mirage Wash from just upstream of El Mirage Road to just downstream of Dysart Road and along Lower El Mirage Wash Tributary from just upstream of the confluence with the wash to just downstream of Dysart Road. The FIRM has been revised along the wash from just upstream of El Mirage Road to approximately 1,700 feet upstream of Dysart Road and along the tributary from just upstream of the confluence with the wash to approximately 100 feet downstream of Greenway Road. The BFEs for the wash decreased, the width of the SFHA increased in some areas and decreased in other areas and the width of the regulatory floodway decreased. The BFEs for the tributary and the widths of the SFHA and the regulatory floodway decreased. The base flood is contained in the channel along the wash from just upstream of Cactus Road to just downstream of Dysart Road and along the tributary from just upstream of the confluence with the wash to approximately 800 feet downstream of Dysart Road. The modifications are shown on FIRM Panel 04013C1605 H, FEMA Case No. 00-09-083P.

Cave Creek

The LOMR effective on January 14, 2002, for the City of Phoenix revises the FIRM along Cave Creek from approximately 200 feet upstream of Thomas Road to approximately 1,300 feet upstream of Thomas Road, east of 19th Avenue. The effective FIRM also eliminated a SFHA along Grand Canal from the intersection of Heatherbrae Drive and 21st Avenue to the vicinity of the intersection of Glenrosa Avenue and 19th Avenue. As a result of the modifications, the width of the SFHA decreased for Cave Creek and increased for Grand Canal. The modifications are shown on FIRM Panel 04013C2130 F, FEMA Case No. 02-09-117P.

Roosevelt Irrigation District (RID) Canal

The LOMR effective on January 15, 2002, for the City of Goodyear shows the effects of an additional hydraulic analysis along Roosevelt Irrigation District Canal from just downstream of New Litchfield Road to just upstream of the RID Canal Overchute and extending south to approximately 500 feet north of Thomas Road. As a result of the modifications, the width of the Special Flood Hazard Area (SFHA) increased in some areas and decreased in other areas. An SFHA designated Zone AH, subject to shallow flooding with depths between 1 foot and 3 feet and with BFEs determined was removed from just downstream of New Litchfield Road to the RID Canal Overchute. In addition, an SFHA designated Zone A, with no BFEs determined, was added from the RID Canal Overchute to approximately 500 feet north of Thomas Road. The modifications are shown on FIRM Panel 04013C2080 H, FEMA Case No. 02-09-257P.

Indian Bend Wash

A LOMR effective on January 23, 2002, for the City of Scottsdale revises the FIRM at two locations along Indian Bend Wash: from approximately 400 feet upstream to approximately 1,000 feet upstream of Scottsdale Road and from approximately 400 feet downstream to approximately 700 feet upstream of Indian Bend Road. As a result of the modifications, the widths of the SFHA and the regulatory floodway for Indian Bend Wash increased in some areas and decreased in other areas. Also, the floodplain and floodway boundary delineations shifted approximately 100 feet west from approximately 400 feet downstream of Indian Bend Road to just upstream of Scottsdale Road. The modifications are shown on FIRM Panel 04013C1695 G, FEMA Case No. 02-09-196P.

Reems Road

The LOMR (FEMA Case No. 02-09-165P) effective on February 19, 2002, for the City of Surprise shows the effects of channelization and culvert construction along Reems Road from Greenway Road to Bell Road and construction of a retention basin located west of Reems Road and approximately 900 feet upstream of Greenway Road. As a result of the modifications, the width of the SFHA along Reems Road decreased. BFEs and an SFHA designated Zone AH, an SFHA subject to shallow flooding with depths between 1 foot and 3 feet and with BFEs determined, were added for the retention basin. The channel, culverts and Reems Road contain the base flood. The modifications are shown on FIRM Panels 04013C1145 G and 04013C1585 G.

Dale Creek Wash

A LOMR effective on March 5, 2002, for Maricopa County (Unincorporated Areas) shows the effects of placement of fill along Dale Creek Wash from just upstream to approximately 2,000 feet upstream of the Litchfield Park Detention Facility; channelization; and culvert construction, FEMA Case No. 01-09-1158P. The channelization project consisted of an earth-lined trapezoidal channel with 6:1 side slopes and a 20-foot bottom width from just upstream to approximately 2,000 feet upstream of the newly constructed culvert. The culvert project consisted of construction of two 4-foot by 8-foot reinforced-concrete box culverts beneath Bethany Home Road. This request also included an updated hydraulic analysis that incorporated more detailed topographic information to reflect existing watershed conditions along Dale Creek Wash from just downstream to approximately 2,000 feet upstream of the Litchfield Park Detention Facility. As a result of the modifications, the BFEs for Dale Creek Wash and the widths of the SFHA and the regulatory floodway decreased. The modifications are shown on FIRM Panel 04013C1615 J.

Sheely Farms East\Agua Fria Interceptor Channel

A LOMR (FEMA Case No. 02-09-723P) effective on April 23, 2002, for the City of Phoenix shows the effects of construction of drainage channels associated with the development of Sheely Farms East and the recently constructed Agua Fria Interceptor Channel. The drainage channels were constructed along the eastern and northern boundaries of the project site and convey offsite flows and a portion of onsite flows to the Agua Fria Freeway Interceptor Channel along the western boundary of the site. As a result of the modifications, the width of the SFHA along the elevated top bank of the Roosevelt Irrigation District Canal decreased, and the SFHA and the water surface elevation associated with the base flood are contained within the channels. The modifications are shown on FIRM Panel 04013C2085 F.

Agua Fria River Tributaries

A LOMR (FEMA Case No. 02-09-031P) effective on May 15, 2002, for Maricopa County (Unincorporated Area) shows the effects of new hydrologic and hydraulic analysis, updated topographic information, and a new floodplain delineation study for tributaries to the Agua Fria River: along unnamed Wash 1 from approximately 240 feet upstream of its confluence with Unnamed Wash 2 to just downstream of State Route 74; along Unnamed Wash 2 from its confluence with the Agua Fria River to just downstream of SR74; and along Unnamed Wash 3 from its confluence with the Agua Fria River to approximately 24,000 feet upstream. The letter also requested to show the effects of approximate studies of Tributary 1 to Unnamed Wash 1 from its confluence with Unnamed Wash 1 to just downstream of SR74; of Tributary 1 to Unnamed Wash 2 from its confluence with Unnamed Wash 2 to approximately 7,000 feet upstream; of Tributary 2 to Unnamed Wash 2 from its confluence with Unnamed Wash 2 to approximately 2,400 feet upstream of SR74; and of the upper reach of Unnamed Wash 2 from just upstream to approximately 7,400 feet upstream of SR74. The letter also included a request to show the effects of approximate studies of the upper reach of Twin Buttes Wash from approximately 1,000 feet downstream to approximately 9,200 feet upstream of the Dove Valley Road alignment; of the upper reach of Caterpillar Tank Wash from approximately 600 feet upstream to approximately 2,000 feet upstream of the Dove Valley Road alignment; of Unnamed Wash 4 from its confluence with the Agua Fria River to approximately 7,100 feet upstream; of Unnamed Wash 5 from its confluence with the Agua Fria River to approximately 17,000 feet upstream; of Unnamed Wash 6 from its confluence with the Agua Fria River to approximately 8,200 feet upstream; of Unnamed Wash 7 from its confluence with the Agua

Fria River to approximately 7,200 feet upstream; of the entire reach of Tributary 1 to Unnamed Wash 7; of Unnamed Wash 8 from its confluence with the Agua Fria River to approximately 7,900 feet upstream; and of Unnamed Wash 9 from its confluence with the Agua Fria River to approximately 200 feet upstream. FEMA has revised the FIRM to add SFHAs, designated Zone A, with no BFEs, along the approximate studied reaches of Tributary 2 to Unnamed Wash 2 from just upstream to approximately 2,400 feet upstream of SR74; of the upper reach of Unnamed Wash 2 from just upstream to approximately 7,400 feet upstream of SR74; of Unnamed Wash 2 from just upstream to approximately 7,400 feet upstream of SR74; of Unnamed Wash 4 from its confluence with the Agua Fria River to approximately 7,100 feet upstream; of Unnamed Wash 8 from its confluence with the Agua Fria River to approximately 1,300 feet upstream; and of Unnamed Wash 9 from its confluence with the Agua Fria River to approximately 1,500 feet upstream. The modifications are shown on FIRM Panels 04013C0730 G, 04013C0735 G, 04013C0740 G, 04013C0745 G, and 04013C1160 G.

Agua Fria River

A LOMR (FEMA Case No. 02-09-1008P) effective June 3, 2002, for the City of El Mirage states that FEMA discovered incorrect elevation numbers at two locations on the effective FIRM. FEMA revised the FIRM to modify the BFE along the Agua Fria River at two locations; approximately 4,600 feet downstream and approximately 5,100 feet downstream of Peoria Avenue respectively. The modifications are shown on FIRM Panel 04013C1605 H.

Rawhide Wash

A LOMR (FEMA Case No. 01-09-1199P) effective on June 5, 2002, for the City of Scottsdale shows the effects of new detailed hydrologic and hydraulic analyses and a new floodplain delineation study along Upper Rawhide Wash from approximately 1,800 feet downstream of Dynamite Boulevard to approximately 5,200 feet upstream of Carefree Highway alignment; along Tributary 1 to Rawhide Wash (Tributary 1) from just upstream to approximately 5,700 feet upstream of its confluence with Rawhide Wash; along Tributary 2 to Rawhide Wash (Tributary 2) from just upstream to approximately 7,500 feet upstream of its confluence with Rawhide Wash; along Tributary 3 to Rawhide Wash (Tributary 3) from just upstream to approximately 3,900 feet upstream of its confluence with Tributary 2; and along Tributary 4 to Rawhide Wash (Tributary 4) from just upstream to approximately 7,700 feet upstream of its confluence with Tributary 2. The FIRM has been changed to reflect the addition of BFEs, floodway boundary delineations, and SFHAs. The scale of effective FIRM Panel 04013C0850 E was changed from 1:2,000 to 1:1,000. The area previously shown on FIRM Panel 04013C0850 E was divided into new FIRM Panels 04013C0830 E, 04013C0835 E, 04013C0840 E, and 04013C0845 E. The modifications are shown on FIRM Panels 04013C0820 F, 04013C0830 E, 04013C0840 E, and 04013C1235 F.

Rock Springs Creek

A LOMR (FEMA Case No. 01-09-1060P) effective on June 13, 2002, for the City of Peoria shows the effects of a detailed study that included hydrologic and hydraulic analyses for Rock Springs Creek from approximately 2,300 feet upstream to approximately 17,800 feet upstream of the confluence with the New River. As a result of the modifications, BFEs, an SFHA, and a regulatory floodway were added to the FIRM along Rock Springs Creek from approximately 2,300 feet upstream to approximately 17,800 feet upstream of the confluence. An SFHA designated Zone A, with no BFEs determined, was added along the revised reach from the

confluence to approximately 2,300 feet upstream. An SFHA designated Zone AO, and SFHA subject to shallow flooding with average flood depths of 1 foot to 3 feet, was added east of the revised reaches from approximately 750 feet upstream to approximately 3,300 feet upstream of the confluence. The modifications are shown on FIRM Panel 04013C1180 F.

Indian Bend Wash

A LOMR (FEMA Case No. 02-09-1064P) effective on June 28, 2002, for the City of Phoenix is based upon an earlier letter by the City of Phoenix requesting that the effective FIRM be revised by previous LOMRs dated May 15, 1998 (FEMA Case No 98-09-253P), and August 22, 2000 (FEMA Case No. 00-09-617P), along Indian Bend Wash from just downstream to approximately 1,800 feet upstream of East Cactus Road. As a result of the modifications, the SFHA, and the regulatory floodway for Indian Bend Wash shifted approximately 50 feet south between 39th Way and East Cactus Road. In addition, Cross Section AY was shifted to show its proper location. The modifications are shown on FIRM Panel 04013C1680 G.

Wash 10 and Wash 11

A LOMR (FEMA Case No. 02-09-068P) for Maricopa County (Unincorporated Areas) effective on August 21, 2002, shows the effects of construction along Wash 10 of an earthen trapezoidal channel from just upstream of the confluence with Wash 11 to approximately 200 feet upstream of Forest Road and six 10-foot by 4-foot concrete box culverts, construction along Wash 11 of an earthen trapezoidal channel from just downstream of an unnamed road to just upstream of Agua Verde Drive and four 10-foot by 4-foot concrete box culverts, and updated topographic information for the above referenced studied reaches of Washes 10 and 11. FEMA has revised the FIRM along Wash 10 from just upstream of the confluence with Wash 11 to approximately 600 feet upstream of Forest Road and along Wash 11 from just downstream of the unnamed road to just upstream of Agua Verde Drive. As a result of the modifications, the BFEs for Washes 10 and 11 and the widths of the SFHAs, and the regulatory floodways decreased. Also, the base flood in contained in the channel and culverts along the above described reach of Wash 11 and along Wash 10 from just upstream of the confluence with Wash 11 to approximately 200 feet upstream of Forest Road. The modifications are shown on FIRM Panel 04013C1285 F.

Wash B

A LOMR (FEMA Case No. 02-09-1084X) for the City of Scottsdale, effective on October 24, 2002, shows the effects of new hydrologic and hydraulic analyses and existing culverts along Wash B from Doubletree Ranch Road to approximately 3,800 feet upstream of Via Linda and along Wash B Tributary from the confluence with Wash B to approximately 2,000 feet upstream. As a result of the modifications, the BFEs for Wash B from 116th Street (Extended) to the Hayden Rhodes Aqueduct increased, and the width of the SFHA increased in some areas and decreased in other areas. A regulatory floodway was added along Wash B from 116th Street (Extended) to the Hayden Rhodes Aqueduct. BFEs, SFHAs, and regulatory floodways were added along Wash B from Doubletree Ranch Road to 116th Street (Extended), along Wash B from approximately 1,100 feet upstream of the Hayden Rhodes Aqueduct to approximately 3,800 feet upstream of Via Linda; and along Wash B Tributary from the confluence with Wash B to approximately 2,000 feet upstream. An SFHA designated Zone A, with no BFEs determined, along Wash B was modified from the Hayden Rhodes Aqueduct to approximately 1,100 feet upstream. Modifications are shown on FIRM Panels 04013C1705 F and 04013C1710 E.

White Tank Alluvial Fan

A LOMR (FEMA Case No. 02-09-386P) for Maricopa County (Unincorporated Areas) effective on September 16, 2002, shows the effects of a floodplain delineation study along the White Tank Alluvial Fan. The FIRM has been modified to show floodplain boundary delineations and zone designations from Interstate Highway 10 to the hydrographic apex, located approximately 24,000 feet upstream of I-10. The affected areas were previously designated Zone X. The active and inactive areas of the alluvial fan, where an approximate study was performed, have been designated Zone A, Zone A (Active Alluvial Fan Flooding-Administrative Floodway), and Zone A (Inactive Alluvial Fan Flooding), respectively, SFHAs with no Base Flood Elevations determined that are subject to active and inactive alluvial fan flooding as those terms are defined in FEMA publication *Guidelines and Specifications for Flood Hazard Mapping Partners*, February 2002. Approximately 5.8 square miles of new floodplain within the White Tank Alluvial Fan were delineated. The modifications are shown on FIRM Panels 04013C1545 G, 04013C1575 E, 04013C2020 G, and 04013C2025 G.

East Fork of Cave Creek

A LOMR (FEMA Case No. 02-09-1208P) for the City of Phoenix effective on September 16, 2002, reflects more accurate delineation of the floodplain boundaries of the 1-percent chance flood along the East Fork of Cave Creek from approximately 1,500 feet downstream to just downstream of Greenway Parkway. Incorrect street alignments in the vicinity of the revised reach along East Fork of Cave Creek have also been revised. As a result of the modifications, the width of the SFHA increased in some areas and decreased in other areas. The modifications are shown on FIRM Panel 04013C1220 H.

Eastern Canal

A LOMR (FEMA Case No. 02-09-260P) for the City of Mesa effective on September 19, 2002, shows the effects of updated topographic information and detailed hydrologic and hydraulic analyses of flooding along the east embankment of Eastern Canal from just downstream of Baseline Road to approximately 1,000 feet upstream of East Hermosa Vista Drive. As a result of the modifications, BFEs were added, and the width of the SFHA, increased in some areas and decreased in other areas along the canal reach. Also, portions of the SFHA were designated Zone AH, an SFHA subject to shallow flooding with flood depths between 1 foot and 3 feet and with BFEs determined, and other portions were redesignated Zone AE, an SFHA with BFEs determined. The base flood is contained in the channel from approximately 1,400 feet downstream to approximately 500 feet downstream of North Lindsay Road. The modifications are shown on FIRM Panels 04013C2185 F, 04013C2195 F, and 04013C2215 G.

Tributaries to Lake Pleasant

A LOMR (FEMA Case No. 02-09-1138P) for Maricopa County (Unincorporated Areas) effective on October 17, 2002, shows the effects of an approximate study of tributaries to Lake Pleasant. The studied watercourses included Washes T6NR1ES4, T7NR1ES34, T7NR1ES35, T7NR1ES26-1, T7NR1ES26-2 T7NR1ES26-2A, T7NR1ES26-2B and T7NR1ES26-3 of Watershed UU in the Upper Agua Fria River basin. The FIRM has been modified to add floodplain boundary delineations and zone designations of the base flood for the washes listed

above in Watershed UU of the Upper Agua Fria River. FIRM Panels 04013C0350 F, 04013C0365 F, and 04013C0375 F have been modified to show the changes.

Fieldstone Estates

A LOMR (FEMA Case No. 02-09-248P) effective on October 30, 2002, for the City of Chandler shows the effects of the placement of fill and relocation of current ponding to designated retention basins in the Fieldstone Estates subdivision from approximately 1,300 feet north to approximately 2,500 feet north of Hunt Highway and from McQueen Road to approximately 1,300 feet west of McQueen Road. As a result of the modifications, the BFEs and the width of the SFHA, decreased within the area from approximately 1,300 feet north to approximately 2,500 feet north of Hunt Highway and from approximately 1,300 feet west to approximately 2,700 feet west of McQueen Road. Several retention basins, designated on the FIRM as Zone AH, SFHAs subject to shallow flooding with depths between 1 foot and 3 feet and with BFEs determined, were added at the following locations: an area approximately 1,500 feet north of Hunt Highway, extending from approximately 400 feet west to approximately 1,400 feet west of McQueen Road; along McQueen Road from approximately 1,300 feet north to approximately 1,500 north of Hunt Highway; along McQueen Road from approximately 1,800 feet north to approximately 2,220 feet north of Hunt Highway; and along McQueen Road from approximately 2,250 feet north to approximately 2,400 feet north of Hunt Highway. The base flood will be contained in the retention basins. The modifications are shown on FIRM Panel 04013C3030 G.

Galloway Wash/Andora Hills Wash

A LOMR (FEMA Case No. 02-09-1409X) effective on December 5, 2002, for the Town of Carefree responds to a request that a LOMR dated August 20, 2002, Case No. 01-09-1157P be corrected to show the correct elevation of the 1-percent chance flood with a BFE label of 2,164 along Galloway Wash approximately 400 feet downstream of School House Road; to include the correct names of Andora Hills Wash Split 1 and Andora Hills Wash Split 2; and to show corrected road names. The determination made in the December 5 LOMR remains valid. The determinations made for Case No. 01-09-1157P in separate LOMRs for the Town of Cave Creek and the City of Scottsdale that also were issued on August 20, 2002, and that will become effective on December 5, 2002, likewise remain valid. FEMA revised the FIRM to modify the elevations, floodplain and floodway boundary delineations, and zone designations of the base flood along Andora Hills Wash from approximately 1,300 feet downstream of Piedra Grand Drive to just downstream of Carefree Drive; along Galloway Wash from approximately 200 feet downstream of Scopa Trail to just downstream of the confluence with Galloway Wash South Branch; and along Galloway Wash South Branch from just upstream of the confluence with Galloway Wash to approximately 50 feet upstream of Pima Road. As a result of the modifications, the BFEs for Andora Hills Wash increased, and the widths of the SFHA, and the regulatory floodway increased in some areas and decreased in other areas. BFEs, an SFHA designated Zone AE, with BFEs determined; and a regulatory floodway were added along Andora Hills Wash from approximately 400 feet downstream to just downstream of Carefree Drive. For both Galloway Wash and Galloway Wash South Branch, the BFEs and the widths of the SFHAs and the regulatory floodways increased in some areas and decreased in other areas. The modifications are shown on FIRM Panels 04013C0808 H and 04013C0809 H.

Galloway Wash

A LOMR (FEMA Case No. 01-09-1157P) effective on December 5, 2002, for the City of Scottsdale shows the effects of revised hydrologic and hydraulic analyses and updated topographic information for Galloway Wash from approximately 200 feet upstream of the confluence with Cave Creek to just downstream of the confluence with Galloway Wash Lower Branch (Galloway Wash South Branch); for Galloway Wash South Branch from just upstream of the confluence with Galloway Wash to approximately 1,000 feet upstream of Pima Road; for an unnamed tributary to Galloway Wash from just upstream to approximately 2,000 feet upstream of the confluence with Galloway Wash; and for Andora Hills Wash from approximately 500 feet upstream of the confluence with Cave Creek to just downstream of Carefree Drive. As a result of the modifications, the BFEs for Galloway Wash South Branch decreased; the width of the SFHA increased in some areas and decreased in other areas; and the width of the regulatory floodway increased from approximately 50 feet upstream to approximately 1,000 feet upstream of Pima Road. BFEs, and SFHA designated Zone AE, with BFEs determined, and a regulatory floodway were added along Galloway Wash South Branch from approximately 600 feet upstream to approximately 1,000 feet upstream of Pima Road. An area designated Zone X, will be added along Galloway Wash South Branch from approximately 50 feet upstream to approximately 1,000 feet upstream of Pima Road. The modifications are shown on FIRM Panel 04013C0809 H.

East Fork Cave Creek/Greenway Parkway Channel

A LOMR (FEMA Case No. 02-09-1253P) effective on November 27, 2002, for the City of Phoenix shows the effects of revised hydrologic and hydraulic analysis as well as updated topographic data for the East Fork of Cave Creek from a point approximately 1.8 miles downstream of Cave Creek Road to a point just downstream of Cave Creek Road. As a result of the modification, the 1-percent chance flood is now contained in the Greenway Parkway Channel. The modifications are shown on FIRM Panel 04013C1220 H.

Airline Canal

A LOMR (FEMA Case No. 02-09-272P) effective on January 21, 2003, for the City of Litchfield Park shows the effects of the removal and backfill of Airline Canal between Bullard Avenue and Litchfield Road; construction of retention basins at Millennium High School; and development of both the Litchfield Park, Phase I, and Palm Valley, Phase 3B, residential subdivisions. The SFHA was removed along Airline Canal from Bullard Avenue to approximately 500 feet west of New Litchfield Road. The SFHAs for onsite drainage are contained in retention basins. Flow is diverted from the retention basins to the Roosevelt Irrigation District Canal via open channels and culverts. In most of the revised area, the open channels and culverts do not contain the base flood. However, flows that are not contained in the open channels and culverts are less than 1 foot in depth. These areas remain designated Zone X (shaded), areas that would be inundated by the base flood with average depths of less than 1 foot. The modifications are shown FIRM Panels 04013C2060 F and 04013C2080 H.

Agua Fria River

A LOMR (FEMA Case No. 03-09-0278P) effective on February, 12, 2003, for the City of Avondale shows that the elevation of the base flood (1-percent) on the effective FIRM were shown incorrectly in two ponding areas along the right overbank of the Agua Fria River Levee. The ponding areas are located from approximately 100 feet upstream to approximately 600

feet upstream and from approximately 1,200 feet upstream to approximately 1,900 feet upstream of Van Buren Street. As a result of the modifications, the BFEs for the ponding areas decrease. The modifications are shown on FIRM Panel 04013C2080 H.

Moon Valley Wash

A LOMR (FEMA Case No. 03-09-0573) effective on March 25, 2003, for the City of Phoenix better reflects a LOMR that was issued on January 24, 1995 (Case No. 95-09-059P). FEMA was asked to revise the FIRM to redelineate the floodplains along Moon Valley Wash North Branch, from Thunderbird Road to approximately 700 feet upstream of Seventh Street; along Moon Valley Wash North Split from the downstream confluence to the upstream confluence with Moon Valley Wash North Branch; along Moon Valley Wash Diversion Channel; and along Moon Valley Wash South Branch from the confluence with Moon Valley Wash North Branch to approximately 700 feet upstream of Seventh Street. As a result of the modifications, the SFHAs shifted in various directions. The modifications are shown on FIRM Panel 04013C1655 J.

Cave Creek

A LOMR (FEMA Case No. 03-09-0505P) for the City of Phoenix effective on April 10, 2003, shows the effects of a LOMR dated May 8, 1996, for the reach of Cave Creek from just upstream of Bell Road to approximately 800 feet upstream of Union Hills Drive. As a result of the modifications, the widths of the SFHA, and the regulatory floodway for Cave Creek increased in some areas and decreased in other areas, and the SFHA and regulatory floodway also shifted in some areas. The modifications are shown on FIRM Panel 04013C1215 J.

Consolidated Canal

A LOMR (FEMA Case No. 02-09-950P) effective on April 17, 2003, for the City of Mesa shows the effects of new hydrologic analysis and updated topographic data along Consolidated Canal from approximately 800 feet south of McKellips Road to Baseline Road. The modifications are shown on FIRM Panels 04013C2180 F, 04013C2185 F, 04013C2190 F, and 04013C2195 F.

Agua Fria River Tributaries

A LOMR (FEMA Case No. 03-09-0302P) effective on April 24, 2003, for Maricopa County (Unincorporated Areas) shows the effects of an approximate study of tributaries to the Agua Fria River in Watershed UU. As a result of the study the following washes are now listed as Zone A; 7N2ES7, 7N2ES6S, 7N2ES6N, 7N2ES7N-T1, 8N2ES31, 8N2ES31-T1, 8N2ES31-T2, 8N2ES31-T3. The modifications are shown on FIRM Panel 04013C0375 F.

Kerby Estates Subdivision/Consolidated Canal East Branch

A LOMR (FEMA Case No. 03-09-0353P) effective on May 7, 2003, for the City of Chandler shows the effects of placement of fill and relocation of current ponding to designated retention basins in the Kerby Estates subdivision. The area of revision is bounded on the north by Ocotillo Road, on the south by Chandler Heights Road, on the west by Consolidated Canal East Branch (CCEB), and on the east by 118th Street. As a result of the modifications, the BFEs for the area just north of Chandler Heights Road, from CCEB to 118th Street (Retention Basin R-3) decreased; new BFEs were added for the area that extends from approximately

3,000 feet north of Chandler Heights Road to just south of Ocotillo Road, along the eastern side of CCEB (Retention Basin R-1) and for the area that extends from just north to approximately 1,600 feet north of Chandler Heights Road, along the eastern side of CCEB (Retention Basin R-2); and the width of the SFHA, increased in some areas and decreased in other areas. SFHAs designated Zone AH, subject to shallow flooding with average depths between 1 foot and 3 feet and BFEs determined, were removed in the revised area, and new SFHAs designated Zone AE, with BFEs determined, were added for Retention Basins R-1 and R-2. In addition, an SFHA designated Zone AH was redesignated Zone X (shaded), an area that would be inundated by the base flood with average depths of less than 1 foot, from approximately 1,600 feet north to approximately 3,000 feet north of Chandler Heights Road, along the eastern side of CCEB. The base flood is contained in the retention basins. The modifications are shown on FIRM Panel 04013C3030 G.

Consolidated Canal East Branch

A LOMR (FEMA Case No. 03-09-0917X) effective on May 12, 2003, for the City of Chandler redelineates the floodplain boundaries along Consolidated Canal East Branch from just downstream of Frye Road to Chandler Boulevard and from Cooper Road to 131st Street to better reflect the effects of a LOMR issued on July 15, 1996 (Case No. 96-09-914P). A LOMR dated April 14, 2003 (Case No. 03-09-0695P), omitted a statement specifying which lots would be inundated by the base flood. LOMR (Case No. 03-09-0917X) revises the April 14 LOMR. As a result of the modifications, the width of the SFHA for Consolidated Canal East Branch decreased. The floodplain boundaries within the Colonia Coronita subdivision have been modified to show that the base flood is contained within the street and parking areas of the subdivision, with the exception of Lots 4, 7, 330, 331, 332, 420, 421, 500, 501, 502, 550, 553 through 556, 559, 560, 581, and 582. FIRM Panel 04013C2670 G shows the modifications.

Agua Fria River

A LOMR (FEMA Case No. 01-09-017P) effective on May 15, 2003, for the City of El Mirage shows the effect of construction of a soil cement levee along the east side of the Agua Fria River from approximately 2,500 feet downstream to just downstream of Northern Avenue. As a result of the modifications, the BFEs for the Agua Fria River increased throughout the revised reach. The modifications are shown on FIRM Panel 04013C1615 J and 04013C1620 G.

Tractor Wash

A LOMR (FEMA Case No. 03-09-0245P) effective on May 20, 2003, for the Town of Buckeye shows the effects of realignment of Tractor Wash to the northwest from approximately 3,800 feet upstream to approximately 7,700 feet upstream of the confluence with Tuthill Dike Wash and channelization along Tractor Wash from approximately 6,400 feet upstream to approximately 6,700 feet upstream of the confluence with Tuthill Dike Wash. As a result of the modifications, the BFEs and the widths of the SFHA and the regulatory floodway increased in some areas and decreased in other areas. All increases in BFE, SFHA width and floodway width are located on property owned by the Caterpillar Foundation in partnership with DMB White Tank LLC. The modifications are shown on FIRM Panels 04013C1570 F and 04013C2035 G.

Southern Pacific Railroad Ditch

A LOMR (FEMA Case No. 02-09-190P) effective on May 22, 2003, for the City of Avondale shows the effects of updated topographic information, placement of levee pipes, excavation of a natural channel, placement of fill, and grading along the Southern Pacific Railroad (SPRR) Ditch from the confluence with the Agua Fria River to approximately 3,200 feet upstream of El Mirage Road. This project also included installation of multiple culverts throughout a gold course along the SPRR ditch from approximately 1,000 feet upstream to approximately 2,600 feet upstream of El Mirage Road. As a result of the modifications, the BFEs for the SPRR Ditch decreased, and the width of the SFHA increased in some areas and decreased in other areas. The modifications are shown on FIRM Panels 04013C2080 H and 04013C2090 G.

Moon Valley Wash North Branch

A LOMR (FEMA Case No. 03-09-0508P) effective on May 28, 2003, for the City of Phoenix shows the effects of updated topographic information for Moon Valley Wash North Branch from 10th Place to approximately 200 feet upstream and of development of the 10th Place and Redfield Road subdivision, which included construction of a retaining wall and placement of fill along Moon Valley Wash North Branch. As a result of the modifications, the BFEs for Moon Valley Wash North Branch increased in some areas and decreased in other areas, and the width of the SFHA decreased. Because the increases and decreases in the BFE are too small to change the whole-foot BFEs shown on the effective FIRM, they will not be published. Modifications are shown on FIRM Panel 04013C1660 G.

Cave Creek

A LOMR (FEMA Case No. 03-09-0290P) effective on May 29, 2003, for the City of Phoenix shows the effects of a new hydraulic analyses and updated topographic data for Cave Creek along Grand Canal from approximately 200 feet upstream of the intersection of 19th Avenue and Grand Canal to just upstream of Seventh Avenue. As a result of the modifications the SFHA width and BFEs have decreased for Cave Creek. Modification are shown on FIRM Panels 04013C1665 H and 04013C2130 F.

Airline Canal

A LOMR (FEMA Case No. 02-09-1125P) effective on July 1, 2003, for the City of Glendale shows the effects of construction of a residential development along Airline Canal. The project includes grading; construction of an underground 48-inch-diameter corrugated-metal irrigation pipe, replacing the elevated Airline Canal from approximately 1,300 feet downstream of Bethany Home Road to just upstream of Colter Channel; and construction of a trapezoidal channel along 127th Avenue from Colter Channel to 250 feet south of Bethany Home Road. As a result of the modifications, the width of the SFHA for Airline Canal has increased in some areas and decreased in other areas. The SFHA increased from approximately 900 feet to approximately 1,100 feet upstream of Colter Channel. Modifications are shown on FIRM Panel 04013C1615 J.

Target Southwest Distribution Center/SPRR Ditch

A LOMR (FEMA Case No. 02-09-943P) effective on July 17, 2003, for the City of Phoenix shows the effects of new hydrologic and hydraulic analyses associated with development of the Target Southwest Distribution Center north of the Southern Pacific Railroad (SPRR) Ditch

The project included construction of two retention/detention basins, a channel along Van Buren Street from just upstream of 75th Avenue to just downstream of 71st Avenue, a channel along 75th Avenue from just upstream of the Roosevelt Irrigation District Canal (RIDC) to just downstream of Van Buren Street, and a channel along 71st Avenue from just upstream of the RIDC to just downstream of Van Buren Street. As a result of the modifications, the BFEs for the SPRR Ditch and the width of the SFHA increased in some areas and decreased in other areas. New SFHAs designated Zone A, with no BFEs determined, were established to the two new detention/retention basins. The first basin is located 200 feet east of 75th Avenue and 100 feet south of Van Buren Street, and the second basin is located 1,500 feet east of 75th Avenue and 200 feet south of Van Buren Street. The modifications are shown on FIRM Panel 04013C2105 E.

Agua Fria River

A LOMR (FEMA Case No. 03-09-1014X) effective on August 28, 2003, for the Town of Youngtown shows the effects of a revised hydraulic analysis and updated topographic information along the profile baseline of the Agua Fria River from approximately 4,900 feet downstream of Grand Avenue to approximately 2,500 feet upstream of Bell Road; along West Split Flow Through El Mirage from approximately 800 feet downstream to just downstream of Grand Avenue; and along the Atchison, Topeka, and Santa Fe (AT&SF) Railroad Channel from just upstream of Grand Avenue to approximately 1,200 feet downstream of Greenway Road. The effects of constructing three 8-foot by 4-foot reinforce-concrete box culverts at Thompson Ranch Road; construction of three 10-foot by 3-foot concrete box culverts at an unnamed road; and channel realignment along the AT&SF Railroad Channel from approximately 7,700 feet downstream to approximately 1,100 feet downstream of Greenway Road were also asked to be revised by FEMA because of an incorrect case number reference. Case No. 02-09-857P was referenced in a letter dated May 13, 2003. The Case No. should have been referenced as 02-09-945P. As a result of the modifications, the BFEs for the Agua Fria River and the width of the regulatory floodway increased in some areas and decreased in other areas. The modifications are shown on FIRM Panel 04013C1610 H.

Arizona Canal

A LOMR (FEMA Case No. 03-09-0482P) effective on October 23, 2003, for the City of Scottsdale shows the effects of hydrologic and hydraulic analysis incorporating updated topographic information along the watersheds upstream of the Arizona Canal from just upstream of Invergordon Road to approximately 650 feet upstream of 68th Street. As a result of the modifications, increases and decreases in the SFHA width and establishment of BFEs for the revised area. Modifications are shown on FIRM Panels 04013C2155 F and 04013C2160 E.

Unnamed Wash No. 1 and Unnamed Wash No. 2

A LOMR (FEMA Case No. 02-09-858P) effective on October 9, 2003, for the Town of Gila Bend shows the effects of updated topographic information along Unnamed Wash No. 1 from approximately 1,700 feet downstream to approximately 1,200 feet upstream of South Main Street and along Unnamed Wash No. 2 from approximately 2,000 feet downstream to approximately 2,500 feet upstream of South Main Street and of construction of two 3-barrel concrete box culverts with barrel spans of 6 feet and a rise of 4 feet under South Main Street at Unnamed Wash No. 1 and Unnamed Wash No. 2. As a result of the modifications, the BFEs for Unnamed Wash No. 1 and Unnamed Wash No. 2 increased, and the widths of the SFHA

and the regulatory floodways increased in some areas and decreased in other areas. The modifications are shown on FIRM Panels 04013C3480 G and 04013C3485 G.

New River at New River, AZ and Black Wash

A LOMR (FEMA Case No. 02-09-1240P) effective on November 13, 2003, for Maricopa County (Unincorporated Areas) shows the effects of updated topographic information a new hydraulic analysis for New River from approximately 2,200 feet downstream of the southbound lane of I-17 to approximately 4,600 feet upstream of New River Road. The hydraulic analysis for New River was updated to reflect bridges that were replaced at the I-17 Frontage Road and at New River Road and the levee system that was constructed along the river from approximately 800 feet downstream to approximately 800 feet upstream of New River Road. The effects of a new detailed hydrologic and hydraulic analyses for Black Wash, a tributary to New River, from its confluence with New River to approximately 3,300 feet upstream of the southbound lane of I-17 was also included in this work. As a result of the modifications, the BFEs for the revised reach of New River increased, the width of the SFHA increased in some areas and decreased in other areas, and a regulatory floodway was established along the revised reach. BFEs, and SFHA and a regulatory floodway were added to the FIRM for Black Wash in the studied reach. The modifications are shown on FIRM Panel 04013C0370 F.

Central Arizona Project (CAP) Canal

A LOMR (FEMA Case No. 03-09-0522P) effective on November 13, 2003, for the City of Phoenix shows the effects of placement of fill, detailed hydrologic and hydraulic analyses, and updated topographic information on the northeast side of the Central Arizona Project (CAP) Canal along Tributary to Cave Creek from approximately 650 feet upstream to approximately 3,400 feet upstream of its confluence with Cave Creek and along Tributary to Tributary to Cave Creek from its confluence with Tributary to Cave Creek to approximately 1,300 feet upstream. The affected areas along the northeast side of the CAP Canal were previously designated Zone AE, with BFEs and Zone A, with no BFEs determined. As a result of the modifications, the width of the SFHA increased in some areas and decreased in other areas, and the BFEs increased in the revised Zone AE. The modifications are shown on FIRM Panel 04013C1210 G.

Citrus Valley Wash/Gila Bend Area Drainage Master Study

A LOMR (FEMA Case No. 02-09-807P) effective on November 13, 2003, for Maricopa County (Unincorporated Areas) shows the effects of detailed hydrologic and hydraulic analyses and updated topographic information along Citrus Valley Wash from approximately 300 feet downstream of Interstate Highway 8 (I-8) (westbound lane) to approximately 5,100 feet upstream of Gila Bend Canal; along Gila Bend Canal Wash from the confluence with Quilotosa Wash to the divergence from Hacker Wash; along I-8 Wash West from the confluence with Saucedo Wash to the divergence from West Quilotosa Wash; along Quilotosa Wash (East Split) from the confluence with Gila Bend Canal Wash to the divergence of Quilotosa Wash; along Quilotosa Wash from approximately 100 feet downstream of I-8 (westbound lane) to approximately 8,800 feet upstream of Gila Bend Canal; along Saucedo Wash from approximately 200 feet downstream of I-8 (westbound lane) to approximately 6,500 feet upstream of Gila Bend Canal; and along West Quilotosa Wash from approximately 200 feet downstream of I-8 (westbound lane) to approximately 6,700 feet upstream of Gila Bend Canal. The request also incorporated two existing three-barrel concrete box culverts with

barrel spans of 12 feet and a rise of 8 feet at each of the I-8 crossings of Quilotosa Wash, Saucedo Wash, and West Quilotosa Wash; two existing 10-foot by 8-foot concrete box culverts along Citrus Valley Wash at I-8; and the Southern Pacific Railroad bridges over Citrus Valley Wash, Quilotosa Wash, Saucedo Wash, and West Quilotosa Wash. The FIRM has been revised to add BFEs, floodplain and floodway boundary delineations, and zone designations along Citrus Valley Wash from approximately 500 feet upstream to approximately 5,100 feet upstream of Gila Bend Canal; along Quilotosa Wash (East Split) from approximately 1,700 feet upstream of the confluence with Gila Bend Canal Wash to the divergence from Quilotosa Wash; along Quilotosa Wash from approximately 2,700 feet upstream to approximately 8,800 feet upstream of Gila Bend Canal; along Saucedo Wash from approximately 1,300 feet upstream to approximately 6,500 feet upstream of Gila Bend Canal; and along West Quilotosa Wash from approximately 1,300 feet upstream to approximately 6,700 feet upstream of Gila Bend Canal. As a result of the modifications, BFEs, SFHAs, and regulatory floodways were added for Citrus Valley Wash, Quilotosa Wash, Quilotosa Wash (East Split), Saucedo Wash, and West Quilotosa Wash. The modifications are shown on FIRM Panels 04013C3470 E and 04013C3490 F.

Bender Wash/Gila Bend ADMS

A LOMR (FEMA Case No. 02-09-857P) effective on November 13, 2003, for Maricopa County (Unincorporated Areas) shows the effects of detailed hydrologic and hydraulic analyses and updated topographic information along Bender Wash from approximately 200 feet downstream to approximately 8,800 feet upstream of Interstate Highway 8 (I-8); along Bender Wash North Tributary from just upstream to approximately 9,500 feet upstream of the confluence with Bender Wash; along Sand Tank Wash from approximately 100 feet upstream to approximately 7,300 feet upstream of I-8 (eastbound); along Scott Avenue Wash from approximately 100 feet upstream to approximately 9,300 feet upstream of I-8 (eastbound); along I-8 Wash East from just upstream to approximately 3,600 feet upstream of the confluence with Evans Wash; along Pioneer Cemetery Wash from just upstream to approximately 8,000 feet upstream of the confluence with Evans Wash; along Evans Wash from just upstream of the confluence with Hacker Wash to approximately 7,500 feet upstream of the Tucson, Cornelia and Gila Bend Railroad (TCGBRR); along Hacker Wash from approximately 500 feet downstream of Pima Street to approximately 2,200 feet upstream of the TCGBRR; and along Hacker Wash Diversion from approximately 100 feet downstream to approximately 2,000 feet upstream of Pima Street. FEMA revised the floodplain boundary delineations and zone designations of the base flood along Evans Wash from just upstream of Gila Bend Canal to approximately 1,300 feet downstream of the TCGBRR and along Hacker Wash from approximately 6,600 feet downstream to approximately 5,600 feet downstream of the TCGBRR, and to add new flood hazard information along the studied reaches of Bender Wash North Tributary, Bender Wash, Sand Tank Wash, Scott Avenue Wash, I-8 Wash East, Pioneer Cemetery Wash, Evans Wash, and Hacker Wash. As a result of the modifications, the effective SFHAs designated Zone A, with no BFEs determined, along Evans and Hacker Washes were redesignated Zone AE, SFHAs with BFEs determined; the widths of the SFHAs increased; and BFEs and regulatory floodways were added along Evans Wash from just upstream of Gila Bend Canal to approximately 1,300 feet downstream of the TCGBRR and along Hacker Wash from approximately 6,600 feet downstream to approximately 5,600 feet downstream of the TCGBRR. BFEs, SFHAs and regulatory floodways were added for Bender Wash North Tributary, Bender Wash, Sand Tank Wash, Scott Avenue Wash, I-8 Wash East, and Pioneer Cemetery Wash and for Evans Wash and Hacker Wash upstream of the aforementioned reaches. Modifications are shown on FIRM Panels 04013C3480 G, 04013C3490 F, and 04013C3491 F.

Buchanan Wash

The LOMR (FEMA Case No. 02-09-290P) effective on September 9, 2004, for the City of Phoenix indicates that a hydraulic analysis was performed to incorporate updated topographic information and the effects of placement of fill along Buchanan Wash from the confluence with Skunk Creek to just downstream of the Central Arizona Project Canal (CAP). This has resulted in a revised delineation of the regulatory floodway, increases and decreases in SFHA width, and increased and decreased BFEs for Buchanan Wash. This LOMR replaces all the information revised on LOMR 03-09-0934P, which was effective on March 25, 2004. Buchanan Wash used to have Cross Sections A to R, and with this LOMR (02-02-290P), it was changed to A to N for the same distance. The change to this LOMR is reflected on FIRM Panel 04013C1185 G and replaces the one dated July 19, 2001.

Moon Valley Wash North Branch, Moon Valley Wash North Split, Moon Valley Wash Diversion Channel, and Moon Valley Wash South Branch

The LOMR (FEMA Case No. 03-09-0012P) effective on April 14, 2004, for the City of Phoenix better reflects the effects of a Letter of Map Revision (LOMR) issued on January 24, 1995 (FEMA Case No. 95-09-059P). Information was received that better demonstrates that all building pads for Lots 274 and 276 through 279, as shown on the plans entitled "Moon Valley, Book 92, page 2, Maricopa County Recorder," dated January 4, 2004; Lots 581 and 582, as shown on the plans entitled "Moon Valley II, Book 92, page 27, Maricopa County Recorder," and Lots 303 and 304, as shown on the plans entitled "Moon Valley, Book 92, page 1, Maricopa County Recorder," both dated December 31, 2003; Lot 88, as shown on the plans entitled "Moon Valley Cluster Homes, Book 168, page 47, Maricopa County Recorder," dated January 5, 2004; and Lot 85, as shown on the plans entitled "Moon Ridge Estates, Book 120, page 21, Maricopa County Recorder," dated March 3, 2003, are outside the SFHA. The modifications to this LOMR are shown on FIRM Panels 04013C1655 J and 04013C1660 G. This LOMR hereby revises the above-mentioned panels of the effective FIRM dated July 19, 2001.

Padelford Wash - From Central Arizona Project (CAP) Canal to State Route 74

The LOMR (FEMA Case No. 03-09-0315P) effective on March 25, 2005, for Maricopa County (Unincorporated Areas) reflects the following revised reaches: Padelford Wash from just upstream of the CAP Canal to approximately 4,300 feet north of State Route 74 (SR74); Padelford Wash (Split 1) from just upstream to approximately 10,900 feet upstream of the CAP Canal; Padelford Wash (Split 2) from just upstream of the CAP Canal to approximately 2,600 feet upstream of Dove Valley Road; Padelford Wash (Split 3) from just upstream of the CAP Canal to approximately 3,700 feet upstream of Dove Valley Road; Padelford Wash (Split 4) from just upstream to approximately 3,400 feet upstream of the CAP Canal; Padelford Wash (Split 5) from just upstream to approximately 5,700 feet upstream of the CAP Canal; Padelford Wash (Tributary A) from the confluence with Padelford Wash to just downstream of SR74; Padelford Wash (Tributary B) from the confluence with Tributary A to just downstream of SR74; and Padelford Wash (Tributary C) from the confluence with Padelford Wash to just downstream of SR74. The modifications are reflected on FIRM Panel 04013C0720 F, revising the effective FIRM dated July 19, 2001. Since this revision request also affects the City of Glendale, a separate LOMR for that community was issued on the same date as this LOMR.

Moon Valley Wash North Branch

The LOMR (FEMA Case No. 03-09-448P) effective on March 10, 2005, for the City of Phoenix reflects an updated hydraulic analysis performed for Moon Valley Wash North Branch from just upstream of 7th Street to just downstream of 11th Place. This has resulted in increases and decreases in SFHA width, and increased and decreased BFEs for the revised reach of Moon Valley Wash North Branch. Information provided demonstrates that all building pads for Buildings A through G, as shown on the plans entitled "Grading & Drainage Plans, Moon Valley Corporate Center, Book 662, page 33, Maricopa County Recorder," dated April 28, 2004, are outside the Special Flood Hazard Area, the area that would be inundated by the base (1-percent-annual-chance) flood. Modifications to this LOMR are shown on FIRM Panels 04013C1655 J and 04013C1660 G.

Indian Bend Wash

The LOMR (FEMA Case No. 04-09-0654X) effective on June 24, 2004, for the City of Phoenix, reflects a study area from 200 feet upstream of North Squaw Peak Freeway to just downstream of the intersection of Acoma Road and 32nd Street. A hydraulic analysis was performed to incorporate updated topographic information, a storm drain, and levee for Indian Bend Wash. This has resulted in a revised delineation of the regulatory floodway, increases and decreases in SFHA width, and increased and decreased BFEs for Indian Bend Wash. These modifications are shown on FIRM Panel 04013C1660 G.

Sonoran Wash

The LOMR (FEMA Case No. 03-09-1019P) effective September 23, 2004, for the City of Phoenix, reflects modified flood elevation determinations for Sonoran Wash. A detailed hydraulic analysis was performed for Sonoran Wash to incorporate a new hydrologic analysis and floodplain delineation study from just upstream to approximately 18,400 feet upstream of its confluence with Skunk Creek. This has resulted in increases in SFHA width and the establishment of a regulatory floodway, an additional SFHA, and BFEs along the revised reach of Sonoran Wash. The modification are shown on FIRM Panels 04013C0790 F and 04013C1205 F.

Jackrabbit Wash – Watershed "00"

The LOMR (FEMA case No. 03-09-1020P) effective May 7, 2004, for Maricopa County (Unincorporated Areas) shows the effects of new hydrologic and hydraulic analyses, new topographic data, and a new floodplain delineation study for the following tributaries to the Hassayampa River: T2-R5-S2, T3-R5-S1, T4-R4-S30, T5-R4-S3, T5-R4-S7-A and -B, T5-R4-S20-A and -B, T5-R4-S21, T6-R4-S27, and T6-R4-S33; for the following tributaries to Daggs Wash: T5-R4-S19, T5-R5-S13-A and -B, T5-R5-S14, T5-R5-S25-A through -C, and T6-R5-S36; for the T3-R5-S33 tributary to Jackrabbit Wash; for the T4-R5-S33 tributary to Star Wash; for the T5-R5-S34-C tributary to Star Wash – Tributary A; for the T5-R5-S35 tributary to Star Wash – Tributary B; for the following tributaries to Star Wash – Tributary C: T5-R5-S34-A and -B; for the T5-R5-S33 tributary to Star Wash – Tributary D; for the following tributaries to Tank Wash: T4-R6-S1 and T4-R5-S7-A and -B; for the T4-R6-S2 tributary to South Branch of Tank Wash; for the following tributaries to Powerline Wash: T5-R6-S30 and T5-R6-S33-A and -B; and for Box Wash.

In addition, based on updated orthographic photos, the FIRM was revised to modify the floodplain and floodway boundary delineations of the base flood along the Hassayampa River from approximately 6,600 feet upstream to approximately 20,000 feet upstream of the Tonopah-Salome-Highway; from approximately 27,000 feet upstream to approximately 30,300 feet upstream of the Tonopah-Salome-Highway; from approximately 7,4000 feet downstream to approximately 23,7000 feet upstream of the Central Arizona Project (CAP) Canal; from approximately 26,8000 feet upstream of the CAP Canal to approximately 3,000 feet downstream of the Atchison, Topeka, and Santa Fe Railway (AT&SF); and approximately from approximately 19,000 feet upstream to approximately 25,000 feet upstream of the AT&SF. The FIRM was also revised to modify the floodplain and floodway boundary delineations of the base flood along Daggs Wash from approximately 7,800 feet upstream of the confluence with the Hassayampa River to approximately 3,700 feet downstream of the CAP Canal and from approximately 1,300 feet downstream of the CAP Canal to approximately 200 feet upstream of Peakview Road; along Daggs Wash West Breakout from the convergence with Daggs Wash to the divergence from Daggs Wash; along Daggs Wash East Split Flow from the convergence with Daggs Wash to the divergence from Daggs Wash; along Jackrabbit Wash from the confluence with the Hassayampa River to approximately 6,500 feet downstream of Wickenburg Road and from approximately 14,500 feet upstream of Wickenburg Road to just upstream of Vulture Mine Road; along Unnamed Tributary of Jackrabbit Wash from the confluence with Jackrabbit Wash to just downstream of Vulture Mine Road; along Powerline Wash from the confluence with Star Wash to approximately 2,700 feet upstream of Vulture Mine Road; along Tank Wash from the confluence with Star Wash to approximately 4,800 feet upstream of the confluence with South Branch of Tank Wash; along South Branch of Tank Wash from the confluence with Tank Wash to approximately 4,600 feet upstream; along Star Wash from the confluence with Powerline Wash to approximately 100 feet upstream of the Jomax Road alignment; along Star Wash – Tributary A from the confluence with Star Wash to just downstream of the Jomax Road alignment; along Star Wash – Tributary B from the confluence with Star Wash – Tributary A to approximately 3,000 feet downstream of the Jomax Road alignment; along Star Wash – Tributary C from the confluence with Star Wash to just downstream of the Jomax Road alignment; along Star Wash – Tributary D from the confluence with Star Wash to just downstream of the Jomax Road alignment; along Star Wash – Tributary E from the confluence with Star Wash – Tributary D to just downstream of the Jomax Road alignment; along White Tanks Wash from approximately 8,300 feet upstream to approximately 10,000 feet upstream of Indian School Road; along Little San Domingo Wash from the confluence with the Hassayampa River to approximately 400 feet upstream of U.S. Highways 60, 70, and 89 (US 60/70/89); along Turtleback Wash from approximately 8,000 feet upstream to approximately 10,500 feet upstream of the AT&SF; along Wash K from the confluence with the Hassayampa River to approximately 500 feet upstream of US 60/70/89; and along Wash L from just upstream of Palm Lake Spillway to approximately 1,500 feet upstream of US 60/70/89. As a result of the modifications, the SFHAs, regulatory floodways, BFEs, cross sections, and stream lines shifted in various directions. The modifications are reflected on FIRM Panels 04013C0240 E, 04013C0265 F, 04013C0660 F, 04013C0675 F, 04013C1035 G, 04013C1055 G, 04013C1060 G, 04013C1070 G, 04013C1080 H, 04013C1090 H, 04013C1510 H, 04013C1525 G, and 04013C1540 G. This LOMR hereby revises the above-referenced panels of the effective FIRM dated July 19, 2001. Since this revision request also affects the Town of Buckeye, a separate LOMR for that community was issued on the same date as this LOMR.

Aguila ADMP (Aguila Farm Channel and Grass Wash)

The LOMR (FEMA Case No. 03-09-1190P) effective on October 12, 2004, for Maricopa County (Unincorporated Areas) shows the effects of new detailed hydraulic analyses, new topographic data, an existing culvert under State Route 71 (SR71), and a new floodplain delineation for Aguila Farm Channel from approximately 1,000 feet downstream to approximately 32,100 feet upstream of SR71. This revision also included new hydrologic and hydraulic analyses, new topographic data, and a new floodplain delineation study for the following tributaries to Aguila Farm Channel: T7-R8-S1A, T7-R8-S1B, T7-R8-S1C, T7-R8-S1D, T7-R8-S1E, T7-R8-S1F, T7-R8-S2, T7-R8-S7, T7-R8-S9 and 10, T7-R8-S18, AND T7-R9-S12; the following tributaries to Centennial Wash: T7-R9-S4, T7-R9-S17, and T7-R10-S13; Grass Wash from approximately 19,500 feet upstream to approximately 23,900 feet upstream of Black Eagle Road; and the following tributaries to Grass Wash: T7-R8-S30, T7-R9-S22, T7-R9-S25A, T7-R9-S25B, T7-R9-S25C, T7-R9-S25D, and T7-R9-S25E.

The FIRM and FIS report were revised to establish elevations, floodplain and floodway boundary delineations, and zone designations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Aguila Farm Channel from approximately 1,000 feet downstream to approximately 32,100 feet upstream of SR71 and to establish floodplain boundary delineations and modify zone designations of the base flood along all the other studied reaches listed above. The affected areas, previously designated Zone D, areas in which flood hazards are undetermined but possible, were redesignated Zone X (shaded), areas that would be inundated by the base flood with average depths less than 1.0 foot. As a result of the new study, a Special Flood Hazard Area (SFHA) designated Zone AE, with Base Flood Elevations (BFEs) determined, and a regulatory floodway were added for Aguila Farm Channel. Also as a result of the new study, SFHAs designated Zone A, with no BFEs determined, were added for all the other studied reaches above.

The modifications are shown on FIRM Panels 040013C0135 F, 040013C0155 F, 040013C0160 F, 040013C0165 F, 040013C0170 F, 040013C0190 F, 040013C0200 E, 040013C0225 E, and 040013C0600 D. This LOMR hereby revises effective FIRM Panel 04013C0600 D dated April 15, 1988, and the other above-referenced panels of the effective FIRM and the affected portions of the FIS report, all dated July 19, 2001.

Upper Agua Fria River – Watersheds 3 & 4

A LOMR (FEMA Case No. 03-09-1312P) effective on January 19, 2004, for Maricopa County (Unincorporated Areas) shows the effects of new hydrologic and hydraulic analyses, new topographic data, and updated bridge and culvert information along Moores Gulch, Moores Gulch Tributaries 1 through 6, Little Squaw Creek, Little Squaw Creek Tributaries 1 through 5, and Wash 8N2ES16. On the effective FIRM, the Special Flood Hazard Area (SFHA), the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), along Moores Gulch from just upstream to approximately 31,300 feet upstream of its confluence with the Agua Fria River is designated Zone A, an SFHA with no Base Flood Elevations determined. The effective FIRM also shows as SFHA designated Zone A along Little Squaw Creek from just upstream to approximately 23,500 feet upstream of its confluence with the Agua Fria River. In addition, the effective FIRM shows an area designated Zone D, an area in which flood hazards are possible but undetermined, along Moores Gulch from approximately 43,000 feet upstream to approximately 49,500 feet upstream of its confluence with the Agua Fria River.

As a result of the modifications, the width of the SFHA for Moores Gulch decreased from just upstream to approximately 12,400 feet upstream of its confluence with the Agua Fria River; a new SFHA designated Zone A was delineated along Moores Gulch from approximately 31,300 feet upstream to approximately 49,500 feet upstream of its confluence with the Agua Fria River; and a new area designated Zone X (shaded), an area subject to inundation by the base flood with the average depths of less than 1 foot, was added along Moores Gulch from approximately 43,000 feet upstream to approximately 49,500 feet upstream of its confluence with the Agua Fria River. Also as a result of the modifications, the width of the SFHA for Little Squaw Creek decreased from just upstream to approximately 24,700 feet upstream of its confluence with the Agua Fria River, new SFHAs designated Zone A were delineated for Moores Gulch Tributaries 1 through 6, Little Squaw Creek Tributaries 1 through 5, and Wash 8N2ES16; and an area designated Zone X (shaded) was added along Moores Gulch Tributary 6 from just upstream to approximately 1,600 feet upstream of its confluence with Moores Gulch. The modifications are shown on FIRM Panels 04013C0025 E, 04013C0050 E, 04013C0375 F, and 04013C0400 G, and affected portions of the Summary of Discharges Table. This LOMR hereby revises the above-referenced panels of the effective FIRM and the affected portions of the FIS report, both dated July 19, 2001.

Wigwam Creek – Phases 2 and 2B

A LOMR (FEMA Case No. 03-09-1538P) effective on June 14, 2004, for Maricopa County (Unincorporated Areas), addresses channel relocation, culvert addition, placement of fill, and other storm drain issues. The revised reaches of this study affect El Mirage Channel, from just upstream of Colter Channel to approximately 1,300 feet upstream of Bethany Home Road; Greenbelt Channel, from just downstream of Wigwam Creek Boulevard to just upstream of Bethany Home Road; and Airline Canal, from approximately 500 feet downstream to just downstream of Colter Channel and from approximately 1,300 feet downstream to just upstream of Bethany Home Road. The modification are reflected on FIRM Panel 40413C1615 J dated July 19, 2001. Since this revision also affects the City of Glendale, a separate LOMR for that community was issued on the same date as this LOMR.

Luke Wash – Watershed “PP”

A LOMR (FEMA Case No. 03-09-1562P) effective on May 7, 2004, for Maricopa County (Unincorporated Areas), as a result of the modifications, new SFHAs designated Zone A, SFHAs with no Base Flood Elevations determined, were delineated for the following watercourses: T1N-R5W-S04, T1N-R5W-S10, T1N-R5W-S15, T1N-R5W-S22, T2N-R5W-S04, T2N-R5W-S05E, T2N-R5W-S05W, T2N-R5W-S21, T2N-R5W-S27N, T2N-R5W-S27S, T2N-R5W-S33E, T2N-R5W-S33W, T3N-R5W-S20, T3N-R5W-S21N, T3N-R5W-S21S, T3N-R5W-S28N, T3N-R5W-S28S, T3N-R5W-S32E, T1S-R5W-S22S, T1S-R5W-S29, T1S-R5W-S29E, and T1S-R5W-S29W. New SFHAs designated Zone A were delineated for the tributary streams to Luke Wash from just upstream to approximately 97,000 feet upstream of the SPRR; to Minor Tributary to Luke Wash from just upstream to approximately 4,400 feet upstream of the SPRR; to East Main Tributary to Luke Wash from just upstream to approximately 24,000 feet upstream of the SPRR; and to East Sub-Tributary to Luke Wash from approximately 5,000 feet upstream to approximately 10,300 feet upstream of its confluence with East Main Tributary to Luke Wash. In addition, an SFHA designated Zone A was delineated for T1S-R5W-S22N from its confluence with East main Tributary to Luke Wash to approximately 9,000 feet upstream. The modifications are shown on FIRM Panels 04013C1510 H, 04013C1525 G, 04013C2000 F, 04013C2460 G, 04013C2470 G,

04013C2475 F, and 04013C2480 G. This LOMR hereby revises the above-referenced panels of the effective FIRM dated July 19, 2001.

Loop 303 White Tanks ADMP – Update Floodplain Delineations

The LOMR (FEMA Case No. 03-09-1653P) effective on December 30, 2004, for Maricopa County (Unincorporated Areas) indicates that hydrologic and hydraulic analyses were performed for Bullard Wash to incorporate existing watershed conditions, more detailed topographic information, and a floodplain delineation study from just upstream of Indian School Road to just downstream of Litchfield Road. This has resulted in the establishment of a regulatory floodway between Indian School Road and Camelback Road, a revised delineation of the regulatory floodway between Camelback Road and Bethany Home Road, increases and decreases in SFHA width, and increases and decreases in BFEs for Bullard Wash. These modifications are reflected on FIRM Panels 04013C1595 G, 04013C1615 J, and 04013C2060 F dated July 19, 2001. Since these revisions also affect the City of Glendale, City of Goodyear, and the City of Litchfield Park, a separate LOMR for those communities was issued on the same date as this LOMR.

Palm Valley Phase 1

The LOMR (FEMA Case No. 04-09-0274P) effective on November 26, 2004, for the City of Avondale and the City of Goodyear indicates the hydrologic and hydraulic analyses performed for the Roosevelt Irrigation District Canal, from approximately 1,500 feet downstream of McDowell Road to just downstream of Roosevelt Canal. FIRM Panel 04013C2080 H, dated July 19, 2001, was revised to reflect this LOMR.

Southern Pacific Railroad Ditch

The LOMR (FEMA Case No. 04-09-0311P) effective on September 23, 2004, for Maricopa County (Unincorporated Areas) shows the effects of a hydraulic analysis that was performed to incorporate an updated hydrologic analysis, the effects of channelization and a culvert, and new topographic information for the Southern Pacific Railroad Ditch along the Glenhurst Project, from approximately 500 feet upstream of the confluence with the Agua Fria River to approximately 1,000 feet upstream of 115th Avenue. FIRM Panels 04013C2080 H, 04013C2085 F, 04013C2090 G, and 04013C2095E, dated July 19, 2001, were revised to reflect this LOMR. Since this revision also affects the City of Avondale, a separate LOMR for that community was issued on the same date as this LOMR.

Loop 303 White Tanks ADMP – Update Floodplain Delineations

The LOMR (FEMA Case No. 04-09-0318P) effective on December 30, 2004, for Maricopa County (Unincorporated Areas) reflects changes made by a detailed hydraulic analysis which was performed for Camelback Wash to incorporate a new hydrologic analysis and floodplain delineation study from the confluence with Bullard Wash to approximately 2,300 feet upstream of Curtis Road and 2,300 feet downstream of Reems Road. This has resulted in the establishment of an SFHA and BFEs for the revised reach of Camelback Wash. FIRM Panels 04013C1590 G and 04013C1595 G, dated July 19, 2001, were revised to reflect this LOMR. Since this revision also affects the City of Glendale and the City of Goodyear, a separate LOMR for those communities was issued on the same date as this LOMR.

North Gateway Transfer North Station

The LOMR (FEMA Case No. 04-09-0381P) effective on March 30, 2005, for the City of Phoenix indicates the effects of a new hydraulic analysis and provides new topographic data for Skunk Creek, from approximately 1,500 feet upstream to 6,400 feet upstream of Granite Reef Aqueduct. FIRM Panels 04013C0770 E and 04013C0790 F, dated July 19, 2001, were revised to reflect this change in the LOMR.

Tuthill Dike Wash Channelization

The LOMR (FEMA Case No. 04-09-0544P) effective on May 27, 2004, for the Town of Buckeye shown the effects of a hydraulic analysis that was performed to incorporate the effects of placement of fill, a new culvert, and channelization and relocation of Tuthill Dike Wash from approximately 2,800 feet downstream of Thomas Road to approximately 1,600 feet upstream of Indian School Road, and channelization and relocation of Tractor Wash from the confluence with Tuthill Dike Wash to approximately 2,800 feet upstream. This has resulted in a revised delineation of the regulatory floodway, increases and decreases in SFHA width, and increased and decreased BFEs for both watercourses. FIRM Panels 04013C2035 G and 04013C2055 F, dated July 19, 2001, were revised to reflect the changes to the LOMR.

CW Ranch

The LOMR (FEMA Case No. 04-09-0552P) effective on December 21, 2004, for Maricopa County (Unincorporated Areas) indicates that a hydraulic analysis was performed to incorporate an updated hydrologic analysis, the effects of channelization and a culvert, and new topographic information for Southern Pacific Railroad Ditch and an unnamed tributary, from approximately 200 feet upstream to approximately 1,000 feet upstream of 111th Avenue. This has resulted in a decrease in SFHA width and decreased BFEs for the Southern Pacific Railroad Ditch and the establishment of an SFHA along the unnamed tributary. FIRM Panels 04013C2085 F and 04013C2095, dated July 19, 2001, were revised to indicate these changes to the LOMR. Since this revision also affects the City of Avondale, a separate LOMR for that community was issued on the same date as this LOMR.

Osborn Road Wash Channelization

The LOMR (FEMA Case No. 04-09-0585P) effective on May 27, 2004, for the Town of Buckeye, reflects the effects of a hydraulic analysis performed to incorporate the effects of placement of fill and channelization along Osborn Road Wash from the confluence with Tuthill Dike Wash to approximately 5,600 feet upstream of Caterpillar Proving Ground Road. This has resulted in a revised delineation of the regulatory floodway, increases and decreases in SFHA width, and increased and decreased BFEs for Osborn Road Wash. The aforementioned channelized portion of Osborn Road Wash contains the base flood. The changes of this LOMR revised FIRM Panels 04013C2035 G and 04013C2055 F, dated July 19, 2001.

Indian Bend Wash Channel Improvements at Hearn Road

The LOMR (FEMA Case No. 04-09-0654X) effective on June 24, 2004, for the City of Phoenix, follows up on a Conditional Letter of Map Revision issued on March 17, 2002 (FEMA Case No. 03-09-0910P). This LOMR reflects the revision of the FIRM and FIS report, modifying the elevations and floodplain and floodway boundary delineations of the

base flood along Indian Bend Wash. As a result of the modifications, the BFEs for Indian Bend Wash and the widths of the SFHA, the area that would be inundated by the base flood, and the regulatory floodway increased in some areas and decreased in other areas. A hydraulic analysis was performed to incorporate updated topographic information, a storm drain, and a levee for Indian Bend Wash. The areas affected by these modifications are approximately 700 feet upstream of North Squaw Peak Freeway, and approximately 1,000 feet upstream of North Squaw Peak Freeway. The modification are shown on FIRM Panel 04013C1660 G, Profile Panel 217P.

Watershed "OO" Zone A Study – Coyote Wash and Jackrabbit Wash Tributaries

The LOMR (FEMA Case No. 04-09-0659P) effective on February 18, 2005, for Maricopa County (Unincorporated Areas) indicates the revisions to the FIRM showing the effects of new hydrologic and hydraulic analyses, new topographic data, and a new floodplain delineation study for T3-R6-S13; the following tributaries to Beer Bottle Wash: T4-R6-S27 and T4-R6-S35; the following tributaries to Coyote Wash: T3-R5-S12, Beer Bottle Wash, T4-R6-S22, T4-R7-S11, T4-R7-S13, and T4-R7-S22; the following tributaries to Dead Horse Wash: T5-R7-S8, T5-R7-S9, T5-R7-S10, T5-R8-S13, T5-R8-S28-A, T5-R8-S34-A and -B, T4-R8-S3, and T4-R8-S4; and the following tributaries to Upper Jackrabbit Wash: T4-R6-S5, T4-R6-S7, T4-R6-S8, Woodchopper Wash, T5-R6-S31, T5-R7-S23-A and -B, T5-R8-S36-A, Dead Horse Wash, T5-R7-S5, T5-R7-S11, T6-R7-S29, T5-R8-S2, T5-R8-S10-A and -B, T6-R8-S34, and T6-R8-S35-A and -B. A portion of the area affected by this revision, although shown on the FIRM as in the unincorporated areas of Maricopa County, was annexed by the City of Buckeye.

The FIRM has been revised to establish floodplain boundary delineations and modify zone designations of the base flood along the studies reaches listed above. The affected areas, previously designated Zone D, areas in which flood hazards are undetermined but possible, were redesignated Zone X (shaded), areas that would be inundated by the base flood with average depths less than 1.0 foot. As a result of the new study, SFHAs designated Zone A, with no BFEs determined, were added to the FIRM. Administrative floodways were delineated along the newly studied reaches listed above for local management of flood hazards in designated areas. In addition, with this LOMR, the effective and revision date(s) information shown on the legends of the following FIRM Panels are being revised: 04013C0200 E and 04013C0625 D that were attached to previous LOMR issued on October 12, 2004 (FEMA Case No. 03-09-1190P).

This LOMR hereby revises effective FIRM Panels 04013C0600 D, 04013C0625 D, 04013C1025 D, and 04013C1050 E, all dated April 15, 1988, and effective FIRM Panels 04013C0200 E, 04013C0225 E, 04013C0625 D, 04013C1035 G, 04013C1065 G, 04013C1510 H, and 04013C1525 G, all dated July 19, 2001. Since these revisions also affect the Town of Buckeye, a separate LOMR for that community was issued on the same date as this LOMR.

Riverwalk Villages Phase 2A

The LOMR (FEMA Case No. 04-09-0716P) effective on June 22, 2004, for the City of Phoenix, indicates that new hydraulic analyses were performed to incorporate the effects of placement of fill along the south bank of the Salt River, in the vicinity of the Riverwalk Villages Phase 2 development, from approximately 800 feet downstream to just downstream

of 51st Avenue. This has resulted in a decrease in SFHA width and decreased BFEs for the Salt River. This LOMR revises FIRM Panel 04013C2120 F, issued on July 19, 2001.

Approximate Floodplain Delineation of Watershed "OO"

The LOMR (FEMA Case No. 04-09-0756P) effective on October 8, 2004, for Maricopa County (Unincorporated County) shows the effects of new hydrologic and hydraulic analyses, new topographic data, and a new floodplain delineation study for the T5-R5-S25-B tributary to Dags Wash; the following tributaries to Star Wash: T4-R5-S33, T5-R5-S18, T5-R5-S29-A and -B, T5-R5-S33, T5-R5-S8, T5-R5-S21-A and -B, T5-R5-S34-A through -C, T5-R5-S16, T5-R5-S17, T6-R5-S21, T5-R5-S10-A, T5-R5-S23-A and -B, T5-R5-S35, T5-R5-S14, and T6-R5-S35; the following tributaries to Tank Wash: T5-R5-S31, T6-R6-S25, T4-R6-S1, T4-R5-S7-A and -B, T5-R6-S18, T5-R6-S12-A and -B, T5-R6-S13, and T6-R6-S22; the following tributaries to Powerline Wash: T5-R7-S14, T6-R7-S34, T5-R6-S30 and T5-R6-S33-A and -B; and Jimmie Wash. This LOMR hereby revises effective FIRM Panels 04013C0600 D, 04013C0625 D, and 04013C0650 D, all dated April 15, 1988, and effective FIRM Panel 04013C0220 E, dated September 29, 1989.

Twin Buttes Wash and White Peak Wash Improvements

The LOMR (FEMA Case No. 04-09-0960P) effective on November 18, 2004, for the City of Peoria, shows the effects of a hydraulic analysis that was performed to incorporate more detailed topographic information and the effects of placement of fill along Twin Buttes Wash and White Peak Wash. This has resulted in a decrease in SFHA width and increased BFEs for Twin Buttes Wash and White Peak Wash. The following reaches were affected: Twin Buttes Wash, from approximately 3.668 miles upstream to approximately 4.621 miles upstream of the confluence with the Agua Fria River, and White Peak Wash, from approximately 0.491 mile upstream to approximately 0.852 mile upstream of the confluence with Twin Buttes Wash. The modifications to this LOMR are shown on FIRM Panels 04013C0740 G and 04013C1155 G, dated July 19, 2001.

Carefree Drainage Master Plan

The LOMR (FEMA Case No. 04-09-1301P) effective on November 24, 2004, for the City of Scottsdale and the Town of Carefree shows the revised FIRM and FIS report, modifying the elevations, floodplain and floodway boundary delineations, and zone designations of the base flood along Galloway Wash Middle Branch, from approximately 200 feet upstream to approximately 1,000 feet upstream of Paint Pony Drive. The FIRM and FIS report have been revised to modify the zone designations and to establish BFEs and base floodplain boundary delineations along Tributary to Galloway Wash Middle Branch from the confluence with Galloway Wash Middle Branch to approximately 700 feet upstream of Paint Pony Drive, along Unnamed Central Tributary to Cave Creek from just upstream of Carefree Highway to approximately 100 feet downstream of Scottsdale Road, and along Windmill Wash from just upstream of Stagecoach Pass to just upstream of Pima Road. The FIRM and FIS report have been revised to modify the zone designations and to establish BFEs and base floodplain boundary delineations along Eastern Pima Wash from just upstream of Stagecoach Pass to approximately 600 feet upstream of Twilight Trail, along Unnamed Central Tributary to Cave Creek from just upstream of Terravita Sunset Trail to just upstream of Carefree Highway and a portion 100 feet downstream of Scottsdale Road, and along Unnamed Tributary to Stagecoach Pass Wash from the confluence with Stagecoach Pass Wash to approximately 300 feet upstream of Wild Flower Road. The base flood is contained along Unnamed Tributary to

Stagecoach Pass Wash from approximately 300 feet upstream of Wild Flower Road to approximately 400 feet upstream of Romping Road; along Windmill Wash from just upstream of Pima Road to the confluence of Windmill Wash North Branch; along Windmill Wash North Branch from the confluence with Windmill Wash to approximately 1,900 feet upstream of Milky Way; and along Windmill Wash South Branch from the confluence with Windmill Wash to approximately 1,500 feet upstream of Milky Way. BFEs and SFHAs designated Zone AE were added to the FIRM for the reaches described above. The modifications are shown on FIRM Panels 040130808 H, 04013C0809 H, 04013C0815 H, 04013C0820 F, and 04013C0850 E, and Profile Panels 148P through 152P. In addition, Profile Panels 152P (a) and 1268P through 1279P were added to the FIS report. The LOMR hereby revises the above-mentioned panels of the effective FIRM and the affected portions of the FIS report, all dated July 19, 2001.

Bullard Wash Channel at Goodyear Planned Regional Center

The LOMR (FEMA Case No. 04-09-1512P) effective on March 10, 2005, for the City of Goodyear, indicates that a hydraulic analysis was performed to incorporate the effects of a new drop structure, channel relocation and channelization along Bullard Wash, from approximately 300 feet upstream of McDowell Road to just upstream of Thomas Road. This has resulted in a revised delineation of the regulatory floodway, increases and decreases in SFHA width, and increased and decreased BFEs for Bullard Wash. This LOMR revises FIRM Panel 04013C2060 F, dated July 19, 2001.

Arizona Canal Floodplain Redelineation

The LOMR (FEMA Case No. 05-09-0403X) effective on February 4, 2005, for the City of Scottsdale, had the FIRM revised to redelineate the floodplain boundaries along the Arizona Canal from just upstream of Invergordon Road to approximately 650 feet upstream of 68th Street, and to represent the BFE referenced to the appropriate datum, the National Geodetic Vertical Datum of 1929 (NGVD). This LOMR revises FIRM Panels 04013C2155 and 04013C2160, dated July 19, 2001.

Table 7. Letters of Map Change

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>City of Avondale</u>			
01-09-018P	Palmilla Apartments	Agua Fria River Levee Pond	July 24, 2001
01-09-497P	Roosevelt Irrigation District Canal Overchute	Roosevelt Irrigation District Canal (RID)	August 23, 2001
02-09-190P	Coldwater Springs - A Portion of parcel 15	Southern Pacific Railroad (SPRR) Ditch	May 22, 2003
02-09-257P	Roosevelt Irrigation District Canal	Roosevelt Irrigation District Canal (RID)	January 15, 2002
03-09-0278P	NE Corner of Van Buren St & Eliseo C. Felix Jr. Way - Parcel 2	Agua Fria River Levee ponding areas	February 12, 2003
04-09-0274P	Palm Valley Phase I	Roosevelt Irrigation District Canal	November 26, 2004
04-09-0311P	Channelization of Southern Pacific Railroad Floodplain Along Glenhurst Project	Southern Pacific Railroad Ditch	September 23, 2004
04-09-0522P	CW Ranch	Southern Pacific Railroad Ditch	December 21, 2004
<u>Town of Buckeye</u>			
01-09-453P	White Tanks Flood Retarding Structure #4 Inlet Channel Improvements	Jackrabbit Trail Wash	October 9, 2001
02-09-386P	White Tank Fan, Site 36	White Tank Alluvial Fan 36	September 16, 2002
03-09-0245P	Tractor Wash Channelization	Tractor Wash	May 20, 2003

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>Town of Buckeye (Continued)</u>			
03-09-1020P	Approximate Delineation of Watershed "00"	Washes T2-R5-S2, T3-R5-S1, T4-R4-S30, T5-R4-S3, T5-R4-S7-A, T5-R4-S7-B, T5-R4-S20-A, T5-R4-S20B, T5-R4-S21, T6-R4-S27, T6-R4-S33, T5-R4-S19, T5-R5-S13-A, T5-R5-S13-B, T5-R5-S14, T5-R5-S25-A, T5-R5-S25-B, T5-R5-S25-C, T6-R5-S36, T3-R5-S33, T4-R5-S33, T5-R5-S34-C, T5-R5-S35, T5-R5-S34-A, T5-R5-S34-B, T5-R5-S33, T4-R6-S1, T4-R5-S7-A, T4-R5-S7-B, T4-R6-S2, T5-R6-S30, T5-R6-S33-A, T5-R6-S33-B	
04-09-0544P	Tuthill Dike Wash Channelization	Tuthill Dike Wash, Tractor Wash	May 7, 2004
04-09-0585P	Osborn Road Wash Channelization	Osborn Road Wash	May 27, 2004
04-09-0659P	Watershed "00" Zone A Study - Coyote Wash, and Jackrabbit Wash Tributaries	Washes T3-R6-S13, T4-R6-S27, T4-R6-S35, T3-R5-S12, Beer Bottle, T4-R6-S22, T4-R7-S11, T4-R7-S13, T4-R7-S22, T5-R7-S8, T5-R7-S9, T5-R7-S10, T5-R8-S13, T5-R8-S28-A, T5-R8-S34-A, T5-R8-S34-B, T4-R8-S3, T4-R8-S4, T4-R6-S5, T4-R6-S7, T4-R6-S8, Woodchopper, T5-R6-S31, T5-R7-S23-A, T5-R7-S23-B, T5-R8-S36-A, Dead Horse, T5-R7-S5, T5-R7-S11, T6-R7-S29, T5-R8-S2, T5-R8-S10-A, T5-R8-S10-B, T6-R8-S34, T6-R8-S35-A, T6-R8-S35-B	February 18, 2005

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>Town of Carefree</u>			
02-09-1409X	Floodplain Delineation Study of Andora Hills and Galloway Washes	Galloway Wash, Andora Hills Wash Split 1, Andora Hills Wash Split 2	December 5, 2002
04-09-1301P	Carefree Drainage Master Plan	Galloway Wash Middle Branch, Tributary to Galloway Wash Middle Branch, Unnamed Central Tributary to Cave Creek, Windmill Wash	November 24, 2004
<u>Town of Cave Creek</u>			
02-09-241X	Cave Creek Floodplain Revision	Cave Creek	April 3, 2002
02-09-1409X	Floodplain Delineation Study of Andora Hills and Galloway Washes	Galloway Wash, Andora Hills Wash Split 1, Andora Hills Wash Split 2	December 5, 2002
<u>City of Chandler</u>			
02-09-248P	Fieldstone Estates	Southern Pacific Railroad	October 30, 2002
03-09-0353P	Kerby Estates	Consolidated Canal East Branch	May 7, 2003
03-09-0917X	Redelineation of Colonia Coronita Homes	Consolidated Canal East Branch	May 12, 2003
<u>City of El Mirage</u>			
00-09-083P	Lower El Mirage Wash & Lower El Mirage Wash Tributary Channelization	Lower El Mirage Wash, Lower El Mirage Wash Tributary	January 4, 2002
01-09-017P	City of Glendale Recycling Facility	Agua Fria River	May 15, 2003
01-09-364A	Arizona Brisas Phase 3, Lots 17-18, 24, 28-30, 55-56, 60-61, 79-80, 82-84, 88-135, 142-151, 170-178, 183-190, 214-221, 223-230, 259-269, 320-309, 325-327, 341-357; Phase 2, Lots 403-427	Agua Fria River	April 13, 2001

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>City of El Mirage (Continued)</u>			
02-09-337A	Walgreens, 15385 N. Dysart Rd.	Lower El Mirage Wash Tributary	February 27, 2002
02-09-945P	Agua Fria Floodplain Delineation from Cactus Road to Bell Road	Agua Fria River, West Split Flow Through El Mirage, Atchison, Topeka and Santa Fe (AT&SF) Railroad Channel	August 28, 2003
02-09-1008P	Sundial 4	Agua Fria River	June 3, 2002
02-09-1049A	Arizona Brisas Phases I, II, III	Agua Fria River	August 28, 2002
02-09-1136X	Sundial 4, Lots 1458-1498, 1533-1536, 1679, 1706-1724, 1734-1770, 1772-1885	Agua Fria River	June 21, 2002
02-09-1199A	Sundial 4, Lots 1789 & 1790	Agua Fria River	August 21, 2002
<u>Town of Gila Bend</u>			
02-09-807P	Gila Bend ADMP/Floodplain Delineation Study	Citrus Valley Wash, Gila Bend Canal Wash, I-8 Wash West, Quilotosa Wash, Quilotosa Wash (East Split), Saucedo Wash, West Quilotosa Wash	November 13, 2003
02-09-857P	Gila Bend ADMP/Floodplain Delineation Study	Bender Wash, Bender Wash North Tributary, Evans Wash, Hacker Wash, Hacker Wash Diversion, I-8 Wash East, Pioneer Cemetery Wash, Sand Tank Wash, Scott Avenue Wash	November 13, 2003
02-09-858P	Gila Bend ADMP/Floodplain Delineation Study	Unnamed Wash No. 1, Unnamed Wash No. 2	October 9, 2003
<u>City of Glendale</u>			
01-09-017P	City of Glendale Recycling Facility	Agua Fria River	May 15, 2003
02-09-1125P	Wigwam Creek, Phase 1	Airline Canal	July 1, 2003
03-09-1538P	Wigwam Creek Phases 2 & 2B	El Mirage Channel, Greenbelt Channel, Airline Canal	June 14, 2004

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>City of Glendale (Continued)</u>			
03-09-1653P	Loop 303 White Tanks ADMP Update Floodplain Delineations	Bullard Wash, West Tributary of Bullard Wash	December 30, 2004
04-09-0318P	Loop 303 White Tanks ADMP Update Floodplain Delineations	Camelback Wash	December 30, 2004
<u>City of Goodyear</u>			
01-09-497P	Roosevelt Irrigation District Canal Overchute	Roosevelt Irrigation Canal (RID)	August 23, 2001
02-09-257P	Roosevelt Irrigation District Canal	Roosevelt Irrigation Canal (RID)	January 15, 2002
02-09-272P	The Village of Litchfield Park, Phase I	Airline Canal	January 21, 2003
03-09-1653P	Loop 303 White Tanks ADMP Update Floodplain Delineations	Bullard Wash, West Tributary of Bullard Wash	December 30, 2004
04-09-0274P	Palm Valley Phase I	Roosevelt Irrigation District Canal	November 26, 2004
04-09-0318P	Loop 303 White Tanks ADMP Update Floodplain Delineations	Camelback Wash	December 30, 2004
04-09-1512P	Bullard Wash Channel at Goodyear Planned Regional Center	Bullard Wash	March 10, 2005
<u>City of Litchfield Park</u>			
02-09-272P	The Village of Litchfield Park, Phase I	Airline Canal	January 21, 2003
03-09-1653P	Loop 303 White Tanks ADMP Update Floodplain Delineations	Bullard Wash, West Tributary of Bullard Wash	December 30, 2004

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>City of Mesa</u>			
02-09-260P	Eastern Canal North Flood Delineation Study	Eastern Canal	September 19, 2002
02-09-950P	Consolidated Canal Floodplain Delineation Study, FCD 99-09	Consolidated Canal	April 17, 2003
<u>Town of Paradise Valley</u>			
02-09-196P	Indian Bend Wash	Indian Bend Wash	January 23, 2002
<u>City of Peoria</u>			
01-09-017P	City of Glendale Recycling Facility	Agua Fria River	May 15, 2003
01-09-1060P	Floodplain and Floodway Delineation for Rock Springs Creek	Rock Springs Creek	June 13, 2002
01-09-1111P	Desert Star Development		December 10, 2001
02-09-031P	North Peoria Area Drainage Master Plan	Caterpillar Tank Wash, Tributary 1 to Unnamed Wash 1, Tributary 1 to Unnamed Wash 2, Tributary 2 to Unnamed Wash 2, Tributary 1 to Unnamed Wash 7, Twin Buttes Wash, Unnamed Wash 1, Unnamed Wash 2, Unnamed Wash 3, Unnamed Wash 4, Unnamed Wash 5, Unnamed Wash 6, Unnamed Wash 7, Unnamed Wash 8, Unnamed Wash 9	May 15, 2002
02-09-1138P	Approximate Zone A Floodplain Delineation Study of Watershed UU (Upper Agua Fria)	Washes T6NR1ES4, T7NR1ES34, T7NR1ES35, T7NR1ES26-1 T7NR1ES26-2, T7NR1ES26-2A T7NR1ES26-2B, T7NR1ES26-3	October 17, 2002

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>City of Peoria (Continued)</u>			
03-09-0315P	Padelford Wash - From Central Arizona Project Canal to State Route 74	Padelford Wash, Padelford Wash Split 1, Padelford Wash Split 2, Padelford Wash Split 3, Padelford Wash Split 4, Padelford Wash Split 5, Padelford Wash Tributary A, Padelford Wash Tributary B, Padelford Wash Tributary C	March 25, 2005
04-09-0960P	Twin Buttes Wash and White Peak Wash Improvement	Twin Buttes Wash, White Peak Wash	November 18, 2004
<u>City of Phoenix</u>			
01-09-285P	Dreamy Draw Wash West @ ACDC Zone AE Without Floodway	Dreamy Draw Wash West	October 15, 2001
01-09-526P	Cave Creek Channelization SEC 19th Ave to Greenway Rd.	Cave Creek	December 12, 2001
01-09-1003P	Tramanto Master Planned Community - Skunk Creek	Skunk Creek	September 10, 2001
02-09-117P	2969 North 19th Avenue Unit 44	Cave Creek and Grand Canal	January 14, 2002
02-09-290P	Buchanan Wash Restudy	Buchanan Wash	September 9, 2004
02-09-723P	Sheely Farms East	Roosevelt Irrigation District (RID) Canal	April 23, 2002
02-09-943P	Target Southwest Distribution Center	Southern Pacific Railroad Ditch	July 17, 2003
02-09-1064P	Flood Plain Delineation for Indian Bend Wash	Indian Bend Wash	June 28, 2002
02-09-1208P	Grandview Road	East Fork of Cave Creek	September 16, 2002
02-09-1253P	E. Fork Cave Creek - Upper E. Fork Cave Creek Channel/ Greenway Parkway Channel	East Fork of Cave Creek	November 27, 2002
03-09-0012P	Moon Valley Wash LOMR	Moon Valley Wash, Moon Valley Wash North Branch, Moon Valley Wash North Split, Moon Valley Wash Diversion Channel, Moon Valley Wash South Branch	April 14, 2004
03-09-0290P	Grand Canal Floodplain Restudy	Cave Creek and Grand Canal	May 29, 2003

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>City of Phoenix (Continued)</u>			
03-09-0448P	Moon Valley Corporate Center	Moon Valley Wash North Branch	March 10, 2005
03-09-0505P	Cave Creek Map Error	Cave Creek	April 10, 2003
03-09-0508P	10th Place and Redfield Subdivision	Moon Valley Wash North Branch	May 28, 2003
03-09-0522P	Eagle Bluff II	Tributary to Cave Creek, Tributary to Tributary To Cave Creek	November 13, 2003
03-09-0573P	Moon Valley Wash Redelineation	Moon Valley Wash North Branch, Moon Valley Wash North Split, Moon Valley Wash Diversion Channel, Moon Valley Wash South Branch	March 25, 2003
03-09-1019P	Skunk Creek Watercourse Master Plan	Sonoran Wash	September 23, 2004
04-09-0179P	Charter Oak Road	Indian Bend Wash	December 17, 2003
04-09-0654X	Indian Bend Wash Channel Improvements at Hearn Road	Indian Bend Wash	June 24, 2004
04-09-0381P	North Gateway Transfer North Station	Skunk Creek	March 30, 2005
04-09-0716P	Riverwalk Villages Phase 2A	Salt River	June 22, 2004
<u>City of Scottsdale</u>			
01-09-1199P	Upper Rawhide Wash Floodplain Delineation Study	Rawhide Wash, Tributary 1 to Rawhide Wash, Tributary 2 to Rawhide Wash, Tributary 3 to Rawhide Wash, Tributary 4 to Rawhide Wash	June 5, 2002
01-09-171P	Thomas Road to McDowell Road	Cross Cut Canal	August 1, 2001
01-09-632P	DC Ranch	North Beardsley Wash, South Beardsley Wash, South Beardsley Wash Breakout	August 31, 2001
02-09-196P	Indian Bend Wash	Indian Bend Wash	January 23, 2002
02-09-1084X	Doubletree Ranch Road to Via Linda; Wash B	Wash B, Wash B Tributary	October 24, 2002
02-09-1409X	Floodplain Delineation Study of Andora Hills and Galloway Washes	Galloway Wash, Andora Hills Wash Split 1, Andora Hills Wash Split 2	December 5, 2002

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>City of Scottsdale (Continued)</u>			
03-09-0482P	Arizona Canal Floodplain Redelineation	Arizona Canal	October 23, 2003
04-09-1301P	Carefree Drainage Master Plan	Galloway Wash Middle Branch, Eastern Pima Wash, Unnamed Central Tributary to Cave Creek, Unnamed Tributary to Stagecoach Pass, Windmill Wash, Windmill Wash North Branch, Windmill Wash South Branch	November 24, 2004
05-09-0403X	Arizona Canal Floodplain Redelineation	Arizona Canal	February 4, 2005
<u>City of Surprise</u>			
00-09-083P	Lower El Mirage Wash & Lower El Mirage Wash Tributary Channelization	Lower El Mirage Wash, Lower El Mirage Wash Tributary	January 4, 2002
01-09-973P	Channelization of Reems Road Floodplain - Greenway Road to Hearn Road	Reems Road	November 2, 2001
02-09-165P	Reems Road, Mountain Vista Ranch Development	Reems Road	February 19, 2002
02-09-945P	Agua Fria Floodplain Delineation From Cactus Road to Bell Road	Agua Fria River, Atchison, Topeka and Santa Fe Railroad Channel, West Split Flow Through El Mirage	August 28, 2003
<u>City of Tolleson</u>			
02-09-943P	Target Southwest Distribution Center	Southern Pacific Railroad Ditch	July 17, 2003

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>Town of Youngtown</u>			
03-09-1014X	Agua Fria Floodplain Delineation From Cactus Road to Bell Road	Agua Fria River, Atchison, Topeka and Santa Fe Railroad Channel, West Split Flow Through El Mirage	August 28, 2003
03-09-1272A	Agua Fria Ranch, Lots 1-2, Portion of Section 25, T3N, R1W, G.&S.R.B&M.	Agua Fria River	September 10, 2003
<u>Unincorporated Areas</u>			
00-09-083P	Lower El Mirage Wash & Lower El Mirage Wash Tributary Channelization	Lower El Mirage Wash, Lower El Mirage Wash Tributary	January 4, 2002
01-09-017P	City of Glendale Recycling Facility	Agua Fria River	May 15, 2003
01-09-184P	Zone A Floodplain Delineation Studies/Wickenburg Area	Cemetery Wash, Holly Wash, Little San Domingo Wash, Monarch Wash, Ox Wash, San Domingo Wash, Sols Wash AH4, Tributary to Amir Wash, Tributary to Hartman Wash, Tributary to Little San Domingo Wash, Tributary to Mockingbird Wash, Tributary to Monarch Wash, Tributary to Sols Wash, Tributary to Sols Wash Tributary AH2, Tributary to Sols Wash Tributary AH3, Tributary to Tributary to Sols Wash, Tributary to Wash K, Tub Springs Wash, Turtleback Wash, Wash 3T6R4, Wash 15T6R4, Wash 20T7R4, Wash 28T7R4, Wash G, Yucca Flat Wash	October 15, 2001

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>Unincorporated Areas (Continued)</u>			
01-09-453P	White Tanks Flood Retarding Structure #4 Inlet Channel Improvements	Jackrabbit Trail Wash	October 9, 2001
01-09-1158P	Dreaming Summit	Dale Creek Wash	March 5, 2002
01-09-1164X	Tiger Wash Alluvial Fan Study	Tiger Wash	November 30, 2001
02-09-031P	North Peoria Area Drainage Master Plan	Caterpillar Tank Wash, Tributary1 to Unnamed Wash 1, Tributary 1 to Unnamed Wash 2, Tributary 2 to Unnamed Wash 2, Tributary 1 to Unnamed Wash 7, Twin Buttes Wash, Unnamed Wash 1, Unnamed Wash 2, Unnamed Wash 3, Unnamed Wash 4, Unnamed Wash 5, Unnamed Wash 6, Unnamed Wash 7, Unnamed Wash 8, Unnamed Wash 9	May 15, 2002
02-09-068P	Tonto Verde East Extension	Wash 10, Wash 11	August 21, 2002
02-09-241X	Cave Creek Floodplain Revision	Cave Creek	April 3, 2002
02-09-309X	Cave Creek Morning Star Rd, Tonto National Forest, FCD 1999C048-5	Cave Creek	January 3, 2002
02-09-386P	White Tank Fan, Site 36	White Tank Alluvial Fan	September 16, 2002
02-09-807P	Gila Bend ADMP/Floodplain Delineation Study	Citrus Valley Wash, Quilotosa Wash, Quilotosa Wash (East Split), Saucedo Wash, West Quilotosa Wash	November 13, 2003
02-09-857P	Gila Bend ADMP/Floodplain Delineation Study	Bender Wash, Bender Wash North Tributary, Evans Wash, Hacker Wash, Hacker Wash Diversion, I-8 Wash East, Pioneer Cemetery Wash, Sand Tank Wash, Scott Avenue Wash	November 13, 2003
02-09-858P	Gila Bend ADMP/Floodplain Delineation Study	Unnamed Wash No. 1 Unnamed Wash No. 2	October 9, 2003

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>Unincorporated Areas (Continued)</u>			
02-09-945P	Agua Fria Floodplain Delineation From Cactus Road to Bell Road	Agua Fria River, West Split Flow Through El Mirage, Atchison, Topeka and Santa Fe (AT&SF) Railroad Channel	August 28, 2003
02-09-1125P	Wigwam Creek Phase 1	Airline Canal	July 1, 2003
02-09-1138P	Approximate Zone A Floodplain Delineation of Watershed UU (Upper Agua Fria)	Washes T6NR1ES4, T7NR1ES34, T7NR1ES35, T7NR1ES26-1, T71ES26-2, T7NR1ES26-2A, T7NR1ES26-2B, T7NR1ES26-3	October 17, 2002
02-09-1240P	New River Above I-17 Floodplain Delineation Study	New River, Black Wash	November 13, 2003
03-09-0302P	Approximate Zone A Floodplain Delineation of Watershed "UU" (Upper Agua Fria) FCD 2000C020	Washes 7N2ES7, 7N2ES6S, 7N2ES6N, 7N2ES7N T1, 8N2ES31, 8N2ES31 T1, 8N2ES31 T2, 8N2ES31	April 24, 2003
03-09-0315P	Padelford Wash - From Central Arizona Project Canal to State Route 74	Padelford Wash, Padelford Wash Split 1, Padelford Wash Split 2, Padelford Wash Split 3, Padelford Wash Split 4, Padelford Wash Split 5, Padelford Wash Tributary A, Padelford Wash Tributary B, Padelford Wash Tributary C	March 25, 2005

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>Unincorporated Areas (Continued)</u>			
03-09-1020P	Approximate Floodplain Delineation of Watershed "00"	Washes T2-R5-S2, T3-R5-S1, T4-R4-S30, T5-R4-S3, T5-R4-S7-A, T5-R4-S7-B, T5-R4-S20-A, T5-R4-S20B, T5-R4-S21, T6-R4-S27, T6-R4-S33, T5-R4-S19, T5-R5-S13-A, T5-R5-S13-B, T5-R5-S14, T5-R5-S25-A, T5-R5-S25-B, T5-R5-S25-C, T6-R5-S36, T3-R5-S33, T4-R5-S33, T5-R5-S34-C T5-R5-S35, T5-R5-S34-A, T5-R5-S34-B, T5-R5-S33, T4-R6-S1, T4-R5-S7-A, T4-R5-S7-B, T4-R6-S2, T5-R6-S30, T5-R6-S33-A, T5-R6-S33-B	May 7, 2004
03-09-1190P	Aquila ADMP	Washes T7-R8-S1A, T7-R8-S1B, T7-R8-S1C, T7-R8-S1D, T7-R8-S1E, T7-R8-S1F, T7-R8-S2, T7-R8-S7, T7-R8-S9, T7-R8-S10, T7-R8-S18, T7-R9-S12, T7-R9-S4, T7-R9-S17, T7-R10-S13, T7-R8-S30, T7-R9-S22, T7-R9-S25A, T7-R9-S25B, T7-R9-S25C, T7-R9-S25D, T7-R9-S25E, Grass Wash	October 12, 2004
03-09-1538P	Wigwam Creek Phases 2 & 2B	E1 Mirage Channel, Greenbelt Channel, Airline Canal	June 14, 2004

Table 7. Letters of Map Change (Continued)

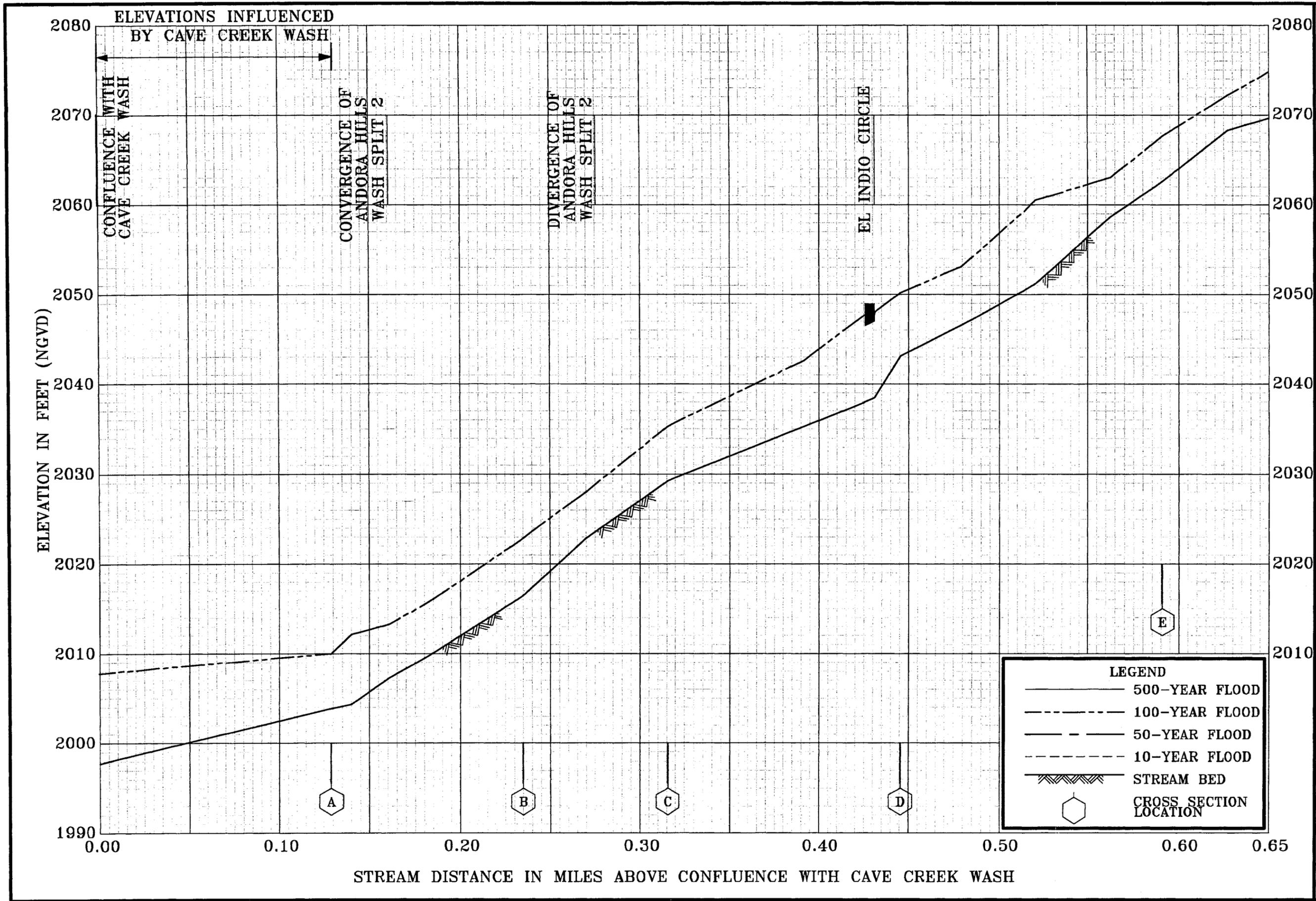
<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>Unincorporated Areas (Continued)</u>			
03-09-1312P	Approximate Zone A Floodplain Delineation Study of Upper Agua Fria River, Watersheds 3 & 4	Moores Gulch, Moores Gulch Tributary 1, Moores Gulch Tributary 2, Moores Gulch Tributary 3, Moores Gulch Tributary 4, Moores Gulch Tributary 5, Moores Gulch Tributary 6, Little Squaw Creek, Little Squaw Creek Tributary 1, Little Squaw Creek Tributary 2, Little Squaw Creek Tributary 3, Little Squaw Creek Tributary 4, Little Squaw Creek Tributary 5, Wash 8N2ES16	January 19, 2004

Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>Unincorporated Areas (Continued)</u>			
03-09-1562P	Luke Wash Watershed (Watershed "PP")	Washes T2N-R5W-S04, T3N-R5W-S20, T3N-R5W-S21N, T3N-R5W-S21S, T3N-R5W-S28N, T3N-R5W-S28S, T1N-R5W-S04, T1N-R5W-S10, T1N-R5W-S15, T1N-R5W-S22, T2N-R5W-S05E, T2N-R5W-S05W, T2N-R5W-S21, T2N-R5W-S27N, T2N-R5W-S27S, T2N-R5W-S33E, T2N-R5W-S33W, T3N-R5W-S32E, T1N-R5W-S30, T1N-R5W-S32, T1N-R6W-S05 (Dickey Wash South), T1N-R6W-S11, T1N-R6W-S12, T1S-R5W-S17, T1S-R5W-S32, T1S-R6W-S13 (Phillips Wash South), T2N-R5W-S08, T2N-R5W-S19, T2N-R5W-S31 (Dickey Wash North), T2N-R5W-S31W (Phillips Wash North), T2N-R5W-S32, T2N-R6W-S35, T2N-R6W-S36, T2N-R6W-S36W, T3N-R5W-S30, T3N-R5W-S31, T1S-R5W-S08, T1S-R5W-S09, T1S-R5W-S09W, T1N-R5W-S28W, T1N-R5W-S28E, T1N-R5W-S33W, T1N-R5W-S33N, T1N-R5W-S33E, T1S-R5W-S22N, T1S-R5W-S16, T1S-R5W-S22S, T1S-R5W-S29, T1S-R5W-S29E, T1S-R5W-S29W	May 7, 2004
03-09-1653P	Loop 303 White Tanks ADMP Update Floodplain Delineations	Bullard Wash, West Tributary of Bullard Wash	December 30, 2004
04-09-0311P	Channelization of Southern Pacific Railroad Floodplain Along Glenhurst Project	Southern Pacific Railroad Ditch	September 23, 2004
04-09-0318P	Loop 303 White Tanks ADMP Update Floodplain Delineations	Camelback Wash	December 30, 2004

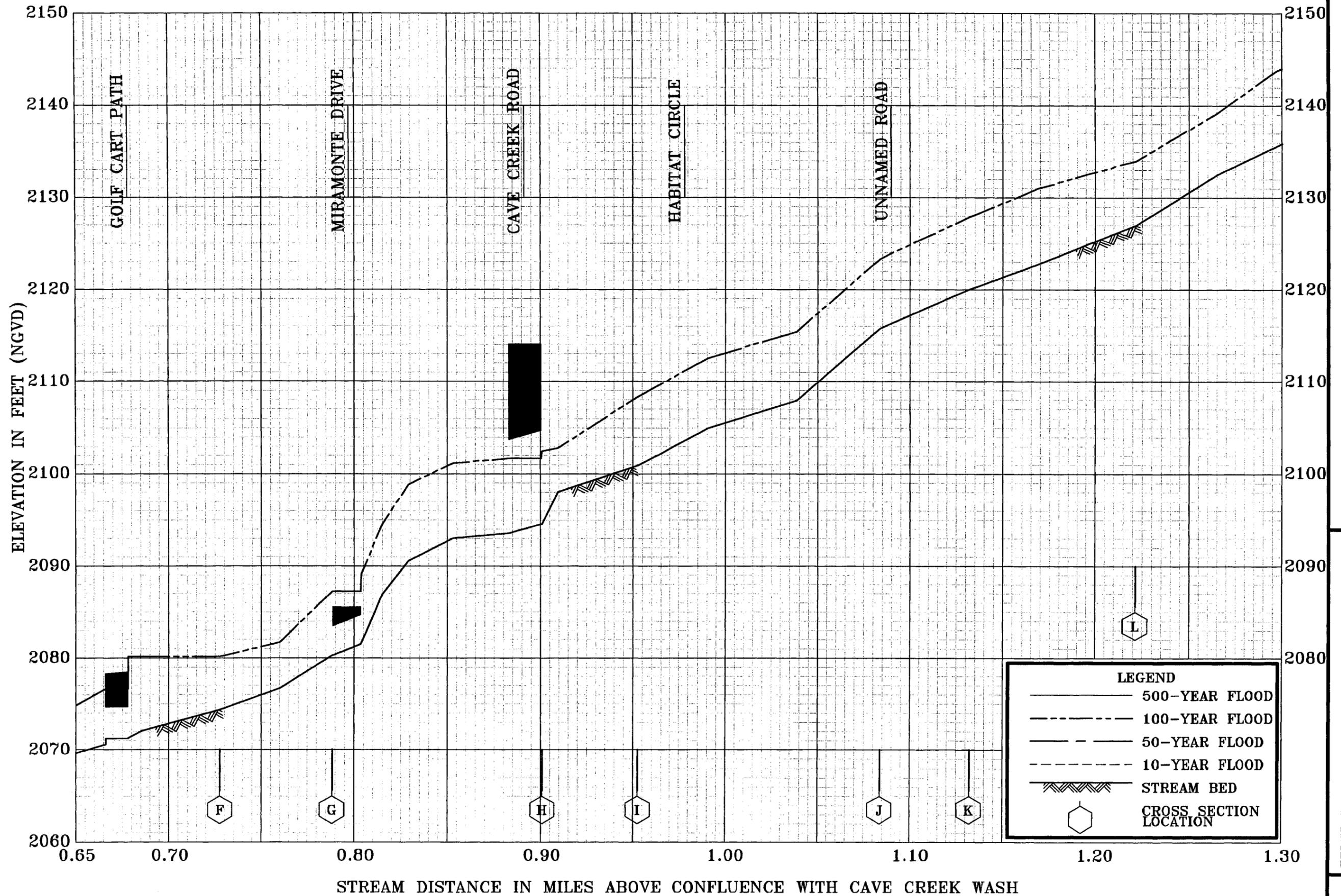
Table 7. Letters of Map Change (Continued)

<u>Community and Case No.</u>	<u>Project</u>	<u>Flooding Source</u>	<u>Effective Date</u>
<u>Unincorporated Areas (Continued)</u>			
04-09-0552P	CW Ranch	Southern Pacific Railroad Ditch	December 21, 2004
04-09-0659P	Watershed "00" Zone A Study - Coyote Wash, and Jackrabbit Wash Tributaries	Washes T3-R6-S13, T4-R6-S27, T4-R6-S35, T3-R5-S12, Beer Bottle, T4-R6-S22, T4-R7-S11, T4-R7-S13, T4-R7-S22, T5-R7-S8, T5-R7-S9, T5-R7-S10, T5-R8-S13, T5-R8-S28-A, T5-R8-S34-A, T5-R8-S34-B, T4-R8-S3, T4-R8-S4, T4-R6-S5, T4-R6-S7, T4-R6-S8, Woodchopper, T5-R6-S31, T5-R7-S23-A, T5-R7-S23-B, T5-R8-S36-A, Dead Horse, T5-R7-S5, T5-R7-S11, T6-R7-S29, T5-R8-S2, T5-R8-S10-A, T5-R8-S10-B, T6-R8-S34, T6-R8-S35-A, T6-R8-S35-B	
04-09-0756P	Approximate Floodplain Delineation of Watershed "00"	Washes T5-R5-S25B, T4-R5-S33, T5-R5-S18, T5-R5-S29A, T5-R5-S29B, T5-R5-S33, T5-R5-S8, T5-R5-S21-A, T5-R5-S21-B, T5-R5-S34-A, T5-R5-S34-B, T5-R5-S34-C, T5-R5-S16, T5-R5-S17, T6-R5-S21, T5-R5-S10-A, T5-R5-S23-A, T5-R5-S23-B, T5-R5-S35, T5-R5-S14, T6-R5-S35, T5-R5-S31, T6-R6-S25, T4-R6-S1, T4-R5-S7-A, T4-R5-S7-B, T5-R6-S18, T5-R6-S12-A, T5-R6-S-12-B, T5-R6-S13, T6-R6-S22, T5-R7-S14, T6-R7-S34, T5-R6-S30, T5-R6-S33-A, T5-R6-S33-B, Jimmie Wash	February 18, 2005
			October 8, 2004



FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

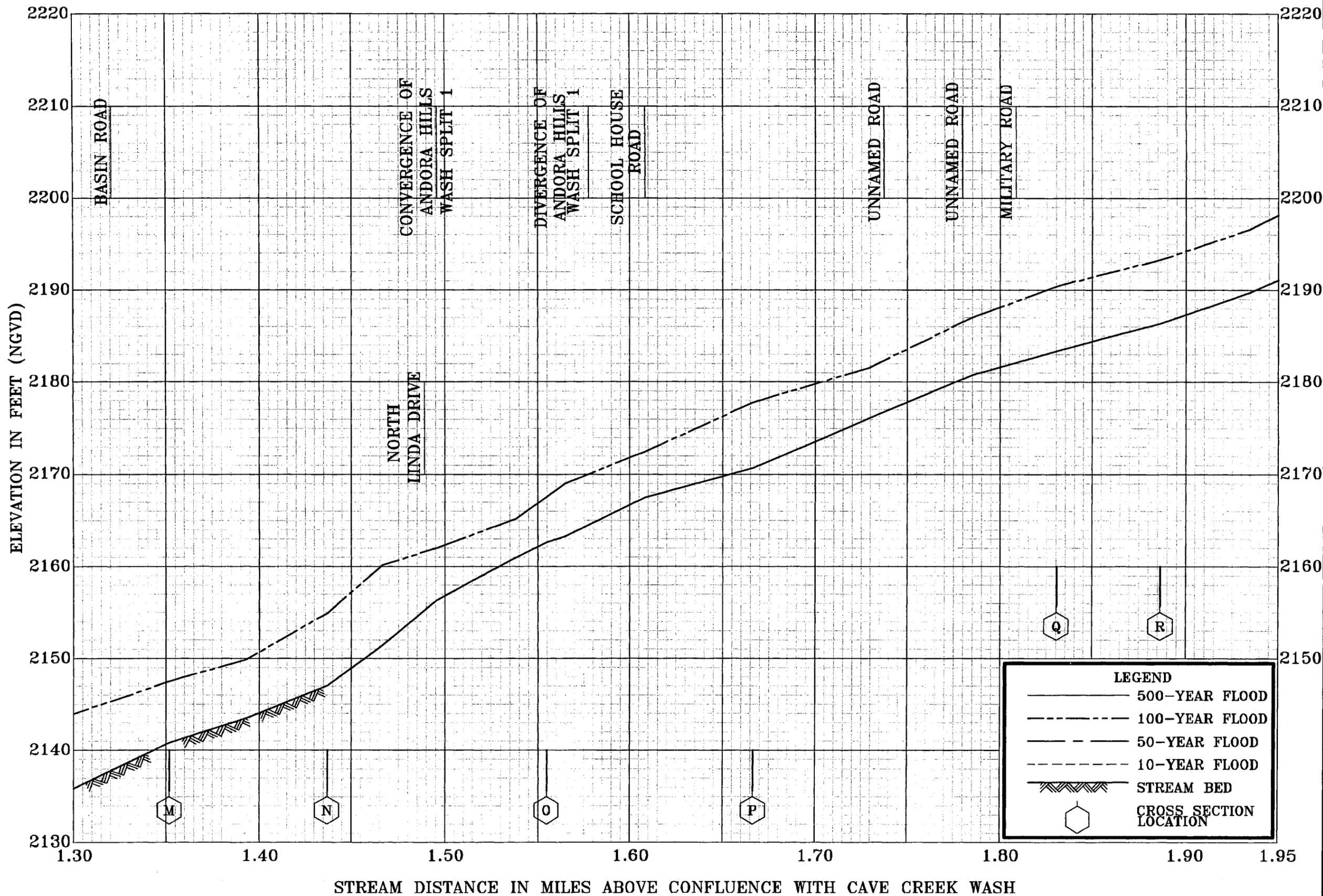


FLOOD PROFILES

ANDORA HILLS WASH

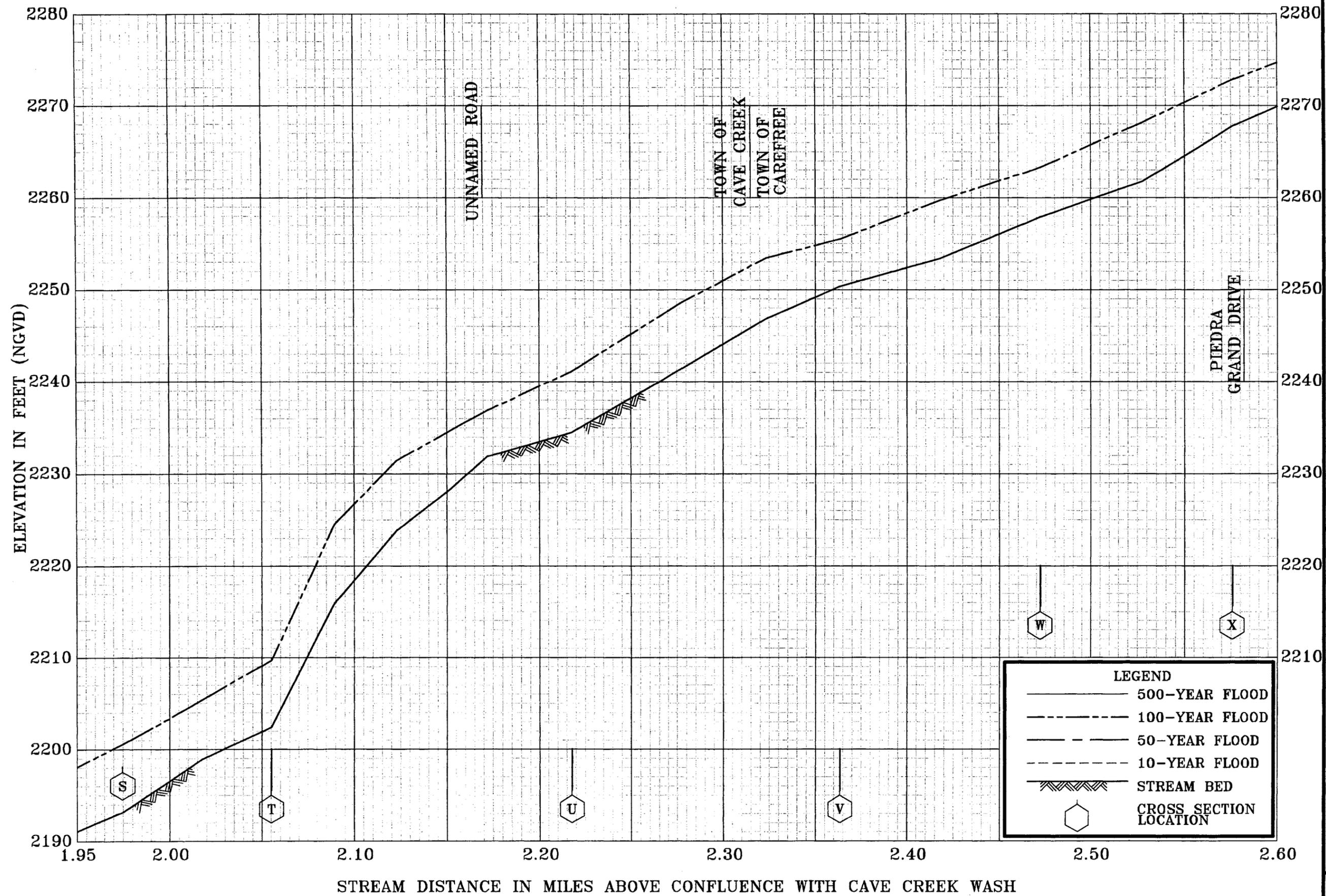
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MARICOPA COUNTY, AZ
AND INCORPORATED AREAS



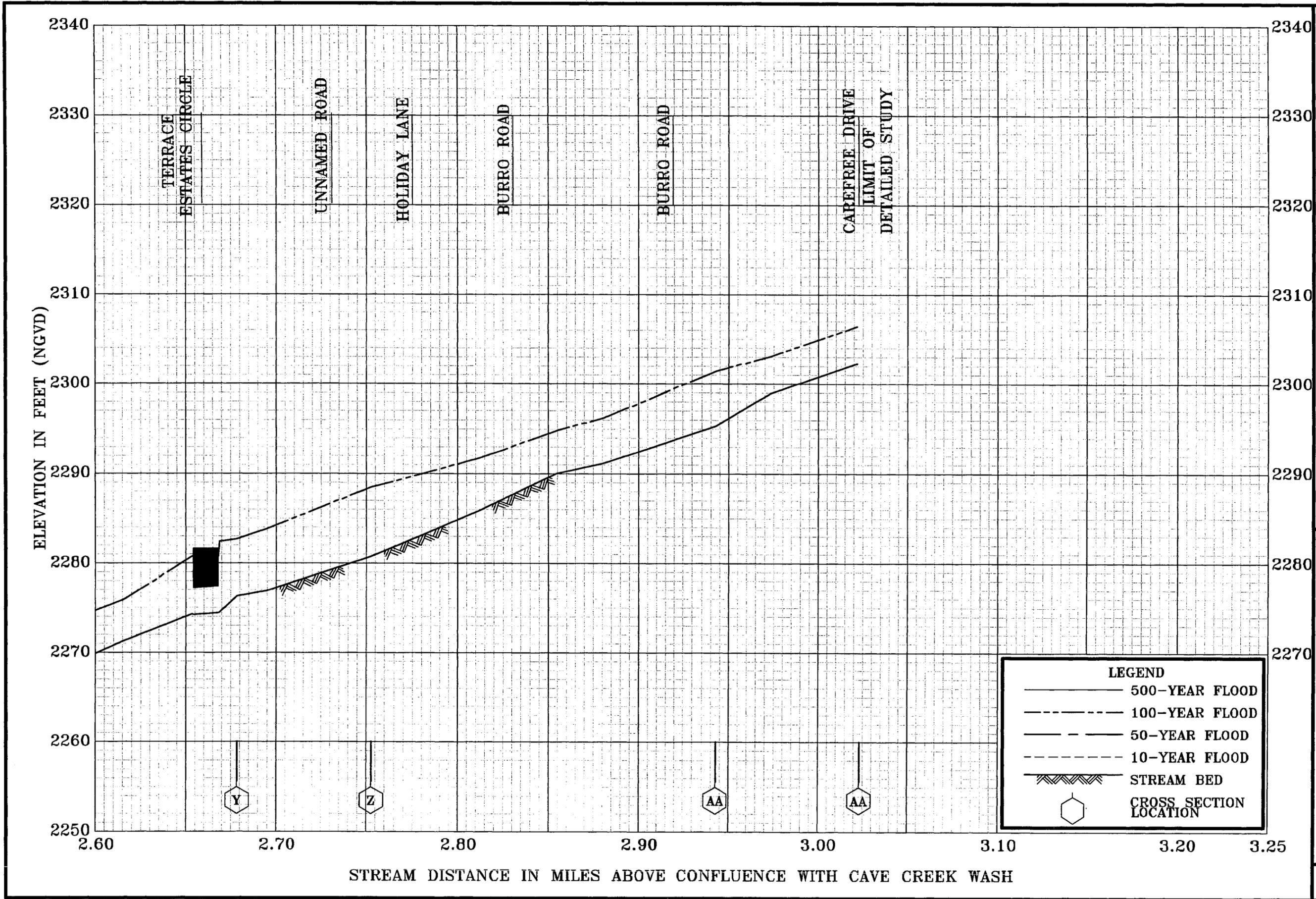
FLOOD PROFILES
ANDORA HILLS WASH

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MARICOPA COUNTY, AZ
AND INCORPORATED AREAS



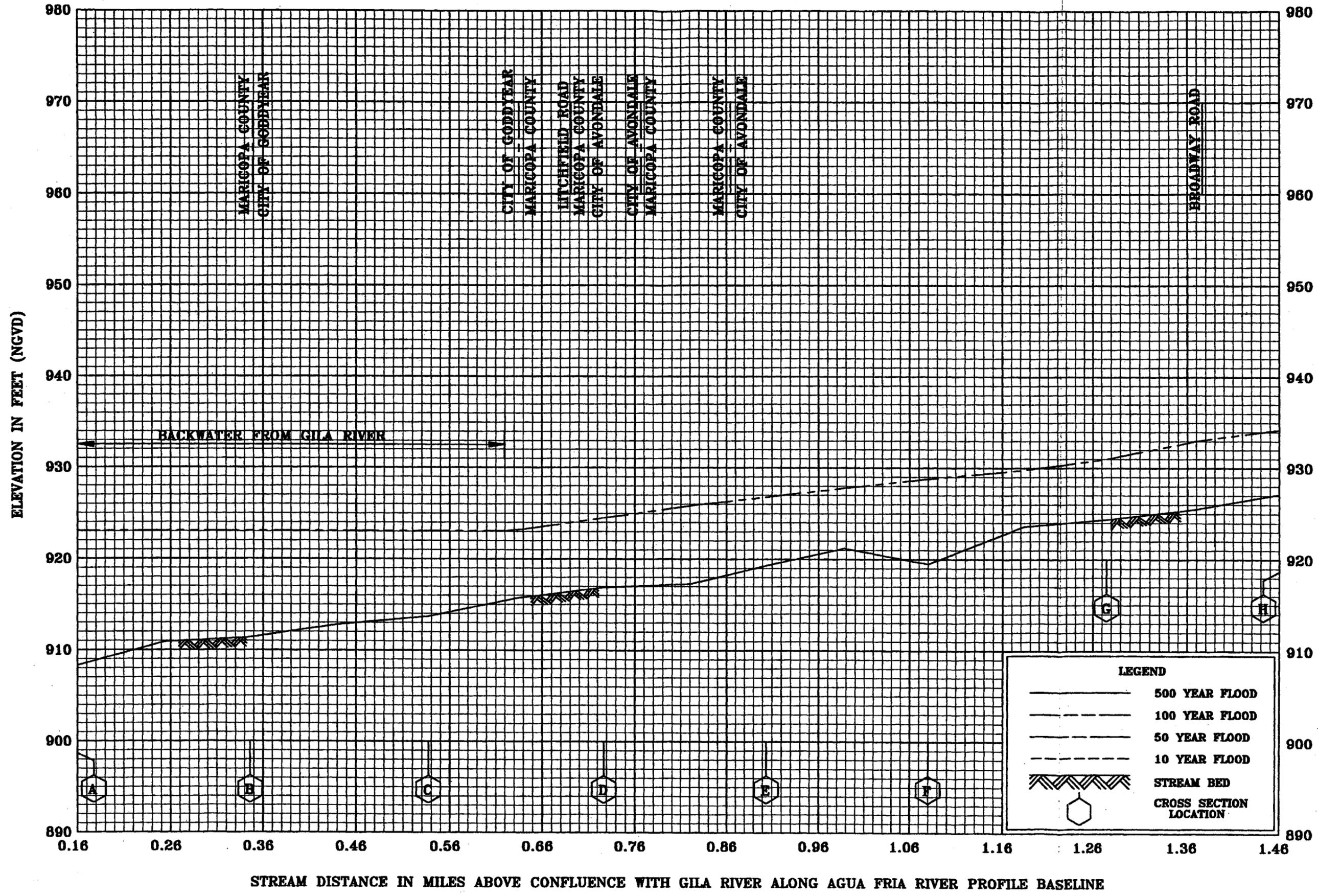
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ANDORA HILLS WASH

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ANDORA HILLS WASH

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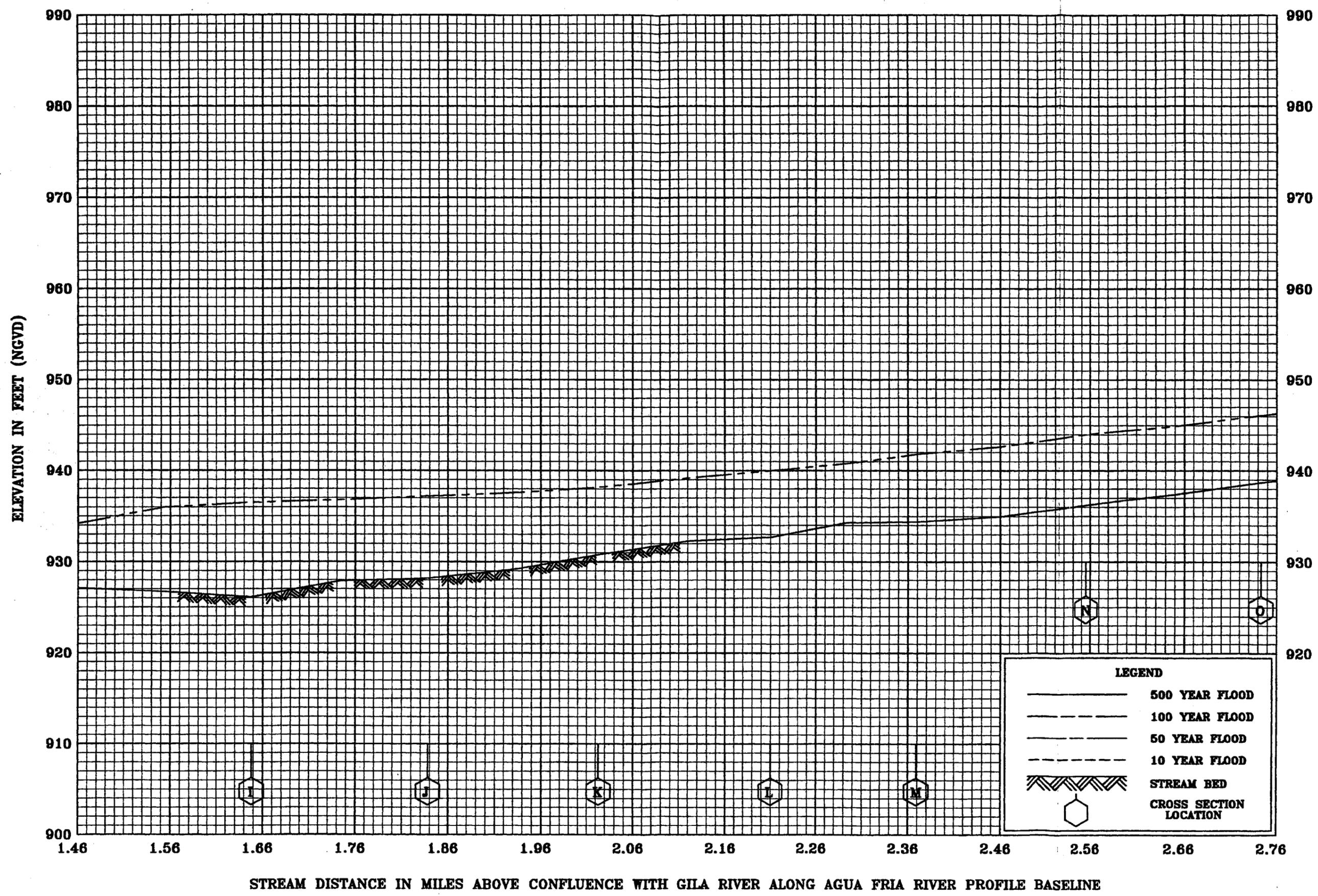
AGUA FRIA RIVER

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MARICOPA COUNTY, AZ

AND INCORPORATED AREAS

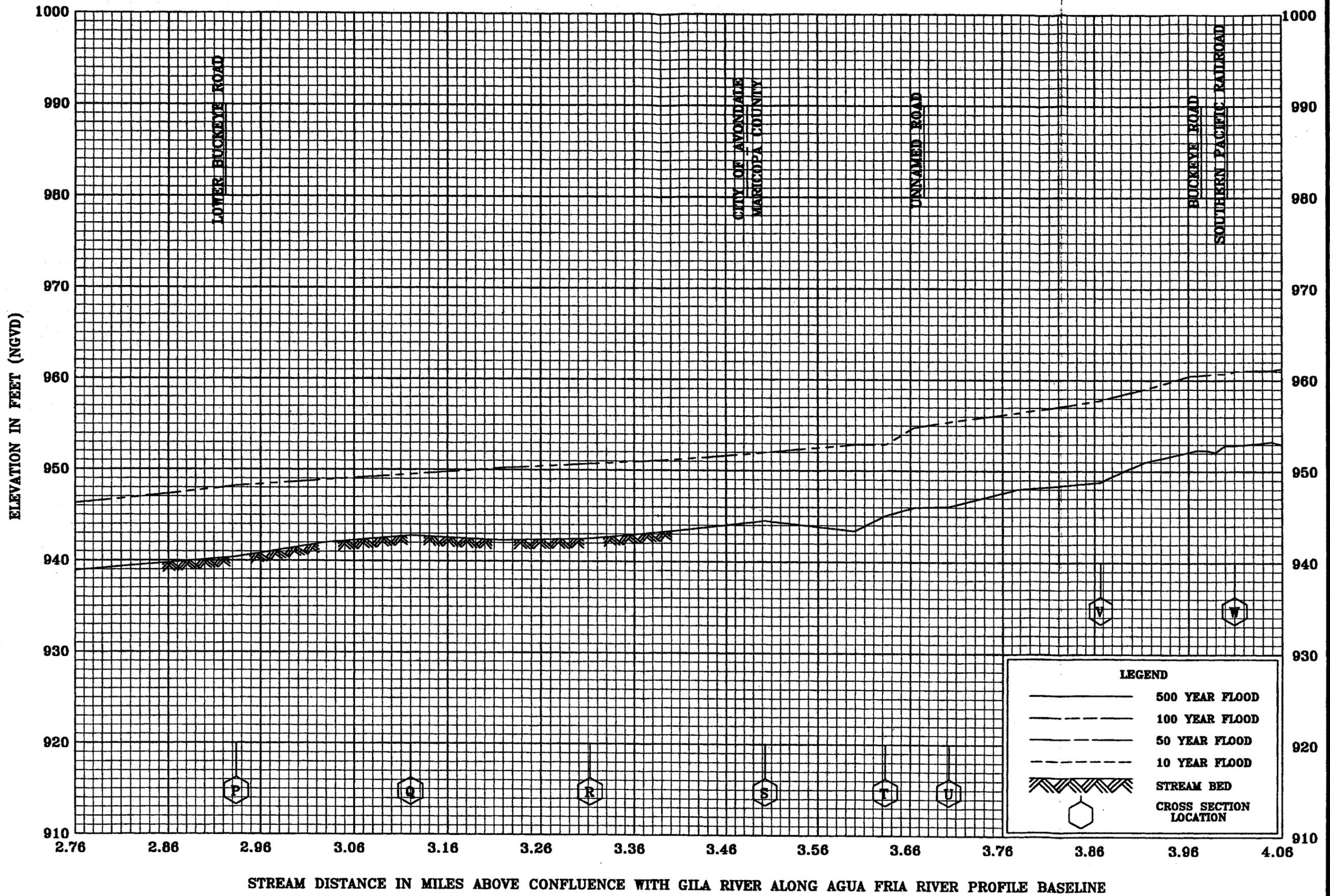
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FLOOD PROFILES
AGUA FRIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

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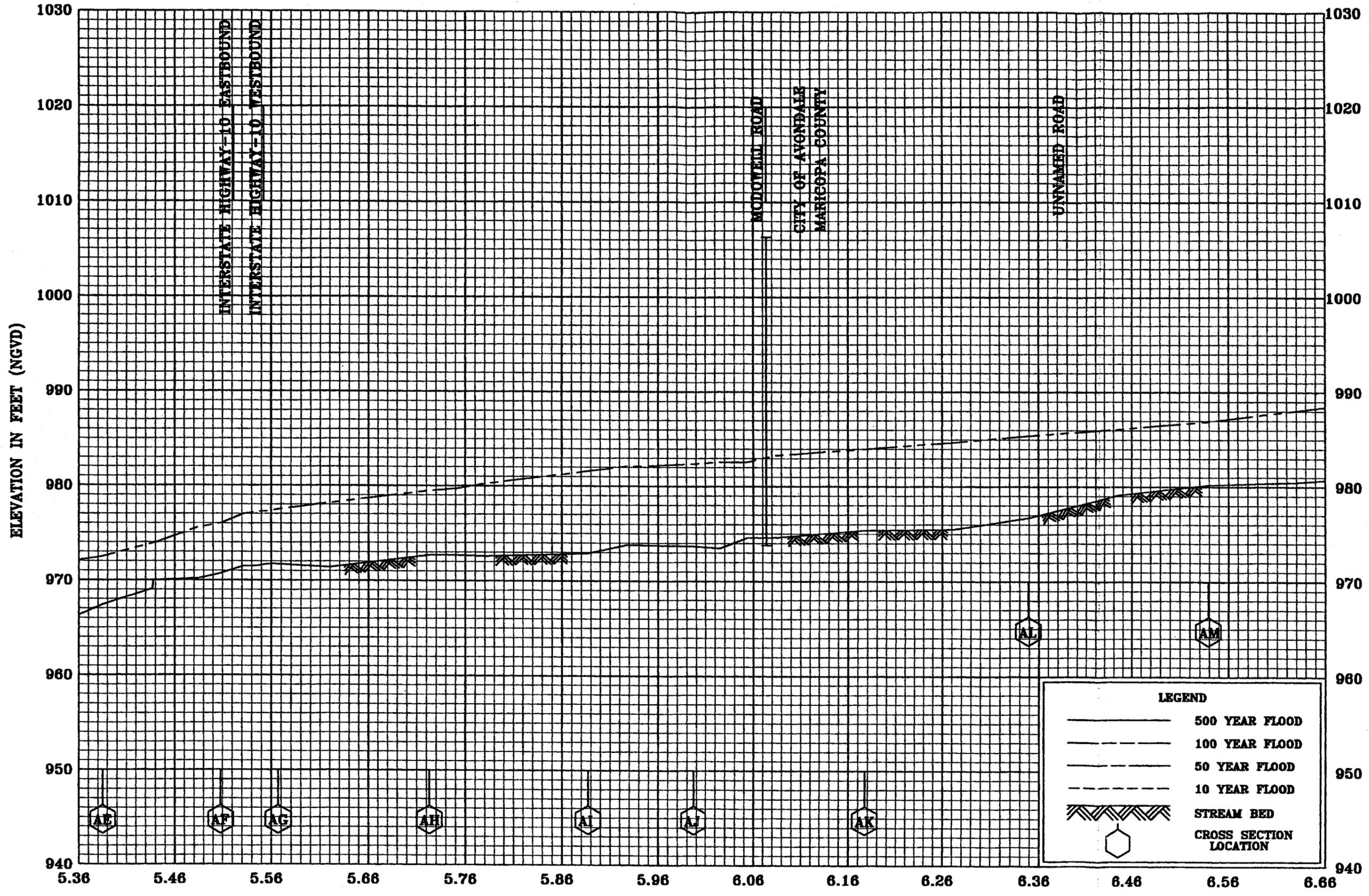
FLOOD PROFILES

AGUA FRIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ

AND INCORPORATED AREAS



STREAM DISTANCE IN MILES ABOVE CONFLUENCE WITH GILA RIVER ALONG AGUA FRIA RIVER PROFILE BASELINE

LEGEND	
	500 YEAR FLOOD
	100 YEAR FLOOD
	50 YEAR FLOOD
	10 YEAR FLOOD
	STREAM BED
	CROSS SECTION LOCATION

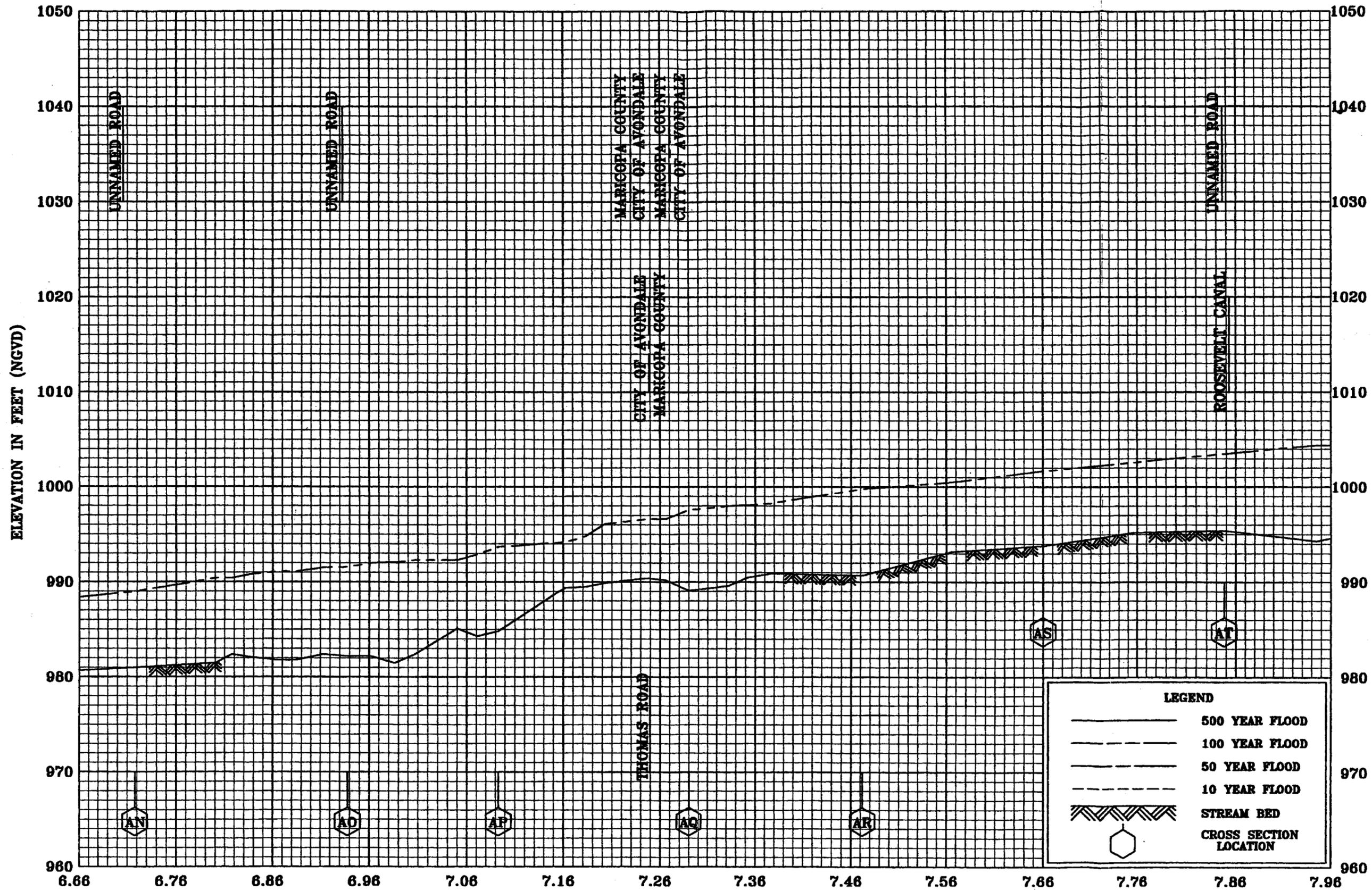
FLOOD PROFILES

AGUA FRIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ

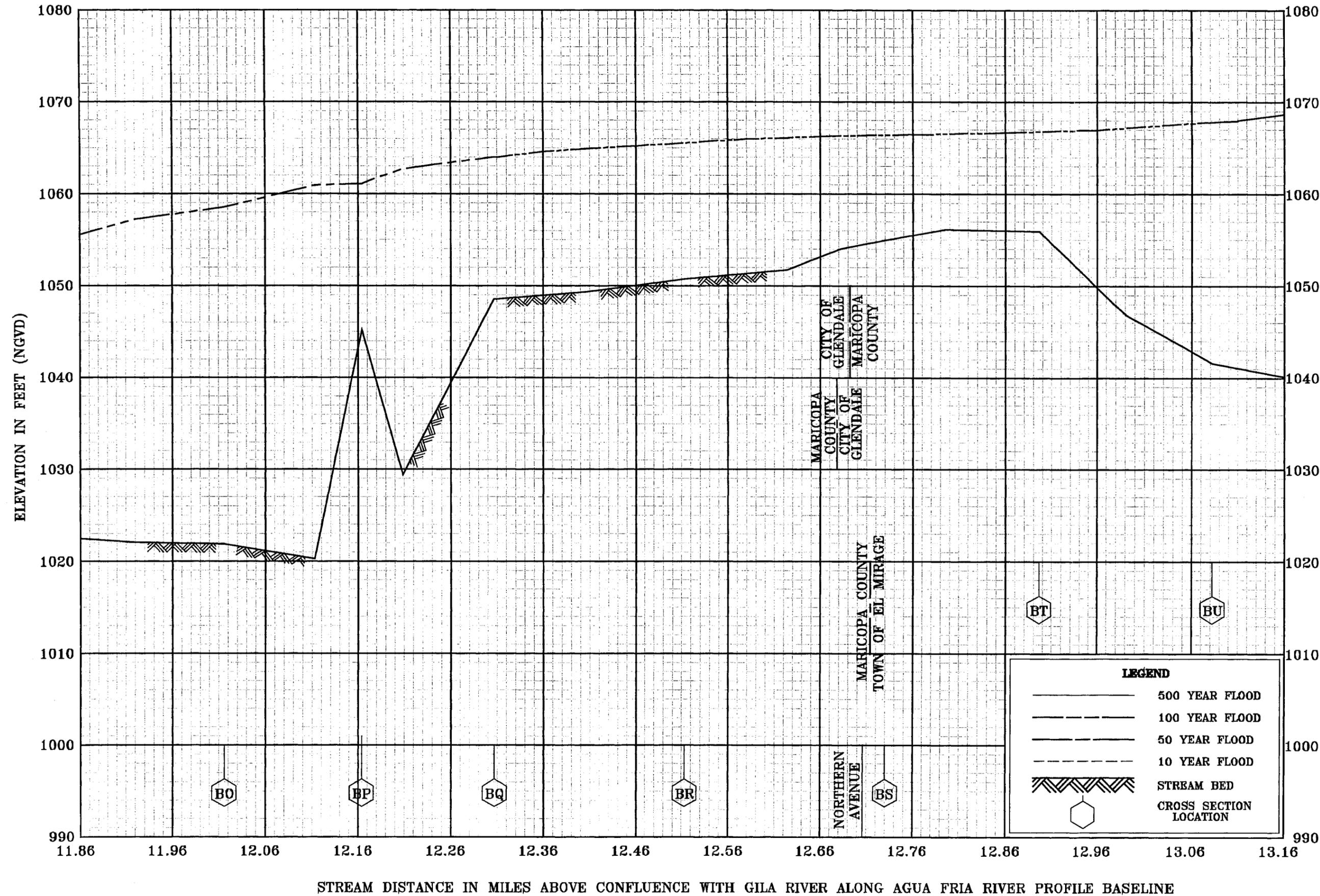
AND INCORPORATED AREAS



STREAM DISTANCE IN MILES ABOVE CONFLUENCE WITH GILA RIVER ALONG AGUA FRIA RIVER PROFILE BASELINE

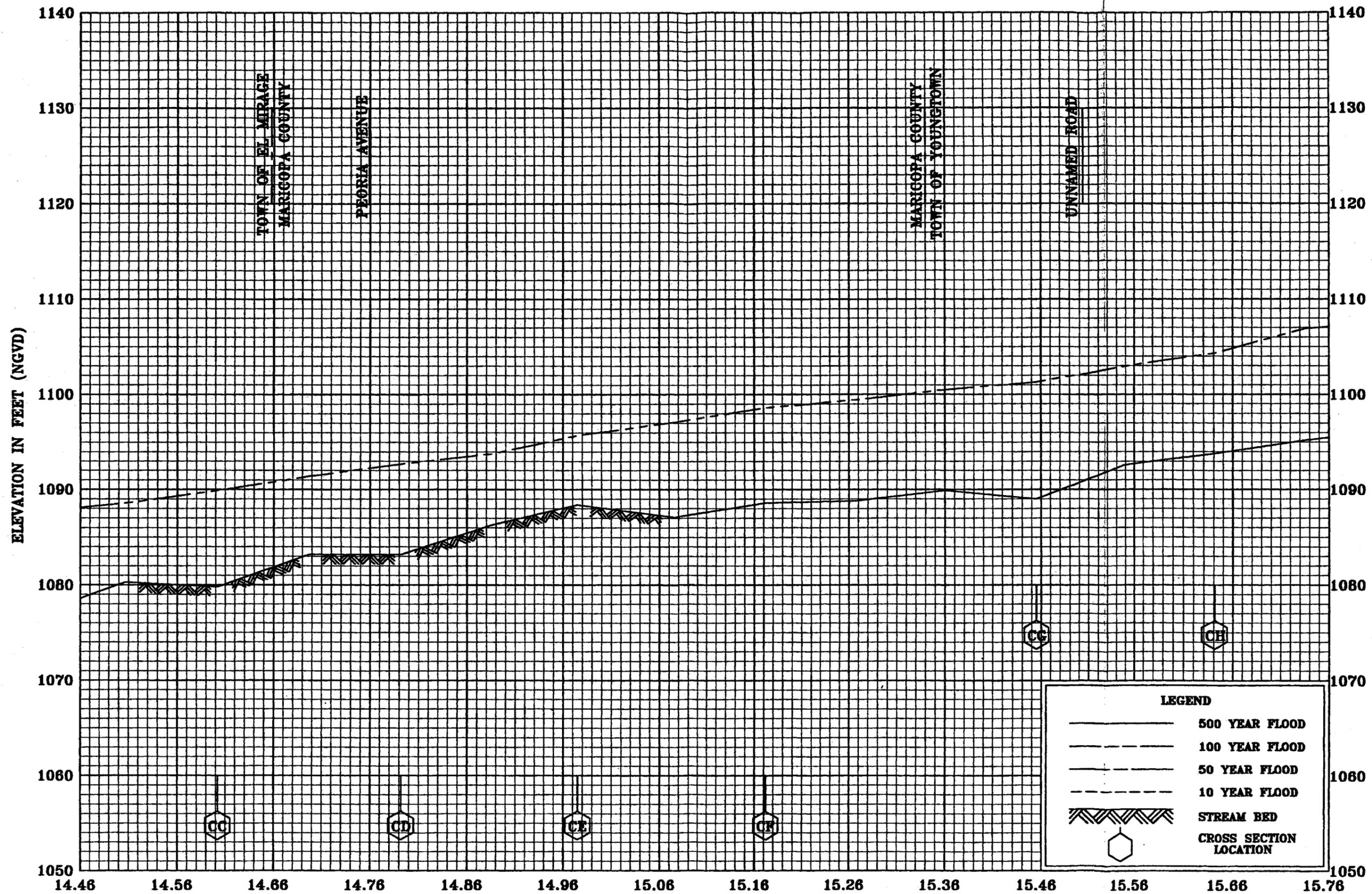
FLOOD PROFILES
 AGUA FRIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
 MARICOPA COUNTY, AZ
 AND INCORPORATED AREAS



FLOOD PROFILES
AGUA FRIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
 MARICOPA COUNTY, AZ
 AND INCORPORATED AREAS

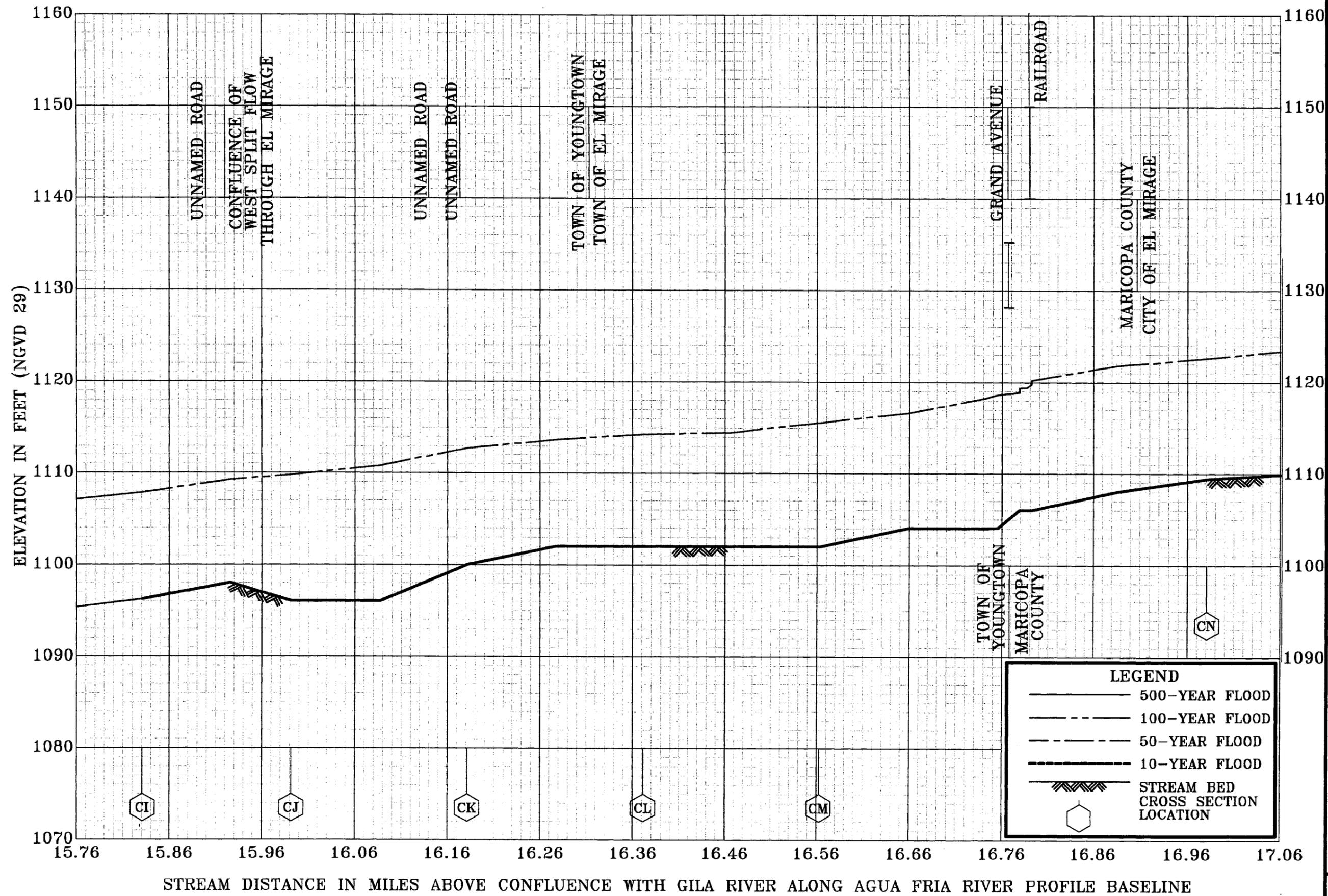


STREAM DISTANCE IN MILES ABOVE CONFLUENCE WITH GILA RIVER ALONG AGUA FRIA RIVER PROFILE BASELINE

LEGEND	
	500 YEAR FLOOD
	100 YEAR FLOOD
	50 YEAR FLOOD
	10 YEAR FLOOD
	STREAM BED
	CROSS SECTION LOCATION

FLOOD PROFILES
AGUA FRIA RIVER

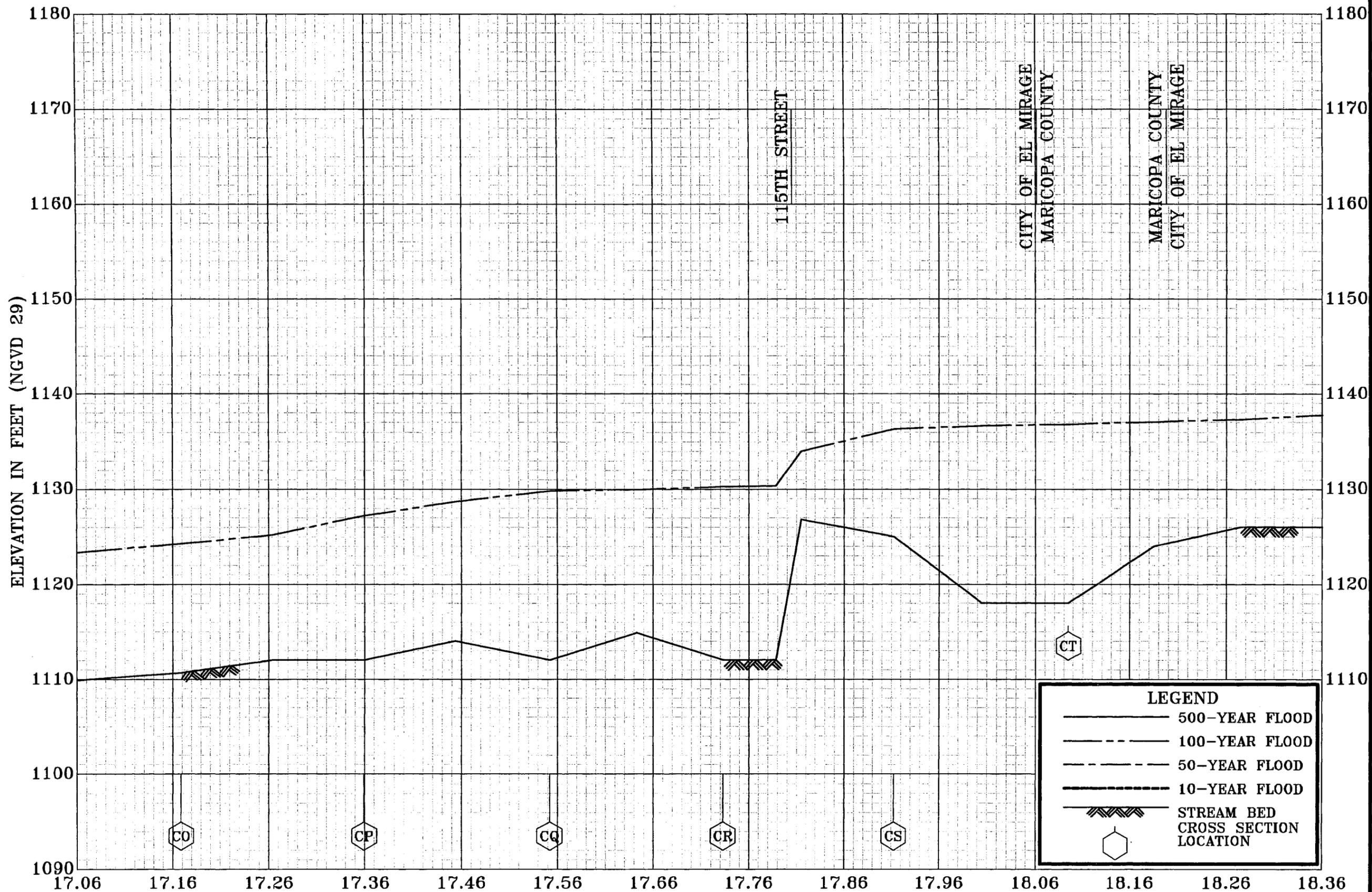
FEDERAL EMERGENCY MANAGEMENT AGENCY
MARIKOPA COUNTY, AZ
AND INCORPORATED AREAS



STREAM DISTANCE IN MILES ABOVE CONFLUENCE WITH GILA RIVER ALONG AGUA FRIA RIVER PROFILE BASELINE

FLOOD PROFILES
AGUA FRIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
MARICOPA COUNTY, AZ
AND INCORPORATED AREAS



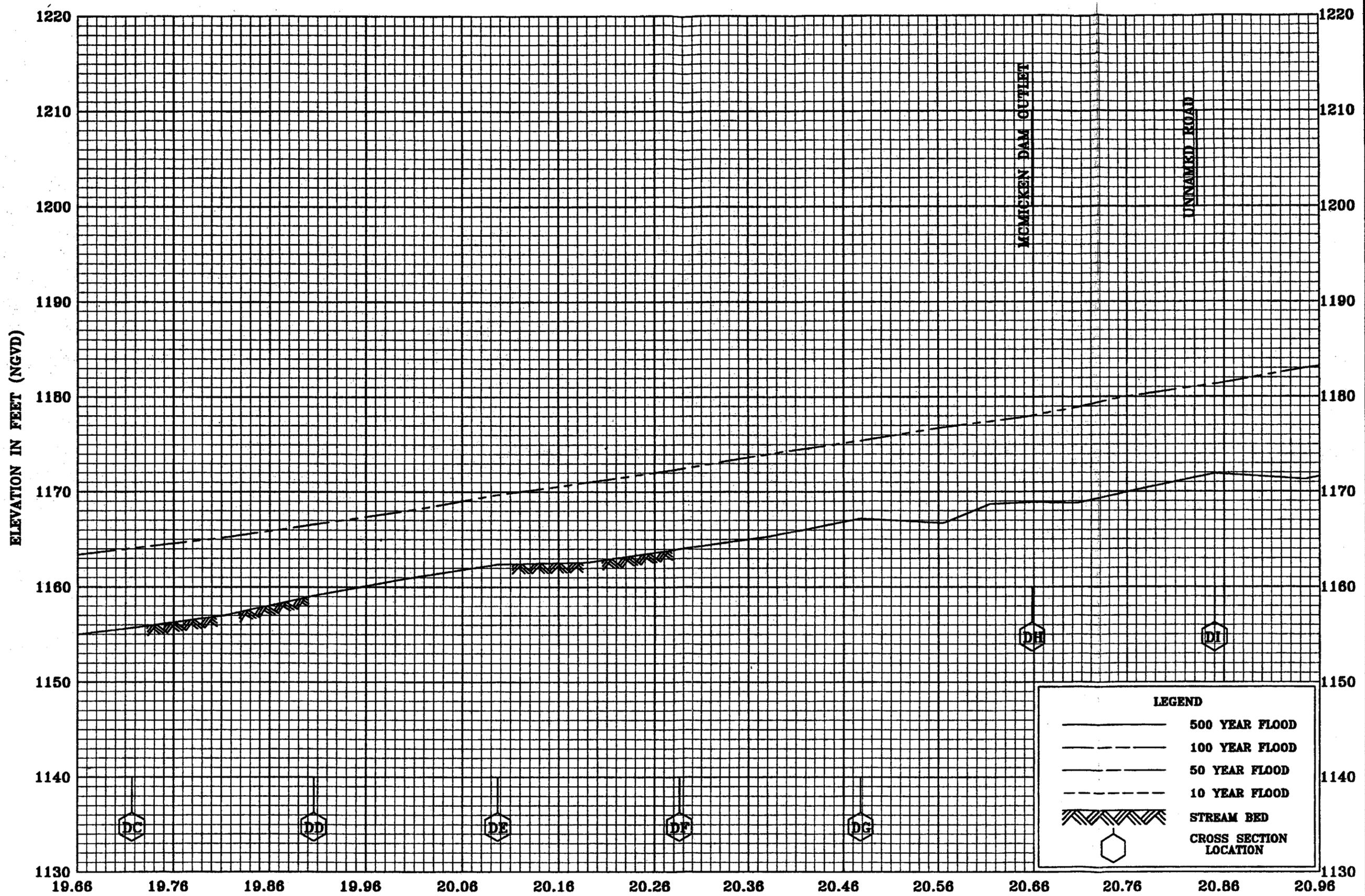
STREAM DISTANCE IN MILES ABOVE CONFLUENCE WITH GILA RIVER ALONG AGUA FRIA RIVER PROFILE BASELINE

FLOOD PROFILES

AGUA FRIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

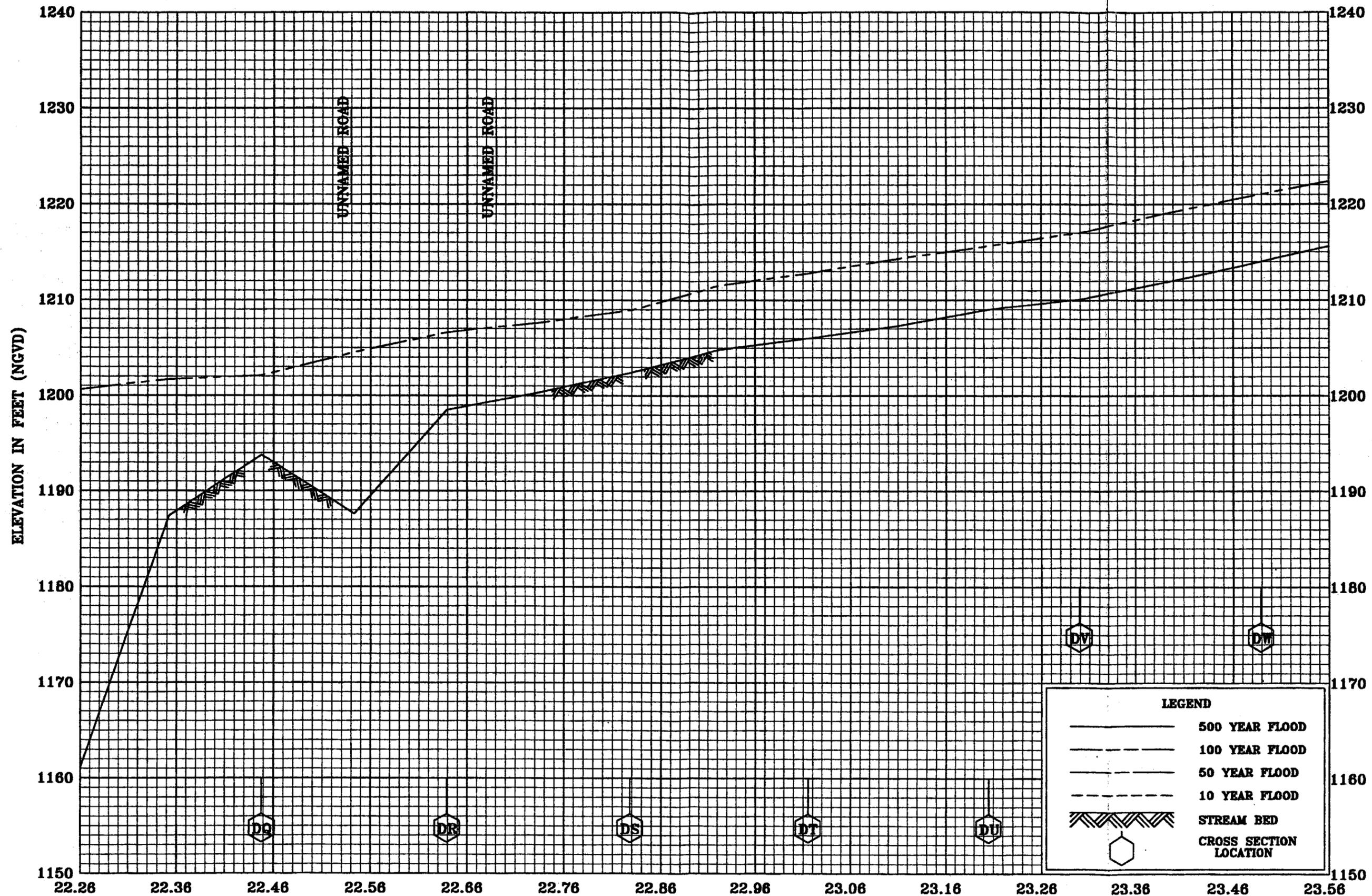


STREAM DISTANCE IN MILES ABOVE CONFLUENCE WITH GILA RIVER ALONG AGUA FRIA RIVER PROFILE BASELINE

LEGEND	
	500 YEAR FLOOD
	100 YEAR FLOOD
	50 YEAR FLOOD
	10 YEAR FLOOD
	STREAM BED
	CROSS SECTION LOCATION

FLOOD PROFILES
AGUA FRIA RIVER

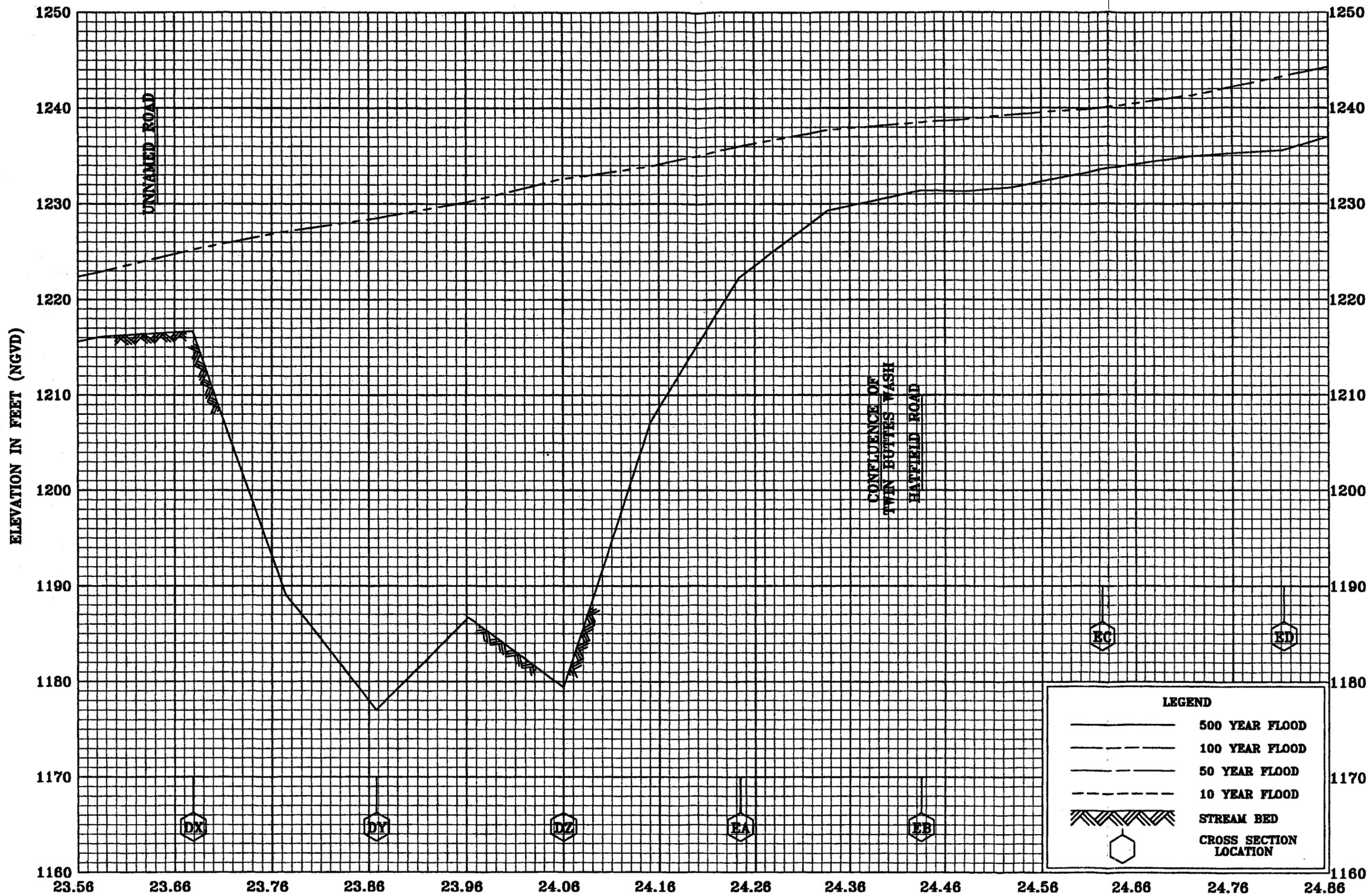
FEDERAL EMERGENCY MANAGEMENT AGENCY
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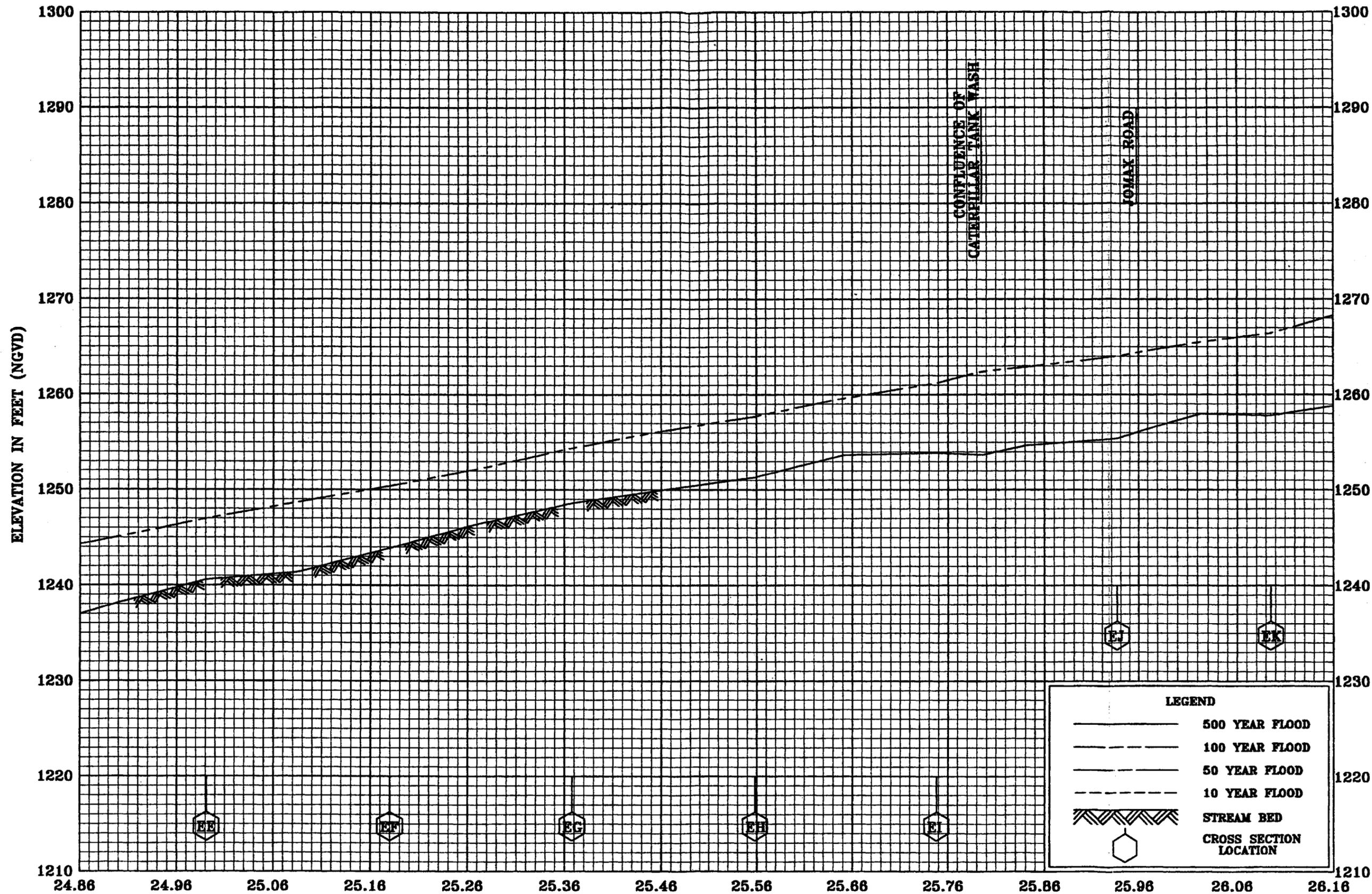
FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ

AND INCORPORATED AREAS

FLOOD PROFILES

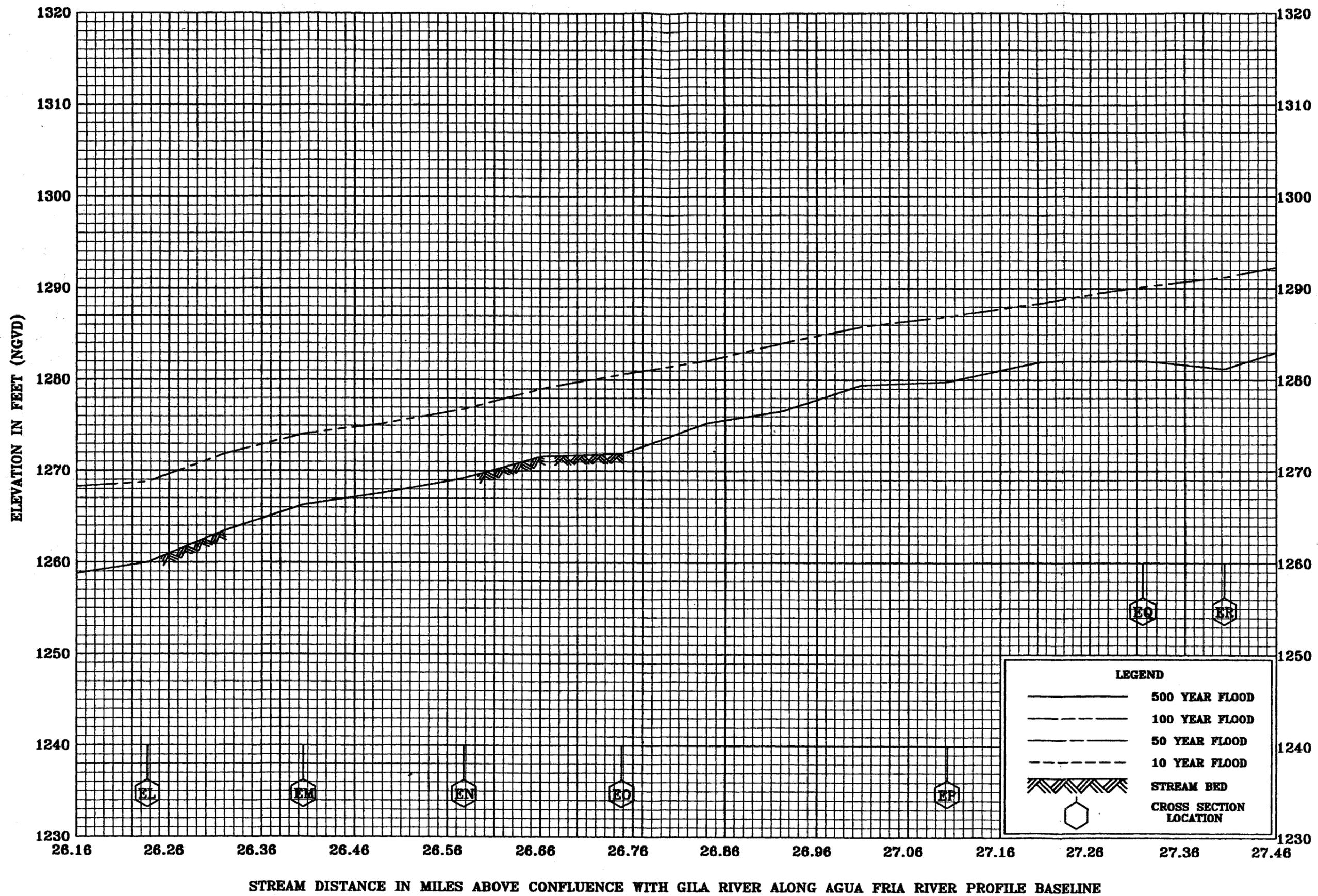
AGUA FRIA RIVER



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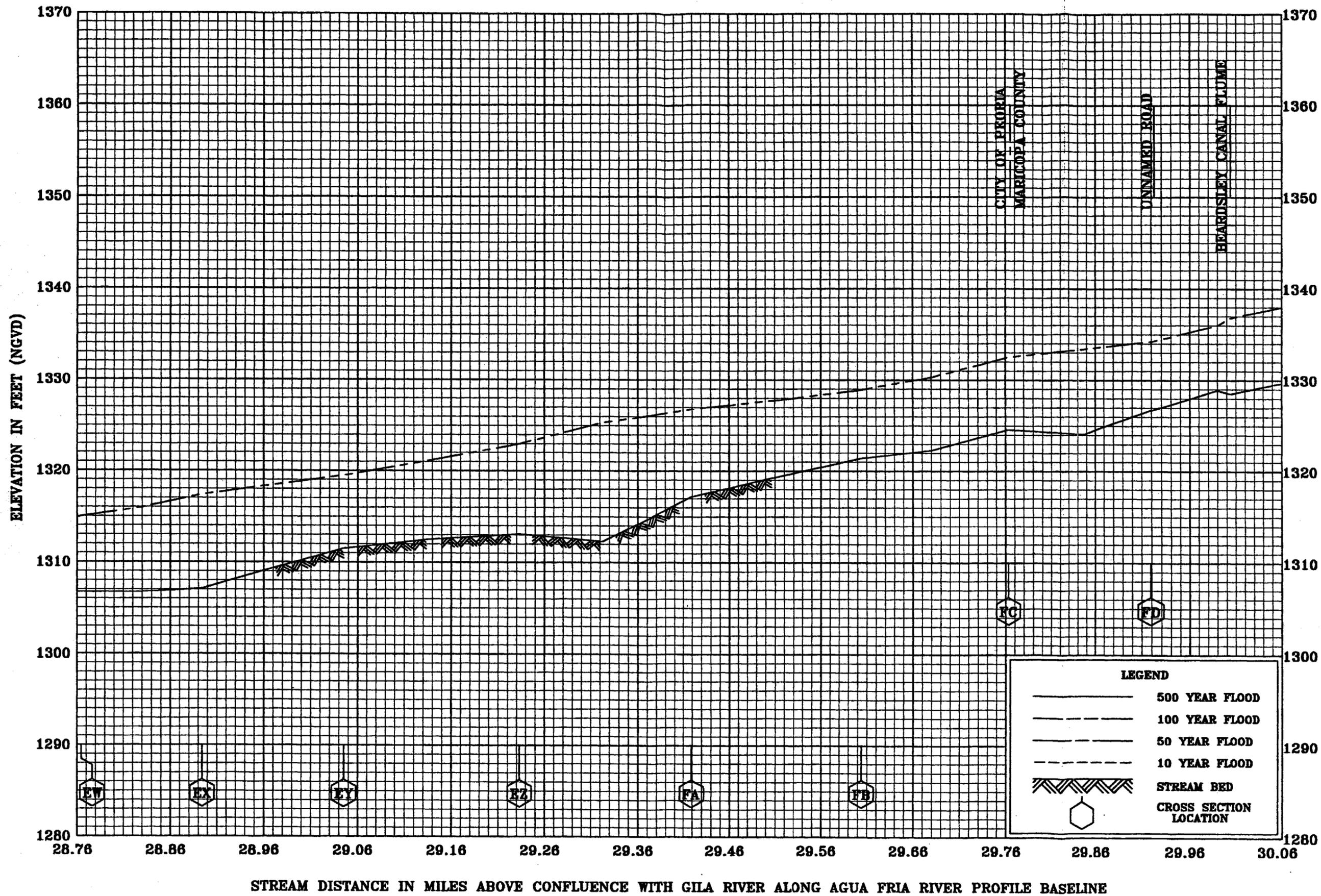
FLOOD PROFILES
 AGUA FRIA RIVER

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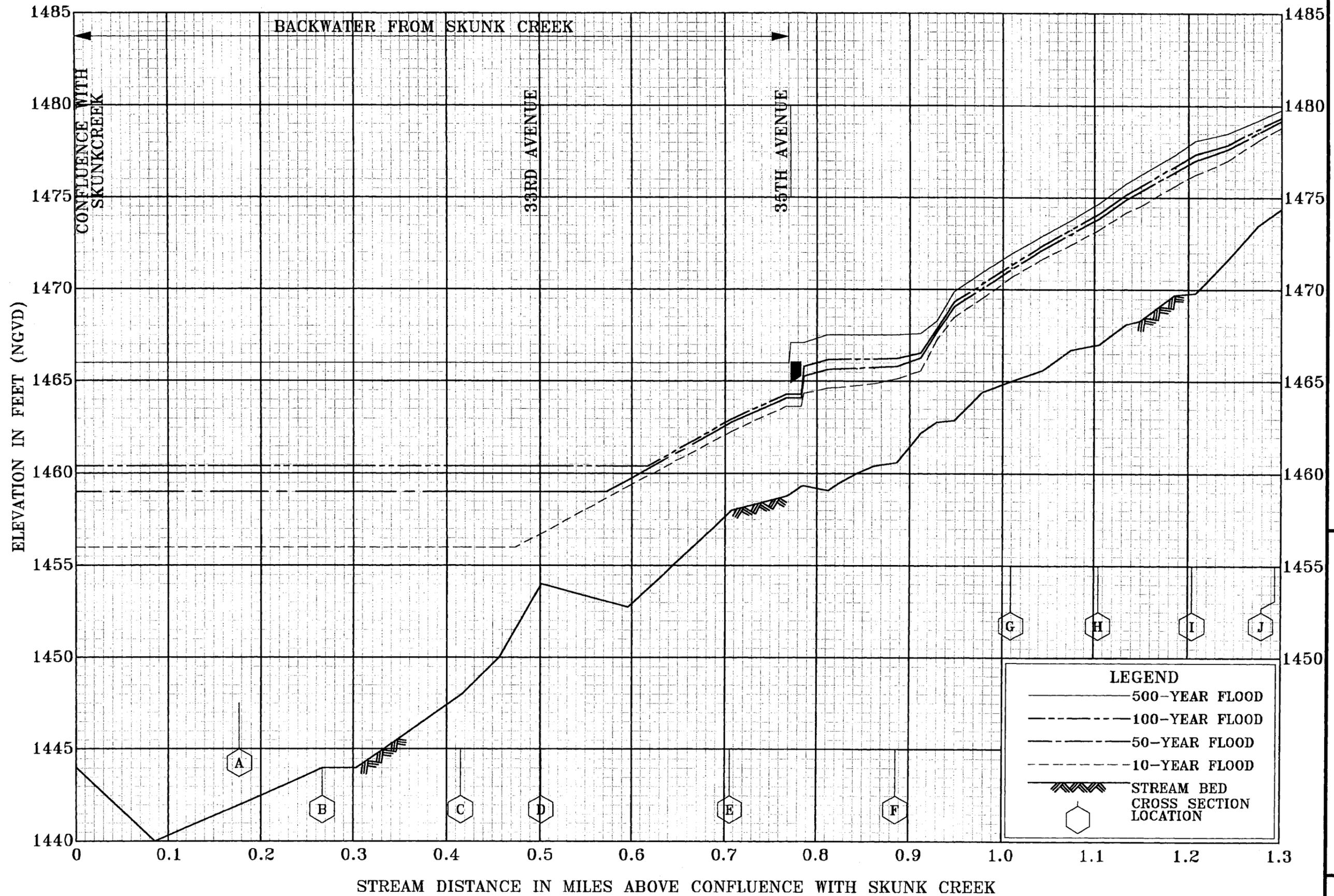
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 MARICOPA COUNTY, AZ
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FLOOD PROFILES
 AGUA FRIA RIVER



FLOOD PROFILES
 AGUA FRIA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
 MARICOPA COUNTY, AZ
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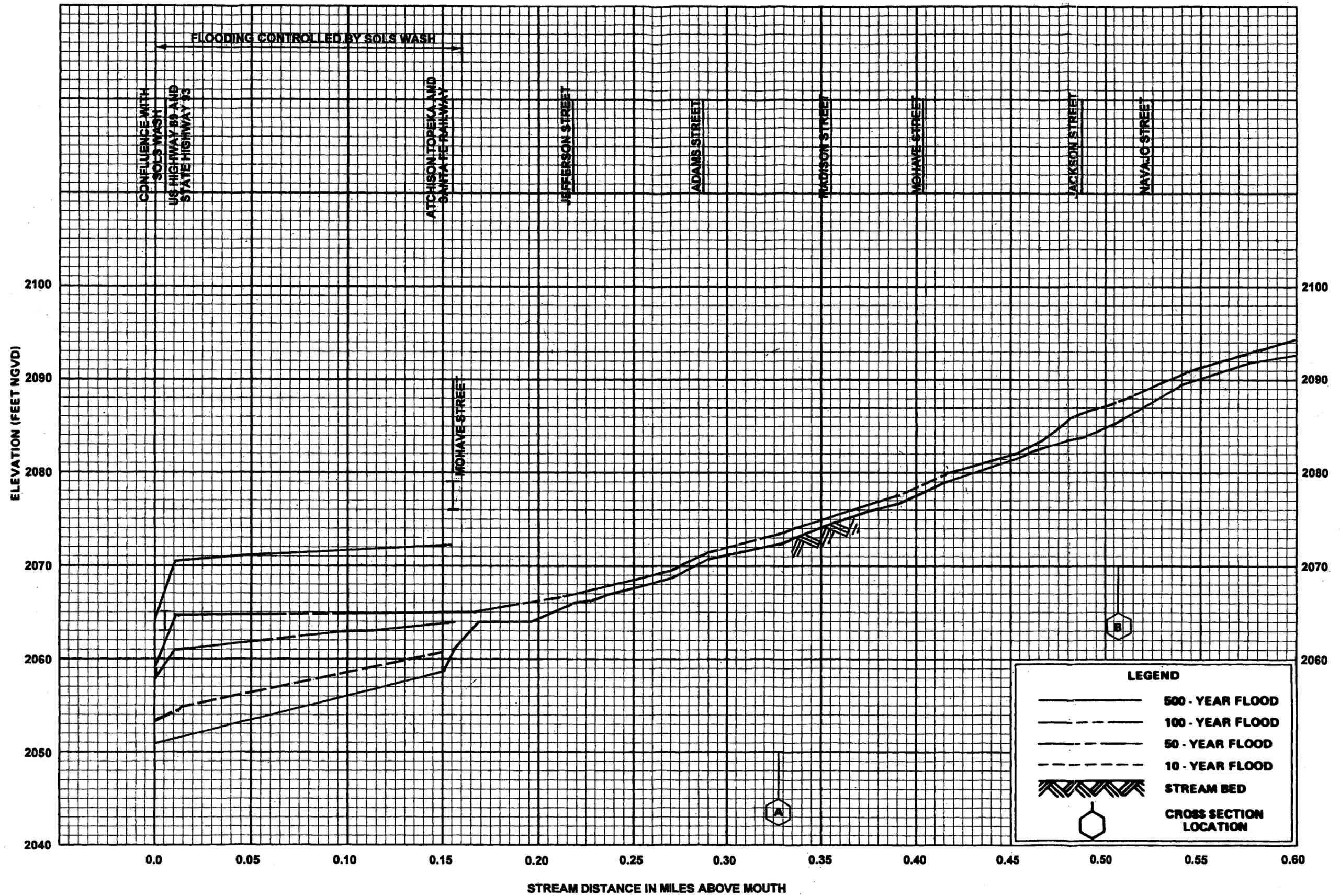


FLOOD PROFILES

BUCHANAN WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

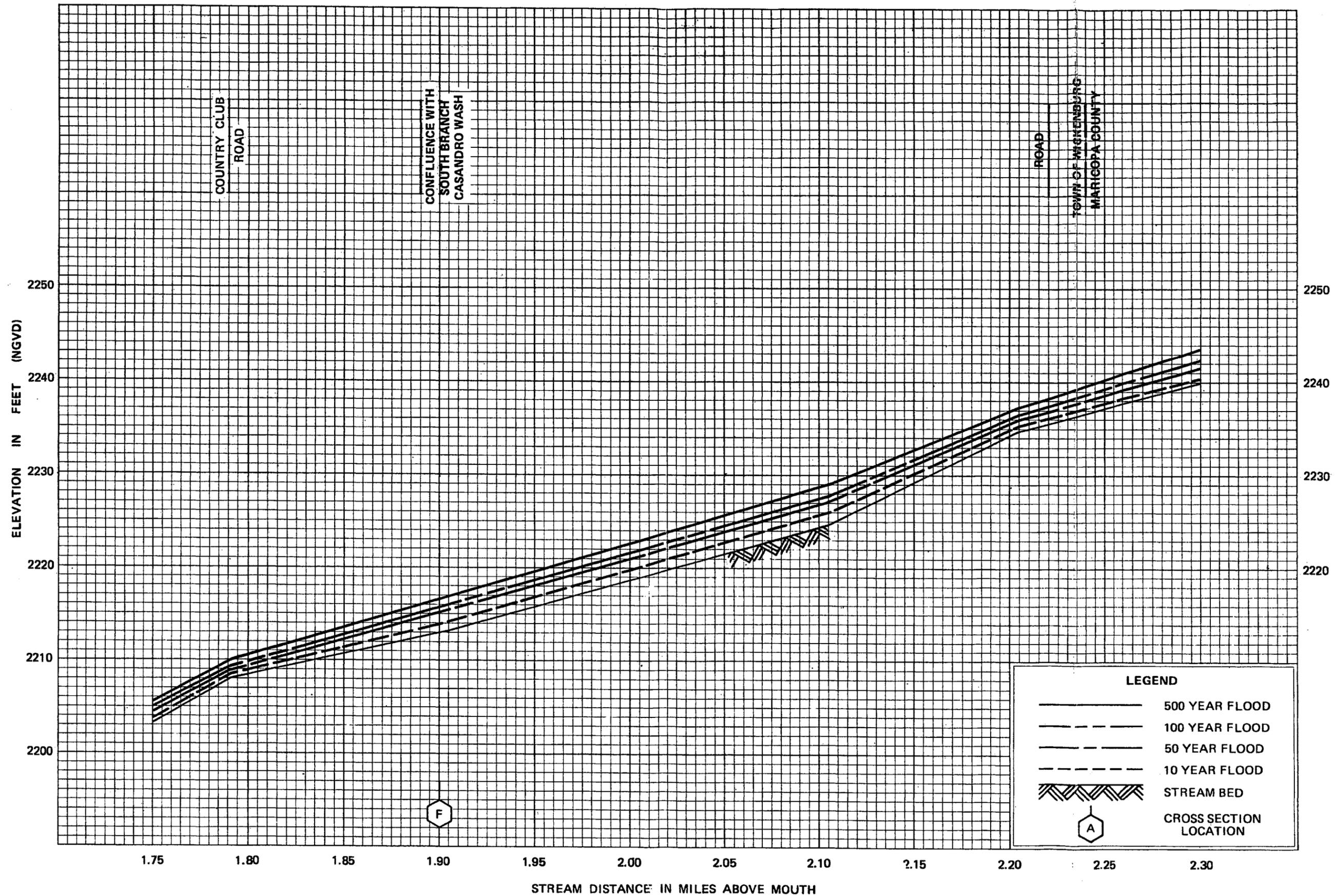
MARICOPA COUNTY, AZ
AND INCORPORATED AREAS



FLOOD PROFILES

CASANDRO WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY
 MARICOPA COUNTY, AZ
 AND INCORPORATED AREAS

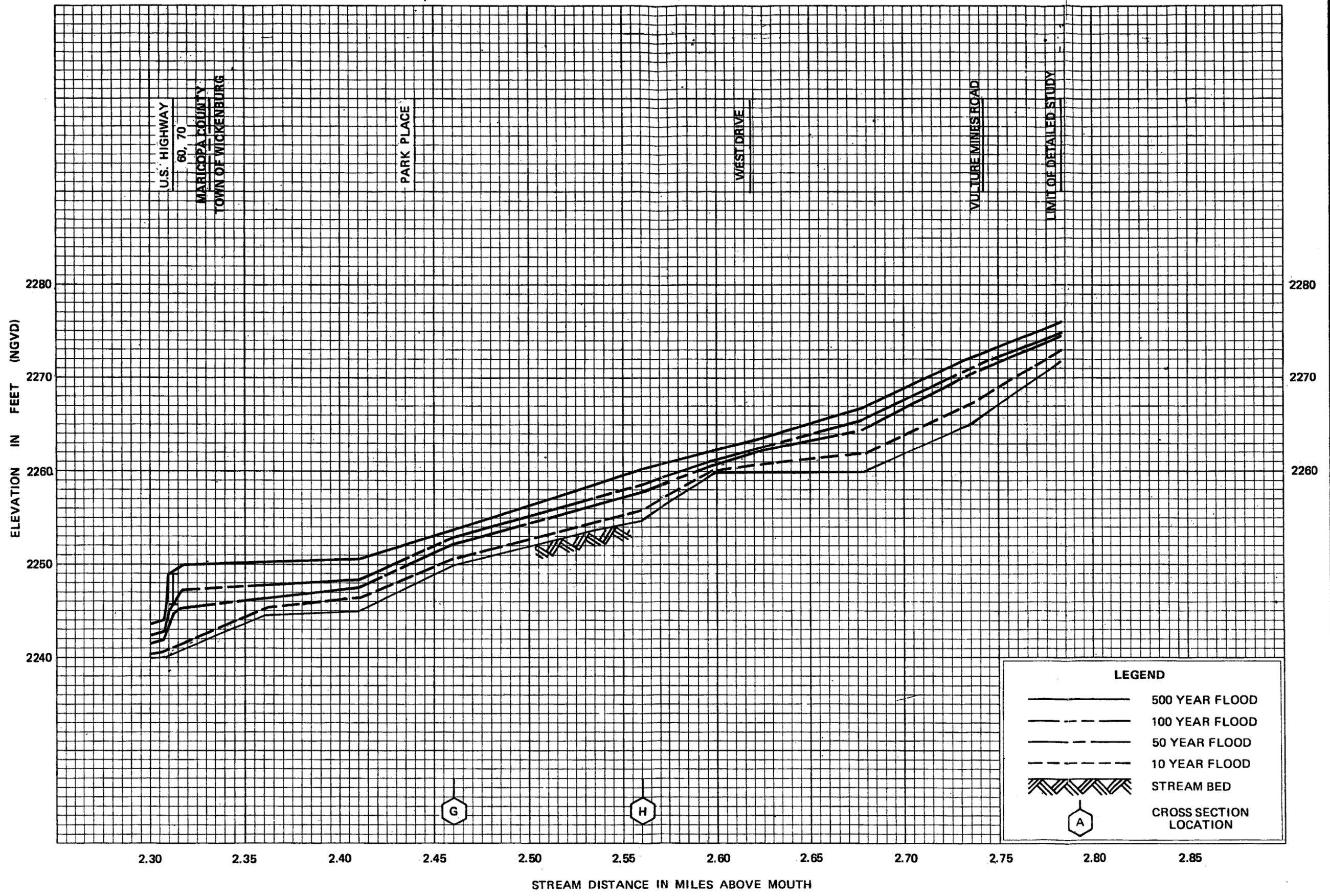


FLOOD PROFILES

CASANDRO WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

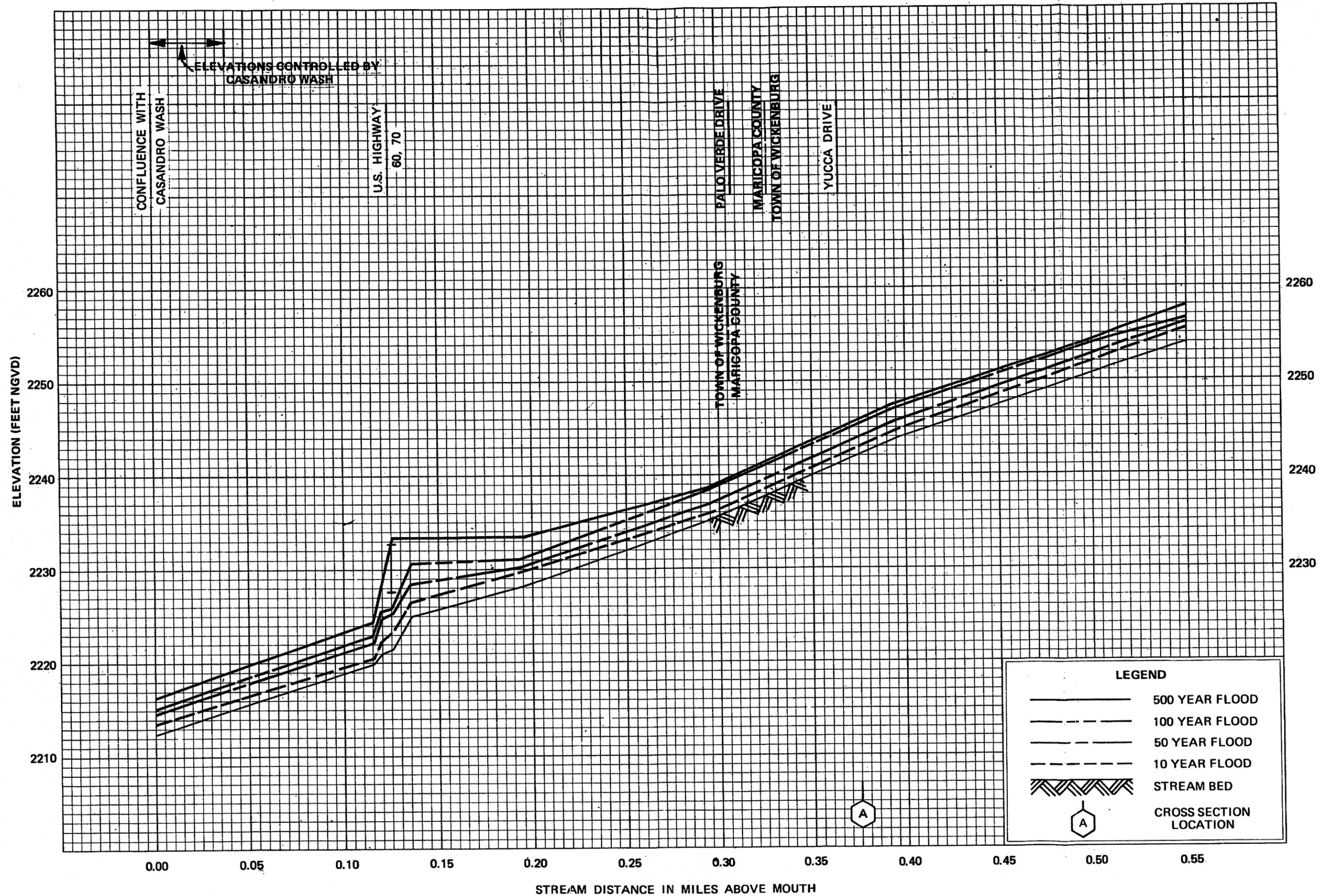


FLOOD PROFILES

CASANDRO WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
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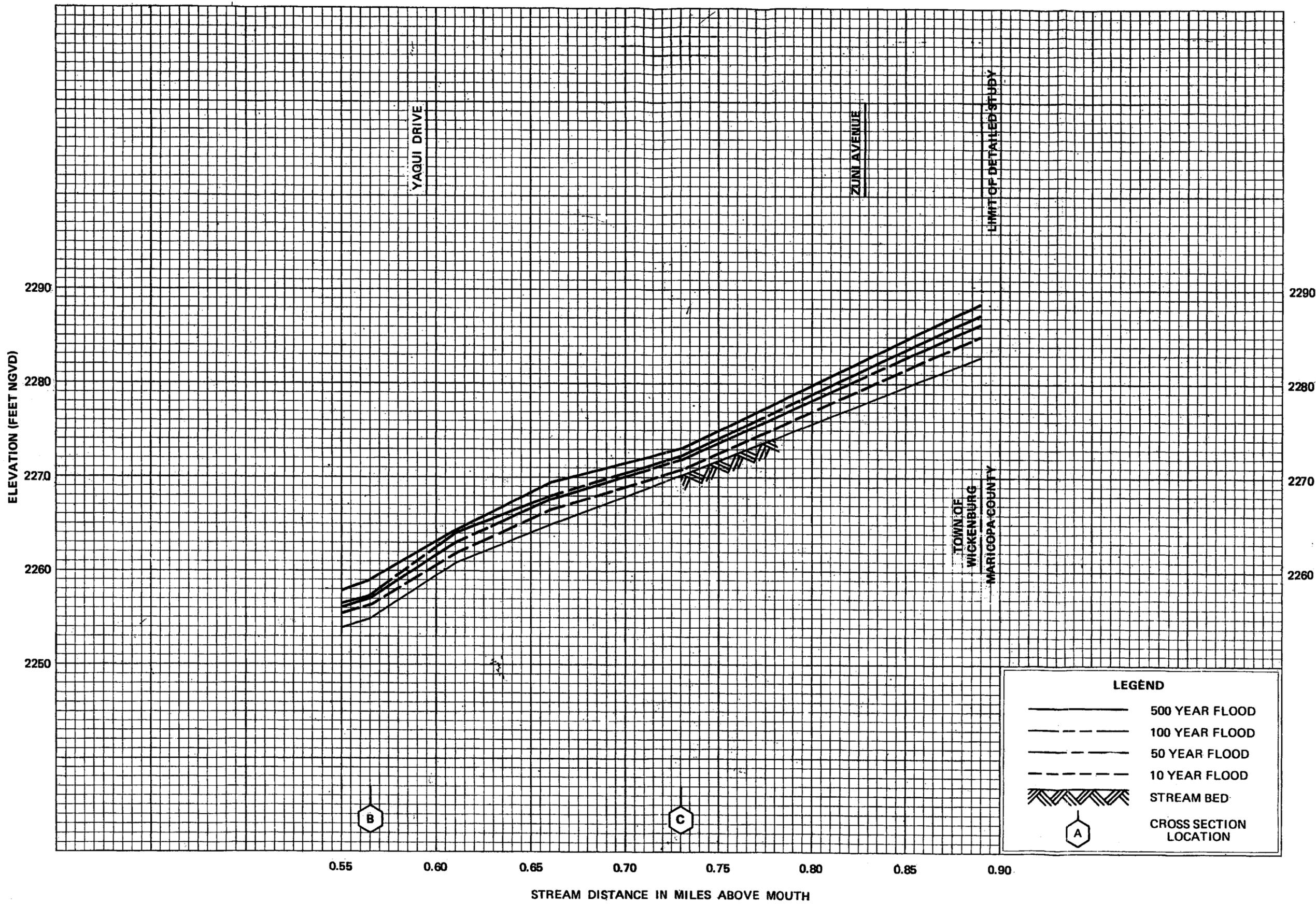


FLOOD PROFILES

SOUTH BRANCH CASANDRO WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS



FLOOD PROFILES
SOUTH BRANCH CASANDRO WASH

FEDERAL EMERGENCY MANAGEMENT AGENCY
 MARICOPA COUNTY, AZ
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