

FLOOD INSURANCE STUDY
NEW RIVER BELOW SKUNK CREEK
MARICOPA COUNTY, ARIZONA



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FLOOD INSURANCE STUDY
NEW RIVER BELOW SKUNK CREEK
MARICOPA COUNTY, ARIZONA

December 30, 1986

Prepared For:
Flood Control District of Maricopa County
3335 W. Durango
Phoenix, Arizona 85009

Prepared By:
Coe & Van Loo Consulting Engineers, Inc.
4550 North 12th Street
Phoenix, Arizona 85014

REQUEST FOR APPROVAL OF RESTUDY

This is to request that a determination be made as to whether or not a certain land area can be delineated for Special Flood Hazard Area.

Pertinent Data:

Water Course Restudied by Detailed Methods : New River from Agua Fria River to Skunk Creek Confluence

Reach Length : 8.6 River miles

Community : Maricopa County, Arizona

Community Number : 040037

Study funded by : Flood Control District of Maricopa County

Study Contractor : Coe and Van Loo Consulting Engineers, Inc.

All documents submitted in support of this restudy appeal are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

22nd Jan. '87
Date

A circular seal for a Registered Professional Engineer in Arizona, U.S.A. The seal contains the text "REGISTERED PROFESSIONAL ENGINEER", "CERTIFICATE NO. 10512", and "ARIZONA, U.S.A.". The seal is stamped over a signature line.
[Signature]
Signature of APPLICANT

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OTHER PERTINENT DATA

1. Hydrology Report by Coe & Van Loo Consulting Engineers, dated November 15, 1986.
2. Letter from Coe & Van Loo Consulting Engineers, dated November 11, 1986.
3. Letter from Flood Control District of Maricopa County, Corps of Engineers, Channelization at Grand Avenue. December 2, 1986.
4. Letter from Coe & Van Loo Consulting Engineers, request to FEMA for old data, dated December 30, 1986.
5. Letter from Federal Emergency Management Agency, response to CVL letters, dated January 13, 1987.
6. Letter from the U.S. Army Corps of Engineers, Approval for CVL Hydrology Report, dated January 14, 1987.
7. Glendale Municipal Airport New River Channelization "As Built Plans from Z & H Engineering, dated September 10, 1986 (under separate cover).
8. Skunk Creek and New River Contract Drawing from the U.S. Army Corps of Engineers (under separate cover).
9. Plaza Del Rio As built Certification Letter from Sunrise Engineering, Inc., dated January 23, 1987 (as built plans under separate cover).
10. Letter from Federal Emergency Management Agency, Letter of Map Amendment for Cross Sections 410.0 through 475.7, dated November 26, 1986.
11. Letter from Federal Emergency Management Agency, Letter of Map Amendment for Cross Sections 394.0 through 410, dated March 24, 1986.
12. HEC-2 old data, Maricopa County Flood Insurance Review 10-Year Flood Run and 100-Year Flood Run (under separate cover).



ATTACHMENTS
(under separate cover)

1. FLOODWAY ANALYSIS HEC-2 INPUT
2. FLOODWAY ANALYSIS HEC-2 OUTPUT
3. FLOODZONE ANALYSIS HEC-2 INPUT
4. FLOODZONE ANALYSIS HEC-2 OUTPUT
5. FLOODPLAIN DELINEATION MAPS



I. Study Contractor Information

Name of Study Contractor: Coe & Van Loo Consulting Engineers, Inc./Flood Control District of Maricopa County

Street Address of Study Contractor: 4550 N. 12th St., Phoenix, AZ 85014/3335 W. Durango, Phoenix, Arizona 85009

Telephone No. of Study Contractor: (602) 264-6831/(602) 262-1501

Study Contractor Project Manager to be Contacted for Additional Information: Ashok Patel, P.E./David Johnson, Chief Hydrologist

II. FIS Contract Information

Name of FIS Community: Glendale, Phoenix, Peoria, & Unincorporated Areas of Maricopa County

County: Maricopa County

State: Arizona

III. Coordination

The study was coordinated with the Flood Control District of Maricopa County, City of Glendale, City of Phoenix, City of Peoria, U.S. Army Corps of Engineers (LA Dist.) (Corps), and both the regional offices and the Washington D.C. office of the Federal Emergency Management Agency.

IV. Scope of Study

Water Course Studied:

Name: New River

Location: From Agua Fria River Confluence to the Skunk Creek Confluence (approximately 8.6 miles)

Direction of Flow: Southwesterly

Limits of Study: Agua Fria River downstream; New River above the Skunk Creek Confluence upstream

Type of Study: FIS Restudy

V. Community Description

Maricopa County is located in southcentral Arizona. The location, population, development data, Meteorology and factors affecting flooding are described in the original FIS. (See Reference 4).

VI. Principal Flood Problems

The principal flood problems are as described in the original FIS. (See Reference 4).



VII. Flood Protection Measures

For Watercourse studied, the following is a list of structural and nonstructural flood protection measures such as earth and concrete dams, channels, flood plain management plans, which reduce potential flood damage.

1. Channelization completed by the Glendale Municipal Airport.
2. Channelization to be completed by the U.S. Army Corps of Engineers in the vicinity of Grand Avenue - see attached letter.
3. Channelization completed by the Plaza Del Rio and Desert Harbor Development from approximately 3600 feet downstream on Thunderbird Road bridge to North of Greenway Road.
4. New River Dam (completed 1984), Adobe Dam (completed 1982).

VIII. Hydrologic Analyses

Hydrology analysis per CVL Report approved by the Corps (see letter) (Reference 7). The following is a summary of peak discharges used for FIS:

TABLE 1: PROPOSED PEAK DISCHARGES-NEW RIVER
(Discharge in cfs)

Location	Frequency (Years)			
	<u>10</u>	<u>50</u>	<u>100</u>	<u>500</u>
(1) Upstream of Agua Fria River	12,500	29,000	39,000	70,000
(2) Downstream of Skunk Creek	13,500	31,000	41,000	75,000

IX. Hydraulic Analyses

- A. The source of starting water surface elevations was the COE Analysis of the Agua Fria River which was based on the slope area method.
- B. The cross sections were obtained from the original Corps input run for New River based on 1982 topography. The cross sections were revised to include the channelization as follows:
 1. Glendale Municipal Airport "as built" construction plans from Sec. 10.0 to Sec. 77.0.
 2. Plaza Del Rio development south of Thunderbird Road per Aerial Photography Contour Maps from Sec 384.0 to Sec 409.0.
 3. Desert Harbor Development per Aerial Photography Contour Maps from Sec. 410.0 to Sec 8.655.
- C. The roughness factors ("n" values) for New River from the confluence of the Agua Fria North to the confluence of Skunk Creek were established by the Corps. Coe & Van Loo completed a field investigation of the river and reviewed the "n" values utilized by the Corps. Based on field investigation and photos, Coe and Van Loo adopted Corp's "n" values for FIS purpose.

Table of "n" Values

"n" value for the channel = 0.035

"n" value for the overbanks = 0.045

- D. Method 1 encroachments also based on the Corps model were utilized for computing the floodway limits with a maximum water surface rise of 1 foot. In some areas encroachments were utilized to better model non-effective flow areas for the natural (or existing) condition analysis.

X. Other Studies

1. U.S. Department of Housing and Urban Development, Flood Insurance Agency, "Flood Insurance Study, Maricopa County, Arizona, Unincorporated Areas," May, 1979. (Reference 4)
2. U.S. Army Corps of Engineers, Preliminary Floodplain Delineation for Floodplain Management purpose, July, 1985. (Reference 1)

XI. Location of Data

The data incorporated in this FIS can be obtained from the Flood Control District of Maricopa County, 3335 W. Durango, Phoenix, Arizona 85009.

XII. Bibliography and References

1. U.S. Army Corps of Engineers, Los Angeles District, "Gila River Basin, Phoenix, Arizona and Vicinity (including New River), Design Memorandum No. 3, Skunk Creek and the New and Agua Fria Rivers (Arizona Canal Diversion Channels to the Gila River)", July, 1985.
2. U. S. Army Corps of Engineers, Los Angeles District, "Gila River Basin, Phoenix, Arizona and Vicinity (including New River), Design Memorandum No. 2, Hydrology Part 2", 1982.
3. U. S. Army Corps of Engineers, Los Angeles District, "Summary of Discharge-Frequencies for New River". Letter Dated October 31, 1986.
4. U. S. Department of Housing and Urban Development, Flood Insurance Agency, "Flood Insurance Study, Maricopa County, Arizona, Unincorporated Areas," May, 1979.
5. Coe and Van Loo Consulting Engineers, Inc., "New River Hydrology, New River Downstream of Skunk Creek Confluence, Maricopa County, Arizona." Letter Dated October 2, 1986.
6. U. S. Army Corps of Engineers, Los Angeles District, "Hydrology for Flood Insurance Studies, Maricopa County Streams, Arizona", June, 1983. Revised May, 1985.
7. Coe and Van Loo Consulting Engineers, Inc., "Hydrology Update, November 15, 1986, New River Below Skunk Creek, Maricopa County, Arizona", November 15, 1986.



8. U. S. Army Corps of Engineers, Hydrologic Engineering Center, "HEC-2 Water Surface Profiles", Generalized Computer Program, Davis, California, October, 1973.
9. U. S. Army Corps of Engineers, Los Angeles District, "Skunk Creek and New River Contract Drawings", Spec. No. DACW 09-86-B0024, Dated August, 19, 1986.
10. Z & H Engineering, Inc., "Glendale Municipal Airport New River Channelization 'As Built' Plans", dated September 10, 1986.
11. Federal Emergency Management Agency, "Flood Insurance Study Guidelines and Specifications for Study Contractors.", September, 1985.

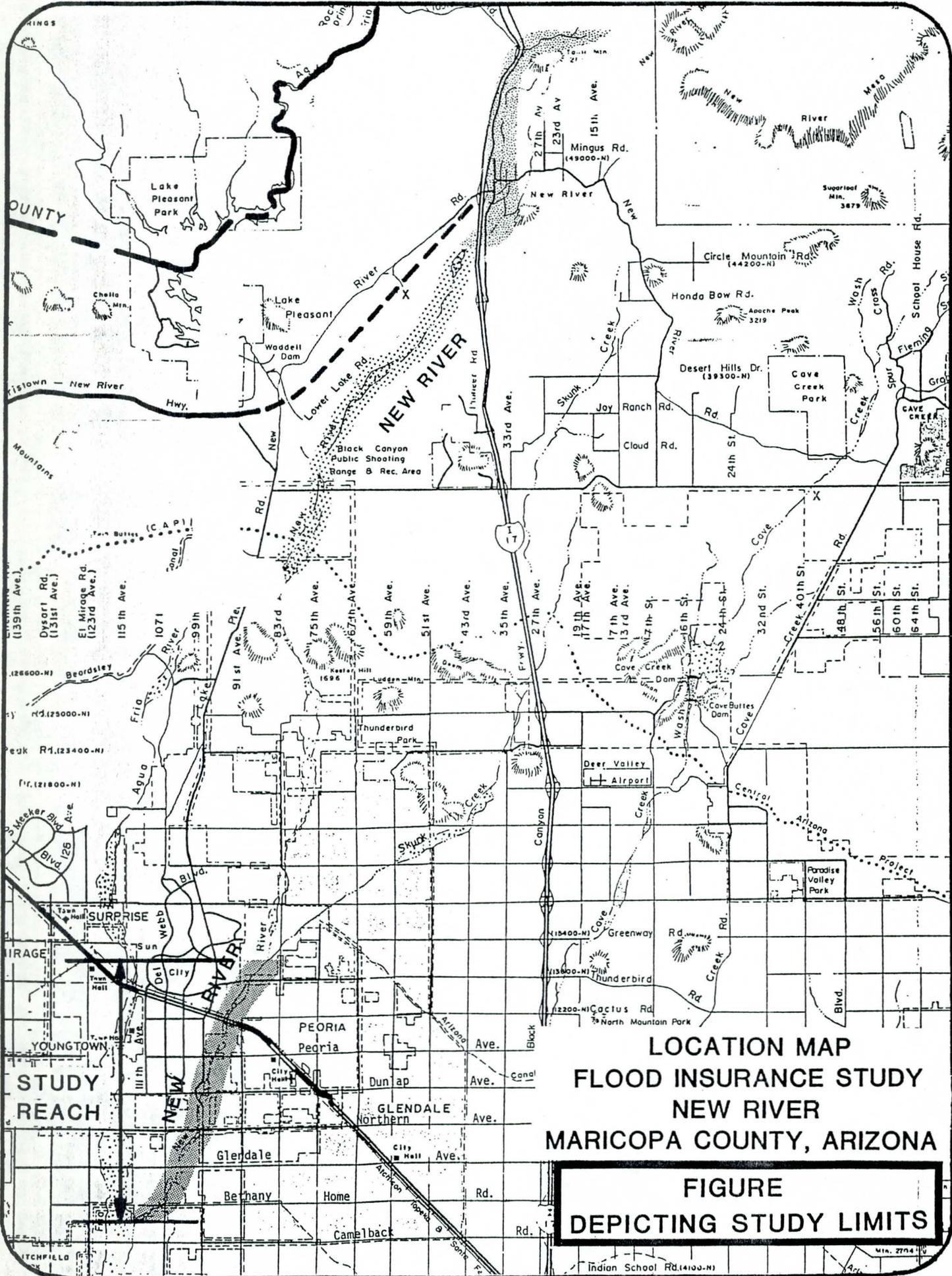


ELEVATION REFERENCE MARKS

<u>REFERENCE MARK</u>	<u>WORK MAP PANEL</u>	<u>ELEVATION (feet NGVD)</u>	<u>DESCRIPTION OF LOCATION</u>
RM 1	1	1023.722	U.S.C.E. Bronze Disk Stamped "NR-155, 1972, L.A. Dist." on the Northwest Corner of a concrete bridge over an irrigation canal on Camelback Road 0.75 miles west of 107th Avenue.
RM 2	1	1043.652	U.S.C.E. Bronze Disk Stamped "NR-154, 1972, L.A. Dist." 0.5 feet above ground at intersection of Bethany Home Road and 107th Avenue, 100 feet west of centerline of 107th Avenue, inside a fenced enclosure around a well and a pump.
RM 3	1 & 2	1074.249	4" Bronze Disk Stamped "2 N1E Sec. 7 N.E. Cor." Maricopa County Survey, N.E. Cor, Sec. 7, T2N, R1E, 107th Ave. & Glendale Ave.
RM 4	2 & 3	1064.047	3" Bronze Disk Set flush in top of concrete base of guard rail, 19 feet west of the East end of the Southeast corner of the Glendale Ave. Bridge.
RM 5	3	1088.71	MCHD, Brass Cap Stamped "PD 70 MCHD" Flush with pavement at intersection of 103rd Ave. & Griswold Road.
RM 6	3	1094.97	5/8" Rebar Flush with A.C. Pavement Stamped "PD 152" at a point 500'+ south of intersection of 99th Ave. & Olive Ave.
RM 7	4	1117.537	3" Bronze Disk Set flush in concrete base of the guard rail 37 feet East of the West end at the Southwest corner of the Peoria Avenue Bridge. Stamped "No. 1118.97", Arizona Highway Department"

RM 8	5	1139.167	3" Bronze Disk Set in sidewalk at the Southeast corner of the East bound bridge at Grand Ave. Stamped "1140.31, 285 + 75, 1965", Arizona Highway Department.
RM 9	5	1137.41	4" Bronze Disk 0.5' below surface in a well at the intersection of 91st Ave. & Cactus Road. NE Corn, Sec. 31, T3N, R1E, G & S.R.B. & M. Stamped with Punch Mark, Maricopa County Highway Department.
RM 10	5	1150.893	4" Bronze Disk In a Well at the S.W. Corner, Sec. 10, T3N, R1E, G & S.R.B. & M.
RM 11	6	1160.225	Copper Weld Rod Stamped "NR-17, 1972" Set flush with road surface on the center line of Thunderbird Road. 0.5 miles west of 83rd Avenue.
RM 12	6	1175.911	5/8" Rebar, 0.3' below surface at the W 1/4 Corner, Sec. 11, T3N, R1E, G & S.R.B. & M., City of Glendale Datum 1175.54.





LOCATION MAP
 FLOOD INSURANCE STUDY
 NEW RIVER
 MARICOPA COUNTY, ARIZONA

**FIGURE
 DEPICTING STUDY LIMITS**

FIGURE 1

STATION	----- WIDTH	FLOODWAY SECTION AREA	----- MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
501.450	2850.	11270.	3.5	1028.2	1027.5	0.7
10.000	1320.	4222.	9.2	1030.1	1029.5	0.6
13.000	1324.	7047.	5.5	1032.0	1031.1	0.9
20.000	1345.	7192.	5.4	1033.4	1032.5	0.9
26.800	1250.	5892.	6.6	1034.5	1033.9	0.6
32.600	1224.	5783.	6.7	1036.1	1035.3	0.8
38.000	1165.	5386.	7.2	1037.2	1037.0	0.2
45.000	982.	6602.	6.5	1039.1	1039.1	0.0
51.700	775.	7026.	5.6	1040.1	1040.1	0.0
54.000	832.	7591.	5.1	1040.3	1040.3	0.0
59.000	925.	7128.	5.5	1040.7	1040.7	0.0
63.000	864.	6279.	6.2	1041.0	1041.0	0.0
70.500	661.	3203.	12.2	1042.2	1042.2	0.0
77.000	442.	2954.	13.2	1046.9	1046.9	0.0
84.000	542.	5782.	6.7	1050.7	1050.7	0.0
88.700	569.	7029.	5.5	1051.4	1051.1	0.3
95.500	802.	7112.	5.5	1051.9	1051.5	0.4
100.700	514.	3833.	10.2	1051.9	1051.5	0.4
107.000	531.	6820.	5.7	1053.9	1053.7	0.2
110.700	458.	2830.	13.8	1053.5	1053.2	0.3
117.200	350.	3314.	11.8	1058.4	1058.5	-0.1
118.000	350.	3291.	11.9	1058.8	1058.9	-0.1
120.000	407.	5280.	7.4	1061.0	1061.1	-0.1
125.000	452.	5427.	7.2	1061.5	1061.6	-0.1
131.400	490.	2875.	13.6	1061.6	1062.1	-0.5
135.000	357.	3270.	11.9	1064.7	1064.8	-0.1
140.000	517.	5079.	7.7	1067.2	1066.5	0.7
143.000	768.	4817.	8.1	1067.7	1066.9	0.8
146.000	1191.	3866.	10.1	1068.6	1068.6	0.0
149.600	1356.	6705.	6.0	1071.3	1070.5	0.8
158.000	1300.	6238.	6.4	1073.1	1072.8	0.3
167.000	1250.	5416.	7.4	1074.6	1074.1	0.5
170.000	1103.	4851.	8.2	1075.1	1074.4	0.7
174.100	1450.	5231.	7.6	1077.2	1077.2	0.0
178.000	1650.	7849.	5.1	1079.4	1079.1	0.3
178.500	1665.	7774.	5.1	1079.7	1079.3	0.4
181.600	1225.	5084.	7.9	1079.7	1079.4	0.3
185.200	651.	3883.	10.3	1080.7	1080.9	-0.2
190.000	597.	5074.	7.9	1083.0	1082.4	0.6
193.600	441.	3716.	10.8	1083.4	1082.9	0.5
198.400	437.	4385.	9.1	1085.3	1085.1	0.2
202.400	378.	3390.	11.8	1085.8	1085.7	0.1
206.000	416.	3433.	11.7	1087.4	1087.4	0.0
210.500	360.	5108.	7.8	1089.6	1089.6	0.0
216.000	454.	5940.	6.7	1090.3	1090.2	0.1
218.000	535.	7269.	5.5	1090.6	1090.5	0.1
220.800	481.	6550.	6.1	1090.7	1090.6	0.1
223.000	495.	5882.	6.8	1090.9	1090.7	0.2
229.000	623.	6255.	6.4	1091.5	1091.3	0.2
231.500	296.	3072.	13.0	1091.1	1091.5	-0.4
232.600	595.	5352.	7.5	1095.6	1095.1	0.5
235.000	360.	4604.	8.7	1095.8	1095.5	0.3
238.800	524.	5447.	7.3	1096.6	1096.3	0.3
240.800	499.	3950.	10.1	1096.5	1096.4	0.1
245.800	395.	3950.	10.1	1098.2	1097.2	1.0
251.000	488.	5055.	7.9	1099.9	1099.2	0.7
256.000	306.	3579.	11.2	1100.2	1099.7	0.5
258.800	351.	4392.	9.1	1101.5	1101.2	0.3
262.000	343.	4147.	9.6	1102.0	1101.7	0.3
265.000	584.	6674.	6.0	1103.3	1103.1	0.2
270.500	401.	4777.	8.4	1103.5	1103.3	0.2

FLOODWAY DATA

NEW RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, ARIZONA

TABLE 2

STATION	----- WIDTH	FLOODWAY SECTION AREA	----- MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
273.500	430.	5371.	7.4	1104.1	1103.9	0.2
277.000	276.	2727.	14.7	1103.1	1102.9	0.2
281.000	239.	2531.	15.8	1105.5	1105.5	0.0
288.000	340.	4316.	9.3	1110.6	1110.6	0.0
290.000	290.	4351.	9.4	1110.9	1110.9	0.0
291.000	268.	3916.	10.5	1111.1	1111.1	0.0
293.000	344.	3626.	11.3	1111.4	1111.4	0.0
297.000	336.	3534.	11.6	1112.6	1112.6	0.0
302.000	211.	2252.	18.2	1112.9	1112.9	0.0
305.000	217.	2886.	14.2	1116.7	1116.7	0.0
307.000	238.	3319.	12.4	1118.2	1118.5	-0.3
311.500	427.	6415.	6.4	1120.6	1120.6	0.0
314.000	657.	7882.	5.2	1120.9	1120.9	0.0
318.000	785.	6820.	6.0	1121.2	1121.0	0.2
323.000	891.	6216.	6.6	1121.8	1121.7	0.1
328.000	462.	4869.	8.4	1122.4	1122.3	0.1
330.000	400.	4050.	10.1	1122.4	1122.3	0.1
334.000	352.	3821.	10.7	1123.3	1123.2	0.1
337.000	352.	3708.	11.1	1124.1	1124.1	0.0
340.500	351.	3658.	11.2	1125.1	1125.1	0.0
342.000	351.	3646.	11.2	1125.6	1125.6	0.0
343.000	351.	3654.	11.2	1125.9	1125.9	0.0
344.000	346.	3459.	11.9	1126.5	1126.5	0.0
345.000	348.	3918.	10.5	1127.8	1127.8	0.0
346.000	349.	3962.	10.3	1128.7	1128.7	0.0
346.500	351.	3835.	10.7	1128.8	1128.8	0.0
346.600	351.	3584.	11.4	1128.7	1128.7	0.0
346.900	357.	3514.	11.7	1128.7	1128.7	0.0
347.000	347.	3970.	10.3	1129.4	1129.4	0.0
349.000	381.	3920.	10.5	1130.1	1130.1	0.0
352.000	348.	3139.	13.1	1130.7	1130.7	0.0
358.000	630.	2990.	13.7	1135.6	1136.1	-0.5
365.000	950.	5511.	7.4	1140.7	1140.0	0.7
370.000	677.	4292.	9.6	1141.8	1141.6	0.2
373.000	798.	4267.	9.6	1142.7	1142.3	0.4
377.000	690.	3937.	10.4	1143.7	1143.1	0.6
384.000	356.	4012.	10.2	1146.1	1145.1	1.0
388.000	352.	4372.	9.4	1147.1	1146.5	0.6
391.500	397.	4225.	9.7	1147.9	1147.3	0.6
395.000	389.	4497.	9.1	1148.7	1148.3	0.4
402.000	385.	4641.	8.8	1150.0	1149.7	0.3
406.000	379.	4374.	9.4	1150.6	1150.3	0.3
409.000	251.	3299.	12.4	1150.7	1150.5	0.2
409.810	233.	3161.	13.0	1150.6	1150.4	0.2
409.820	232.	3254.	12.6	1151.6	1151.5	0.1
410.000	243.	3345.	12.3	1151.8	1151.7	0.1
412.000	282.	3595.	11.4	1152.7	1152.6	0.1
418.000	336.	3942.	10.4	1154.6	1154.5	0.1
423.000	327.	3860.	10.6	1155.7	1155.7	0.0
425.000	341.	4172.	9.8	1156.3	1156.3	0.0
428.000	353.	4460.	9.2	1157.0	1157.0	0.0
434.000	385.	4542.	9.0	1158.1	1158.1	0.0
440.000	385.	4971.	8.2	1159.2	1159.2	0.0
443.200	397.	4752.	8.6	1159.6	1159.6	0.0
449.400	466.	2729.	15.0	1161.2	1161.2	0.0
451.000	584.	2854.	14.4	1165.3	1165.2	0.1
8.655	398.	5130.	3.7	1169.9	1169.9	0.0

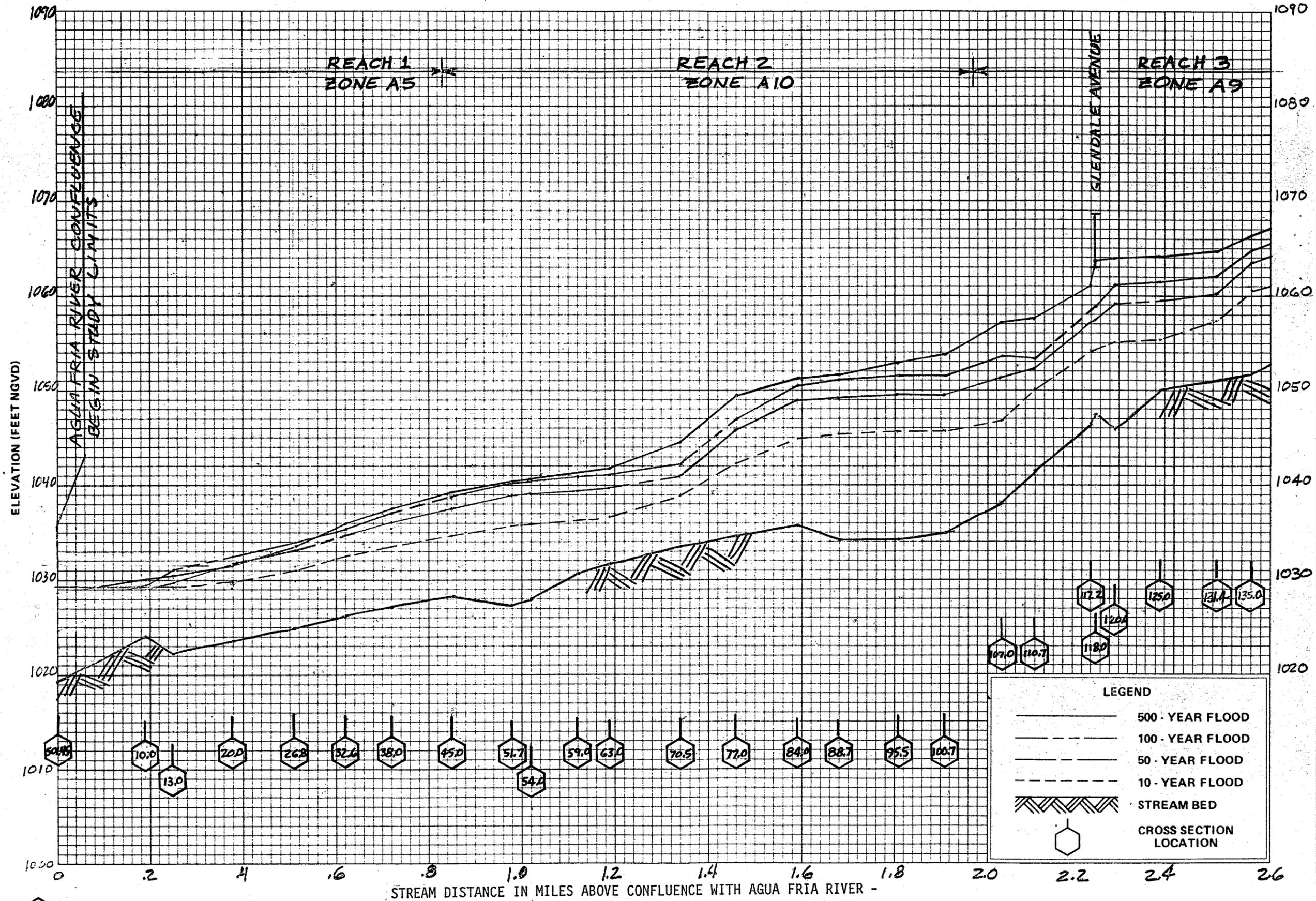
FLOODWAY DATA

NEW RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, ARIZONA

TABLE 2



10.0 GROSS SECTION DATA PER HEC-2 ANALYSIS IN HUNDREDS OF FEET

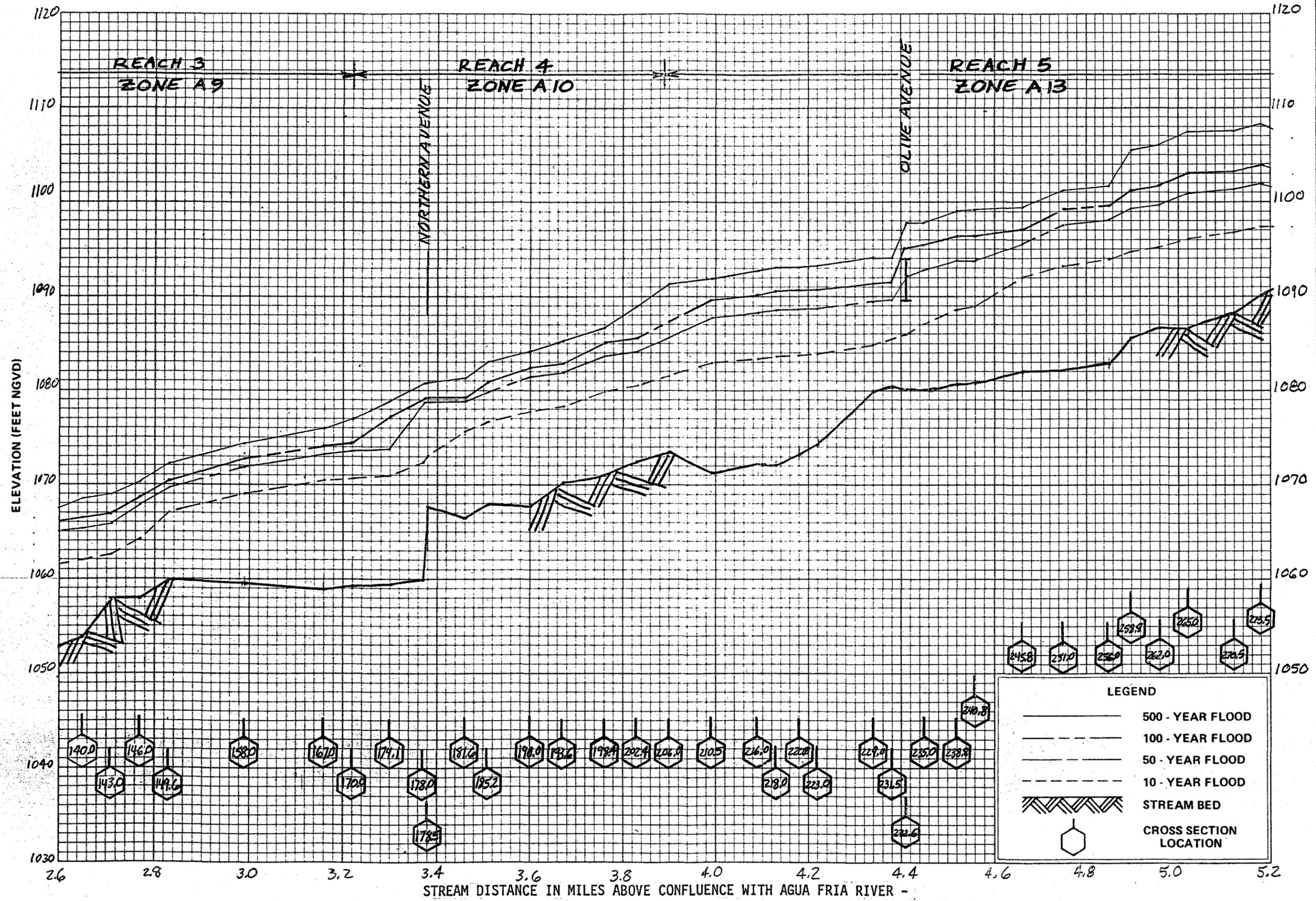
FLOOD PROFILES

NEW RIVER
AGUA FRIA RIVER TO SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, ARIZONA

EXHIBIT 1



10.0 CROSS SECTION DATA PER HEC-2 ANALYSIS IN HUNDREDS OF FEET

FEDERAL EMERGENCY MANAGEMENT AGENCY
 MARICOPA COUNTY, ARIZONA
 AGUA FRIA RIVER TO SKUNK CREEK
 NEW RIVER
 FLOOD PROFILES
 EXHIBIT 2

HYDROLOGY UPDATE

NOVEMBER 15, 1986
NEW RIVER BELOW SKUNK CREEK
MARICOPA COUNTY, ARIZONA

Prepared For:
New River Flood Insurance Study
Flood Control District of Maricopa County
3335 W. Durango
Phoenix, AZ 85009

Prepared By:
Coe & Van Loo Consulting Engineers, Inc.
4550 North 12th Street
Phoenix, AZ 85014





Planning
Civil Engineering
Landscape Architecture
Hydrology
Sanitary Engineering
Surveying

FOUNDERS
P.E. COE, P.E. (1915-1977)
H.W. VAN LOO, P.E.

JOHN B. NELSON, PE., L.S.
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PAUL W. R. HOSKIN, PE.

November 14, 1986

Mr. John Matticks, Acting Chief
Federal Emergency Management Agency
Risk Studies Division
Federal Insurance Administration
500 C Street, SW Room 422
Washington, D.C. 20472

Certified Mail

Attn: Mr. Philip Myers

Re: New River Hydrology, Restudy
New River Downstream of Skunk Creek Confluence
Maricopa County, AZ (Community No. 040037)

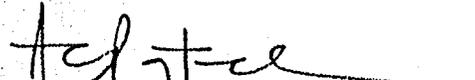
Gentlemen:

Enclosed with this letter please find hydrology update for the referenced restudy. We have evaluated available hydrologic data from the Corps of Engineers (Corps) and recommend that the Corps data be adopted by FEMA for the use of Floodplain study. The data from the Corps, however, lacked floodpeaks for the 10- and 500-years. In the hydrology update, therefore, we have defined flood-frequency curve to be used for the restudy. We respectfully request your early review and response regarding our recommendations. Additionally, the hydrology update has been submitted to the Corps for their review, comment and approval.

Should you have any questions regarding the subject data, please do not hesitate to call.

Very truly yours,

COE & VAN LOO
Consulting Engineers, Inc.


Ashok C. Patel, P.E., L.S.
Senior Vice President

ACP/1s
2/29/44

CC: Ray Lenaburg, FEMA
Chief, Planning, Corps
Bob Schaezel, Corps
Dan Sagramoso, MCFCD
Dave Johnson, MCFCD
Doug Plasencia, MCFCD

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2. Proposed Peak Discharges - New River	4

APPENDIX

Figure 1 - Figure Depicting Study Limits

Plate 1 - Frequency-Discharge Curve

ATTACHMENTS:

1. U.S. Army Corps of Engineers, Los Angeles District, "Summary of Discharge-Frequencies for New River". Letter Dated October 31, 1986. (Ref. 3).
2. U. S. Department of Housing and Urban Development, Flood Insurance Agency, "Flood Insurance Study, Maricopa County, Arizona, Unincorporated Areas," May, 1979. (Partially printed) (Ref. 4).
3. Coe and Van Loo Consulting Engineers, Inc., "New River Hydrology, New River Downstream of Skunk Creek Confluence, Maricopa County, Arizona." Letter Dated October 2, 1986. (Ref. 5).

HYDROLOGY UPDATE
NEW RIVER FLOOD INSURANCE STUDY

Introduction

The Corps of Engineers has developed a program for the implementation of a comprehensive flood control plan to protect parts of metropolitan Phoenix. The final plan will include the construction of four earthfill dams, the construction of 16.5 miles of channelization along the Arizona Canal, acquisition of flowage easements and improved floodplain management. The four dams, Dreamy Draw Dam, Cave Buttes Dam, Adobe Dam and New River Dam have all been completed (Ref. 1). The Arizona Canal Diversion Channel (A.C.D.C.) is partially complete but is designed to ultimately intercept runoff from the north and divert it parallel to the Arizona Canal, outletting to Skunk Creek.

As a result of the construction of the New River and Adobe Dams, the 100-year peak discharge within New River has been substantially reduced over the natural conditions. This is a temporary condition and after completion of the A.C.D.C. additional floodwater will be diverted to Skunk Creek and consequently the New River.

The Corps of Engineers has completed hydrologic studies (Ref. 2) for the entire project area for both existing and future flow conditions. The established flood-frequency discharges have been reiterated and summarized in a recent letter to Coe and Van Loo (CVL) (Ref. 3).

Scope of Study

In light of recent and future changes in the floodplain usage for the New River, due to flood control improvements, the Flood Control District of Maricopa

County (MCFCD) has requested CVL to perform a floodplain study and redelineation for New River from its confluence with the Agua Fria River to Skunk Creek (South Reach, See Figure 1). A Flood Insurance Study performed for the Federal Emergency Management Agency (FEMA) in May, 1979 (Ref. 4) is the present basis for floodplain regulation on New River. As a result of the dynamic nature of metropolitan Phoenix, undeveloped floodplains are increasingly under pressure to be developed. The Corps of Engineers has already established future condition hydrology and a floodplain analysis for the 100-year peak discharges, along New River these have not been adopted by FEMA. The purpose of this recent effort by CVL is to obtain official acceptance of a revised floodplain delineation based upon future flood conditions. This was agreed upon in concept with Mr. Philip Myers, FEMA representative, Washington, D.C., as confirmed in a letter dated October 2, 1986 (Ref. 5).

Methodology

The Corps of Engineers has already established hydrology for both present and future conditions as follows (taken from Ref. 3):

TABLE 1: DISCHARGE-FREQUENCIES FOR NEW RIVER

LOCATION	CONDITION	10	25	50	100	SPF	500
		discharges in cfs					
New River Downstream of Skunk Creek	Present: with Adobe and New River Dams without ACDC	4600	_____	13,000	21,000	44,000	53,000
New River Downstream of Skunk Creek ^{1,2}	Future: with Adobe, New River and Cave Buttes Dams with ACDC	_____	_____	_____	41,000	68,000	_____
New River Upstream of Agua Fria River ^{1,2}	Future: with Adobe, New River and Cave Buttes Dams with ACDC	_____	21,000	29,000	39,000	69,000	_____

Notes: 1. These flows include 2000 cfs from the Agua Fria River Basin to account for potential future development.



2. For future conditions there is less than 5 percent difference between the two location.

The floodplain has already been established for the future condition (after completion of the ACDC) by the Corps of Engineers using the above discharge information. Since an existing Flood Insurance study is in effect for this river reach, the standards used in the original Flood Insurance Study must be adhered to. The present study defined the 10-year and 100-year flood profiles and established Flood Hazard Factors (FHF's) for the floodplain. As a result, this study needs to establish the 10-year frequency discharges. This information is not available from the original COE reports and thus needs to be established.

Frequency-discharge information available from Table 1 was plotted on log-probability paper as indicated in Plate 1 for both New River downstream of Skunk Creek⁽²⁾ and also upstream of the confluence with the Agua Fria River.⁽¹⁾ Three plotting points were available for New River upstream of the Agua Fria River producing a relatively straight line, the 10-year and 500-year discharges were then obtained by extrapolation. The New River downstream of Skunk Creek only has an established discharge value for the 100-year event. Considering that the actual change in contributing drainage area is insignificant, and in the absence of better information, it appears appropriate to extrapolate the curve for (2) based upon the frequency-discharge curve developed for (1).

Recommendations & Conclusions

The Corps of Engineers has performed extensive studies to obtain the hydrologic information for the New River presented in Table 1. The 100-year frequency peak discharges thus developed will be utilized in future floodplain management. The 10-year peak discharges obtained from extrapolation are



proposed to be used in the study for the purpose of defining Flood Hazard Factors. The additional flood frequencies presented for the 50-, and 500-year discharges will not be utilized for future floodplain regulation but are included for reference.

The peak discharges proposed for use in this Flood Insurance Study are thus as follows:

TABLE 2: PROPOSED PEAK DISCHARGES-NEW RIVER
(Discharge in cfs)

<u>Location</u>	<u>Frequency (Years)</u>			
	<u>10</u>	<u>50</u>	<u>100</u>	<u>500</u>
(1) Upstream of Agua Fria River	12,500	29,000	39,000	70,000
(2) Downstream of Skunk Creek	13,500	31,000	41,000	75,000

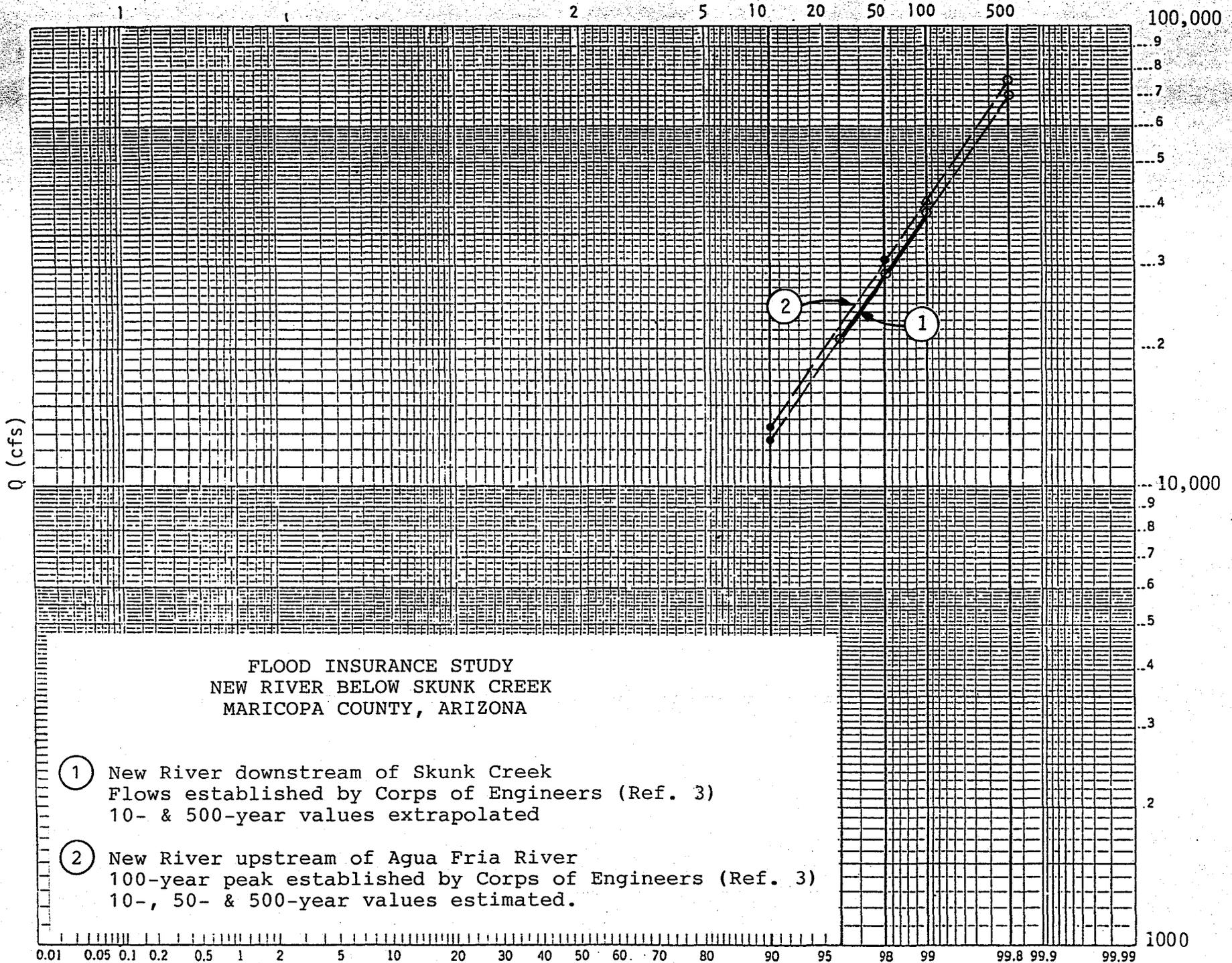


REFERENCES

1. U.S. Army Corps of Engineers, Los Angeles District, "Gila River Basin, Phoenix, Arizona and Vicinity (including New River), Design Memorandum No. 3, Skunk Creek and the New and Agua Fria Rivers (Arizona Canal Diversion Channels to the Gila River)", July, 1985.
2. U. S. Army Corps of Engineers, Los Angeles District, "Gila River Basin, Phoenix, Arizona and Vicinity (including New River), Design Memorandum No. 2, Hydrology Part 2", 1982.
3. U. S. Army Corps of Engineers, Los Angeles District, "Summary of Discharge-Frequencies for New River". Letter Dated October 31, 1986.
4. U. S. Department of Housing and Urban Development, Flood Insurance Agency, "Flood Insurance Study, Maricopa County, Arizona, Unincorporated Areas," May, 1979.
5. Coe and Van Loo Consulting Engineers, Inc., "New River Hydrology, New River Downstream of Skunk Creek Confluence, Maricopa County, Arizona." Letter Dated October 2, 1986.
6. U. S. Army Corps of Engineers, Los Angeles District, "Hydrology for Flood Insurance Studies, Maricopa County Streams, Arizona", June, 1983. Revised May, 1985.



RECURRENCE INTERVAL (YEARS)



FLOOD INSURANCE STUDY
NEW RIVER BELOW SKUNK CREEK
MARICOPA COUNTY, ARIZONA

- ① New River downstream of Skunk Creek
Flows established by Corps of Engineers (Ref. 3)
10- & 500-year values extrapolated
- ② New River upstream of Agua Fria River
100-year peak established by Corps of Engineers (Ref. 3)
10-, 50- & 500-year values estimated.



DEPARTMENT OF THE ARMY

LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2711
LOS ANGELES, CALIFORNIA 90053-2325

RECEIVED

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COE & VAN LOO
Phoenix, AZ

October 31, 1986

REPLY TO
ATTENTION OF

Office of the Chief
Water Resources Branch

Mr. Ashok C. Patel
Coe & Van Loo Consulting Engineers
4550 North 12th Street
Phoenix, Arizona 85014-4291

Dear Mr. Patel:

Reference is made to your letter of September 5, 1986 in which you requested some hydrologic data for the New River. The data you requested is enclosed.

If we can be of further assistance or if you have any questions, please contact Mrs. Jody Fischer of our Hydrologic Engineering Section. Her telephone number is (213) 894-4759.

Sincerely,

for RLT
Carl F. Enson
Chief, Planning Division

Enclosure

<u>Location</u>	<u>Condition</u>	<u>Frequency (years)</u>					
		<u>10</u>	<u>25</u>	<u>50</u>	<u>100</u>	<u>SPF 500</u>	
		<u>discharges in cfs</u>					
New River Downstream of Skunk Creek	Present: with Adobe and New River Dams without ACDC	4600	_____	13,000	21,000	44,000	53,000
New River Downstream of Skunk Creek ^{1,2}	Future: with Adobe, New River and Cave Buttes Dams with ACDC	_____	_____	_____	41,000	68,000	_____
New River Upstream of Aqua Fria River ^{1,2}	Future: with Adobe, New River and Cave Buttes Dams with ACDC	_____	21,000	29,000	39,000	69,000	_____

NOTES: 1. These flows include 2000 cfs from the Aqua Fria River Basin to account for potential future development.

2. For future conditions there is less than 5 percent difference between the two locations.

File



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November 14, 1986

Mr. John Matticks, Acting Chief
Federal Emergency Management Agency
Risk Studies Division
Federal Insurance Administration
500 C Street, SW Room 422
Washington, D.C. 20472

Certified Mail

Attn: Mr. Philip Myers

Re: New River Hydrology, Restudy
New River Downstream of Skunk Creek Confluence
Maricopa County, AZ (Community No. 040037)

Gentlemen:

This letter is to confirm our telephone conversations today with Mr. Myers regarding the reference hydrology. The following was discussed:

The Flood Insurance Study (FIS) in effect was published in May, 1979 only included:

- 1. 100-year floodplain and floodway analysis.
- 2. 10- and 100-year flood profiles to establish Flood Hazard Factors. No 50- and 500-year flood profiles were included in that study (see Attachment).

It is our understanding that the restudy which is being performed by our office will include a similar 100-year floodplain & floodway analysis together with 10- and 100-year flood profiles based on updated hydrology.

As per our contract with the Maricopa County Flood Control District, the restudy will be completed by early January, 1987. In light of the time constraints, therefore we would appreciate your immediate response, if you have any comments regarding the subject profiles.

Should you need any further clarification please do not hesitate to call.

Very truly yours,

COE & VAN LOO
Consulting Engineers, Inc.

Ashok C. Patel, P.E., L.S.
Senior Vice President

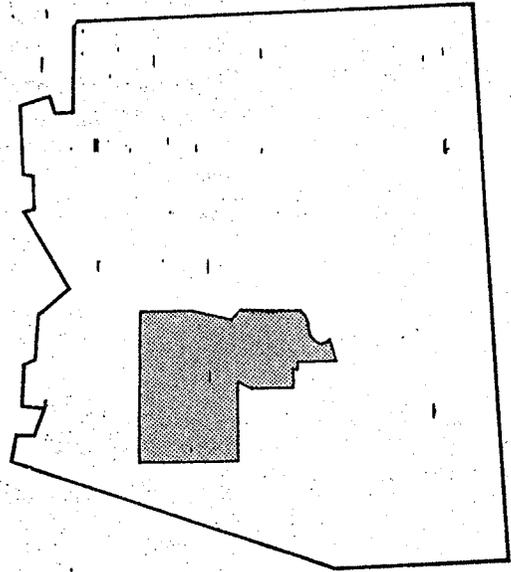
ACP/lis
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CC: Ray Lenaburg, FEMA
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FLOOD INSURANCE STUDY

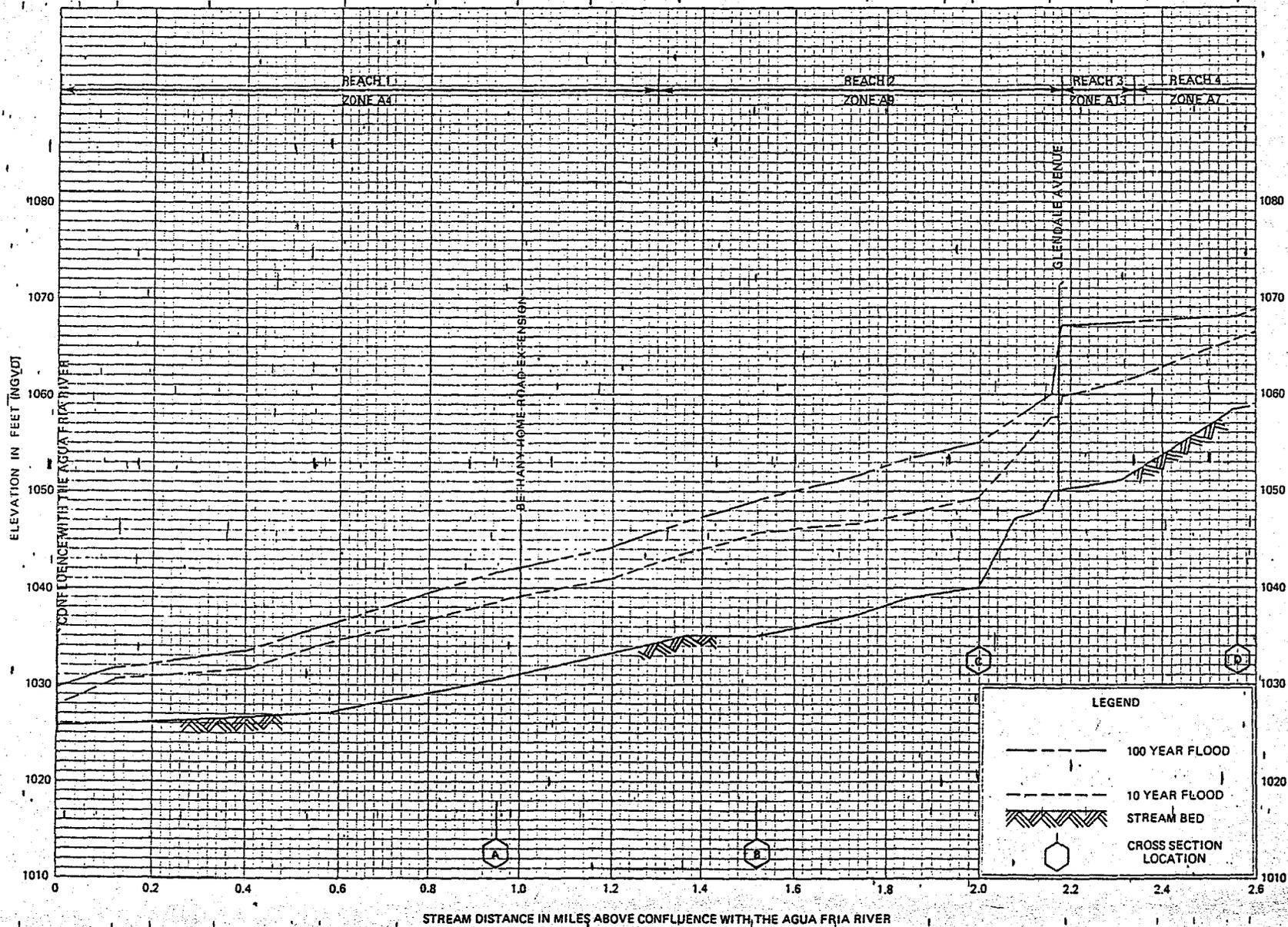


MARICOPA COUNTY,
ARIZONA
UNINCORPORATED AREAS



MAY 1979

U.S. DEPARTMENT of HOUSING & URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION



FLOOD PROFILES

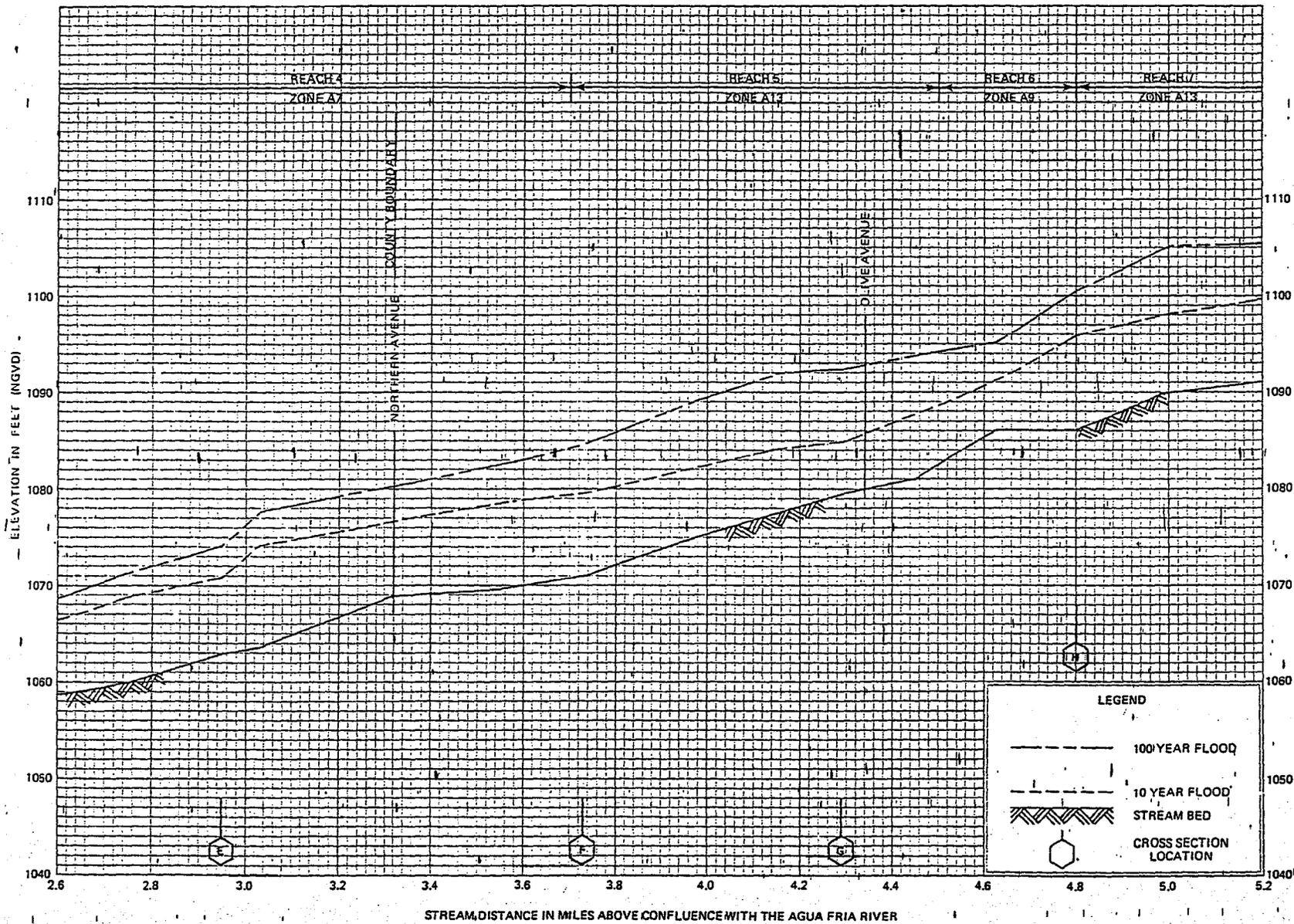
NEW RIVER

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Federal Insurance Administration

MARICOPA COUNTY, AZ

UNINCORPORATED AREAS



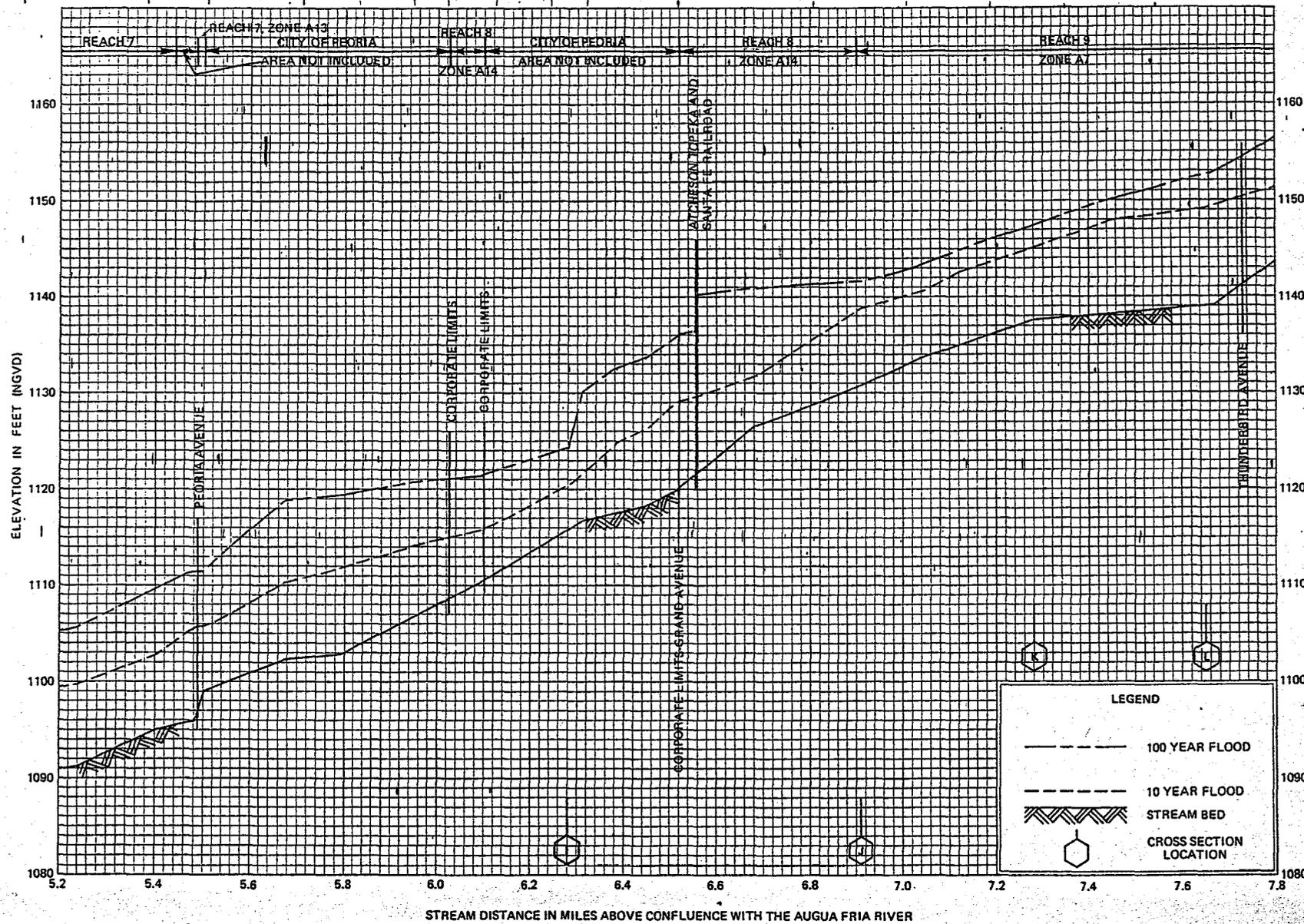
FLOOD PROFILES

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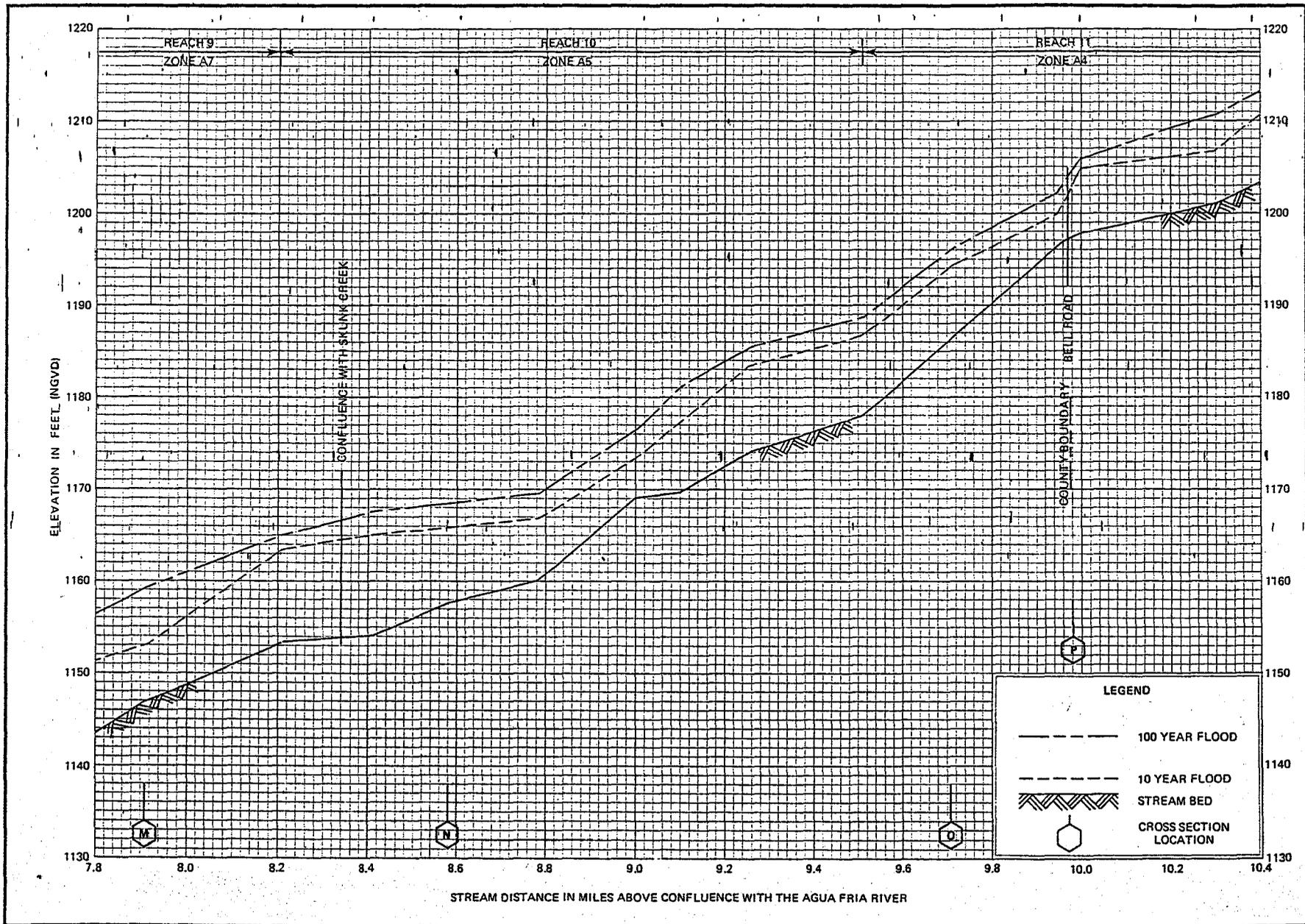


FLOOD PROFILES

NEW RIVER

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

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NEW RIVER

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October 2, 1986

Federal Emergency Management Agency (FEMA)
Washington, D.C. 20472

Attn: Mr. Philip Myers

RE: New River Hydrology
New River Downstream of Skunk Creek Confluence
Maricopa County, Arizona

Gentlemen:

This letter is to confirm our telephone conversations regarding the referenced hydrology. Accordingly, the following resolutions were made by FEMA:

1. The restudy on New River to be based on the hydrology which accounts for the Arizona Canal Diversion Channel contributing. The estimated 100-year Floodpeak at the mouth of New River is 39,000 cfs as per the Corps of Engineers.
2. The restudy limits for New River to be from its confluence with Agua Fria River at downstream side to its confluence with Skunk Creek at upstream site.
3. The restudy to be based upon the Corps of Engineers initial work which defines the 100-year floodplain and floodway. This work to be updated to include the 10-, 50- and 500-year floodprofiles. These profiles to match with the recently updated FEMA floodplain maps (October, 1987) prepared by Dames and Moore in the vicinity of New River and Skunk Creek confluence.

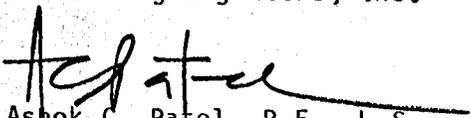
Due to the added scope of work in Items 2 and 3 above, we are presently negotiating engineering fees with our clients as well as the Maricopa County Flood Control District. It is our intent to complete the restudy in an expedited manner so that it can be incorporated with the recent floodplain maps by Dames and Moore during the 90 days appeal process.

Your timely action in regards to the New River hydrology has sincerely been appreciated.

Should you have any question regarding this letter please do not hesitate to call.

Very truly yours,

COE & VAN LOO
Consulting Engineers, Inc.



Ashok C. Patel, P.E., L.S.
Senior Vice President

ACP/1s
2/28/86

CC: Dan Sagramoso, MCFCD
F. Michael Geddes, Geddes & Co.
Bob Henchbarger, Michael Baker, Jr.





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November 11, 1986

Federal Emergency Management Agency (FEMA)
Region IX
Presidio of San Francisco
Building 105
San Francisco, CA 94129

Attn: Mr. Ray Lenaburg
Project Officer

Re: New River Floodplain Study
Maricopa County, Arizona

Dear Mr. Lenaburg:

This letter is to inform you that our firm, Coe and Van Loo Consulting Engineers, Inc. (CVL), has been contracted with the Flood Control District of Maricopa County (FCDMC) in connection with the referenced study (see Figure 1). This study involves:

1. Redelineation of New River Floodplain upstream of Agua Fria River to below Skunk Creek confluence (approximately 8.5 river miles).

For this study, the most current data on topographic mapping and HEC-2 computer model (1984) furnished by the U.S. Army Corps of Engineers (COE) will be used.

The COE had performed a 100-year floodplain and floodway analysis for FCDMC (1984) based on recent hydrology and topographic mapping. That information will be the basis for our analysis. CVL will review COE's data and incorporate necessary modification to the delineation in accordance with the FEMA Guidelines. Accordingly, flood profiles will be calculated for the 10-, 50-, 100- and 500-year floodpeaks. Additionally, the 100-year floodplain will be delineated. It should be noted that the currently adopted Flood Insurance Rate Map for Maricopa County, unincorporated areas, Panel Number 040037 1210A dated July 2, 1979 does not show 500-year floodplain. However, entire area outside the 100-year floodplain is called out as Zone 'B'. This is dictated by the topographic condition of New River. For this reason, we believe our new study will not be required to incorporate the 500-year floodplain delineation. Your input in this regard will be appreciated.

Federal Emergency Management Agency (FEMA)
Re: New River Floodplain Study
Page 2
November 11, 1986

Please note that our study will be completed within the current 90 days appeal process (January, 1987) so that, after FEMA's review and acceptance, it can be incorporated with the new mapping.

2. Detailed Study of New River Upstream of New River Dam (Approx. 20.0 river miles).

This study consists of the North and Middle Reaches as shown on Figure 1. Current FEMA maps show this reach as Floodzone 'A' delineated by approximate methods. In our contract, a detailed study will be performed for this reach in accordance with the FEMA Guidelines, including new mapping, hydrology, hydraulic analysis, delineation, etc. It is scheduled to be completed by November, 1987. We will closely coordinate its progress with you in a timely manner.

We look forward to be working with you on this project. Should you have any questions regarding our scope of work, please do not hesitate to call.

Very truly yours,

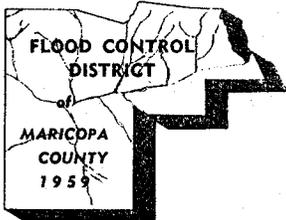
COE & VAN LOO
Consulting Engineers, Inc.


Ashok C. Patel, P.E., L.S.
Senior Vice President

ACP/1s
2/29/34

CC: Phil Myers, FEMA
Dan Sagramoso, FCDMC
Dave Johnson, FCDMC
Matt McMillen, Dames & Moore





FLOOD CONTROL DISTRICT

of

Maricopa County

3335 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 262-1501

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DEC 2 1986

Mr. Ashok Patel
Coe and Van Loo Inc
4550 N. 12th Street
Phoenix, Arizona 85014

Re: New River Redelineation, FCD 86-27

Mr. Patel:

The Flood Control District is the local sponsor of the U.S. Army Corps of Engineers; Phoenix, Arizona, and Vicinity (Including New River), flood control project which includes the Cave Buttes, Adobe Mountain, Dreamy Draw and New River Dams, The Arizona Canal Diversion Channel and Channelization of the New River at Grand Avenue.

Per FEMA guidelines "adequate Progress" has been made on this project, (...100% authorized, at least 60% appropriated, at least 50% expended, and the project is at least 50% completed), and as such would wish to have this information included for the Flood Insurance Study you are now performing.

David R. Johnson
Chief Hydrologist



COE & VAN LOO
December 30, 1986

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Mr. John Matticks, Acting Chief
Federal Emergency Management Agency
Risk Studies Division
Federal Insurance Administration
500 C Street, SW Room 422,
Washington, D.C. 20472

Certified Mail

Attn: Mr. Philip Myers

Re: New River FIS, Restudy
New River Downstream of Skunk Creek Confluence
Maricopa County, AZ (Community No. 040037)

Gentlemen:

As you are aware, Coe and Van Loo Consulting Engineers, Inc., has been retained by the Flood Control District of Maricopa County (FCDMC) to perform a restudy of New River for the referenced study reach. The restudy is essentially complete and is being reviewed by the local agencies before submittal to your office. We anticipate a formal submittal to FEMA in about two to three weeks from now. As part of the submittal, we need to include an old HEC-2 data on New River for the currently effective flood maps. The FCDMC does not have access to this old data and therefore we are respectfully requesting the old HEC-2 data from your office. Study Reach details follow:

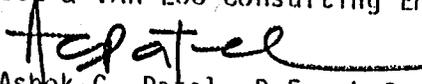
Study Reach: New River downstream of Skunk Creek to Agua
Fria River Confluence
Community: Maricopa County, Arizona
Community Number: 040037
Date of the Study: May, 1979

Please note that New River has recently been restudied upstream of Skunk Creek Confluence, and FEMA has produced preliminary maps for that portion of New River through Dames and Moore. It is likely that Dames and Moore may have acquired the old HEC-2 data as part of the requirement for that reach.

Should you have any questions regarding this request please do not hesitate to call.

Very truly yours,

COE & VAN LOO Consulting Engineers, Inc.


Ashok C. Patel, P.E., L.S.
Senior Vice President

ACP/1s - 2/30/2

CC: Ray Lenaburg, FEMA Region IX
Dave Johnson, FCDMC
Doug Plasencia, FCDMC



Federal Emergency Management Agency

Washington, D.C. 20472

RECEIVED

JAN 21 1987

COE & VAN LOO
Phoenix, AZ

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

JAN 13 1987

Mr. Ashok C. Patel, P.E., L.S.
Senior Vice President
Coe & Van Loo Consulting Engineers, Inc.
4550 North 12th Street
Phoenix, Arizona 85014

Dear Mr. Patel:

This letter is in response to your letter of October 2, 1986, and November 14, 1986, to Mr. Philip Myers of my staff, and November 11, 1986, to Mr. Ray Lenaburg of our Regional Office staff in San Francisco, California, and your telephone conversation with a representative of our Technical Evaluation Contractor (TEC) on October 10, 1986, concerning the Flood Insurance Study (FIS) for Maricopa County, Arizona. In these communications, you indicated that Coe and Van Loo (CVL) had been contracted by the Flood Control District of Maricopa County (FCDMC) to perform additional detailed study on the New River between the confluence with Skunk Creek and the confluence with the Agua Fria River and upstream of the New River Dam. In your letter to Mr. Myers, you requested that FEMA confirm the 100-year flood discharge value and scope of study proposed by CVL for the reach of the New River between Skunk Creek and the Agua Fria River.

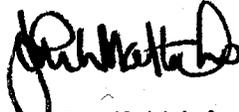
With your November 14 letter, you included a report entitled Hydrology Update, New River Below Skunk Creek, Maricopa County, Arizona. The 10-, 50-, 100-, and 500-year flood discharge values given in this report are acceptable for use in this restudy of the New River.

Your letter to Mr. Lenaburg outlines the proposed scope of the CVL analysis for the reach of the New River. Your analysis will be based on a 100-year floodplain and floodway model developed by the U.S. Army Corps of Engineers (COE) in 1984. CVL will modify this COE model to reflect existing floodplain conditions, and develop 10-, 50-, and 500-year flood discharges and profiles. Delineations of the 100-year floodplain and floodway will be developed. No 500-year floodplain delineations are necessary because most of this portion of Maricopa County is designated as Zone B. The flood profiles and floodplain delineations developed by CVL should tie into those presented in the revised FIS for Maricopa County. In addition, please ensure that all unusual situations, such as those discussed with our TEC on October 10, are thoroughly investigated and explained in your submittal. The 90-day appeal period for Maricopa County will end on January 29, 1987.

If the CVL analyses are received by that time, and our review finds these analyses acceptable, the information will be incorporated into the FIS before it is printed.

If you should have any questions concerning this matter, please call Mr. Philip Myers of my staff in Washington, D.C., at (202) 646-2755.

Sincerely,



John L. Matticks
Acting Chief, Risk Studies Division
Federal Insurance Administration



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2711
LOS ANGELES, CALIFORNIA 90053-2325

RECEIVED

JAN 20 1987

COE & VAN LOO
Phoenix, AZ

January 14, 1987

Office of the Chief
Water Resources Branch

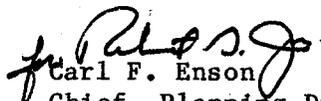
Mr. Ashok Patel
Coe & Van Loo Consulting Engineers, Inc.
4550 North 12th Street
Phoenix, Arizona 85014

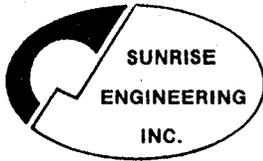
Dear Mr. Patel:

Our Hydrologic Engineering Section has reviewed the hydrology update for the New River below Skunk Creek, Maricopa County, Arizona, dated November 15, 1986 prepared by your office. The peak discharges in table 2 of the report are considered adequate for flood insurance study purposes. However, the statement in paragraph 3 of page 1 that "Reference 2 contains present conditions," should be changed. Reference 2 deals only with future conditions.

If you have any questions, please call Mr. Tony Nefas of the Flood Plain Management Section at (213) 894-5454 and refer to file No. A-06-440.

Sincerely,


Carl F. Enson
Chief, Planning Division



SUNRISE ENGINEERING, INC.

1550 EAST UNIVERSITY DRIVE, SUITE N-1 • MESA, ARIZONA 85203 • (602) 833-3339

FILLMORE, UT
CEDAR CITY, UT
MESA, AZ

January 23, 1987

Dr. Gries and Mrs. Sharon Harper
Plaza Del Rio Development
9401 West Thunderbird Road
Peoria, AZ 85345

RE: As built Elevations

Dear Mrs. Harper;

We certify that the fill material on this project was brought to reasonable conformity with the finish elevations shown on the grading and drainage plan sheets 1, 2, & 3 prepared by Ellis-Murphy Engineers and Land Surveyors dated November, 1985.

The benchmark used for this project was the Maricopa County brass cap on the Southwest corner of the bridge on Thunderbird Road at New River. The brass cap was stamped Elevation = 1163.46.

If you need further information, please give us a call.

Respectfully,

A handwritten signature in cursive script that reads 'James A. Cox'.

James A. Cox, R.L.S.,
President

JAC/sh

cc: Coe & Van Loo, Mr. Ashok C. Patel, P.E.





Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IA-RA-RS (102)
Community: City of Peoria,
Maricopa County, Arizona
Effective Date of
Revision: November 26, 1985
Community Numbers: 040050, 0042 C,
and 0046 C

Honorable Edmund Pang
Mayor, City of Peoria
P.O. Box 38
Peoria, Arizona

Dear Mayor Pang:

Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) Panels 0042 and 0046 for your community have been revised to modify the elevations, flood plain boundaries, and floodway of a flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along the reach of the New River between Thunderbird Road and Greenway Road.

The base flood elevations for the New River shown as ranging from 1,154 feet National Geodetic Vertical Datum (NGVD) to 1,178 feet NGVD on the above-mentioned panels have been modified and now range from 1,146 feet NGVD to 1,171 feet NGVD. The new base flood elevations are shown on the enclosed hand-revised copies of Panels O2P and O3P of the flood profiles for the New River.

The flood plain boundaries for the New River have been modified as shown between cross section 410.0 and 475.7 on Sheet Nos. 1 of 3 through 3 of 3 of the maps entitled Delineation of Flood Boundaries & Floodway, New River, prepared by Ellis-Murphy, Inc. (EM). The floodway limits in this area are now coincident with the new 100-year flood plain boundaries.

These revisions were made using information provided by Mr. Ronald Schreier of EM and amends the effective FIRM and FBFM for the City of Peoria dated January 16, 1981.

This modification has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and the 44 CFR Part 55.



Public notification of modifications to the flood elevations will be given in the Peoria Times on December 13, 1985, and on December 20, 1985. In addition, a notice of changes will be published in the Federal Register.

As required by the legislation, a community must adopt and enforce flood plain management measures to ensure continued eligibility to participate in the National Flood Insurance Program. Therefore, your community must enforce these regulations using, at a minimum, the base flood elevations, zones, and floodways in the Special Flood Hazard Areas as shown on the FIRM and FBFM for your community, including the above-mentioned floodway, zone designation, and zone boundary modifications.

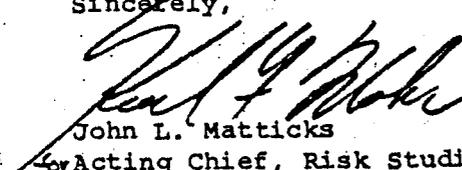
The maps as listed above and as amended by this letter will be used for all flood insurance policies and renewals issued for your community on and after the effective date listed above.

The revised zone designation is effective on the date of this letter; however, within 90 days of the second publication in the Peoria Times, a citizen may request the Federal Emergency Management Agency (FEMA) to reconsider this determination. Any request for reconsideration must be based on scientific or technical data. All interested parties are on notice that, until the 90-day period elapses, the determination by FEMA itself may be modified.

A Consultation Coordination Officer (CCO) has been designated to assist you with any problems that you may have concerning the new base flood elevations, flood boundaries, floodway, and zone designations. The CCO will be the primary liaison between your community and FEMA.

Any questions may be directed to your CCO. Your CCO is Ms. Patty Clendenning, in the FEMA Regional Office in San Francisco, California. She can be reached at (415) 556-9840; or, you can call members of my staff at (202) 646-2767.

Sincerely,

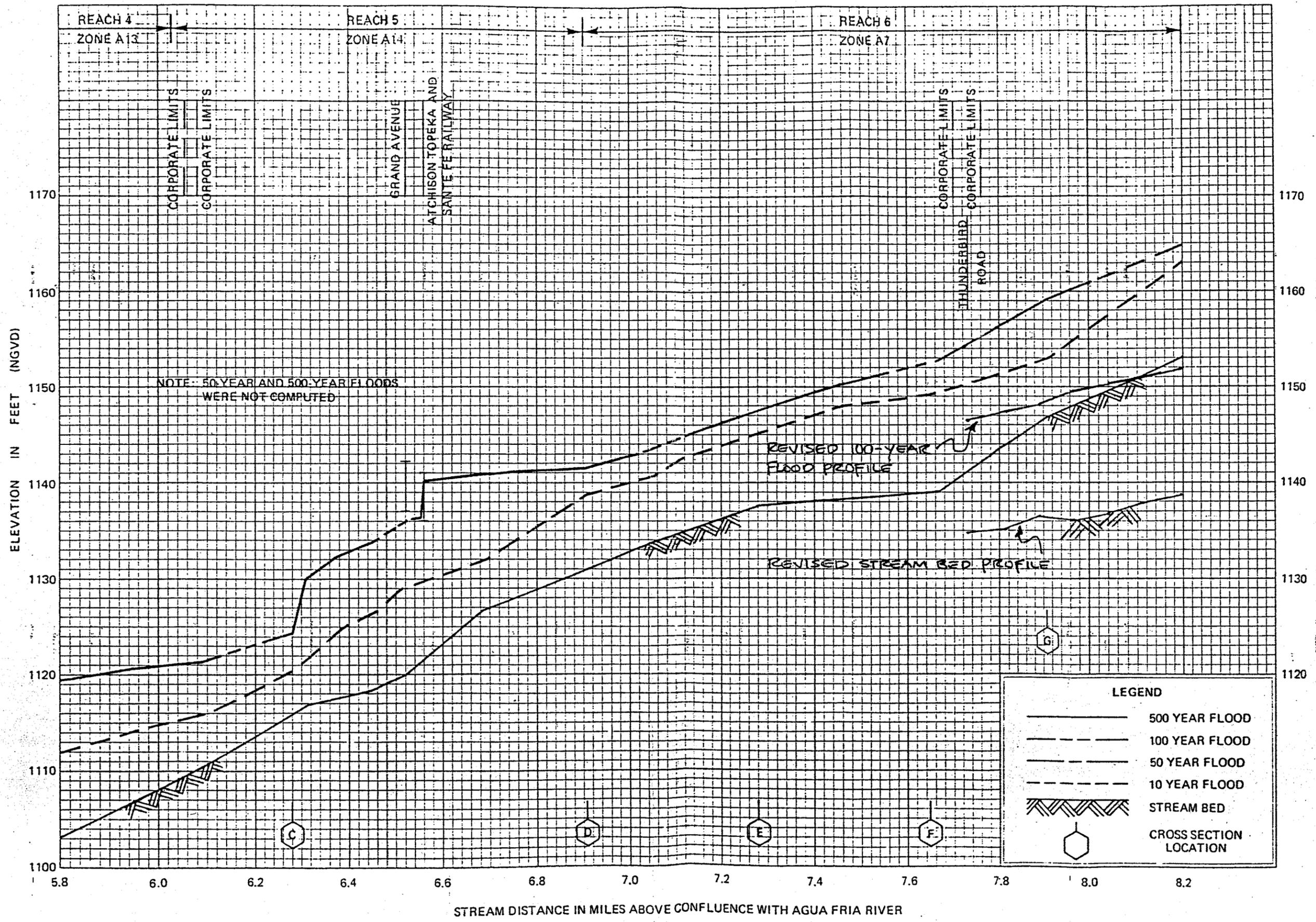


John L. Matticks

Acting Chief, Risk Studies Division
Federal Insurance Administration

Enclosure

cc: Mr. John Norris, RGW Company (w/enclosure)
Mr. Robert Kiesl, KM Development Corporation
Mr. Ronald Schreier, Ellis-Murphy, Inc. (w/enclosure)



FLOOD PROFILES

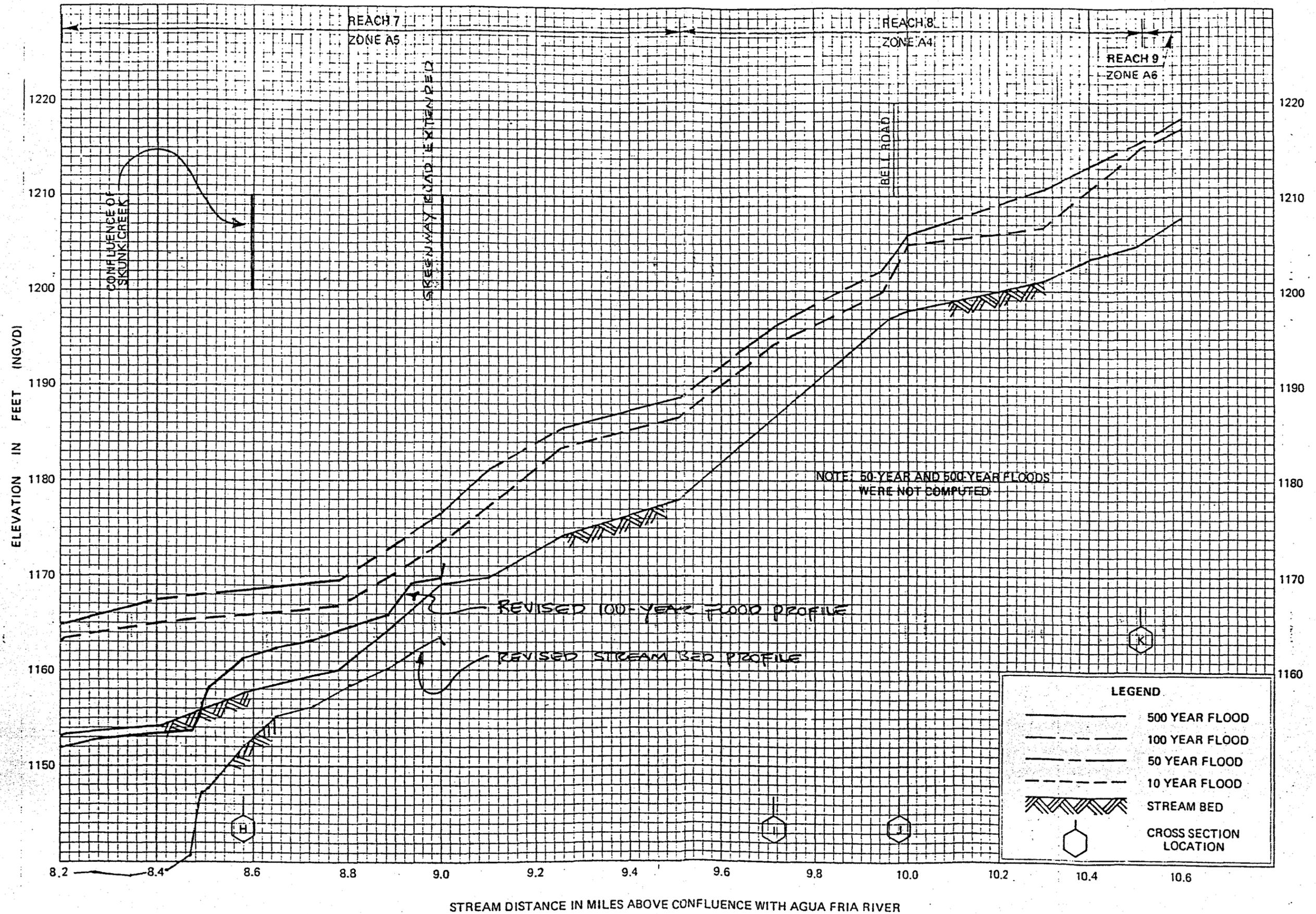
NEW RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

CITY OF PEORIA, AZ
(MARICOPA CO.)

02P

REVISION MADE BY LOMR DATED 11-26-85



FLOOD PROFILES

NEW RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

CITY OF PEORIA, AZ
(MARICOPA CO.)

REVISION MADE BY LOMR DATED 11-26-85



Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IA-RA-RS (102)
Community: City of Peoria,
Maricopa County, Arizona
Effective Date of
Revision: MAR 24 1986
Community Panel Number: 040050 0042 C

The Honorable Edmund Pang
Mayor, City of Peoria
P.O. Box 38
Peoria, Arizona 85345

Dear Mayor Pang:

Flood Insurance Rate Map (FIRM) Panel 0042 and Flood Boundary and Floodway Map (FBFM) Panel 0042 for your community have been revised to modify the elevations, flood plain boundaries, and floodway of a flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along the reach of the New River from Thunderbird Road to approximately 1,550 feet downstream.

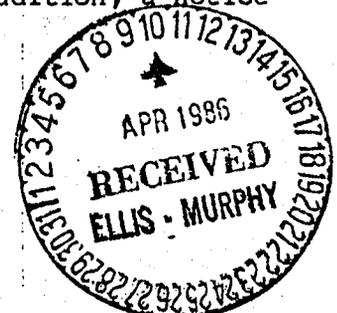
The base flood elevations for the New River shown as ranging from 1,150 feet National Geodetic Vertical Datum (NGVD) to 1,155 feet NGVD on the above-mentioned panel have been modified and now range from 1,144 feet NGVD to 1,146 feet NGVD. The new base flood elevations are shown on the enclosed hand-revised copy of Profile Panel 02P for the New River.

The flood plain boundaries for the New River have been modified as shown between cross sections 410.0 and 394.0 on Sheet No. 1 of 1 of the map entitled Delimitation of Flood Boundaries & Floodway, New River, prepared by Ellis-Murphy, Inc. (EM). The floodway limits in this area are now coincident with the new 100-year flood plain boundaries.

These revisions were made using information provided by Mr. Ronald Schreier of EM and amends the effective FIRM and FBFM for the City of Peoria dated January 16, 1981.

This modification has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65.

Public notification of modification to the flood elevations will be given in the Peoria Times on April 4, 1986, and April 11, 1986. In addition, a notice of changes will be published in the Federal Register.



As required by the legislation, a community must adopt and enforce flood plain management measures to ensure continued eligibility to participate in the National Flood Insurance Program. Therefore, your community must enforce these regulations using, at a minimum, the base flood elevations, zones, and floodways in the Special Flood Hazard Areas as shown on the FIRM and FBFM for your community, including the above-mentioned floodway, flood elevation, and flood boundary modifications.

The community number and suffix code listed above will be used for all flood insurance policies and renewals issued for your community on and after the effective date listed above.

The modifications are effective on the date of this letter; however, within 90 days of the second publication in the Peoria Times, a citizen may request the Federal Emergency Management Agency (FEMA) to reconsider this determination. Any request for reconsideration must be based on scientific or technical data. All interested parties are on notice that, until the 90-day period elapses, the determination by FEMA itself may be modified.

A Consultation Coordination Officer (CCO) has been designated to assist you with any problems that you may have concerning the new base flood elevations, flood boundaries, and floodway. The CCO will be the primary liaison between your community and FEMA.

Any questions may be directed to your CCO. Your CCO is Ms. Patricia R.D. Rippe, located in the FEMA Regional Office in San Francisco. She can be reached at (415) 556-9840; or, you can contact Mr. Philip Myers of my staff in Washington, D.C., at (202) 646-2755.

Sincerely,

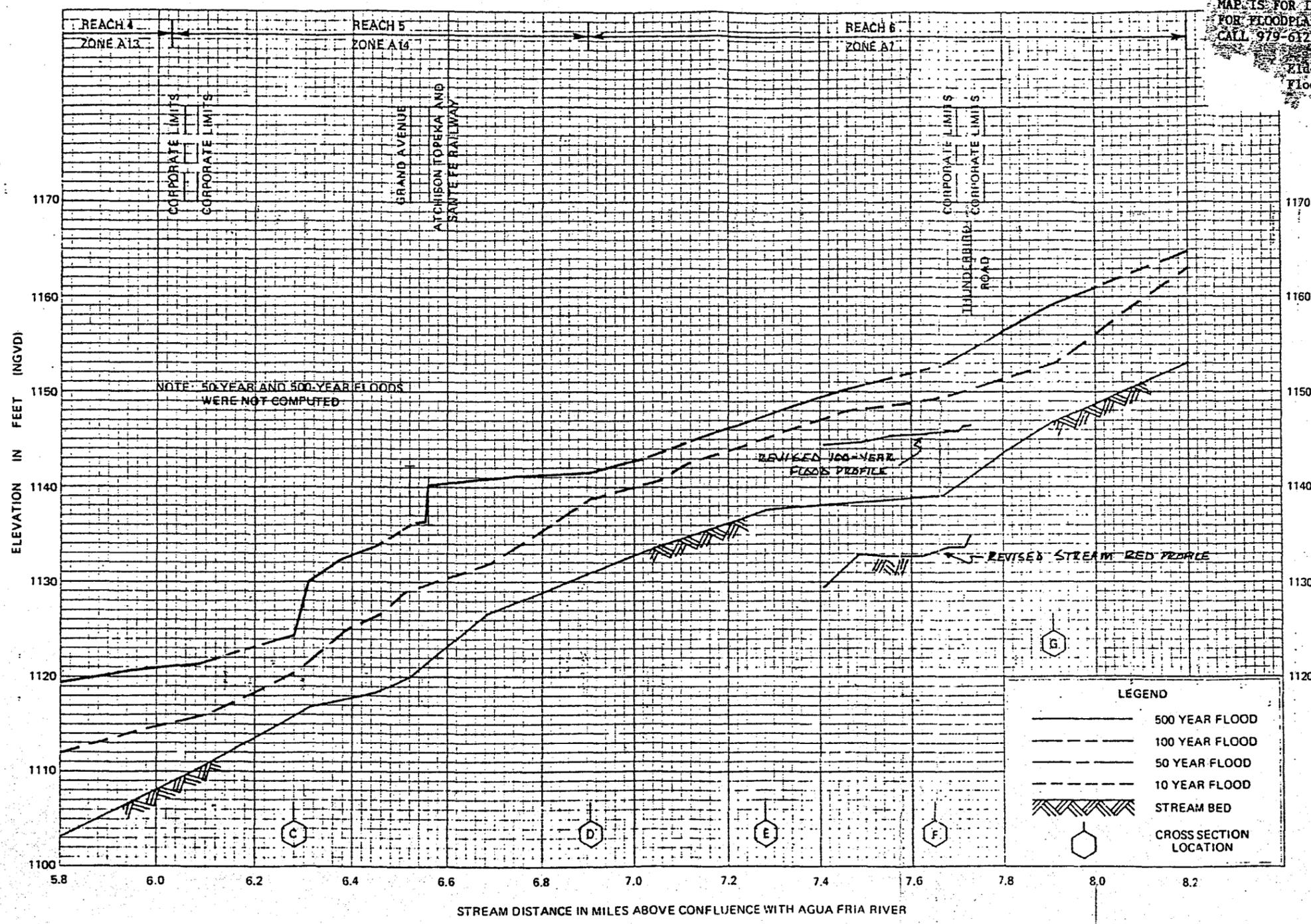
John L. Matticks wsl

John L. Matticks
Acting Chief, Risk Studies Division
Federal Insurance Administration

Enclosure

cc: Mr. Dick Hanson, RGW Company (w/enclosure)
Mr. Robert Kiesel, KM Development Corporation
Mr. Ronald Schreier, Ellis-Murphy, Inc. (w/enclosure)

MAP IS FOR INSURANCE PURPOSES
 FOR FLOODPLAIN ELEVATIONS PLEASE
 CALL 979-6121
 Eldon R. Johansen
 Floodplain Administrator



LEGEND

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

FLOOD PROFILES
 NEW RIVER
 FEDERAL EMERGENCY MANAGEMENT AGENCY
 Federal Insurance Administration
 CITY OF PEORIA, AZ
 (MARICOPA CO.)
 02P

GLENDALE MUNICIPAL AIRPORT
 CHANNELIZATION COMPLETED FOR
 GLENDALE AIRPORT WAS REDUCED &
 SPLICED ONTO THIS MAP TO SHOW
 NEW RIGHT BANK ALIGNMENT.
 ORIGINAL C.O.E CONTROL LINE
 WAS USED WITH UPDATED
 CHANNELIZATION.

MATCH LINE SEE SHEET 2
 ZONE A10
 ZONE A5

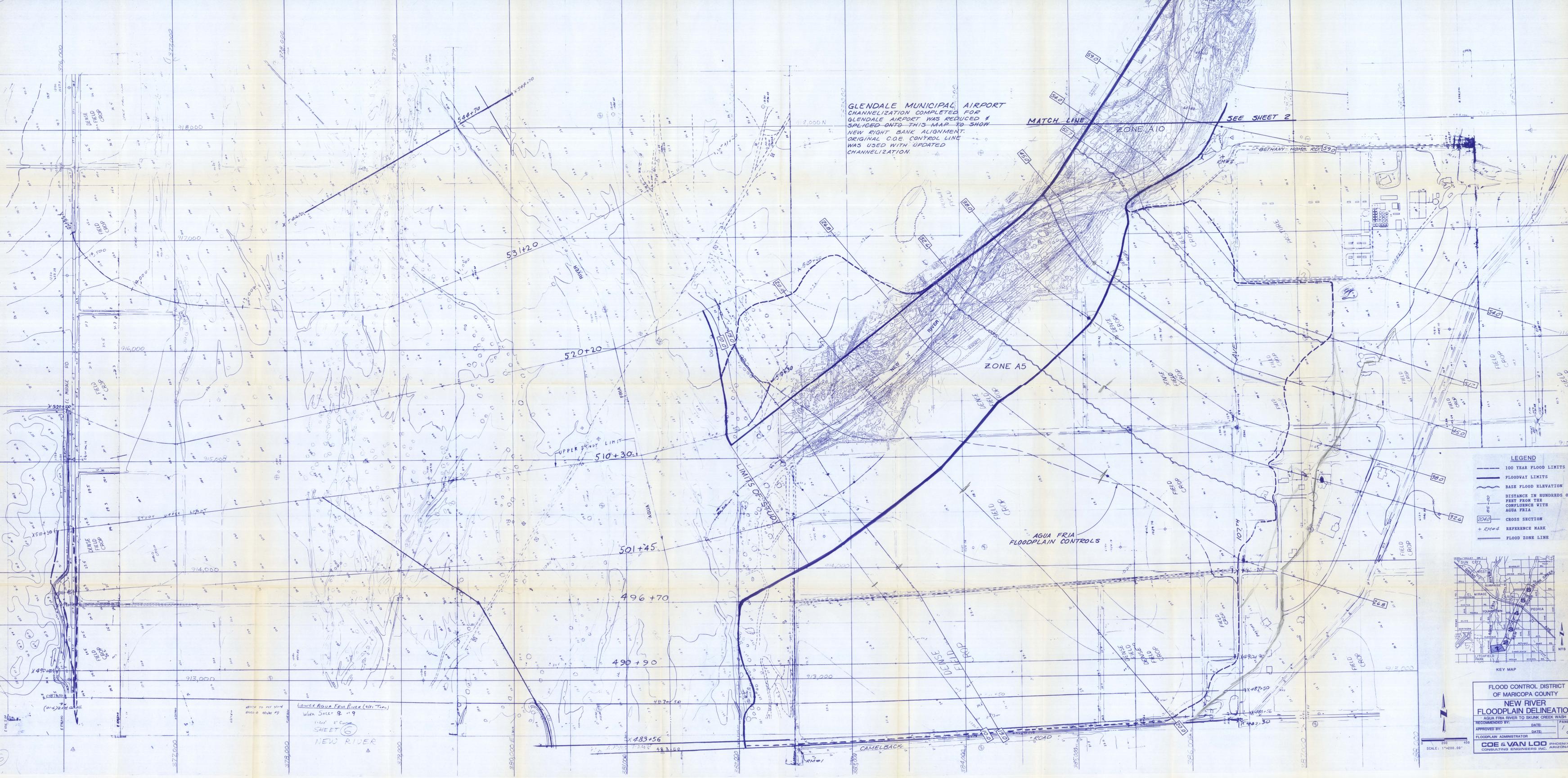
AGUA FRIA
 FLOODPLAIN CONTROLS

- LEGEND**
- 100 YEAR FLOOD LIMITS
 - FLOODWAY LIMITS
 - BASE FLOOD ELEVATION
 - DISTANCE IN HUNDREDS OF FEET FROM THE CONFLUENCE WITH AGUA FRIA
 - CROSS SECTION
 - + REFERENCE MARK
 - FLOOD ZONE LINE

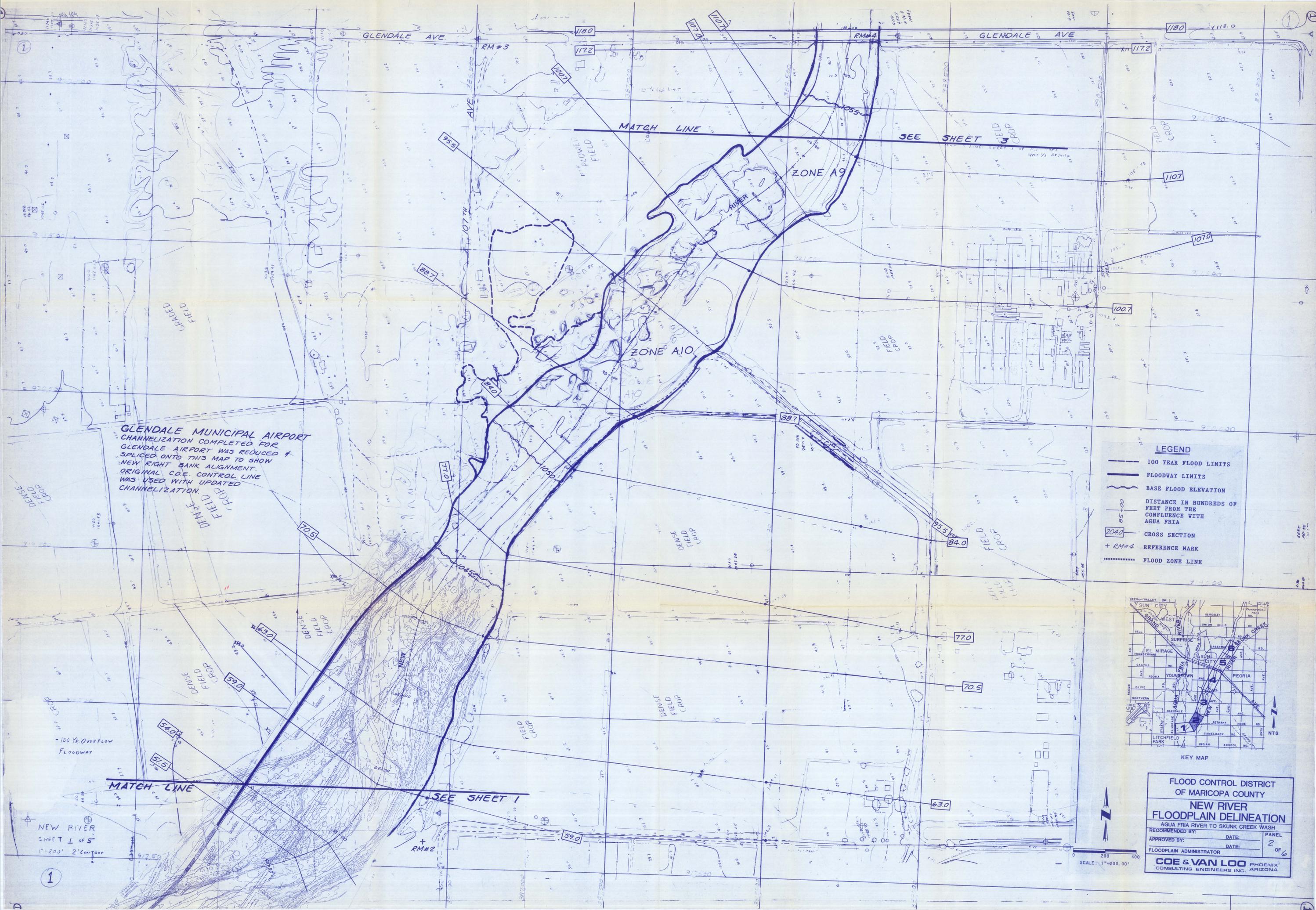


FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
**NEW RIVER
 FLOODPLAIN DELINEATION**
 AGUA FRIA RIVER TO SKUNK CREEK WASH
 RECOMMENDED BY: DATE: PANEL:
 APPROVED BY: DATE: OF 6
 FLOODPLAIN ADMINISTRATOR
COE & VAN LOO REGISTERED PROFESSIONAL ENGINEERS INC. ARIZONA

SCALE: 1"=200.00'
 0 200 400



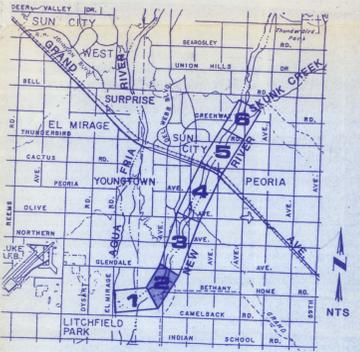
LOWER AGUA FRIA RIVER (WIN TRAIL)
 WORK SHEET # 9
 SHEET 6
 NEW RIVER



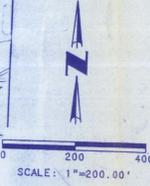
GLENDALE MUNICIPAL AIRPORT
 CHANNELIZATION COMPLETED FOR
 GLENDALE AIRPORT WAS REDUCED &
 SPLICED ONTO THIS MAP TO SHOW
 NEW RIGHT BANK ALIGNMENT.
 ORIGINAL C.O.E. CONTROL LINE
 WAS USED WITH UPDATED
 CHANNELIZATION.

LEGEND

- 100 YEAR FLOOD LIMITS
- FLOODWAY LIMITS
- BASE FLOOD ELEVATION
- DISTANCE IN HUNDREDS OF FEET FROM THE CONFLUENCE WITH AGUA FRIA
- CROSS SECTION
- REFERENCE MARK
- FLOOD ZONE LINE

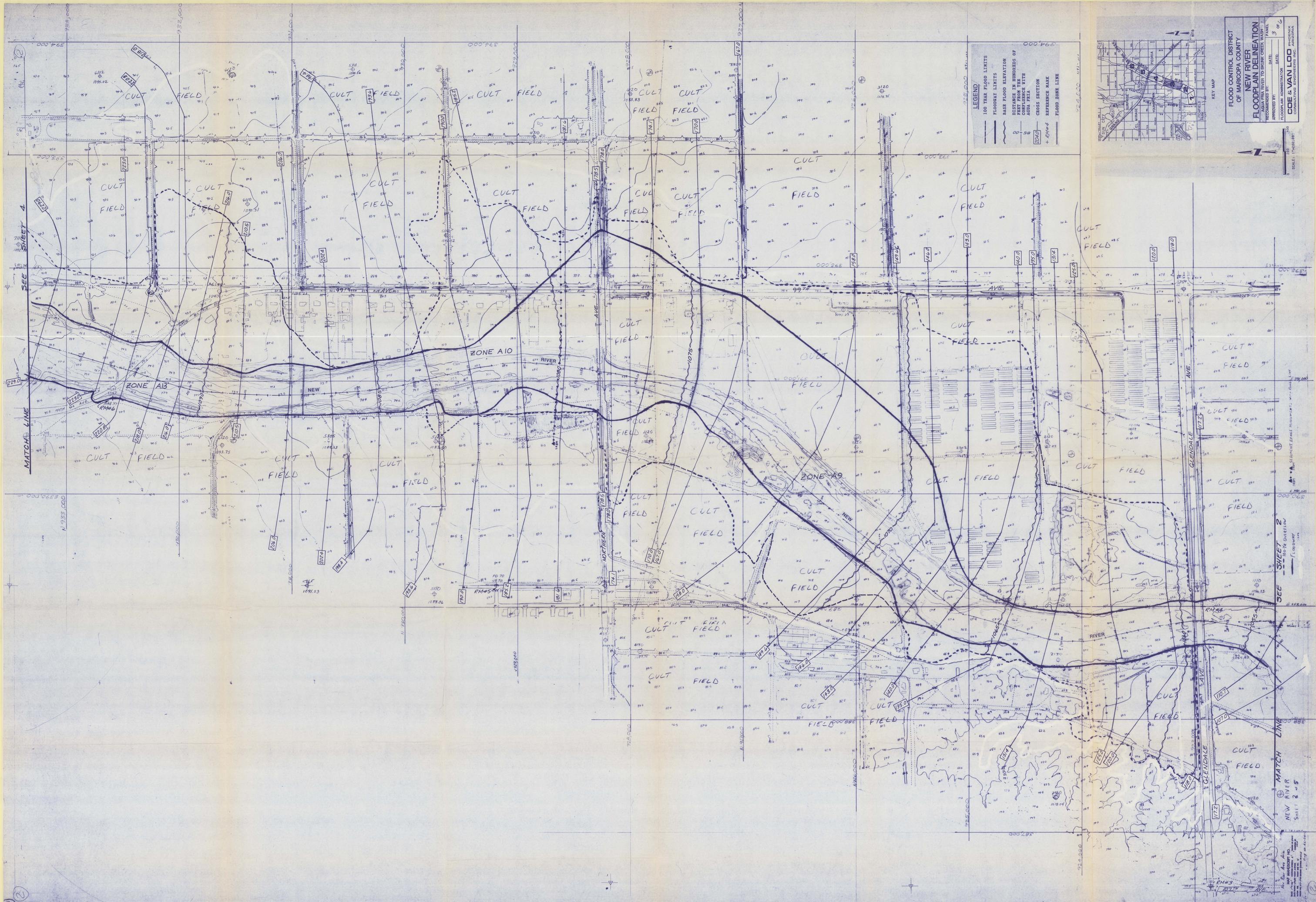


FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
**NEW RIVER
 FLOODPLAIN DELINEATION**
 AGUA FRIA RIVER TO SKUNK CREEK WASH
 RECOMMENDED BY: _____ DATE: _____
 APPROVED BY: _____ DATE: _____
 FLOODPLAIN ADMINISTRATOR
COE & VAN LOO PHOENIX
 CONSULTING ENGINEERS INC. ARIZONA



NEW RIVER
 SHEET 1 OF 5
 1"=200' 2' CONTOUR

1



LEGEND

- 100 YEAR FLOOD LIMITS
- ROADWAY LIMITS
- BASE FLOOD ELEVATION
- DISTANCE IN HUNDREDS OF FEET FROM THE CONFLUENCE WITH NEW RIVER
- CROSS SECTION REFERENCE MARK
- FLOOD ZONE LINE



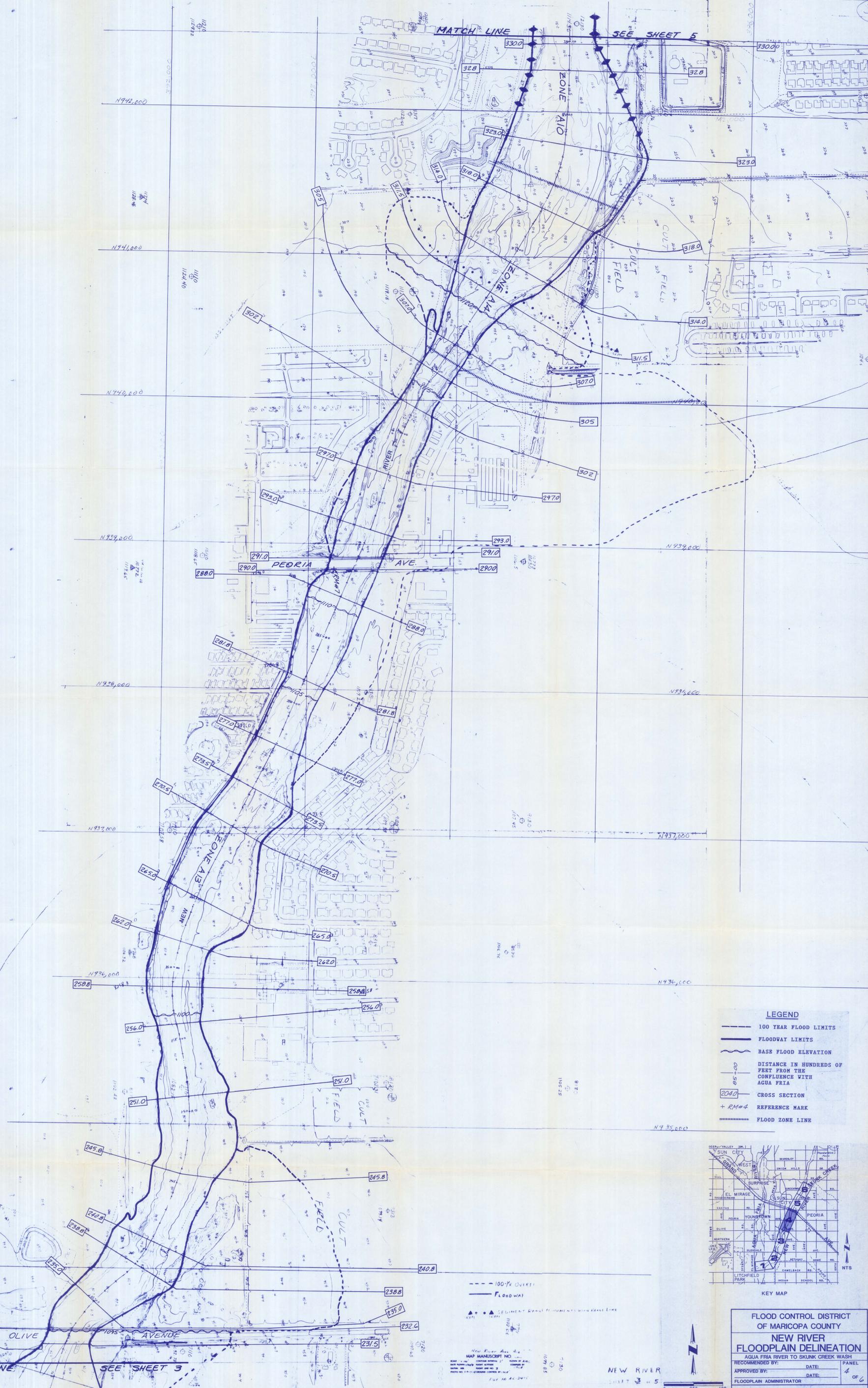
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
NEW RIVER FLOODPLAIN DELINEATION
 PREPARED BY: _____ DATE: _____
 APPROVED BY: _____ DATE: _____
 FLOODPLAIN ADMINISTRATOR: _____
COE & VAN LOO
 CONSULTING ENGINEERS INC.
 SCALE: 1" = 400'-0"

SEE SHEET 4

MATCH LINE

SEE SHEET 2

MATCH LINE
 NEW RIVER
 SHEET 2 of 5



LEGEND

- 100 YEAR FLOOD LIMITS
- FLOODWAY LIMITS
- BASE FLOOD ELEVATION
- DISTANCE IN HUNDREDS OF FEET FROM THE CONFLUENCE WITH AGUA FRIA
- CROSS SECTION
- REFERENCE MARK
- FLOOD ZONE LINE



--- 100% OVERT
 --- FLOODWAY
 ▲ SEDIMENT BASIN
 ● SEDIMENT BASIN

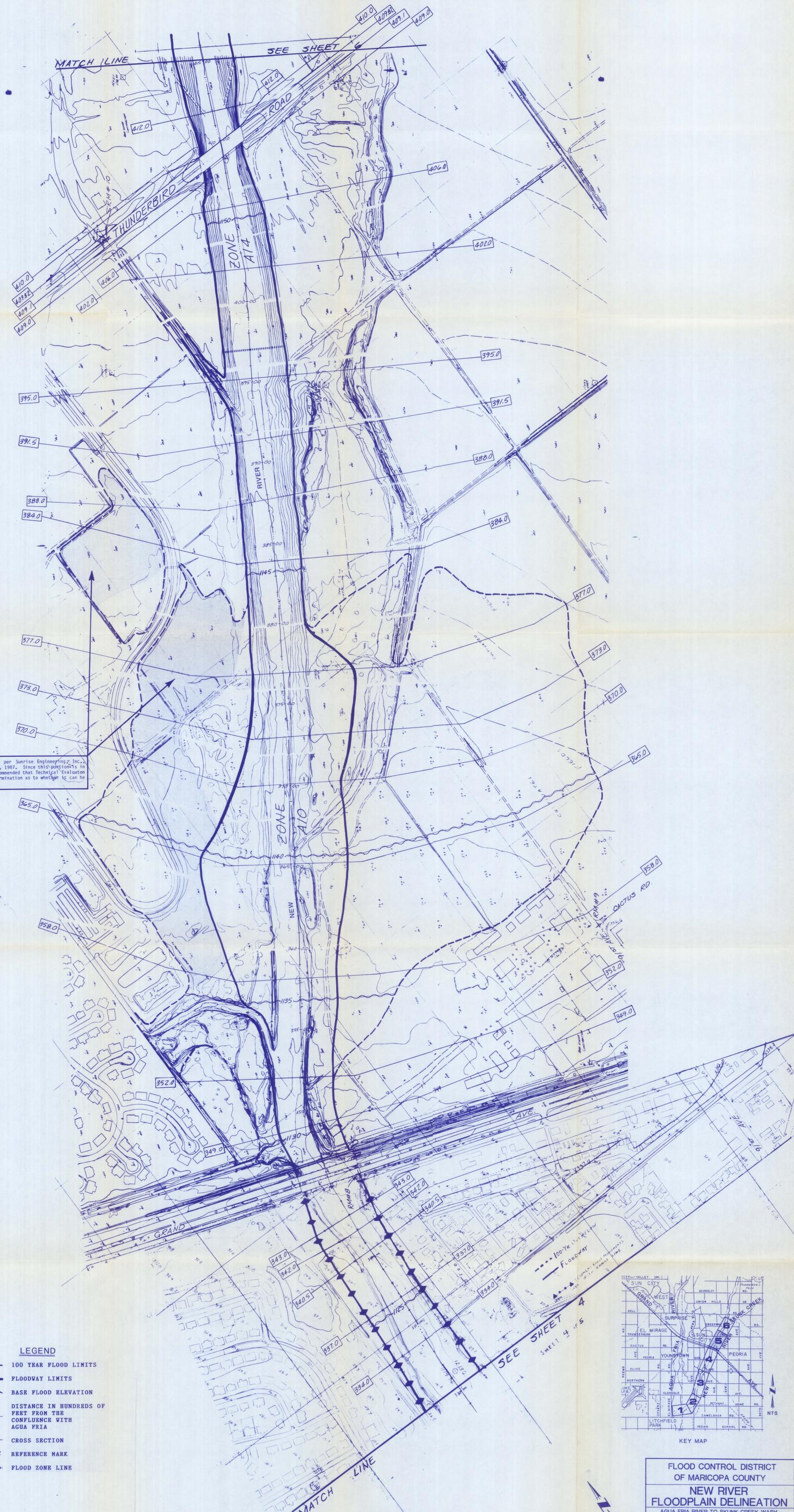
New River Area
 MAP MANUSCRIPT NO. 1000
 DATE: 10/28/85
 FILE NO. 16-A-2445

NEW RIVER
 SHEET 3 of 5
 SCALE: 1"=200.00'

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
NEW RIVER FLOODPLAIN DELINEATION
 AGUA FRIA RIVER TO SKUNK CREEK WASH
 RECOMMENDED BY: _____ DATE: _____ PANEL: _____
 APPROVED BY: _____ DATE: _____ PANEL: 4 of 6
 FLOODPLAIN ADMINISTRATOR
COE & VAN LOO PHOENIX CONSULTING ENGINEERS INC. ARIZONA

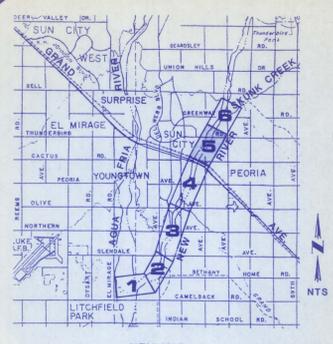
MATCH LINE SEE SHEET 3

MATCH LINE SEE SHEET 5



Area shaded has recently been filled per Sunrise Engineering, Inc., certification letter dated January 23, 1987. Since this portion is in the floodplain fringe area, it is recommended that Technical Evaluation Contractor (TEC) review and make determination as to whether it can be placed under Zone "B" designation.

- LEGEND**
- 100 YEAR FLOOD LIMITS
 - FLOODWAY LIMITS
 - ~ BASE FLOOD ELEVATION
 - DISTANCE IN HUNDREDS OF FEET FROM THE CONFLUENCE WITH AGUA FRIA
 - 204.0 CROSS SECTION
 - + RM#4 REFERENCE MARK
 - FLOOD ZONE LINE



FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

**NEW RIVER
FLOODPLAIN DELINEATION**

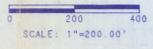
AGUA FRIA RIVER TO SKUNK CREEK WASH

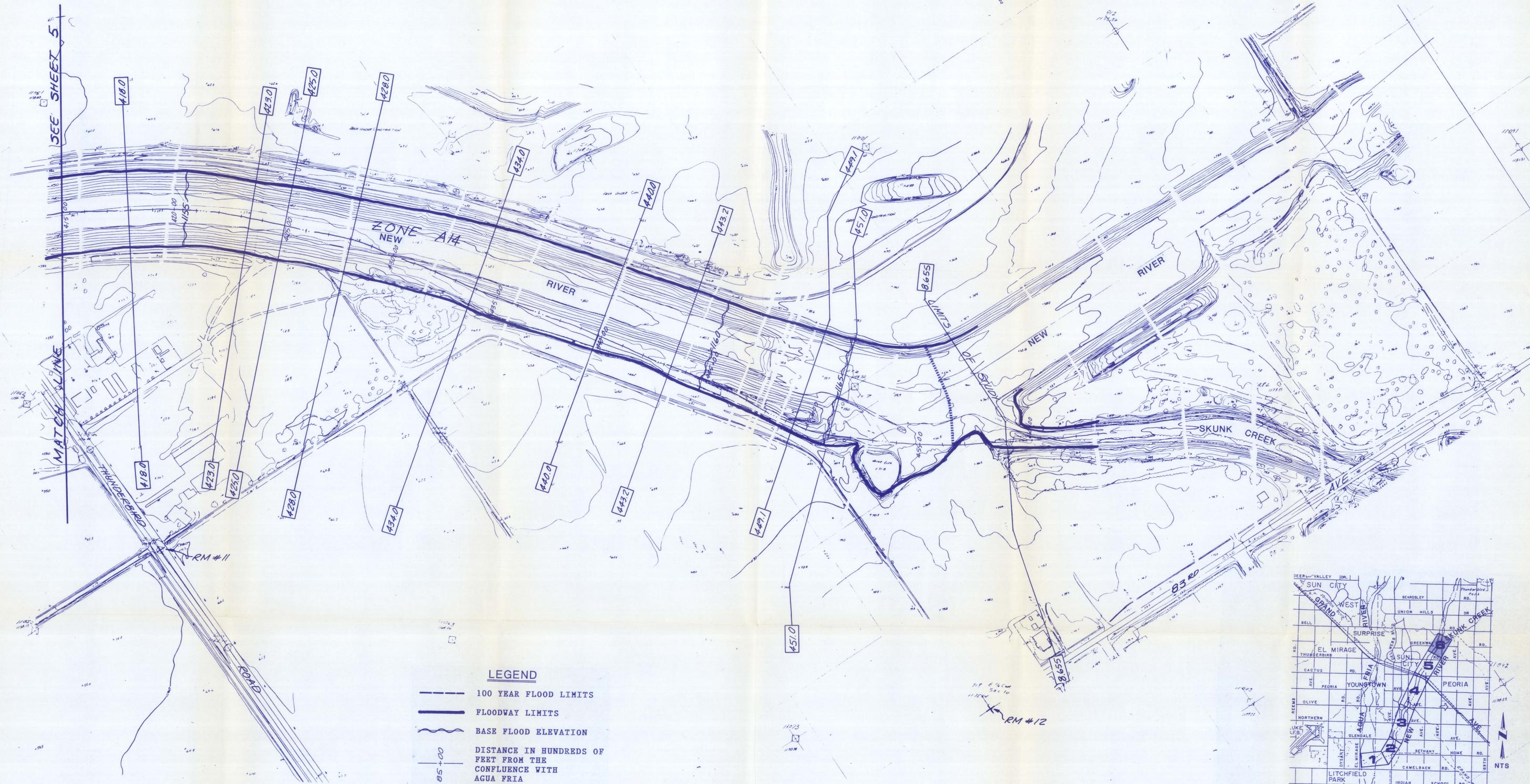
RECOMMENDED BY: _____ DATE: _____ PANEL 5 OF 6

APPROVED BY: _____ DATE: _____

FLOODPLAIN ADMINISTRATOR

COE & VAN LOO PHOENIX ARIZONA
CONSULTING ENGINEERS INC.





LEGEND

--- 100 YEAR FLOOD LIMITS

— FLOODWAY LIMITS

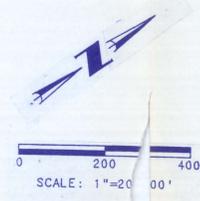
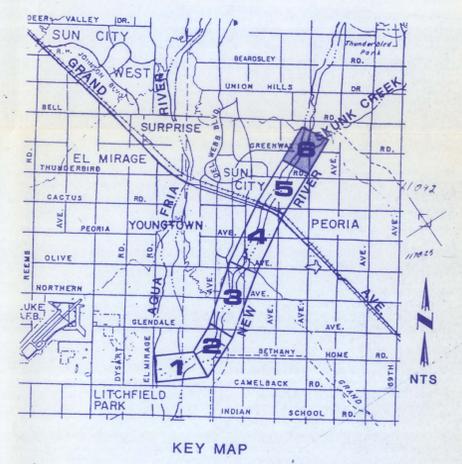
~ BASE FLOOD ELEVATION

— DISTANCE IN HUNDREDS OF FEET FROM THE CONFLUENCE WITH AGUA FRIA

2040 — CROSS SECTION

+ RM#4 REFERENCE MARK

..... FLOOD ZONE LINE



FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

**NEW RIVER
FLOODPLAIN DELINEATION**

AGUA FRIA RIVER TO SKUNK CREEK WASH

RECOMMENDED BY: _____ DATE: _____ PANEL
APPROVED BY: _____ DATE: _____ 6
FLOODPLAIN ADMINISTRATOR _____ OF 6

COE & VAN LOO PHOENIX
CONSULTING ENGINEERS INC. ARIZONA



GLLENDALE MUNICIPAL AIRPORT
CHANNELIZATION COMPLETED FOR
GLLENDALE AIRPORT WAS REDUCED &
SPliced ONTO THIS MAP TO SHOW
NEW RIGHT BANK ALIGNMENT.
ORIGINAL C.O.E. CONTROL LINE
WAS USED WITH UPDATED
CHANNELIZATION.

MATCH LINE SEE SHEET 2

ZONE A5

CAMELBACK RANCH
AGUA FRIA FLOODPLAIN CONTROLS

APPROXIMATE LEVEL ALIGNMENT (SEE PRELIMINARY LEVEL DESIGN PLANS)

- LEGEND**
- 100 YEAR FLOOD LIMITS
 - FLOODWAY LIMITS
 - BASE FLOOD ELEVATION
 - DISTANCE IN HUNDREDS OF FEET FROM THE CONFLUENCE WITH AGUA FRIA
 - CROSS SECTION
 - + RM#4 REFERENCE MARK
 - FLOOD ZONE LINE



APPENDIX X SHEET 2a
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
NEW RIVER FLOODPLAIN DELINEATION
AGUA FRIA RIVER TO SKUNK CREEK WASH
RECOMMENDED BY: DATE: PANEL:
APPROVED BY: DATE: OF 2
FLOODPLAIN ADMINISTRATOR
COE & VAN LOO PHOENIX
CONSULTING ENGINEERS INC. ARIZONA
SCALE: 1"=200.00'
CVL #1122-12 REV: 7-87

LOWER AGUA FRIA RIVER (NRI TRIM)
WORK SHEET # 19
SHEET 6
NEW RIVER