

CLOMR TO LOMR SUPPLEMENTAL DATA

FOR

CAMELBACK RANCH LEVEE NORTH

FEMA CASE NO. 98-09-1026R

SUBMITTED BY

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2801 WEST DURANGO STREET
PHOENIX, ARIZONA 85009**

(602) 506-1501

MARCH 2000

December 15, 1999

emailed
12-15-99
~12:30

TO: James Heyen, West Consultants, Inc.
FROM: Mike Duncan, Flood Control District of Maricopa County
SUBJECT: Information for Camelback Ranch Levee North LOMR
FCD Contract # 1999C048, Assignment No. 1

MODELS INCLUDED IN THIS E-MAIL:

For Agua Fria River: input: "aguafria" 10-25-96
output: "aguafria" 10-29-96 (WordPad can be used to open these files)
from Coe and Van Loo study dated 10-31-96 (FCD contract 95-05)
This study corresponds to the LOMR dated August 5, 1997 of FIRM 1620F

For New River: effective model for the lowest end of New River,
input: "revsb" 8-28-87
output: "revsbo" 5-5-89 (WordPad can be used to open these files)
This corresponds to the model printout, "1986 FIS DUPLICATE MODEL," in
the CLOMR notebook.

OTHER NEARBY LOMR:

The LOMR dated April 16, 1998, of FIRM 1620F is for Camelback Ranch Levee **South** (FCD contract 95-15), south of Camelback Road. It does not affect this work, because the modeling for this work will start at the upstream side of the bridge at Camelback Road.

800-FT. EXTENSION OF NEW RIVER MODEL

The CLOMR for Camelback ... North says that the proposed conditions model for New River should be extended 800 feet downstream. In Table 2, p. 12, of the submittal notebook for the CLOMR,
CLOMR Sta. 4 = FIRM Sta. A = Sta. 20 of the 1986 Flood Ins. Study

Sta. 20 is 2000 feet from the start of the '86 FIS model, but on the work map of the CLOMR, Figure 2A, the LIMIT OF DETAILED STUDY line is only 1200 feet downstream of CLOMR Sta. 4. The model can be extended by taking cross-sections "501.45" and "10" from the '86 FIS model (file "revsb") and modifying any portions that may cross the levee.

The new Agua Fria modeling will need to have a cross-section that coincides with cross-section "501.45", in order to get the starting W.S. El.

If you have any questions, please call me at 602-506-4732.

COMR NOTEBOOK:

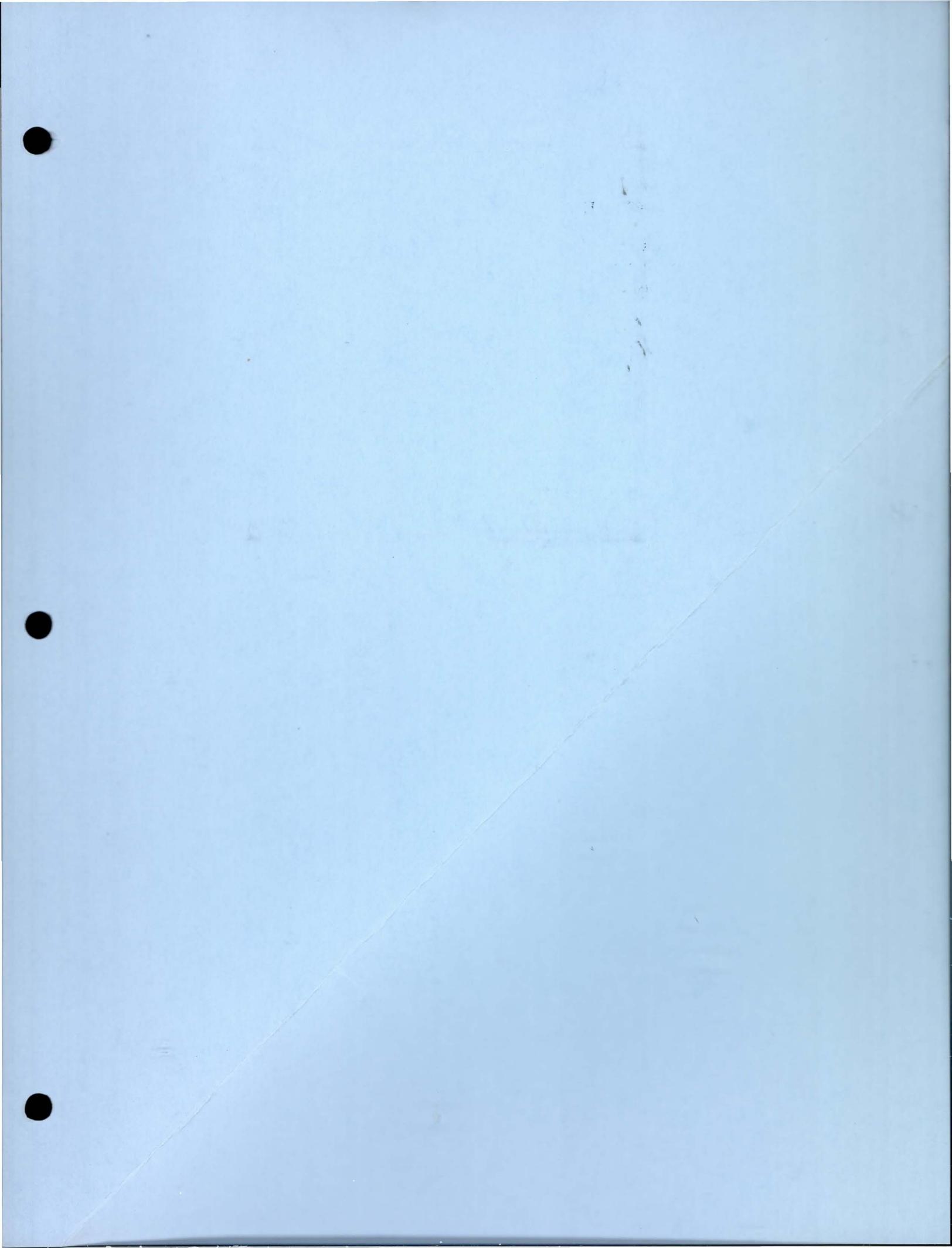
lib. A371.930

"New River Aqueduct River
to Bethany Home Road"

COMR
notebook to be A400.932
~~A371.953~~ ↑
(sent to library in 8-15-01)

SOME LIBRARY NUMBERS
RELATED TO COMELOCK
RANCH LEVEL NORTH

A 400.505
.922
.611
.917
.930





Federal Emergency Management Agency

Washington, D.C. 20472

Property of
Flood Control District of MC Library
Please Return to
2801 W. Durango
Phone No: 85009

FLOOD CONTROL DISTRICT RECEIVED	
AUG 14 '00	
CH & GM	FINANCE
IPIO	LANDS
ADMIN	O & M
REG	P & PM
<input checked="" type="checkbox"/> ENG	FILE
CONTRACTS	
ROUTING	<i>MWD</i>

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO: 85009
Case No.: 00-09-569P

The Honorable Elaine Scruggs
Mayor, City of Glendale
5850 West Glendale Avenue
Glendale, AZ 85301

Community: City of Glendale, AZ
Community No.: 040045
Panel Affected: 04013C1620 F
Effective Date of **AUG 10 2000**
This Revision:

102-I-A-C

Dear Mayor Scruggs:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for Maricopa County, Arizona and Incorporated Areas (the effective FIRM and FIS report for your community), in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated March 21, 2000, Mr. Michael Duncan, P.E., Civil Engineer, Engineering Division, Flood Control District of Maricopa County, requested that FEMA revise the FIRM and FIS report to show the effects of construction of the Camelback Ranch Levee-North along the Agua Fria River from just upstream of Camelback Road to the confluence with the New River; construction of the Camelback Ranch Levee-North along the New River from just upstream of the confluence with the Agua Fria River to just upstream of Bethany Home Road alignment; construction of the Glendale Airport Levee along the Agua Fria River from approximately 1,200 feet upstream to approximately 1,900 feet upstream of the confluence with the New River; construction of the Glendale Airport Levee along the New River from approximately 900 feet upstream to approximately 2,900 feet upstream of the confluence with the Agua Fria River; construction of a channel along the New River from approximately 5,000 feet downstream to just upstream of Bethany Home Road alignment; construction of the Glendale Airport Outlet Channel west of the New River channel approximately 1,300 feet upstream of the confluence of the New River with the Agua Fria River; and placement of fill along the New River from approximately 1,300 feet upstream to approximately 2,700 feet upstream of the confluence with the Agua Fria River. The effects of construction of the Camelback Ranch Levee-North and the Glendale Airport Levee are shown along the profile baselines of the Agua Fria and New Rivers on the FIRM and in the FIS report. The effects of construction of the Glendale Airport Outlet Channel and placement of fill along the New River are shown along the New River profile baseline on the FIRM and FIS report. This request follows up on a Conditional Letter of Map Revision issued on November 4, 1998.

All data required to complete our review of this request were submitted with letters from Mr. Grant I. Anderson, P.E, City Engineer/Floodplain Manager, City of Glendale; Mr. Ray Dovalina, P.E., Floodplain Manager, Street Transportation Department, City of Phoenix; and Mr. Duncan.

We have completed our review of the submitted data and the flood data shown on the effective FIRM and FIS report. We have revised the FIRM and FIS report to modify the elevations, 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 the New River from just upstream to approximately 2,500 feet upstream of Bethany Home Road alignment. As a result of the modifications, base flood elevations (BFEs) and a

regulatory floodway were added, and the zone designation of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, was changed to Zone AE, with BFEs determined, along the New River profile baseline from approximately 500 feet upstream to approximately 2,500 feet upstream of Bethany Home Road alignment. The modifications are shown on the enclosed annotated copies of FIRM Panel(s) 04013C1620 F, Profile Panel(s) 237P, and affected portions of the Floodway Data Table. This Letter of Map Revision (LOMR) hereby revises the above-referenced panel(s) of the effective FIRM dated September 4, 1991, and the affected portions of the FIS report dated September 30, 1995.

Because this revision request also affects the City of Phoenix and the unincorporated areas of Maricopa County, separate LOMRs for those communities were issued on the same date as this LOMR.

The modifications are effective as of the date shown above. The map panel(s) as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

The following table is a partial listing of existing and modified BFEs:

Location	Existing BFE (feet)*	Modified BFE (feet)*
Just upstream of Bethany Home Road alignment	None	1,039
Approximately 2,200 feet upstream of Bethany Home Road alignment	None	1,044

*Referenced to the National Geodetic Vertical Datum, rounded to the nearest whole foot

Public notification of the proposed modified BFEs will be given in the *Arizona Republic* on or about August 31 and September 7, 2000. A copy of this notification is enclosed. In addition, a notice of changes will be published in the *Federal Register*. Within 90 days of the second publication in the *Arizona Republic*, a citizen may request that FEMA reconsider the determination made by this LOMR. 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 to modify the BFEs presented in this LOMR may itself be modified.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare a related article for publication in your community's local newspaper. This article should describe the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

We are processing a revised FIRM and FIS report for Maricopa County; therefore, we will not physically revise and republish the FIRM and FIS report for your community to incorporate the modifications made by this LOMR at this time. Preliminary copies of the FIRM and FIS report, which present information from the effective FIRMs and FIS reports for your community and other incorporated communities in Maricopa County, were submitted to your community for review on December 23, 1997. Revised preliminary copies

of the FIRM and FIS report were submitted to your community for review on May 29, 1998. We will incorporate the modifications made by this LOMR into the revised FIRM and FIS report before they become effective.

The floodway is provided to your community as a tool to regulate floodplain development. Therefore, the floodway modifications described in this LOMR, while acceptable to FEMA, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 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, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed minimum NFIP criteria. These criteria are the minimum and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM to which the regulations apply and the modifications described in this LOMR. Our records show that your community has met this requirement.

A Consultation Coordination Officer (CCO) has been designated to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Jack Eldridge
Chief, Community Mitigation Programs Branch
Federal Emergency Management Agency, Region IX
The Presidio of San Francisco, Building 105
San Francisco, California 94129-1250
(415) 923-7184

FEMA makes flood insurance available in participating communities; in addition, we encourage communities to develop their own loss reduction and prevention programs. Through the *Project Impact: Building Disaster Resistant Communities* initiative, launched by FEMA Director James Lee Witt

in 1997, we seek to focus the energy of businesses, citizens, and communities in the United States on the importance of reducing their susceptibility to the impact of all natural disasters, including floods, hurricanes, severe storms, earthquakes, and wildfires. Natural hazard mitigation is most effective when it is planned for and implemented at the local level, by the entities who are most knowledgeable of local conditions and whose economic stability and safety are at stake. For your information, we are enclosing a copy of a pamphlet describing this nationwide initiative. For additional information on *Project Impact*, please visit our Web site at www.fema.gov/impact.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the CCO for your community at the telephone number cited above. If you have any questions regarding this LOMR, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,



Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

For: Matthew B. Miller, P.E., Chief
Hazards Study Branch
Mitigation Directorate

Enclosures

cc: The Honorable Skip Rimsza
Mayor, City of Phoenix

The Honorable Andrew Kunasek
Chairman, Maricopa County
Board of Supervisors

Mr. Michael Duncan, P.E.
Civil Engineer
Engineering Division
Flood Control District of Maricopa County

Mr. Grant I. Anderson, P.E.
City Engineer/Floodplain Manager
City of Glendale

Mr. Ray Dovalina, P.E.
Floodplain Manager
Street Transportation Department
City of Phoenix

CHANGES ARE MADE IN DETERMINATIONS OF BASE FLOOD ELEVATIONS FOR THE CITIES OF GLENDALE AND PHOENIX AND THE UNINCORPORATED AREAS OF MARICOPA COUNTY, ARIZONA, UNDER THE NATIONAL FLOOD INSURANCE PROGRAM

On September 4, 1991, the Federal Emergency Management Agency identified Special Flood Hazard Areas (SFHAs) in the Cities of Glendale and Phoenix and the unincorporated areas of Maricopa County, Arizona, through issuance of a Flood Insurance Rate Map (FIRM). The Mitigation Directorate has determined that modification of the elevations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) for certain locations in these communities is appropriate. The modified base flood elevations (BFEs) revise the FIRM for the communities.

The changes are being made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and are in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65.

A hydraulic analysis was performed to incorporate the effects of construction of the Camelback Ranch Levee-North and Glendale Airport Levee; construction of a channel along the New River from approximately 4,400 feet downstream to just upstream of Bethany Home Road alignment; construction of the Glendale Airport Outlet Channel; and placement of fill along the New River from approximately 1,200 feet upstream to approximately 3,000 feet upstream of the confluence with the Agua Fria River. This has resulted in a revised delineation of the regulatory floodway and decreased BFEs for the New River from just upstream of the confluence with the Agua Fria River to just downstream of Bethany Home Road alignment, a decrease in SFHA width from just upstream of the confluence with the Agua Fria River to approximately 800 feet downstream of Bethany Home Road alignment, and an increase in SFHA width from approximately 800 feet downstream to just downstream of Bethany Home Road alignment. This has also resulted in a revised delineation of the regulatory floodway and decreased BFEs for the Agua Fria River from just upstream of Camelback Road to approximately 2,000 feet upstream of the confluence with the New River; a decrease in SFHA width from just upstream to approximately 1,700 feet upstream of Camelback Road; and an increase in SFHA width from approximately 600 feet upstream to approximately 1,700 feet upstream of the confluence with the New River. In addition, this has resulted in the establishment of a regulatory floodway and BFEs for the New River from approximately 600 feet upstream to approximately 2,200 feet upstream of Bethany Home Road alignment. The table below indicates existing and modified BFEs for selected locations along the affected lengths of the flooding source(s) cited above.

Location	Existing BFE (feet)*	Modified BFE (feet)*
New River:		
^{1,2} Approximately 1,500 feet upstream of confluence with Agua Fria River along profile baseline	1,032	1,031
^{1,2} Approximately 700 feet downstream of Bethany Home Road alignment	1,040	1,037
³ Just upstream of Bethany Home Road alignment	None	1,039
³ Approximately 2,200 feet upstream of Bethany Home Road alignment	None	1,044

Agua Fria River:

^{1,2}Approximately 3,700 feet upstream of
Camelback Road along
profile baseline

1,031

1,030

*National Geodetic Vertical Datum, rounded to nearest whole foot

¹City of Phoenix

²Unincorporated areas of Maricopa County

³City of Glendale

Under the above-mentioned Acts of 1968 and 1973, the Mitigation Directorate must develop criteria for floodplain management. To participate in the National Flood Insurance Program (NFIP), the community must use the modified BFEs to administer the floodplain management measures of the NFIP. These modified BFEs will also be used to calculate the appropriate flood insurance premium rates for new buildings and their contents and for the second layer of insurance on existing buildings and contents.

Upon the second publication of notice of these changes in this newspaper, any person has 90 days in which he or she can request, through the Chief Executive Officer of the community, that the Mitigation Directorate reconsider the determination. Any request for reconsideration must be based on knowledge of changed conditions or new scientific or technical data. All interested parties are on notice that until the 90-day period elapses, the Mitigation Directorate's determination to modify the BFEs may itself be changed.

Any person having knowledge or wishing to comment on these changes should immediately notify:

The Honorable Elaine Scruggs
Mayor, City of Glendale
5850 West Glendale Avenue
Glendale, AZ 85301

OR

The Honorable Skip Rimsza
Mayor, City of Phoenix
200 West Washington Street, 11th Floor
Phoenix, AZ 85003-1611

OR

The Honorable Andrew Kunasek
Chairman, Maricopa County
Board of Supervisors
301 West Washington Street, 10th Floor
Phoenix, AZ 85003



Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Andrew Kunasek
Chairman, Maricopa County
Board of Supervisors
301 West Jefferson, 10th Floor
Phoenix, AZ 85003

IN REPLY REFER TO:
Case No.: 00-09-569P

Community: Maricopa County, AZ
Community No.: 040037
Panel Affected: 04013C1620 F
Effective Date of **AUG 10 2000**
This Revision:

102-I-A-C

Dear Mr. Kunasek:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for Maricopa County, Arizona and Incorporated Areas, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated March 21, 2000, Mr. Michael Duncan, P.E., Civil Engineer, Engineering Division, Flood Control District of Maricopa County, requested that FEMA revise the FIRM and FIS report to show the effects of construction of the Camelback Ranch Levee-North along the Agua Fria River from just upstream of Camelback Road to the confluence with the New River; construction of the Camelback Ranch Levee-North along the New River from just upstream of the confluence with the Agua Fria River to just upstream of Bethany Home Road alignment; construction of the Glendale Airport Levee along the Agua Fria River from approximately 1,200 feet upstream to approximately 2,000 feet upstream of the confluence with the New River; construction of the Glendale Airport Levee along the New River from approximately 900 feet upstream to approximately 2,900 feet upstream of the confluence with the Agua Fria River; construction of a channel along the New River from approximately 4,400 feet downstream to just upstream of Bethany Home Road alignment; construction of the Glendale Airport Outlet Channel west of the New River channel approximately 1,200 feet upstream of the confluence of the New River with the Agua Fria River; and placement of fill along the New River from approximately 1,200 feet upstream to approximately 3,000 feet upstream of the confluence with the Agua Fria River. The effects of construction of the Camelback Ranch Levee-North and the Glendale Airport Levee are shown along the profile baselines of the Agua Fria and New Rivers on the FIRM and in the FIS report. The effects of construction of the Glendale Airport Outlet Channel and placement of fill along the New River are shown along the New River profile baseline on the FIRM and FIS report. This request follows up on a Conditional Letter of Map Revision issued on November 4, 1998.

All data required to complete our review of this request were submitted with letters from Mr. Grant I. Anderson, P.E., City Engineer/Floodplain Manager, City of Glendale; Mr. Ray Dovalina, P.E., Floodplain Manager, Street Transportation Department, City of Phoenix; and Mr. Duncan.

We have completed our review of the submitted data and the flood data shown on the effective FIRM and FIS report. We have revised the FIRM and FIS report to modify the elevations and floodplain and floodway boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year

(base flood) along the Agua Fria River profile baseline from just upstream of Camelback Road to approximately 2,000 feet upstream of the confluence with the New River and along the New River profile baseline from just upstream of the confluence with the Agua Fria River to just downstream of Bethany Home Road alignment. As a result of the modifications, the base flood elevations (BFEs) for the New River decreased, and the widths of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, and the regulatory floodway increased in some areas and decreased in other areas. Also as a result of the modifications, the BFEs for the Agua Fria River decreased, and the widths of the SFHA and the regulatory floodway increased in some areas and decreased in other areas. The base flood along the Agua Fria profile baseline is contained within the Glendale Airport Levee from approximately 1,200 feet upstream to approximately 2,000 feet upstream of the confluence with the New River and within the Camelback Ranch Levee-North from just upstream of Camelback Road to the confluence with the New River. The base flood along the New River profile baseline is contained within the Glendale Airport Levee from approximately 900 feet upstream to approximately 2,900 feet upstream of the confluence with the Agua Fria River and within the Camelback Ranch Levee-North from just upstream of the confluence with the Agua Fria River to just downstream of Bethany Home Road alignment. The base flood also is contained in the Glendale Airport Outlet Channel. The modifications are shown on the enclosed annotated copies of FIRM Panel(s) 04013C1620 F, Profile Panel(s) 237P, and affected portions of the Floodway Data Table. This Letter of Map Revision (LOMR) hereby revises the above-referenced panel(s) of the effective FIRM dated September 4, 1991, and the affected portions of the FIS report dated September 30, 1995.

Because this revision request also affects the Cities of Glendale and Phoenix, separate LOMRs for those communities were issued on the same date as this LOMR.

The modifications are effective as of the date shown above. The map panel(s) as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

The following table is a partial listing of existing and modified BFEs:

Location	Existing BFE (feet)*	Modified BFE (feet)*
New River:		
Approximately 1,500 feet upstream of confluence with the Agua Fria River along the profile baseline	1,032	1,031
Approximately 700 feet downstream of Bethany Home Road alignment	1,040	1,037
Agua Fria River:		
Approximately 3,700 feet upstream of Camelback Road along the profile baseline	1,031	1,030

*Referenced to the National Geodetic Vertical Datum, rounded to the nearest whole foot

Public notification of the proposed modified BFEs will be given in the *Arizona Republic* on or about August 31 and September 7, 2000. A copy of this notification is enclosed. In addition, a notice of changes will be published in the *Federal Register*. Within 90 days of the second publication in the *Arizona Republic*, a citizen may request that FEMA reconsider the determination made by this LOMR. 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 to modify the BFEs presented in this LOMR may itself be modified.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare a related article for publication in your community's local newspaper. This article should describe the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

We are processing a revised FIRM and FIS report for Maricopa County; therefore, we will not physically revise and republish the FIRM and FIS report for your community to incorporate the modifications made by this LOMR at this time. Preliminary copies of the FIRM and FIS report, which present information from the effective FIRMs and FIS reports for your community and incorporated communities in Maricopa County, were submitted to your community for review on December 23, 1997. Revised preliminary copies of the FIRM and FIS report were submitted to your community for review on May 29, 1998. We will incorporate the modifications made by this LOMR into the revised FIRM and FIS report before they become effective.

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This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 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, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed minimum NFIP criteria. These criteria are the minimum and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM to which the regulations apply and the modifications described in this LOMR. Our records show that your community has met this requirement.

A Consultation Coordination Officer (CCO) has been designated to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Jack Eldridge
Chief, Community Mitigation Programs Branch
Federal Emergency Management Agency, Region IX
The Presidio of San Francisco, Building 105
San Francisco, California 94129-1250
(415) 923-7184

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If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the CCO for your community at the telephone number cited above. If you have any questions regarding this LOMR, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,



Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

For: Matthew B. Miller, P.E., Chief
Hazards Study Branch
Mitigation Directorate

Enclosures

cc: The Honorable Elaine Scruggs
Mayor, City of Glendale

The Honorable Skip Rimsza
Mayor, City of Phoenix

Mr. Michael Duncan, P.E.
Civil Engineer
Engineering Division
Flood Control District of Maricopa County

Mr. Grant I. Anderson, P.E.
City Engineer/Floodplain Manager
City of Glendale

Mr. Ray Dovalina, P.E.
Floodplain Manager
Street Transportation Department
City of Phoenix

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On September 4, 1991, the Federal Emergency Management Agency identified Special Flood Hazard Areas (SFHAs) in the Cities of Glendale and Phoenix and the unincorporated areas of Maricopa County, Arizona, through issuance of a Flood Insurance Rate Map (FIRM). The Mitigation Directorate has determined that modification of the elevations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) for certain locations in these communities is appropriate. The modified base flood elevations (BFEs) revise the FIRM for the communities.

The changes are being made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and are in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65.

A hydraulic analysis was performed to incorporate the effects of construction of the Camelback Ranch Levee-North and Glendale Airport Levee; construction of a channel along the New River from approximately 4,400 feet downstream to just upstream of Bethany Home Road alignment; construction of the Glendale Airport Outlet Channel; and placement of fill along the New River from approximately 1,200 feet upstream to approximately 3,000 feet upstream of the confluence with the Agua Fria River. This has resulted in a revised delineation of the regulatory floodway and decreased BFEs for the New River from just upstream of the confluence with the Agua Fria River to just downstream of Bethany Home Road alignment, a decrease in SFHA width from just upstream of the confluence with the Agua Fria River to approximately 800 feet downstream of Bethany Home Road alignment, and an increase in SFHA width from approximately 800 feet downstream to just downstream of Bethany Home Road alignment. This has also resulted in a revised delineation of the regulatory floodway and decreased BFEs for the Agua Fria River from just upstream of Camelback Road to approximately 2,000 feet upstream of the confluence with the New River; a decrease in SFHA width from just upstream to approximately 1,700 feet upstream of Camelback Road; and an increase in SFHA width from approximately 600 feet upstream to approximately 1,700 feet upstream of the confluence with the New River. In addition, this has resulted in the establishment of a regulatory floodway and BFEs for the New River from approximately 600 feet upstream to approximately 2,200 feet upstream of Bethany Home Road alignment. The table below indicates existing and modified BFEs for selected locations along the affected lengths of the flooding source(s) cited above.

Location	Existing BFE (feet)*	Modified BFE (feet)*
New River:		
^{1,2} Approximately 1,500 feet upstream of confluence with Agua Fria River along profile baseline	1,032	1,031
^{1,2} Approximately 700 feet downstream of Bethany Home Road alignment	1,040	1,037
³ Just upstream of Bethany Home Road alignment	None	1,039
³ Approximately 2,200 feet upstream of Bethany Home Road alignment	None	1,044

Agua Fria River:

^{1,2}Approximately 3,700 feet upstream of
Camelback Road along
profile baseline

1,031

1,030

*National Geodetic Vertical Datum, rounded to nearest whole foot

¹City of Phoenix

²Unincorporated areas of Maricopa County

³City of Glendale

Under the above-mentioned Acts of 1968 and 1973, the Mitigation Directorate must develop criteria for floodplain management. To participate in the National Flood Insurance Program (NFIP), the community must use the modified BFEs to administer the floodplain management measures of the NFIP. These modified BFEs will also be used to calculate the appropriate flood insurance premium rates for new buildings and their contents and for the second layer of insurance on existing buildings and contents.

Upon the second publication of notice of these changes in this newspaper, any person has 90 days in which he or she can request, through the Chief Executive Officer of the community, that the Mitigation Directorate reconsider the determination. Any request for reconsideration must be based on knowledge of changed conditions or new scientific or technical data. All interested parties are on notice that until the 90-day period elapses, the Mitigation Directorate's determination to modify the BFEs may itself be changed.

Any person having knowledge or wishing to comment on these changes should immediately notify:

The Honorable Elaine Scruggs
Mayor, City of Glendale
5850 West Glendale Avenue
Glendale, AZ 85301

OR

The Honorable Skip Rimsza
Mayor, City of Phoenix
200 West Washington Street, 11th Floor
Phoenix, AZ 85003-1611

OR

The Honorable Andrew Kunasek
Chairman, Maricopa County
Board of Supervisors
301 West Washington Street, 10th Floor
Phoenix, AZ 85003



Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Skip Rimsza
Mayor, City of Phoenix
200 West Washington Street, 11th Floor
Phoenix, AZ 85003-1611

IN REPLY REFER TO:
Case No.: 00-09-569P

Community: City of Phoenix, AZ
Community No.: 040051
Panel Affected: 04013C1620 F
Effective Date of **AUG 10 2000**
This Revision:

102-I-A-C

Dear Mayor Rimsza:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for Maricopa County, Arizona and Incorporated Areas (the effective FIRM and FIS report for your community), in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated March 21, 2000, Mr. Michael Duncan, P.E., Civil Engineer, Engineering Division, Flood Control District of Maricopa County, requested that FEMA revise the FIRM and FIS report to show the effects of construction of the Camelback Ranch Levee-North along the Agua Fria River from just upstream of Camelback Road to the confluence with the New River; construction of the Camelback Ranch Levee-North along the New River from just upstream of the confluence with the Agua Fria River to just upstream of Bethany Home Road alignment; construction of the Glendale Airport Levee along the Agua Fria River from approximately 1,200 feet upstream to approximately 2,000 feet upstream of the confluence with the New River; construction of the Glendale Airport Levee along the New River from approximately 900 feet upstream to approximately 2,900 feet upstream of the confluence with the Agua Fria River; construction of a channel along the New River from approximately 4,400 feet downstream to just upstream of Bethany Home Road alignment; construction of the Glendale Airport Outlet Channel west of the New River channel approximately 1,200 feet upstream of the confluence of the New River with the Agua Fria River; and placement of fill along the New River from approximately 1,200 feet upstream to approximately 3,000 feet upstream of the confluence with the Agua Fria River. The effects of construction of the Camelback Ranch Levee-North and the Glendale Airport Levee are shown along the profile baselines of the Agua Fria and New Rivers on the FIRM and in the FIS report. The effects of construction of the Glendale Airport Outlet Channel and placement of fill along the New River are shown along the New River profile baseline on the FIRM and FIS report. This request follows up on a Conditional Letter of Map Revision issued on November 4, 1998.

All data required to complete our review of this request were submitted with letters from Mr. Grant I. Anderson, P.E., City Engineer/Floodplain Manager, City of Glendale; Mr. Ray Dovalina, P.E., Floodplain Manager, Street Transportation Department, City of Phoenix; and Mr. Duncan.

We have completed our review of the submitted data and the flood data shown on the effective FIRM and FIS report. We have revised the FIRM and FIS report to modify the elevations and floodplain and floodway boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year

(base flood) along the Agua Fria River profile baseline from just upstream of Camelback Road to approximately 2,000 feet upstream of the confluence with the New River and along the New River profile baseline from just upstream of the confluence with the Agua Fria River to just downstream of Bethany Home Road alignment. As a result of the modifications, the base flood elevations (BFEs) for the New River decreased, and the widths of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, and the regulatory floodway increased in some areas and decreased in other areas. Also as a result of the modifications, the BFEs for the Agua Fria River decreased, and the widths of the SFHA and the regulatory floodway increased in some areas and decreased in other areas. The base flood along the Agua Fria profile baseline is contained within the Glendale Airport Levee from approximately 1,200 feet upstream to approximately 2,000 feet upstream of the confluence with the New River and within the Camelback Ranch Levee-North from just upstream of Camelback Road to the confluence with the New River. The base flood along the New River profile baseline is contained within the Glendale Airport Levee from approximately 900 feet upstream to approximately 2,900 feet upstream of the confluence with the Agua Fria River and within the Camelback Ranch Levee-North from just upstream of the confluence with the Agua Fria River to just downstream of Bethany Home Road alignment. The base flood also is contained in the Glendale Airport Outlet Channel. The modifications are shown on the enclosed annotated copies of FIRM Panel(s) 04013C1620 F, Profile Panel(s) 237P, and affected portions of the Floodway Data Table. This Letter of Map Revision (LOMR) hereby revises the above-referenced panel(s) of the effective FIRM dated September 4, 1991, and the affected portions of the FIS report dated September 30, 1995.

Because this revision request also affects the City of Glendale and the unincorporated areas of Maricopa County, separate LOMRs for those communities were issued on the same date as this LOMR.

The modifications are effective as of the date shown above. The map panel(s) as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

The following table is a partial listing of existing and modified BFEs:

Location	Existing BFE (feet)*	Modified BFE (feet)*
New River:		
Approximately 1,500 feet upstream of confluence with the Agua Fria River along the profile baseline	1,032	1,031
Approximately 700 feet downstream of Bethany Home Road alignment	1,040	1,037
Agua Fria River:		
Approximately 3,700 feet upstream of Camelback Road along the profile baseline	1,031	1,030

*Referenced to the National Geodetic Vertical Datum, rounded to the nearest whole foot

Public notification of the proposed modified BFEs will be given in the *Arizona Republic* on or about August 31 and September 7, 2000. A copy of this notification is enclosed. In addition, a notice of changes will be published in the *Federal Register*. Within 90 days of the second publication in the *Arizona Republic*, a citizen may request that FEMA reconsider the determination made by this LOMR. 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 to modify the BFEs presented in this LOMR may itself be modified.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare a related article for publication in your community's local newspaper. This article should describe the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

We are processing a revised FIRM and FIS report for Maricopa County; therefore, we will not physically revise and republish the FIRM and FIS report for your community to incorporate the modifications made by this LOMR at this time. Preliminary copies of the FIRM and FIS report, which present information from the effective FIRMs and FIS reports for your community and other incorporated communities in Maricopa County, were submitted to your community for review on December 23, 1997. Revised preliminary copies of the FIRM and FIS report were submitted to your community for review on May 29, 1998. We will incorporate the modifications made by this LOMR into the revised FIRM and FIS report before they become effective.

The floodway is provided to your community as a tool to regulate floodplain development. Therefore, the floodway modifications described in this LOMR, while acceptable to FEMA, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 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, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed minimum NFIP criteria. These criteria are the minimum and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM to which the regulations apply and the modifications described in this LOMR. Our records show that your community has met this requirement.

A Consultation Coordination Officer (CCO) has been designated to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Jack Eldridge
Chief, Community Mitigation Programs Branch
Federal Emergency Management Agency, Region IX
The Presidio of San Francisco, Building 105
San Francisco, California 94129-1250
(415) 923-7184

FEMA makes flood insurance available in participating communities; in addition, we encourage communities to develop their own loss reduction and prevention programs. Through the *Project Impact: Building Disaster Resistant Communities* initiative, launched by FEMA Director James Lee Witt in 1997, we seek to focus the energy of businesses, citizens, and communities in the United States on the importance of reducing their susceptibility to the impact of all natural disasters, including floods, hurricanes, severe storms, earthquakes, and wildfires. Natural hazard mitigation is most effective when it is planned for and implemented at the local level, by the entities who are most knowledgeable of local conditions and whose economic stability and safety are at stake. For your information, we are enclosing a copy of a pamphlet describing this nationwide initiative. For additional information on *Project Impact*, please visit our Web site at www.fema.gov/impact.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the CCO for your community at the telephone number cited above. If you have any questions regarding this LOMR, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,



Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

For: Matthew B. Miller, P.E., Chief
Hazards Study Branch
Mitigation Directorate

Enclosures

cc: The Honorable Elaine Scruggs
Mayor, City of Glendale

The Honorable Andrew Kunasek
Chairman, Maricopa County
Board of Supervisors

Mr. Michael Duncan, P.E.
Civil Engineer
Engineering Division
Flood Control District of Maricopa County

Mr. Grant I. Anderson, P.E.
City Engineer/Floodplain Manager
City of Glendale

Mr. Ray Dovalina, P.E.
Floodplain Manager
Street Transportation Department
City of Phoenix

CHANGES ARE MADE IN DETERMINATIONS OF BASE FLOOD ELEVATIONS FOR THE CITIES OF GLENDALE AND PHOENIX AND THE UNINCORPORATED AREAS OF MARICOPA COUNTY, ARIZONA, UNDER THE NATIONAL FLOOD INSURANCE PROGRAM

On September 4, 1991, the Federal Emergency Management Agency identified Special Flood Hazard Areas (SFHAs) in the Cities of Glendale and Phoenix and the unincorporated areas of Maricopa County, Arizona, through issuance of a Flood Insurance Rate Map (FIRM). The Mitigation Directorate has determined that modification of the elevations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) for certain locations in these communities is appropriate. The modified base flood elevations (BFEs) revise the FIRM for the communities.

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A hydraulic analysis was performed to incorporate the effects of construction of the Camelback Ranch Levee-North and Glendale Airport Levee; construction of a channel along the New River from approximately 4,400 feet downstream to just upstream of Bethany Home Road alignment; construction of the Glendale Airport Outlet Channel; and placement of fill along the New River from approximately 1,200 feet upstream to approximately 3,000 feet upstream of the confluence with the Agua Fria River. This has resulted in a revised delineation of the regulatory floodway and decreased BFEs for the New River from just upstream of the confluence with the Agua Fria River to just downstream of Bethany Home Road alignment, a decrease in SFHA width from just upstream of the confluence with the Agua Fria River to approximately 800 feet downstream of Bethany Home Road alignment, and an increase in SFHA width from approximately 800 feet downstream to just downstream of Bethany Home Road alignment. This has also resulted in a revised delineation of the regulatory floodway and decreased BFEs for the Agua Fria River from just upstream of Camelback Road to approximately 2,000 feet upstream of the confluence with the New River; a decrease in SFHA width from just upstream to approximately 1,700 feet upstream of Camelback Road; and an increase in SFHA width from approximately 600 feet upstream to approximately 1,700 feet upstream of the confluence with the New River. In addition, this has resulted in the establishment of a regulatory floodway and BFEs for the New River from approximately 600 feet upstream to approximately 2,200 feet upstream of Bethany Home Road alignment. The table below indicates existing and modified BFEs for selected locations along the affected lengths of the flooding source(s) cited above.

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Agua Fria River:

^{1,2}Approximately 3,700 feet upstream of
Camelback Road along
profile baseline

1,031

1,030

*National Geodetic Vertical Datum, rounded to nearest whole foot

¹City of Phoenix

²Unincorporated areas of Maricopa County

³City of Glendale

Under the above-mentioned Acts of 1968 and 1973, the Mitigation Directorate must develop criteria for floodplain management. To participate in the National Flood Insurance Program (NFIP), the community must use the modified BFEs to administer the floodplain management measures of the NFIP. These modified BFEs will also be used to calculate the appropriate flood insurance premium rates for new buildings and their contents and for the second layer of insurance on existing buildings and contents.

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Any person having knowledge or wishing to comment on these changes should immediately notify:

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Mayor, City of Glendale
5850 West Glendale Avenue
Glendale, AZ 85301

OR

The Honorable Skip Rimsza
Mayor, City of Phoenix
200 West Washington Street, 11th Floor
Phoenix, AZ 85003-1611

OR

The Honorable Andrew Kunasek
Chairman, Maricopa County
Board of Supervisors
301 West Washington Street, 10th Floor
Phoenix, AZ 85003

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
						(FEET NGVD)		
Agua Fria River (Cont'd)								
BA	9.252	1,738	10,150	5.4	1,021.7	1,021.7	1,021.7	0.0
BB	9.437	1,694	10,162	5.4	1,023.1	1,023.1	1,023.1	0.0
BC	9.600	2,072	9,395	5.8	1,024.5	1,024.5	1,024.5	0.0
BD	9.776	1,820	8,651	6.3	1,026.3	1,026.3	1,026.3	0.0
BE	9.953	2,203	11,152	4.9	1,028.7	1,028.7	1,028.7	0.0
BF	10.142	1,394	5,092	5.9	1,030.1	1,030.1	1,030.5	0.4
BG	10.327	1,231	5,331	5.6	1,032.8	1,032.8	1,033.2	0.4
BH	10.521	740	3,634	8.3	1,034.5	1,034.5	1,034.8	0.3
BI	10.699	749	4,886	6.1	1,038.5	1,038.5	1,039.1	0.6
BJ	10.889	985	6,513	4.6	1,040.5	1,040.5	1,041.1	0.6
BK	11.103	730	4,884	6.1	1,043.2	1,043.2	1,043.4	0.2
BL	11.481	812	5,451	5.5	1,046.8	1,046.8	1,047.0	0.2
BM	11.581	620	2,998	10.0	1,048.3	1,048.3	1,048.3	0.0
BN	11.823	892	5,128	6.7	1,054.4	1,054.4	1,054.4	0.0
BO	12.016	1,738	6,858	5.0	1,058.5	1,058.5	1,058.9	0.4
BP	12.164	2,408	6,640	5.2	1,061.1	1,061.1	1,061.4	0.3
BQ	12.307	2,709	17,026	2.0	1,064.0	1,064.0	1,064.5	0.5
BR	12.513	2,786	21,039	1.6	1,065.2	1,065.2	1,066.0	0.8
BS	12.730	2,300	11,248	3.1	1,065.8	1,065.8	1,066.7	0.9
BT	12.896	938	6,621	5.2	1,066.3	1,066.3	1,067.0	0.7
BU	13.082	703	4,849	7.1	1,067.6	1,067.6	1,068.2	0.6
BV	13.273	441	3,297	10.5	1,070.4	1,070.4	1,070.5	0.1
BW	13.465	551	5,555	6.2	1,073.6	1,073.6	1,073.7	0.1
BX	13.716	1,385	8,159	4.2	1,075.5	1,075.5	1,075.6	0.1
BY	13.929	1,334	5,387	6.4	1,079.2	1,079.2	1,079.4	0.2
BZ	14.123	1,040	5,776	6.0	1,082.2	1,082.2	1,082.5	0.3

¹Miles Above Confluence With Gila River

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FEDERAL EMERGENCY MANAGEMENT AGENCY

MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

FLOODWAY DATA

AGUA FRIA RIVER

REVISED TO
REFLECT LOMR
DATED AUG 10 2000

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	(FEET NGVD)		
						WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
New River								
A	0.29	1,204	7,061	5.5	1,031.1	1,031.1	1,031.1	0.0
B	0.43	979	5,935	6.6	1,032.9	1,032.9	1,032.9	0.0
C	0.56	1,023	6,287	6.2	1,034.3	1,034.3	1,034.3	0.0
D	0.64	920	5,599	7.0	1,035.1	1,035.1	1,035.1	0.0
E	0.72	901	5,590	7.0	1,036.1	1,036.1	1,036.1	0.0
F	0.87	896	5,431	7.2	1,038.1	1,038.1	1,038.1	0.0
G	0.90	904	5,047	7.7	1,038.6	1,038.6	1,038.6	0.0
H	1.06	878	6,304	6.5	1,040.1	1,040.1	1,040.1	0.0
I	1.12	743	4,924	8.3	1,040.5	1,040.5	1,040.5	0.0
J	1.27	469	4,106	10.0	1,043.0	1,043.0	1,043.0	0.0
K	1.40	397	4,319	9.5	1,044.9	1,044.9	1,044.9	0.0

¹Miles Above Confluence With Agua Fria River

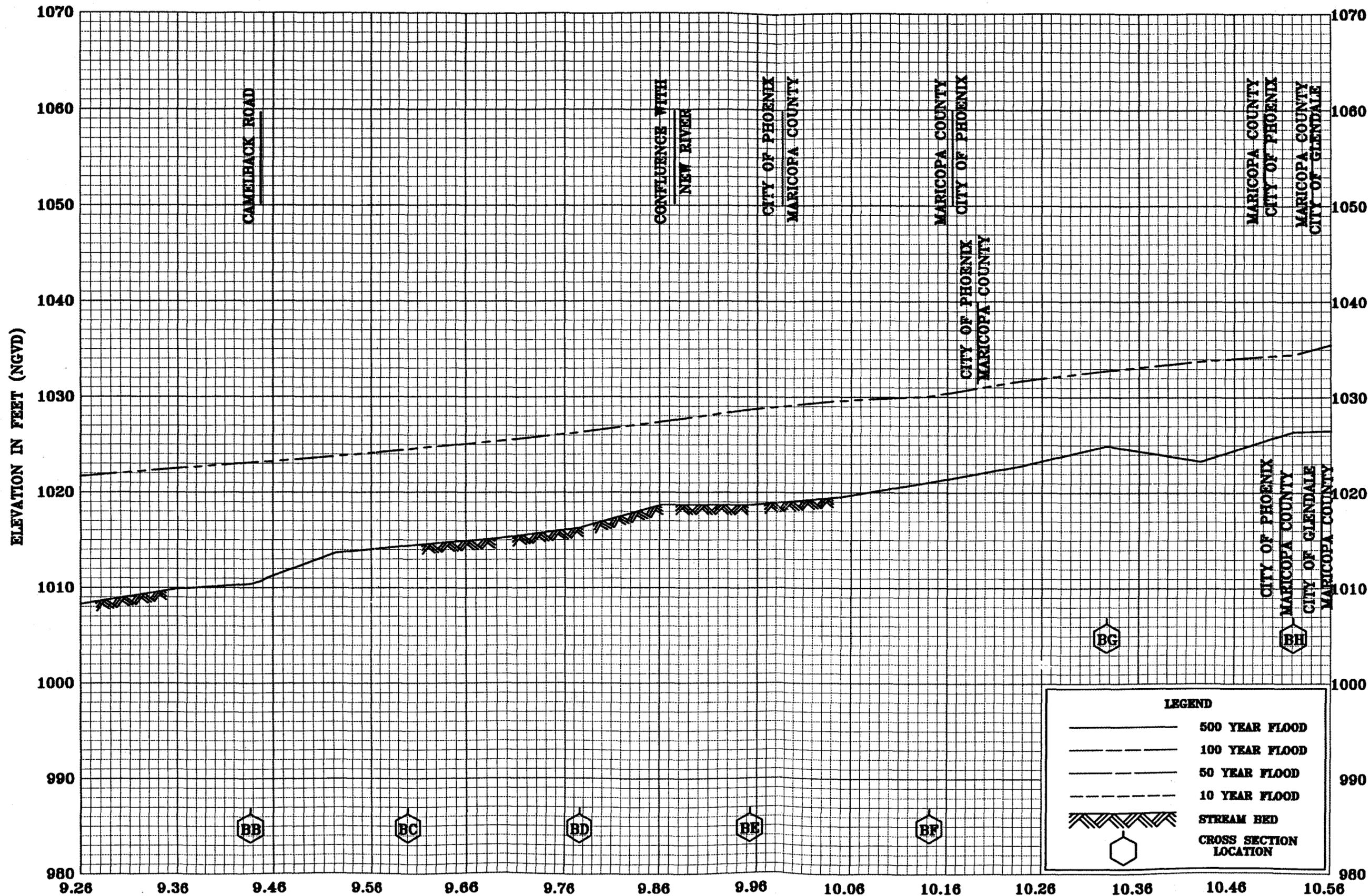
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FEDERAL EMERGENCY MANAGEMENT AGENCY
MARICOPA COUNTY, AZ
AND INCORPORATED AREAS

FLOODWAY DATA

NEW RIVER

REVISED TO
REFLECT LOMR
DATED AUG 10 2000



STREAM DISTANCE IN FEET 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

FEDERAL EMERGENCY MANAGEMENT AGENCY
MARICOPA, AZ
 AND INCORPORATED AREAS

FLOOD PROFILES
 AGUA FRIA RIVER

REVISED TO
 REFLECT LOMR
 DATED AUG 10 2000



PROJECT IMPACT Building a Disaster Resistant Community

BACKGROUND

PROJECT IMPACT is an initiative developed by FEMA Director James Lee Witt to challenge the country to undertake actions that protect families, businesses and communities by reducing the effects of natural disasters. This initiative includes a national awareness campaign, the selection of pilot communities that demonstrate the benefits of hazard mitigation through a partnership approach, and an outreach effort to businesses and communities using a new guidebook that offers a formula for a community or business to follow to become disaster resistant.

RATIONALE

The increasing number and severity of natural disasters the past decade demands that action be taken to reduce the threat that hurricanes, severe storms, earthquakes, floods and wildfires impose upon the economic stability, economic future and safety of the citizens of the U.S. As the federal agency responsible for emergency management, FEMA is committed to reducing disaster losses by focusing the energy of businesses, citizens, and communities in the U.S. on the importance of reducing their susceptibility to the impact of natural disasters.

There are three primary tenets of the PROJECT IMPACT initiative:

- *Mitigation is a local issue.* It is best addressed by a local partnership that involves government, businesses and private citizens.
- *Private sector participation is essential.* Disasters threaten the economic and commercial growth of our cities, towns, villages and counties. Without the participation of the private sector, comprehensive solutions will not be developed.
- *Mitigation is a long-term effort that requires long-term investment.* Disaster losses will not be eliminated overnight.

PILOT COMMUNITIES

Director Witt and FEMA have worked closely with seven communities throughout the U.S. to develop a PROJECT IMPACT plan that localities, businesses and citizens can follow to build disaster resistant communities where they live and work. Director Witt will participate in events in each of these communities to congratulate them on their foresight, commitment, and contribution to a disaster resistant nation.

PROJECT IMPACT GUIDEBOOK

The guidebook presents that steps a community can take to become disaster resistant. It also provides examples of the actions and resources available to accomplish this goal.

Want to talk to a Map Specialist about Flood Hazard Mapping?



If your home or business is located in the floodplain, you will need to purchase and maintain flood insurance. If you have a mortgage, your bank will require it.



*For all your flood hazard
map questions, call toll-free:*

1-877-FEMA MAP (1-877-336-2627)

or visit our Web Site at www.fema.gov/mit/tsd

FEMA's flood hazard maps— also called Flood Insurance Rate Maps or FIRMs— are used to determine your property's flood risk. Increasing development, severe weather events, and other activities in the floodplain will change the flood risks shown on the maps. FEMA is working hard to update and modernize all of the flood hazard maps. However, with more than 18,000 communities participating in the National Flood Insurance Program (NFIP), this will take time. Meanwhile, the FEMA Map Assistance Center (FMAC) has a staff of trained professionals ready to help

Typical flood hazard map questions we answer:



Property Owner: "My home has never flooded. Why do I need flood insurance?"



Real Estate Agent: "I think the previous owner had an exemption from flood insurance— is there a record of this exemption?"



Developers and Engineers: "What is the status of my request for a map change? How long will it take?"

Community Officials: "How do I request a physical revision to a flood map?"

Lenders: "How can we help our customers whose homes are located in a flood zone?"

Other important National Flood Insurance Program toll-free numbers:

- To purchase flood hazard maps for a nominal fee... **1-800-358-9616**
- For general flood insurance information... **1-800-427-4661**
- To order any current FEMA publication... **1-800-480-2520**
- For lender questions on flood policy coverage and rates... **1-800-611-6125**
- For agent questions on policy coverage and rates... **1-800-720-1093**





Federal Emergency Management Agency

Washington, D.C. 20472

May 16, 2000

Mr. Michael Duncan, P.E.
Civil Engineer
Engineering Division
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

IN REPLY REFER TO:
Case No.: 00-09-569P
Communities: Cities of Glendale and
Phoenix and Maricopa
County, AZ
Community Nos.: 040045, 040051, and
040037

316-ACK.FRQ

Dear Mr. Duncan:

This responds to your letter dated May 3, 2000, concerning a March 21, 2000, request that the Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	Camelback Ranch Levee—North/Glendale Airport Levee
Flooding Sources:	New River and Agua Fria River
FIRM Panel(s) Affected:	04013C1620 F

We have completed an inventory of the items that you submitted. We have received the data and the review and processing fee (\$3,400) required to begin a detailed technical review of your request. If additional data are required, we will inform you within 30 days of the date of this letter.

Please direct all questions concerning your request to our Mapping Coordination Contractor at the following address:

Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304

Attention: Ms. Pernille Buch-Pedersen
Telephone: (703) 317-6224
Fax: (703) 960-9125

When you write us about your request, you must include the case number referenced above in your letter.

FLOOD CONTROL DISTRICT RECEIVED	
MAY 22, 00	
IC & SW	FINANCE
PIO	LANDS
ADMIN	O & M
REG	P & PM
ENG	FILE
CONTRACTS	
ROUTING	MWD

If you have any questions concerning FEMA policy, or the National Flood Insurance Program in general, please contact the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,



Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

cc: Mr. Grant Anderson
Floodplain Manager
City of Glendale

Mr. Ray Dovalina, P.E.
Floodplain Manager
City of Phoenix



**Need Information on
FEMA FLOOD HAZARD MAPS?
CONTACT 1-877-FEMA MAP
(Toll Free 1-877-336-2627)**



This release is intended to acquaint the public with the Federal Emergency Management Agency's new toll-free number established to respond to questions regarding National Flood Insurance Program (NFIP) Flood Hazard maps, including:

- How do I go about getting a Letter of Map Amendment (LOMA)? A Letter of Map Revision Based on Fill (LOMR-F)? A Letter of Map Revision (LOMR)?
- What is the status of my request for a LOMA? LOMR-F? Study?
- How long does it take to get the map revised?
- Did FEMA receive my request for a Letter of Map Amendment?
- I was just told by my lender that my house is in a floodplain and I need flood insurance, what are my options?
- Was a LOMA ever issued for my property?
- Has the National Flood Insurance Program Flood Hazard map for my community been revised?

The following procedures have been established by FEMA for changing and correcting the NFIP Flood Hazard maps. They are: Letters of Map Amendment (LOMAs), Letters of Map Revision (LOMRs), Letters of Map Revision Based on Fill (LOMR-Fs), and Physical Map Revisions.

As a result of numerous requests for revisions or corrections to the NFIP Flood Hazard maps, FEMA has assigned a dedicated staff of trained professionals to respond to the public's requests for information on the procedures to revise or correct the NFIP Flood Hazard maps.

If you have any questions regarding the NFIP Flood Hazard maps or need current information and facts on FEMA Mapping Procedures, call 1-877-FEMA-MAP.

Below are additional Toll-Free numbers that can be used to obtain other information regarding the NFIP and its products.

- For information about the NFIP's Preferred Risk Policy, ask your insurance agent or company, or call the NFIP's toll-free number at 1-800-427-9662.
- For any current FEMA publications, call FEMA's Publication Center at 1-800-480-2520.
- For answers to flood insurance related questions, call the National Flood Insurance Telephone Response Center at 1-800-427-4661.
- For ordering printed copies of effective NFIP Flood Hazard maps and related documents, call the FEMA Map Service Center at 1-800-358-9616.

Additional information on flood insurance and other FEMA programs and activities is available on the FEMA World Wide Web Site (<http://www.FEMA.gov>) and from FEMA's 24-hour-FAX-on-Demand system at (202) 646-FEMA. TDD# 1-800-427-5593.



FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

May 3, 2000

Ms. Pernille Buch-Pedersen
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304

FEMA Case No.: 00-09-569P

Communities: Cities of Glendale and Phoenix and Maricopa County, AZ
Community Nos.: 040045, 040051, and 040037

316-ACK.FRQ

Identifier: Camelback Ranch Levee--North and Glendale Airport Levee
Flooding Sources: Agua Fria and New Rivers
FIRM Panel Affected: 04013C1620 F

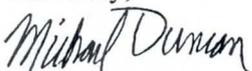
Dear Ms. Buch-Pedersen:

As requested in Max Yuan's letter of April 20, 2000, the following items are enclosed:

1. FEMA MT-2 Form 1 with page 2 signed by an official of the City of Glendale and with another page 2 signed by an official of the City of Phoenix;
2. A letter discussing the adoption and enforcement of the modified floodway for the City of Glendale; and
3. A letter discussing the adoption and enforcement of the modified floodway for the City of Phoenix.

If you have any questions, please contact me at (602) 506-4732.

Sincerely,


Michael Duncan, P.E.
Engineering Division

Enclosures

Copies to: Grant Anderson, P.E., City Engineer
City of Glendale
5850 W. Glendale Avenue
Glendale, Arizona 85301

Ray Dovalina, P.E., Floodplain Manager
City of Phoenix
200 West Washington Street, 5th Floor
Phoenix, Arizona 85003-1611

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

1. REQUESTED RESPONSE FROM FEMA

This request is for a:

- CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60,65 & 72).
- LOMR A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, floodway or flood elevations. LOMRs typically decrease flood hazards. (See 44 CFR Ch. 1 Parts 60 & 65.)
- Other Describe:

2. OVERVIEW

1. The basis for this revision request is (are): (check all that apply)

- Physical Change Improved Methodology/Data Floodway Revision
- Other Describe:

Note: A photograph is not required, but is very helpful during review.

2. Flooding Source: New River and Agua Fria River

3. Project Name/Identifier: Camelback Ranch Levee - North/Glendale Airport Levee

4. FEMA zone designations affected: AE
 (example: A, AH, AO, A1-A30, A99, AE, V, V1-V30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301 480287	Katy, City Harris County	TX TX	480301 48201C	0005D 0220G	02/08/83 09/28/90
040051	Phoenix, City	AZ	04013C	1620F	04/16/98
040045 040037	Glendale, City Maricopa County	AZ	04013C 04013C	1620F 1620F	04/16/98 04/16/98

6. The area of revision encompasses the following types of flooding and structures. Check all that apply.

Types of Flooding		Structures	
<input checked="" type="checkbox"/> Riverine	<input type="checkbox"/> Channelization	<input type="checkbox"/> Levee/Floodwall	<input checked="" type="checkbox"/> Bridge/Culvert
<input type="checkbox"/> Coastal	<input type="checkbox"/> Dam	<input type="checkbox"/> Fill	<input type="checkbox"/> Other (describe)
<input type="checkbox"/> Alluvial fan	<input type="checkbox"/> Other (describe)		
<input type="checkbox"/> Shallow Flooding (e.g. Zones AO and AH)			
<input type="checkbox"/> Lakes			
<input type="checkbox"/> Other (describe)			

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?
 Yes No

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? Yes No N/A
3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? Yes No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for performing overseeing compliance with the maintenance and operation plans of the Flood Control District of Maricopa County and City of Glendale
 (Name)

flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Operation and maintenance plans are attached. Yes No N/A

6. REVIEW FEE

The review fee for the appropriate request category has been included. Yes Fee amount: \$3,400

OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt.

Yes

Please see Instructions for Fee Amounts

7. SIGNATURE

Note: I understand that my signature indicates that all information submitted in support of this request is correct

Michael W. Duncan

Signature of Revision Requester

Michael W. Duncan, P.E., Civil Engineer
 Printed Name and Title of Revision Requester

Flood Control District Of Maricopa County
 Company Name

Telephone No.: 602-506-4732

Date: 5-3-00

Note: Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community

Grant Anderson, P.E.

Signature of Community Official

Grant Anderson, P.E., City Engineer and Floodplain Manager
 Printed Name and Title of Community Official

City of Glendale, Arizona
 Community Name

Telephone No.: 623-930-3630

Date: 5-1-00

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2

Michael W. Duncan

Signature

Michael W. Duncan, Civil Engineer
 Printed Name and Title of Revision Requester

Registr. No. 24124 Expires (Date) 09/30/2002 State AZ

Type of License/Expertise: Professional Civil Engineer

Check which forms have been included with this request

Form Name and (Number)	Required if
<input type="checkbox"/> Hydrologic (3)	new or revised discharges
<input checked="" type="checkbox"/> Hydraulic (4)	new or revised water-surface elevations
<input checked="" type="checkbox"/> Mapping (5)	floodplain/floodway changes
<input checked="" type="checkbox"/> Channelization (6)	channel is modified
<input checked="" type="checkbox"/> Bridge/Culvert (7)	addition/revision of bridge/culvert
<input checked="" type="checkbox"/> Levee/Floodwall (8)	addition/revision of levee/floodwall
<input type="checkbox"/> Coastal (9)	new or revised coastal elevations
<input type="checkbox"/> Coastal Structures (10)	addition/revision of coastal structure
<input type="checkbox"/> Dam (11)	addition/revision of dam
<input type="checkbox"/> Alluvial Fan (12)	structures proposed on alluvial fan

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?
 Yes No

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? Yes No N/A

3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? Yes No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for performing overseeing compliance with the maintenance and operation plans of the Flood Control District of Maricopa County and City of Glendale
 (Name)

flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Operation and maintenance plans are attached. Yes No N/A

6. REVIEW FEE

The review fee for the appropriate request category has been included. Yes Fee amount: \$3,400
 OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt. Yes

Please see Instructions for Fee Amounts

7. SIGNATURE

Note: I understand that my signature indicates that all information submitted in support of this request is correct


 Signature of Revision Requester

Michael W. Duncan, P.E., Civil Engineer
 Printed Name and Title of Revision Requester

Flood Control District Of Maricopa County
 Company Name

Telephone No.: 602-506-4732 Date: 4-25-00

Note: Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.


 Signature of Community Official

Ray Dovalina, P.E., Floodplain Manager
 Printed Name and Title of Community Official

City of Phoenix, Arizona
 Community Name

Telephone No.: 602-262-4026 Date: 4-25-00

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2


 Signature 4-25-00

Michael W. Duncan, Civil Engineer
 Printed Name and Title of Revision Requester

Registr No. 24124 Expires (Date) 09/30/2002 State AZ

Type of License/Expertise: Professional Civil Engineer

Check which forms have been included with this request

Form Name and (Number)	Required if
<input type="checkbox"/> Hydrologic (3)	new or revised discharges
<input checked="" type="checkbox"/> Hydraulic (4)	new or revised water-surface elevations
<input checked="" type="checkbox"/> Mapping (5)	floodplain/floodway changes
<input checked="" type="checkbox"/> Channelization (6)	channel is modified
<input type="checkbox"/> Bridge/Culvert (7)	addition/revision of bridge/culvert
<input checked="" type="checkbox"/> Levee/Floodwall (8)	addition/revision of levee/floodwall
<input type="checkbox"/> Coastal (9)	new or revised coastal elevations
<input type="checkbox"/> Coastal Structures (10)	addition/revision of coastal structure
<input type="checkbox"/> Dam (11)	addition/revision of dam
<input type="checkbox"/> Alluvial Fan (12)	structures proposed on alluvial fan



FLOOD CONTROL DISTRICT RECEIVED	
MAY 03 '00	
CH & GM	FINANCE
PIO	LANDS
ADMIN	O & M
REG	P & PM
<input checked="" type="checkbox"/> ENG	F.I.E.
CONTRACTS	MWD
ROUTING	

May 1, 2000

Max H. Yuan, P.E.
Project Engineer
Hazards Study Branch
Mitigation Directorate
Federal Emergency Management Agency
500 "C" Street, S.W.
Washington, D.C. 20472

SUBJECT: CASE NO. 00-09-569P
FLOODPLAIN DELINATION FOR CAMELBACK RANCH LEVEE
NORTH/GLENDALE AIRPORT LEVEE
FIRM PANEL NO. 04013C1620 F

Dear Mr. Yuan:

I am writing this letter in response to your letter dated April 20, 2000, requesting additional data be submitted prior to issuance of a Letter of Map Revision. One of the items requested was a letter stating the City of Glendale adopt and enforce the modified floodway within our community. This letter serves as the City of Glendale verification that we will adopt and enforce the modified floodway as it appears on the revised FIRM map per the Letter of Map Revision.

Please contact me at (623) 930-3630 should you have any questions or require additional information.

Sincerely,

Grant I. Anderson, P.E.
City Engineer / Floodplain Administrator

DAS/km

cc Ms. Pernille Buch-Pederson
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304



City of Phoenix
STREET TRANSPORTATION DEPARTMENT

April 25, 2000

Mr. Matthew B. Miller, P.E.
Chief, Hazard Studies Branch
Mitigation Directorate
Federal Emergency Management Agency
500 "C" Street, S.W.
Washington, D.C. 20472

Dear Mr. Miller:

RE: CASE NO.: 00-09-569P
FLOODPLAIN DELINATION FOR CAMELBACK RANCH LEVEE
NORTH / GLENDALE AIRPORT
FIRM PANEL 04013C1620 F

This is in response to your letter of April 20, 2000 requesting that additional data be submitted prior to issuance of a Letter of Map Revision. One item requested was a letter stating that our community will adopt and enforce the modified floodway. This letter serves as the City of Phoenix verification that we will adopt and enforce the modified floodway as it appears on the revised FIRM maps per the Letter of Map Revision.

If you should have any questions, please contact me at (602) 262-4026.

Sincerely,

Thomas E. Callow, P.E.
Interim Street Transportation Director

A handwritten signature in black ink, appearing to read "Ray Dovalina".

Ray Dovalina, P.E.
Floodplain Manager

TEC/rd/aff/camelback.doc



Federal Emergency Management Agency

Washington, D.C. 20472

FLOOD CONTROL DISTRICT RECEIVED	
APR 24 '00	
IC & GM	FINANCE
PIO	LANDS
ADMIN	O & M
REG	P & PM
ENG	FILE
CONTRACTS	

MWD

April 20, 2000

Mr. Michael Duncan, P.E.
 Civil Engineer
 Engineering Division
 Flood Control District of Maricopa County
 2801 West Durango Street
 Phoenix, AZ 85009

IN REPLY REFER TO:
 Case No.: 00-09-569P
 Communities: Cities of Glendale and Phoenix
 and Maricopa County, AZ
 Community Nos.: 040045, 040051, and 040037

316-ACK.FRQ

Dear Mr. Duncan:

This responds to your request dated March 21, 2000, that the Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	Camelback Ranch Levee—North/Glendale Airport Levee
Flooding Sources:	New River and Agua Fria River
FIRM Panel(s) Affected:	04013C1620 F

We have completed an inventory of the items that you submitted. The items identified below are required before we can begin a detailed review of your request.

1. Our preliminary review revealed that the Cities of Glendale and Phoenix are affected by this revision. Please provide community acknowledgment in the form of a letter stating that each city has reviewed the revision request and understands the effects of the revision on flooding conditions in the communities, or Application/Certification Form 1, entitled "Revision Requester and Community Official Form," signed by a community official from the Cities of Glendale and Phoenix.
2. Please submit a letter stating that the Cities of Glendale and Phoenix will adopt and enforce the modified floodway.

If all required items are not submitted within 90 days of the date of this letter, we will treat any subsequent request as an original submittal, and it will be subject to all submittal/payment procedures.

If you are unable to meet the 90-day deadline for submittal of required items, and would like FEMA to continue processing your request, you must request an extension of the deadline. This request must be submitted to our Mapping Coordination Contractor in writing and must provide (1) the reason why the data cannot be submitted within the requested timeframe, and (2) a new date for the submittal of the data. We receive a very large volume of requests and cannot maintain inactive requests for an indefinite period of

time. Therefore, the fees will be forfeited for any request for which neither the requested data nor a written extension request is received within 90 days.

Please direct all required items and questions concerning your request to our Mapping Coordination Contractor at the following address:

Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304

Attention: Ms. Pernille Buch-Pedersen
Telephone: (703) 317-6224
Fax: (703) 960-9125

When you write us about your request, please include the case number referenced above in your letter.

If you have any questions concerning FEMA policy, or the National Flood Insurance Program in general, please contact the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,



Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

Enclosure

cc: Mr. Grant Anderson
Floodplain Manager
City of Glendale

Ms. Cindy D. White, P.E.
Floodplain Manager
City of Phoenix

**INSTRUCTIONS FOR COMPLETING THE
REVISION REQUESTER AND COMMUNITY OFFICIAL FORM
(FORM 1)**

This form provides the basic information regarding revision requests and must be submitted with each request. It contains much of the material needed for FEMA to assess the nature and complexity of the proposed revision. It will identify: (a) the type of response expected from FEMA; (b) those elements that will require supporting data and analyses; and (c) items needing concurrence of others. This form will also assure that the community is aware of the impacts of the request and has notified impacted property owners, if required. All items must be completed accurately. If the revision request is being submitted by an individual, firm, or other non-community official, contact should be made with appropriate community officials. NFIP regulation 44 CFR Ch. 1, Section 65.4, requires that revisions based on new technical data be submitted by the Chief Executive Officer (CEO) of the community or a designated official. Should the CEO refuse to submit such a request on behalf of another party, FEMA will agree to review it only if written evidence is provided indicating the CEO or designee has been requested to do so.

Requested Response from FEMA

1. Indicate the type of response being requested. Brief descriptions of possible responses are provided in the introduction; more detail regarding these responses and the data required to obtain each response are provided in the NFIP regulations, 44 CFR Ch. 1, and in the document entitled Appeals, Revisions and Amendments to Flood Insurance Maps: A Guide for Community Officials, (FIA 12).

Overview

1. Physical changes include watershed development, flood control structures, etc. Note that fees will be assessed for FEMA's review of proposed and "as-built" projects, as outlined in NFIP regulations 44 CFR Ch. 1, Part 72. Improved methodology may be a different technique (model) or adjustments to models used in the effective FIS. Improved data include revised as well as new data. Floodway revisions involve any shift in the FEMA-designated floodway boundaries, regardless of whether the shift is mappable.
2. Flooding source refers to a specific lake, stream, ocean, etc. This should match the flooding source name shown on the FIRM, if it has been labeled. (Examples: Lake Michigan, Duck Pond, or Big Hollow Creek).
3. Project Name/Identifier can be the name of a flood control project or other pertinent structure having an impact on the effective FIS, the name of a subdivision or area, or some other identifying phrase.
4. The Zone designation(s) affected can be obtained from the FIRM.
5. The map number, panel number, community number, and effective date can be obtained from the FIRM title block. The sample FIRM panels (Figures 1 and 2) provide a convenient source of information to fill in item 5.
6. Indicate the type(s) of flooding and structure(s) associated with the revision request.

Encroachment Information

1. If the revision request involves changes to a designated floodway and the floodway is regulated by a State agency, approval by the appropriate State agency must be obtained.

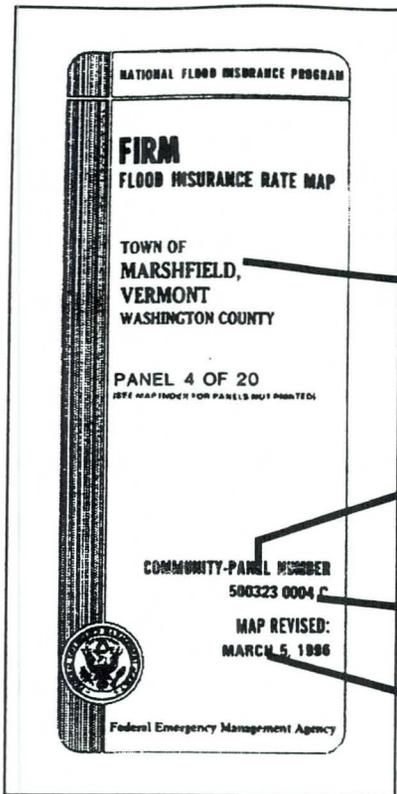


Figure 1. Sample FIRM Panel (Single Community)

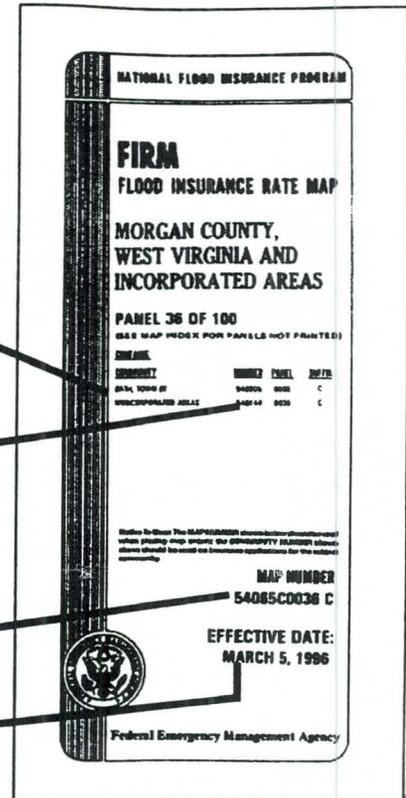


Figure 2. Sample FIRM Panel (Countywide)

2. This question applies to projects built in the floodway only. Indicate if the project built in the floodway causes any increase in the 1% annual chance flood elevation. If the project causes increases, all requirements of Section 65.12 of the NFIP regulations must be met.
3. This question applies to projects built in the floodway fringe, or the floodplain for streams where a floodway has not been established. If the project causes increases in the 1% annual chance flood elevation greater than one foot (or any other more stringent requirement set by the community), all requirements of Section 65.12 of the NFIP regulations must be met.

Maintenance Responsibility

For revisions involving flood a control structure, indicate if the community will be responsible for maintaining the structure. Attach a maintenance and operations plan.

Review Fee

Enter the fee amount associated with the request as indicated in the fee schedule provided in the introduction. Or, indicate that the revision meets the requirements for a fee exemption.

Signature

Signature and Title of Revision Requester

The person signing this certification should own the property involved in the request or have legal authority to represent a group/firm/organization or other entity in legal actions pertaining to the NFIP.

Signature and Title of Community Officials

The person signing this certification should be the CEO for the community involved in this revision request or an official legally designated by the CEO. If more than one community is affected by the change, the community official from the community that is most affected should sign the form and letters from the other affected communities should be enclosed. If the community or communities disagree with the proposed revision, a signed statement should be attached to the request explaining the reasons or bases for disagreement. The community should refer to the document entitled Appeals, Revisions, and Amendments to Flood Insurance Maps: A Guide for Community Officials, (FIA-12).

Certification by Registered Professional Engineer and/or Land Surveyor

The licensed professional engineer and/or land surveyor should have a current license in the State in which one of the impacted communities resides. While the individual signing this form is not required to have obtained the supporting data or performed the analyses, he or she must have supervised and reviewed the work.

A certification by a registered professional engineer or other party does not constitute a warranty or guarantee of performance, expressed or implied. Certification of data is a statement that the data is accurate to the best of the certifier's knowledge. Certification of analyses is a statement that the analyses have been performed correctly and in accordance with sound engineering practices. Certification of structural works is a statement that the works are designed in accordance with sound engineering practices to provide protection from the 1% annual chance flood. Certification of "as-built" conditions is a statement that the structure(s) has been built according to the plans being certified, is in place, and is fully functioning.

If the requester is a Federal agency who is responsible for the design and construction of flood control facilities, a letter stating that "the analyses submitted has been performed correctly and in accordance with sound engineering practices" may be submitted in lieu of this form. Regarding the certification of completion of flood control facilities, a letter from the Federal agency certifying its completion and the flood frequency event to which the project protects may be submitted in lieu of this form.

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

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1. REQUESTED RESPONSE FROM FEMA

This request is for a:

- CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60,65 & 72).
- LOMR A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, floodway or flood elevations. LOMRs typically decrease flood hazards. (See 44 CFR Ch. 1 Parts 60 & 65.)
- Other Describe: _____

2. OVERVIEW

1. The basis for this revision request is (are): (check all that apply)

- Physical Change
- Improved Methodology/Data
- Floodway Revision
- Other Describe: _____

Note: A photograph is not required, but is very helpful during review.

2. Flooding Source: _____

3. Project Name/Identifier: _____

4. FEMA zone designations affected: _____
 (example: A, AH, AO, A1-A30, A99, AE, V, V1-V30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301 480287	Katy, City Harris County	TX TX	480301 48201C	0005D 0220G	02/08/83 09/28/90

6. The area of revision encompasses the following types of flooding and structures. Check all that apply.

Types of Flooding	Structures
<input type="checkbox"/> Riverine	<input type="checkbox"/> Channelization
<input type="checkbox"/> Coastal	<input type="checkbox"/> Levee/Floodwall
<input type="checkbox"/> Alluvial fan	<input type="checkbox"/> Bridge/Culvert
<input type="checkbox"/> Shallow Flooding (e.g. Zones AO and AH)	<input type="checkbox"/> Dam
<input type="checkbox"/> Lakes	<input type="checkbox"/> Fill
<input type="checkbox"/> Other (describe)	<input type="checkbox"/> Other (describe)

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP? Yes No

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? Yes No N/A

3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? Yes No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for performing overseeing compliance with the maintenance and operation plans of the _____ flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.
(Name)

Operation and maintenance plans are attached. Yes No N/A

6. REVIEW FEE

The review fee for the appropriate request category has been included. Yes Fee amount: \$ _____
OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt Yes

Please see Instructions for Fee Amounts

7. SIGNATURE

Note: I understand that my signature indicates that all information submitted in support of this request is correct

Signature of Revision Requester

Printed Name and Title of Revision Requester

Company Name

Telephone No. _____ Date _____

Note: Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.

Signature of Community Official

Printed Name and Title of Community Official

Community Name

Telephone No. _____ Date _____

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2

Signature

Printed Name and Title of Revision Requester
Registr No. _____ Expires (Date) _____ State _____
Type of License/Expertise: _____

Check which forms have been included with this request

- | <u>Form Name and (Number)</u> | <u>Required if</u> |
|--|---|
| <input type="checkbox"/> Hydrologic (3) | new or revised discharges |
| <input type="checkbox"/> Hydraulic (4) | new or revised water-surface elevations |
| <input type="checkbox"/> Mapping (5) | floodplain/floodway changes |
| <input type="checkbox"/> Channelization (6) | channel is modified |
| <input type="checkbox"/> Bridge/Culvert (7) | addition/revision of bridge/culvert |
| <input type="checkbox"/> Levee/Floodwall (8) | addition/revision of levee/floodwall |
| <input type="checkbox"/> Coastal (9) | new or revised coastal elevations |
| <input type="checkbox"/> Coastal Structures (10) | addition/revision of coastal structure |
| <input type="checkbox"/> Dam (11) | addition/revision of dam |
| <input type="checkbox"/> Alluvial Fan (12) | structures proposed on alluvial fan |



**Need Information on
FEMA FLOOD HAZARD MAPS?
CONTACT 1-877-FEMA MAP
(Toll Free 1-877-336-2627)**



This release is intended to acquaint the public with the Federal Emergency Management Agency's new toll-free number established to respond to questions regarding National Flood Insurance Program (NFIP) Flood Hazard maps, including:

- How do I go about getting a Letter of Map Amendment (LOMA)? A Letter of Map Revision Based on Fill (LOMR-F)? A Letter of Map Revision (LOMR)?
- What is the status of my request for a LOMA? LOMR-F? Study?
- How long does it take to get the map revised?
- Did FEMA receive my request for a Letter of Map Amendment?
- I was just told by my lender that my house is in a floodplain and I need flood insurance, what are my options?
- Was a LOMA ever issued for my property?
- Has the National Flood Insurance Program Flood Hazard map for my community been revised?

The following procedures have been established by FEMA for changing and correcting the NFIP Flood Hazard maps. They are: Letters of Map Amendment (LOMAs), Letters of Map Revision (LOMRs), Letters of Map Revision Based on Fill (LOMR-Fs), and Physical Map Revisions.

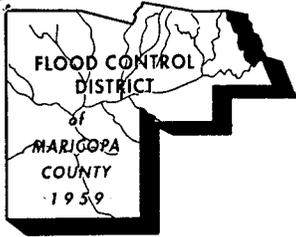
As a result of numerous requests for revisions or corrections to the NFIP Flood Hazard maps, FEMA has assigned a dedicated staff of trained professionals to respond to the public's requests for information on the procedures to revise or correct the NFIP Flood Hazard maps.

If you have any questions regarding the NFIP Flood Hazard maps or need current information and facts on FEMA Mapping Procedures, call 1-877-FEMA-MAP.

Below are additional Toll-Free numbers that can be used to obtain other information regarding the NFIP and its products.

- For information about the NFIP's Preferred Risk Policy, ask your insurance agent or company, or call the NFIP's toll-free number at 1-800-427-9662.
- For any current FEMA publications, call FEMA's Publication Center at 1-800-480-2520.
- For answers to flood insurance related questions, call the National Flood Insurance Telephone Response Center at 1-800-427-4661.
- For ordering printed copies of effective NFIP Flood Hazard maps and related documents, call the FEMA Map Service Center at 1-800-358-9616.

Additional information on flood insurance and other FEMA programs and activities is available on the FEMA World Wide Web Site (<http://www.FEMA.gov>) and from FEMA's 24-hour-FAX-on-Demand system at (202) 646-FEMA. TDD# 1-800-427-5593.



FLOOD CONTROL DISTRICT

of

Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

March 21, 2000

Ms. Pernille Buch-Pederson
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304

FEMA Case No.: 98-09-1026R

Communities: Maricopa County, City of Glendale, City of Phoenix
Community Nos.: 040037, 040045, 040051

Subject: LOMR request for Camelback Ranch Levee - North and Glendale Airport Levee
Based on CLOMR of November 4, 1998, and enclosed Supplemental Data

Identifier: Camelback Ranch Levee - North and Glendale Airport Levee
Flooding Sources: Agua Fria and New Rivers
FIRM Panel Affected: 04013C1620F

Dear Ms. Buch-Pedersen:

The subject levees have been constructed. A LOMR is hereby requested based on As-built Plans and a Notebook of Supplemental Data that are enclosed in this package. The Notebook contains FEMA application forms and supplemental data that address the comments of the above-referenced CLOMR. A check for \$ 3,400 (for a LOMR with a previously issued CLOMR) has been submitted separately. If you have any questions, please contact me at (602) 506-4732.

Sincerely,

Michael Duncan, P.E.
Engineering Division

Enclosures

Copy to:

Bill Jenkins, State Coordinator, NFIP
Arizona Department of Water Resources
500 North 3rd Street
Phoenix, Arizona 85004

Grant Anderson, Floodplain Manager
City of Glendale
5850 W. Glendale Avenue
Glendale, Arizona 85301

Floodplain Manager
City of Phoenix
200 West Washington Street, 5th Floor
Phoenix, Arizona 85003-1611

COORD:

JIT EAR

INFO:

RWS

FILE:

FCD 98-37

CLOMR TO LOMR SUPPLEMENTAL DATA

FOR

CAMELBACK RANCH LEVEE NORTH

FEMA CASE NO. 98-09-1026R

SUBMITTED BY

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2801 WEST DURANGO STREET
PHOENIX, ARIZONA 85009**

(602) 506-1501

MARCH 2000

FEMA case no. 98-09-1026R

CLOMR to LOMR Supplement

Camelback Ranch Levee North
and Glendale Airport Levee

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- 3 WORK MAPS
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- 7 COMPACTION REPORTS
- 8 SOIL CEMENT STRENGTH REPORTS
- 9 AS-BUILT PLANS



Section 1 -- FEMA FORMS

MT-2	Form 1	Main
MT-2	Form 4	Hydraulic -- Agua Fria River
MT-2	Form 4	Hydraulic -- New River
MT-2	Form 5	Mapping
MT-2	Form 6	Channelization
MT-2	Form 8	Levee/Floodwall

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- CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60,65 & 72).
- LOMR A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, floodway or flood elevations. LOMRs typically decrease flood hazards. (See 44 CFR Ch. 1 Parts 60 & 65.)
- Other Describe: _____

2. OVERVIEW

1. The basis for this revision request is (are): (check all that apply)

- Physical Change Improved Methodology/Data Floodway Revision
- Other Describe: _____

Note: A photograph is not required, but is very helpful during review.

2. Flooding Source: New River and Agua Fria River

3. Project Name/Identifier: Camelback Ranch Levee - North/Glendale Airport Levee

4. FEMA zone designations affected: AE
 (example: A, AH, AO, A1-A30, A99, AE, V, V1-V30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301 480287	Katy, City Harris County	TX TX	480301 48201C	0005D 0220G	02/08/83 09/28/90
040051	Phoenix, City	AZ	04013C	1620F	04/16/98
040045 040037	Glendale, City Maricopa County	AZ	04013C 04013C	1620F 1620F	04/16/98 04/16/98

6. The area of revision encompasses the following types of flooding and structures. Check all that apply.

Types of Flooding		Structures	
<input checked="" type="checkbox"/> Riverine	<input type="checkbox"/> Channelization	<input type="checkbox"/> Coastal	<input checked="" type="checkbox"/> Levee/Floodwall
<input type="checkbox"/> Alluvial fan	<input type="checkbox"/> Bridge/Culvert	<input type="checkbox"/> Shallow Flooding (e.g. Zones AO and AH)	<input type="checkbox"/> Dam
<input type="checkbox"/> Lakes	<input type="checkbox"/> Fill	<input type="checkbox"/> Other (describe)	<input type="checkbox"/> Other (describe)

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?
 Yes No

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? Yes No N/A
3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? Yes No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for performing overseeing compliance with the maintenance and operation plans of the Flood Control District of Maricopa County and City of Glendale
 (Name)

flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Operation and maintenance plans are attached. Yes No N/A

6. REVIEW FEE

The review fee for the appropriate request category has been included. Yes Fee amount: \$3,400
 OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt. Yes

Please see Instructions for Fee Amounts

7. SIGNATURE

Note: I understand that my signature indicates that all information submitted in support of this request is correct


 Signature of Revision Requester

Michael W. Duncan, P.E., Civil Engineer
 Printed Name and Title of Revision Requester

Flood Control District Of Maricopa County
 Company Name

Telephone No.: 602-506-4732 Date: 3-21-00

Note: Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.


 Signature of Community Official

Michael S. Ellegood, P.E., Chief Engineer and General Manager
 Printed Name and Title of Community Official

Maricopa County
 Community Name

Telephone No.: 602-506-1501 Date: 3/22/00

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2


 Signature

Michael W. Duncan, Civil Engineer
 Printed Name and Title of Revision Requester

Registr No. 24124 Expires (Date) 09/30/2002 State AZ

Type of License/Expertise: Professional Civil Engineer

Check which forms have been included with this request

Form Name and (Number)	Required if
<input type="checkbox"/> Hydrologic (3)	new or revised discharges
<input checked="" type="checkbox"/> Hydraulic (4)	new or revised water-surface elevations
<input checked="" type="checkbox"/> Mapping (5)	floodplain/floodway changes
<input checked="" type="checkbox"/> Channelization (6)	channel is modified
<input type="checkbox"/> Bridge/Culvert (7)	addition/revision of bridge/culvert
<input checked="" type="checkbox"/> Levee/Floodwall (8)	addition/revision of levee/floodwall
<input type="checkbox"/> Coastal (9)	new or revised coastal elevations
<input type="checkbox"/> Coastal Structures (10)	addition/revision of coastal structure
<input type="checkbox"/> Dam (11)	addition/revision of dam
<input type="checkbox"/> Alluvial Fan (12)	structures proposed on alluvial fan

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Note: Fill out one form for each flooding source studied

Community Name: Maricopa County/City of Glendale/City of Phoenix

Flooding Source: Agua Fria River

Project Name/Identifier: Camelback Ranch Levee - North/Glendale Airport Levee

1. REACH TO BE REVISED

Describe the limits of the revision OR submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? Yes

Downstream Limit: _____

Upstream Limit: _____

2. MODELS SUBMITTED

Requirements: for areas which have detailed flooding:

Full input and output listings along with files on diskette for each of the models listed below (items 1-4) and a summary of the source of input parameters used in the models must be provided. The summary must include a description of any changes made from model to model (e.g., Duplicate Effective model to Corrected Effective model). At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.

for areas which do not have detailed flooding:

Only the 100-year (Base) flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses (including all calculations) for existing or pre-project conditions and revised or post-project conditions must be submitted.

1. Duplicate Effective Model Natural File Name aguafria 10-25-96 Floodway File Name (same)

Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models (10-, 50-, 100-, and 500-year multi-profile runs and the floodway run) must be obtained and then reproduced on the requester's equipment to produce the Duplicate Effective model. This is required to assure that the effective models input data has been transferred correctly to the requester's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

2. Corrected Effective Model Natural File Name _____ Floodway File Name _____

The Corrected Effective model is the model that corrects any errors that occur in the Duplicate Effective model, adds any additional cross sections to the Duplicate Effective model, or incorporates more detailed topographic information than that used in the currently effective model. The Corrected Effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

3. Existing or Pre-Project Conditions Model Natural File Name _____ Floodway File Name _____

The Duplicate Effective model or Corrective Effective model is modified to produce the Existing or Pre-Project Conditions model to reflect any modifications that have occurred within the floodplain since the date of the Effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the Corrected Effective model or Duplicate Effective model.

4. Revised or Post-Project Conditions Model Natural File Name Agua99WEST Floodway File Name (same)

The Existing or Pre-Project Conditions model (or Duplicate Effective model or Corrected Effective model, as appropriate) is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for the proposed project this model must reflect proposed conditions.

5. Other - Please attach a sheet describing all other models submitted along with the file names. Natural Floodway

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

3. STARTING WATER-SURFACE ELEVATIONS

Explain how they were determined.

Explanation Attached?

Yes

No

NOTE: If the effective study is an approximate study, the slope/area method is recommended.
For detailed analysis studies, using a known water-surface elevation is recommended.

4. RESULTS (from the model used to revise the 100-year water surface elevations)

If the results indicate any of the following, attach an explanation - to this form, or to the hydraulic model printout- as to the reasonableness of the situation.

- Supercritical depth Critical Depth Drawdowns Negative Floodway Surcharges
- Floodway Surcharges Greater Than Maximum Allowed by Community/State
- Water surface elevations higher than the end points of cross sections.
- Floodway discharge is different than the Natural 100-year (base) flood discharge.
- Project causes 100-year floodplain or floodway elevations to increase (state if increases are located off the requester's property)

Explanation attached with Form

Explanation provided on attached printout

If Hydraulic model used is HEC-2, has it been checked with FEMA'S CHECK-2 computer program? Yes

No

(see instructions for information on how to obtain CHECK-2)

5. REVISED FIRM/FBFM AND FLOOD PROFILES

1. Profile Transition

- a. 100-Year Water-Surface Elevations - indicate the difference in water surface elevations where the project 100-year elevations tie into the existing 100-year water surface elevations at each end of the project.

Downstream End 9.266 within 0.00 (feet)
Cross-Section #

Upstream End 10.265 within 0.00 (feet)
Cross-Section #

- b. Floodway Elevations - indicate the difference in water surface elevations where the project floodway elevations tie into the existing floodway water surface elevations at each end of the project.

Downstream End 9.266 within 0.00 (feet)
Cross-Section #

Upstream End 10.265 within 0.00 (feet)
Cross-Section #

- c. Floodway widths - indicate the difference in floodway widths where the project floodway widths tie into the existing floodway width at each end of the project.

Downstream End _____ within _____ (feet)
Cross-Section #

Upstream End _____ within _____ (feet)
Cross-Section #

2. Profile Checklist (check box if information has been provided on profile)

The following information (unless in parentheses) must be included at the same scale as the existing profiles for this project:

- Stream Name Community Name Corporate Limits labeled Study limits labeled
- Confluences labeled Channel Stationing Streambed profiled Cross Sections labeled
- Horizontal/Vertical Scales indicated 100-year elevs profiled*
- Road Crossings Labeled Low Chord Elevations Top of Road Elevations

*All recurrence intervals in the effective study must also be profiled.

Floodway Data Table

Attach a Floodway Data Table for each cross section listed in the published Floodway Data table in the FIS report.

Floodway Data Table Attached Yes Not Required

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Note: Fill out one form for each flooding source studied

Community Name: Maricopa County/City of Glendale/City of Phoenix

Flooding Source: New River

Project Name/Identifier: Camelback Ranch Levee - North/Glendale Airport Levee

1. REACH TO BE REVISED

Describe the limits of the revision OR submit a copy of the FIRM with the revision area clearly highlighted. Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? Yes

Downstream Limit: _____

Upstream Limit: _____

2. MODELS SUBMITTED

Requirements: for areas which have detailed flooding:

Full input and output listings along with files on diskette for each of the models listed below (items 1-4) and a summary of the source of input parameters used in the models must be provided. The summary must include a description of any changes made from model to model (e.g., Duplicate Effective model to Corrected Effective model). At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.

for areas which do not have detailed flooding:

Only the 100-year (Base) flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses (including all calculations) for existing or pre-project conditions and revised or post-project conditions must be submitted.

1. Duplicate Effective Model Natural File Name revsb 8-28-87 Floodway File Name (same)

Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models (10-, 50-, 100-, and 500-year multi-profile runs and the floodway run) must be obtained and then reproduced on the requester's equipment to produce the Duplicate Effective model. This is required to assure that the effective models input data has been transferred correctly to the requester's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

2. Corrected Effective Model Natural File Name _____ Floodway File Name _____

The Corrected Effective model is the model that corrects any errors that occur in the Duplicate Effective model, adds any additional cross sections to the Duplicate Effective model, or incorporates more detailed topographic information than that used in the currently effective model. The Corrected Effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

3. Existing or Pre-Project Conditions Model Natural File Name _____ Floodway File Name _____

The Duplicate Effective model or Corrective Effective model is modified to produce the Existing or Pre-Project Conditions model to reflect any modifications that have occurred within the floodplain since the date of the Effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the Corrected Effective model or Duplicate Effective model.

4. Revised or Post-Project Conditions Model Natural File Name New99WEST Floodway File Name (same)

The Existing or Pre-Project Conditions model (or Duplicate Effective model or Corrected Effective model, as appropriate) is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for the proposed project this model must reflect proposed conditions.

5. Other - Please attach a sheet describing all other models submitted along with the file names. Natural Floodway

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

3. STARTING WATER-SURFACE ELEVATIONS

Explain how they were determined.

Explanation Attached?

Yes No

NOTE: If the effective study is an approximate study, the slope/area method is recommended.
For detailed analysis studies, using a known water-surface elevation is recommended.

4. RESULTS (from the model used to revise the 100-year water surface elevations)

If the results indicate any of the following, attach an explanation - to this form, or to the hydraulic model printout- as to the reasonableness of the situation.

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- Floodway Surcharges Greater Than Maximum Allowed by Community/State
- Water surface elevations higher than the end points of cross sections.
- Floodway discharge is different than the Natural 100-year (base) flood discharge.
- Project causes 100-year floodplain or floodway elevations to increase (state if increases are located off the requester's property)

Explanation attached with Form

Explanation provided on attached printout

If Hydraulic model used is HEC-2, has it been checked with FEMA'S CHECK-2 computer program? Yes No
(see instructions for information on how to obtain CHECK-2)

5. REVISED FIRM/FBFM AND FLOOD PROFILES

1. Profile Transition

- a. 100-Year Water-Surface Elevations - indicate the difference in water surface elevations where the project 100-year elevations tie into the existing 100-year water surface elevations at each end of the project.

Downstream End 0.10 within 0.00 (feet)
Cross-Section #

Upstream End 58.12 within 0.02 (feet)
Cross-Section #

- b. Floodway Elevations - indicate the difference in water surface elevations where the project floodway elevations tie into the existing floodway water surface elevations at each end of the project.

Downstream End 0.10 within 0.00 (feet)
Cross-Section #

Upstream End 58.12 within 0.02 (feet)
Cross-Section #

- c. Floodway widths - indicate the difference in floodway widths where the project floodway widths tie into the existing floodway width at each end of the project.

Downstream End _____ within _____ (feet)
Cross-Section #

Upstream End _____ within _____ (feet)
Cross-Section #

2. Profile Checklist (check box if information has been provided on profile)

The following information (unless in parentheses) must be included at the same scale as the existing profiles for this project:

- Stream Name Community Name Corporate Limits labeled Study limits labeled
- Confluences labeled Channel Stationing Streambed profiled Cross Sections labeled
- Horizontal/Vertical Scales indicated 100-year elevs profiled*
- Road Crossings Labeled Low Chord Elevations Top of Road Elevations

*All recurrence intervals in the effective study must also be profiled.

Floodway Data Table

Attach a Floodway Data Table for each cross section listed in the published Floodway Data table in the FIS report.

Floodway Data Table Attached Yes Not Required

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Note: Fill out one form for each flooding source studied

Community Name: Maricopa County/City of Glendale/City of Phoenix

Flooding Source: New River and Agua Fria River

Project Name/Identifier: Camelback Ranch Levee - North/Glendale Airport Levee

This is a Manual Digital submission. *Digital map submissions may be used to update digital FIRM (DFIRM). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance as possible.*

1. MAPPING CHANGES

1. A topographic workmap must be submitted showing the following information (check N/A when not applicable):

- | | | | |
|--|---|-----------------------------|---|
| a. Revised approximate 100-year floodplain boundaries (Zone A) | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| b. Revised detailed 100- and 500-year floodplain boundaries. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| c. Revised floodway boundaries | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| d. Location and alignment of all cross sections with stationing control indicated. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| e. Stream alignments, road alignments and dam alignments. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| f. Current community boundaries. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| g. Effective 100- year floodplain and floodway boundaries from FIRM/FBFM reduced or enlarged to the scale of the topographic workmap | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| h. Tie-ins between the effective and revised 100-, 500-year and floodway boundaries | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| i. The requester's property boundaries and community easements | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| j. The signed certification of a registered professional engineer | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| k. Location and description of reference marks | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| l. Vertical datum (example: NGVD, NAVD) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| m. Coastal zone designations tie into adjacent areas not being revised | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| n. Location and alignment of all coastal transects used to revise the coastal analyze | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| o. V-zone has been delineated to extend landward to the heel of the primary frontal dune | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |

If any items are marked No or N/A please attach an explanation.

2. What is the source and date of the updated topographic information (example: orthophoto maps, July 1985; filed survey, May 1979, beach profile, June 1987 etc.)? Aerial DTM, February, 1995

3. What is the scale and contour interval of the following workmaps?

Effective FIS Scale 1" = 200' Contour Interval 2'

Revision Request Scale 1" = 200' Contour Interval 2'

NOTE: Revised topographic information must be of equal or greater detail than effective.

4. Attach an annotated FIRM/FBFM at the scale of the effective FIRM/FBFM showing the revised 100- and 500-year floodplain and the floodway boundaries and how they tie into those shown on the effective FIRM/FBFM downstream and upstream of the revisions or adjacent to the area of revision for coastal studies. FIRM/FBFM attached? Yes No

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

2. EARTH FILL PLACEMENT

1. The fill is: Existing Proposed
2. Has fill been/will be placed in the regulatory floodway? Yes No
If Yes, please attach completed Riverine Hydraulic Analysis Form (Form 4).
3. Has fill been/will be placed in floodway fringe (*area between the floodway and 100-year floodplain boundaries*)? Yes No

If Yes, then complete A, B, C, and D below.

- a. Are fill slopes for granular materials steeper than one vertical on one-and-one-half horizontal? Yes No

If Yes, justify steeper slopes Slopes retined/protected by 9-foot-thick soil cement layer

- b. Is adequate erosion protection provided for fill slopes exposed to moving flood waters? (*Slopes exposed to flows with velocities of up to 5 feet per second (fps) during the 100-year flood must, at a minimum, be protected by a cover of grass, vines, weeds, or similar vegetation; slopes exposed to flows with velocities greater than 5 fps during the 100-year flood must, at a minimum, be protected by stone or rock riprap.*)

Yes No

If No, describe erosion protection provided _____

- c. Has all fill placed in revised 100-year floodplain been compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test Method or acceptable equivalent method? Yes No
- d. Can structures conceivably be constructed on the fill at any time in the future? Yes No

If Yes, attach certification of fill compaction (item 3c. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer in accordance with Subparagraph 65.5(a)(6) of the NFIP regulations.

Fill certification attached Yes No

4. Has fill been/will be placed in a V zone? Yes No

If Yes, is the fill protected from erosion by a flood control structure such as a revetment or seawall?

Yes No

If Yes, attach the Coastal Structures Form (Form 10).

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.75 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

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Community Name: Maricopa county/City of Glendale/City of Phoenix

Flooding Source: New River and Agua Fria River

Project Name/Identifier: Camelback Ranch Levee - North/Glendale Airport Levee

1. REACH TO BE REVISED

Describe the limits of the revision OR submit a copy of the FIRM with the revision area clearly highlighted. Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? Yes

Downstream Limit: -----

Upstream Limit: -----

2. CHANNEL DESCRIPTION

Attach the following information about the channel (check box if information has been provided):

- Description of the inlet and outlet
- Description of the shape of the channel (both cross sectional and planimetric configuration) and its lining (channel bottom and sides):

3. ACCESSORY STRUCTURES

The channelization includes:

- Levees (Attach Levee/Floodwall System Analysis Form - Form 8)
- Drop structures
- Superelevated sections
- Transitions in cross sectional geometry
- Debris basin/detention basin
- Energy dissipater
- Other (Describe):

4. DRAWING CHECKLIST

Attach the plans of the channelization certified by a registered professional engineer. The plan detail and information should include (check box if information has been provided):

- Channel alignment and locations of inlet, outlet, and accessory structures
- Channel lining
- Typical cross sections and profiles of channel banks and invert

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

5. HYDRAULIC CONSIDERATIONS

1. The channel was designed to carry 39,000 (cfs) and/or the 100-year flood.
2. The design elevation in the channel based on:
 - Subcritical flow
 - Critical flow
 - Supercritical flow
 - Energy grade line
3. If there is the potential for a hydraulic jump at the following locations, check the box(es) that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

Inlet to channel?	<input type="checkbox"/> Yes
Outlet of channel?	<input type="checkbox"/> Yes
At Drop Structures?	<input type="checkbox"/> Yes
At Transitions?	<input type="checkbox"/> Yes
Other locations?	<input type="checkbox"/> Yes

Explanation Attached? Yes No N/A

6. SEDIMENT TRANSPORT CONSIDERATIONS

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the 100-year (base flood) water-surface elevations; and/or based on the stream geomorphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including sewer and deposition) to affect the base flood water-surface elevations, then provide the following information (Check the box if provided):

- Estimated sediment load
- Method used to estimate sediment transport
- Method used to estimate scour and/or deposition
- Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.0 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

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Community Name: Maricopa County/City of Glendale/City of Phoenix

Flooding Source: New River and Agua Fria River

Project Name/Identifier: Camelback Ranch Levee - North/Glendale Airport Levee

1. REACH TO BE REVISED

Describe the limits of the revision OR submit a copy of the FIRM with the revision area clearly highlighted. Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? Yes

Downstream Limit: _____

Upstream Limit: _____

2. LEVEE/FLOODWALL SYSTEM ELEMENTS

1. This Levee/Floodwall analysis is based on:

- upgrading of an existing levee/floodwall system
- a newly constructed levee/floodwall system
- reanalysis of an existing levee/floodwall system

2. Levee elements and locations are:

- earthen embankment, dike, berm, etc. Station 10+00 to 22+40
- structural floodwall Station _____ to _____
- other (describe): Engineered Fill Station 22+40 to 38+40

3. Structural Type:

- monolithic cast-in place reinforced concrete
- reinforced concrete masonry block
- sheet piling
- other (describe): soil cement

4. Has this levee/floodwall system been certified by a Federal agency to provide protection against the 1% annual chance (100-year) flood event? Yes No

If Yes, by which agency? _____

If Yes, complete only the interior drainage section on pages 7 and 8 of this form and the operation and maintenance section of Revision Requestor and Community Official Form.

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

2. LEVEE/FLOODWALL SYSTEM ELEMENTS (Cont'd)

5. Attach certified drawings containing the following information (indicate drawing sheet numbers):
- a. Plan of the levee embankment and floodwall structures. Sheet Numbers 9-13
 - b. A profile of the levee/floodwall system showing the 100-year water-surface (base flood) elevation, levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers 9-13
 - c. A profile of the base flood elevation, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure device. Sheet Numbers 19-20
 - d. A layout detail for the embankment protection measures. Sheet Numbers 3-4
 - e. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers 18

3. FREEBOARD

1. The minimum freeboard provided above the base flood elevation is:

Riverine

- 3.0 feet or more at the downstream end and throughout
- 3.5 feet or more at the upstream end
- 4.0 feet immediately upstream of all structures and constrictions

Yes No
 Yes No
 Yes No

Coastal

1.0 foot above the height of the one percent wave for the 100-year stillwater surge elevation or maximum wave runup (whichever is greater).

Yes No

2.0 feet above 100-year stillwater surge elevation

Yes No

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Part 65.10(b)(1)(ii) of the National Flood Insurance Program regulations.

If No is answered to any of the above, please attach an explanation.

2. Is there an indication from historical records that ice-jamming can effect the base flood elevation? Yes No
 No
 If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Tabulate the elevations at critical locations (tabulate values at each levee crest grade change, and where sediment may accumulate such as along bends in the channel.)

Station	Location	100-year Water Surface Elevation	Levee Crest	Freeboard (ft.)
82+52	Upper end	1040.08	1044.80	4.72
66+50		1037.07	1043.00	5.93
54+50		1034.40	1040.10	5.70
48+50		1033.28	1038.90	5.62
22+40		1025.31	1031.70	6.39
10+00	Lower end	1023.15	1030.00	6.85

(Extend table on an added sheet as needed and reference)



Section 2 -- HYDRAULIC MODELS

The levee construction project called Camelback Ranch Levee North and Glendale Airport Levee has been completed. The levee extends along the east side of the Agua Fria River from Camelback Road northward 1,000 feet to the point where New River joins the Agua Fria River, and then continues upstream on both sides of New River, approximately 7,000 feet, where it ties into existing channelized banks. [for reference: Camelback Ranch Levee South (south of Camelback Road) resulted in a LOMR dated April 16, 1998, FEMA Case NO. 98-09-226P.]

The CLOMR Technical Data Notebook for this project, dated May 1998, contained hydraulic modeling for the portion of New River from 800 feet upstream of where New River joins the Agua Fria River to the upstream end of this project. This CLOMR to LOMR Supplement contains more thorough modeling:

Revised hydraulic model of Agua Fria River
from Camelback Road to the upstream end of the levee

Revised hydraulic model of New River
from its beginning to the upstream end of the levee.

Explanation of Starting Water Surface Elevations (for FEMA MT-2 Form 4 part 3)

Agua Fria River

Starting water surface elevations at River Station 9.266, FP = 1023.82 and FW = 1023.81, are from 1996 model by Coe and Van Loo Consultants for LOMR for Camelback Ranch Levee South.

New River

New River Station 0.1 is identical to Agua Fria River Station 9.519. Starting water surface elevations of FP = 1026.34 and FW = 1026.38 are from the revised conditions model for the Agua Fria River developed for this submittal.

Contents of this Section

Results Tables 1 through 8
 Floodway Data Tables
 Flood Profiles
 FIRM annotated with Revised Floodplain
 FIRM annotated with Revised Floodway

Input and Output printouts of the models

Diskettes of the models (Duplicate Effective & Revised)

Table 1: Comparison of Water Surface Elevations - New River

HEC-2 Section Number	Effective Floodplain Water Surface Elevation (ft)	Duplicate Effective Floodplain Water Surface Elevation (ft)	Change (ft)	Effective Floodway Water Surface Elevation (ft)	Duplicate Effective Floodway Water Surface Elevation (ft)	Change (ft)
20.00	1032.5	1032.5	0.0	1033.4	1033.4	0.0
26.80	1033.9	1033.9	0.0	1034.5	1034.5	0.0
32.60	1035.3	1035.3	0.0	1036.1	1036.1	0.0
38.00	1037.2	1037.2	0.0	1037.4	1037.4	0.0
45.00	1039.1	1039.1	0.0	1039.1	1039.1	0.0
51.70	1040.2	1040.2	0.0	1040.2	1040.2	0.0
54.00	1040.4	1040.4	0.0	1040.4	1040.4	0.0
44.00	1041.1	1041.1	0.0	1041.1	1041.1	0.0
47.00	1041.3	1041.3	0.0	1041.3	1041.3	0.0
51.50	1042.1	1042.1	0.0	1042.1	1042.1	0.0
55.00	1043.2	1043.2	0.0	1043.2	1043.2	0.0
58.12	1044.9	1044.9	0.0	1044.9	1044.9	0.0
HEC-2 Section Number	Duplicate Effective Floodplain Water Surface Elevation (ft)	Post Project Floodplain Water Surface Elevation (ft)	Change (ft)	Duplicate Effective Floodway Water Surface Elevation (ft)	Post Project Floodway Water Surface Elevation (ft)	Change (ft)
501.45	1027.50	1026.34	-1.16	1028.22	1026.38	-1.84
10.00	1029.45	1029.38	-0.07	1030.01	1029.41	-0.60
20.00	1032.50	1031.07	-1.43	1033.40	1031.08	-2.32
26.80	1033.90	1032.94	-0.96	1034.50	1032.95	-1.55
32.60	1035.30	_(1034.14)	-1.16	1036.10	_(1034.15)	-1.95
38.00	1037.20	_(1035.26)	-1.94	1037.40	_(1035.26)	-2.14
45.00	1039.10	_(1036.70)	-2.40	1039.10	_(1036.71)	-2.39
51.70	1040.20	1038.09	-2.11	1040.20	1038.09	-2.11
54.00	1040.40	1038.58	-1.82	1040.40	1038.58	-1.82
44.00	1041.10	1040.08	-1.02	1041.10	1040.08	-1.02
47.00	1041.30	1040.50	-0.80	1041.30	1040.50	-0.80
51.50	1042.10	1041.75	-0.35	1042.10	1041.75	-0.35
55.00	1043.20	1043.01	-0.19	1043.20	1043.01	-0.19
58.12	1044.90	1044.88	-0.02	1044.90	1044.88	-0.02

_() Value Interpolated

----- Break Between Effective Models

Table 2: Key to Cross Section Labeling - New River

Hydraulic Baseline Station	CLOMR / LOMR / HEC-2 Section	FIS Cross Section	FIS Letter Designation	CLOMR / LOMR Letter Designation	East Levee Station (approximate)	West Levee Station (approximate)	Remarks
-00+86	0.10	501.45			27+80		Adapted from Agua Fria River Section 9.519 Adapted from New River Section # 10 in 1986 FIS study
09+24	0.50	10.00			30+00		
13+10	1.00				33+00	15+43	
15+15	2.00				34+50	18+93	
17+22	3.00				36+50	21+43	
19+24	4.00	20.00	A	A	38+50	23+93	
21+25	5.00				40+80	26+43	
23+21	6.00				43+00	30+00	
24+90	7.00				44+80	31+50	
26+70	8.00	26.80	B	B	46+80	33+00	
28+00	9.00				48+50	34+00	
29+60	10.00				50+50	35+20	
31+60	11.00				52+50	37+00	End West Levee Station 38+41
		32.60	C				
33+60	12.00			C	54+00		
35+93	13.00				56+50		
		38.00	D				
37+90	14.00			D	58+50		
40+00	15.00				60+50		
41+98	16.00			E	62+50		
		45.00	E				
43+90	17.00				64+50		
45+77	18.00				66+50		
47+75	19.00				68+80		
49+77	20.00	51.70	F	F	70+70		
51+67	21.00	54.00	G	G	73+20		
53+60	22.00				75+80		
55+62	23.00				78+20		
57+64	24.00				80+50		
60+24	44.00	44.00	H	H	82+52		
63+24	47.00	47.00	I	I			
71+24	55.00	55.00	J	J			
77+86	58.12	58.12	K	K			
							End East Levee

Table 3: Post-Project Water Surface Elevations - New River

Hydraulic Baseline Station	HEC-2 Section Number	Floodplain Water Surface Elevation (ft)	Floodway Water Surface Elevation (ft)	Difference (ft)	Remarks
-00+86	0.10	1026.34	1026.38	0.04	Begin New River CLOMR Adapted from Agua Fria River Section 9.519 $Q_{100} = 54,400$ cfs Adapted from New River Section #10 in 1986 study $Q_{100} = 39,000$ cfs
09+24	0.50	1029.38	1029.41	0.03	
13+10	1.00	1030.08	1030.09	0.01	
15+15	2.00	1030.56	1030.57	0.01	
17+22	3.00	1030.81	1030.82	0.01	
19+24	4.00	1031.07	1031.08	0.01	
21+25	5.00	1031.34	1031.34	0.00	
23+21	6.00	1031.74	1031.74	0.00	
24+90	7.00	1032.27	1032.27	0.00	
26+70	8.00	1032.94	1032.95	0.01	
28+00	9.00	1033.28	1033.28	0.00	
29+60	10.00	1033.63	1033.63	0.00	
31+60	11.00	1034.01	1034.01	0.00	
					End Glendale Levee
33+60	12.00	1034.32	1034.32	0.00	Start CVL 92 LOMR $Q_{100} = 41,000$ cfs End Camelback Levee
35+93	13.00	1034.71	1034.71	0.00	
37+90	14.00	1035.13	1035.13	0.00	
40+00	15.00	1035.64	1035.64	0.00	
41+98	16.00	1036.12	1036.12	0.00	
43+90	17.00	1036.58	1036.58	0.00	
45+77	18.00	1037.07	1037.07	0.00	
47+75	19.00	1037.57	1037.57	0.00	
49+77	20.00	1038.09	1038.09	0.00	
51+67	21.00	1038.58	1038.58	0.00	
53+60	22.00	1039.44	1039.44	0.00	
55+62	23.00	1039.66	1039.66	0.00	
57+64	24.00	1039.87	1039.87	0.00	
60+24	44.00	1040.08	1040.08	0.00	
63+24	47.00	1040.50	1040.50	0.00	
67+74	51.50	1041.75	1041.75	0.00	
71+24	55.00	1043.01	1043.01	0.00	
77+86	58.12	1044.88	1044.88	0.00	

Table 4: Freeboard Summary - New River

Camelback Levee Freeboard Summary (East Bank)

Levee Station	Location	100-Year Water Surface Elevation (ft)	Levee Crest Elevation (ft)	Freeboard (ft)
10+00	Lower End	1023.15	1030.00	6.85
15+60	Grade Break	1024.03	1030.10	6.07
20+50	Grade Break	1024.94	1030.70	5.77
22+40	Grade Break	1025.31	1031.70	6.39
30+85	Grade Break	1026.86	1032.90	6.04
36+70	Grade Break	1030.85	1035.50	4.65
48+50	Grade Break	1033.28	1038.90	5.62
50+50	Grade Break	1033.63	1039.20	5.57
52+50	Grade Break	1034.01	1039.80	5.79
54+50	Grade Break	1034.40	1040.10	5.70
57+40	Grade Break	1034.90	1041.20	6.30
64+30	Grade Break	1036.53	1042.80	6.27
66+50	Grade Break	1037.07	1043.00	5.93
73+30	Grade Break	1038.61	1044.50	5.89
80+34	Grade Break	1039.86	1047.00	7.14
82+52	Upper End	1040.08	1044.80	4.72

Note: Shaded WSEL's from Revised Study Agua Fria River (1999, WEST)

Glendale Levee Freeboard Summary (West Bank)

Levee Station	Location	100-Year Water Surface Elevation (ft)	Levee Crest Elevation (ft)	Freeboard (ft)
09+50	Lower End	1031.84	1036.70	4.86
10+00	Grade Break	1031.56	1036.70	5.14
19+75	Grade Break	1030.56	1035.60	5.04
21+27	PC Station	1030.80	1035.60	4.80
22+12	Grade Break	1030.89	1035.60	4.71
22+43	Start Engineered Fill (El. 1039.50)	1030.92	1033.60	2.68
23+70	Grade Break	1031.06	1033.60	2.54
30+00	Grade Break	1031.74	1034.80	3.06
30+40	Grade Break	1031.88	1035.30	3.42
33+00	Grade Break	1032.95	1036.80	3.85
37+00	Grade Break	1034.01	1040.00	5.99
38+40	Upper End	1034.31	1040.00	5.69

Table 5: Comparison of Water Surface Elevations - Agua Fria River

HEC-2 Section Number	1996 Study Floodplain Water Surface Elevation (ft)	Floodplain Water Surface Elevation (ft)	Change (ft)	1996 Study Floodway Water Surface Elevation (ft)	Floodway Water Surface Elevation (ft)	Change (ft)
9.266	1023.69	1023.82 ^(a)	0.13	1023.81	1023.81 ^(a)	0.00
9.343	1024.39	1024.47	0.08	1024.52	1024.49	-0.03
9.435	1025.38	1025.41	0.03	1025.46	1025.45	-0.01
9.519	1026.33	1026.34	0.01	1026.39	1026.38	-0.01
9.605	1027.42	1027.43	0.01	1027.50	1027.49	-0.01
9.696	1028.72	1028.70	-0.02	1028.76	1028.73	-0.03
9.790	1029.58	1029.57	-0.01	1030.49	1029.60	-0.89
9.885	1030.38	1030.12	-0.26	1031.02	1030.51	-0.51
9.981	1031.70	1031.71	0.01	1032.13	1032.04	-0.09
10.071	1032.83	1032.83	0.00	1033.26	1033.23	-0.03
10.167	1033.82	1033.82	0.00	1034.23	1034.22	-0.01
10.265	1034.48	1034.48	0.00	1034.82	1034.82	0.00

Note: a) These Water Surface Elevation are adopted from Camelback South Levee LOMR.

2/9/00

Table 6: Key to Cross Section Labeling - Agua Fria River

Hydraulic Baseline Station	1996 Study of Agua Fria HEC-2 Section	Revised 1999 HEC-2 Sections	Letter Designation	East Levee Station (approximate)	West Levee Station (approximate)	Remarks
09+19	9.191	9.191		10+00		Beginning of East Levee
09+27	9.266	9.266		14+30		
09+34	9.343	9.343	BC	18+25		
09+44	9.435	9.435		23+10		
09+52	9.519	9.519	BD	27+80		
09+61	9.605	9.605		34+90		
09+70	9.696	9.696	BE	44+50		
09+79	9.790	9.790			26+20	
09+89	9.885	9.885	BF		14+00	
09+98	9.981	9.981				
10+07	10.071	10.071	BG			
10+17	10.167	10.167				
10+27	10.265	10.265	BH			

2/9/00

Table 7: Post-Project Water Surface Elevations - Agua Fria River

Hydraulic Baseline Station	HEC-2 Section Number	Floodplain Water Surface Elevation (ft)	Floodway Water Surface Elevation (ft)	Difference (ft)	Remarks
09+27	9.266	1023.82	1023.81	-0.01	Starting Water Surface Elevations are Adapted from Camelback Ranch Levee South LOMR $Q_{100} = 54,400$ cfs
09+34	9.343	1024.47	1024.49	0.02	
09+44	9.435	1025.41	1025.45	0.04	
09+52	9.519	1026.34	1026.38	0.04	
09+61	9.605	1027.43	1027.49	0.06	
09+70	9.696	1028.70	1028.73	0.03	
09+79	9.790	1029.57	1029.60	0.03	Confluence with New River $Q_{100} = 30,000$ cfs
09+89	9.885	1030.12	1030.51	0.39	Starting with River Station 10.167 and Upstream the Water Surface Elevations are the Same as in 1996 Study of Agua Fria River
09+98	9.981	1031.71	1032.04	0.33	
10+07	10.071	1032.83	1033.23	0.40	
10+17	10.167	1033.82	1034.22	0.40	
10+27	10.265	1034.48	1034.82	0.34	

2/9/00

Table 8: Freeboard Summary - Agua Fria River

Camelback Levee Freeboard Summary (East Bank)

Levee Station	Location	100-Year Water Surface Elevation (ft)	Levee Crest Elevation	Freeboard (ft)
10+00	Lower End	1023.15 ^(a)	1030.00	6.85
15+60	Grade Break	1024.03	1030.10	6.07
20+50	Grade Break	1024.94	1030.70	5.77
22+40	Grade Break	1025.31	1031.70	6.39
30+85	Grade Break	1026.86	1032.90	6.04
36+70	Grade Break	1027.72	1035.50	7.78

Glendale Levee Freeboard Summary (East Bank)

Levee Station	Location	100-Year Water Surface Elevation (ft)	Levee Crest Elevation	Freeboard (ft)
09+50	Lower End	1031.84	1036.70	4.86
10+00	Grade Break	1031.56	1036.70	5.14
19+75	Grade Break	1030.08	1035.60	5.52
21+27	PC Station	1029.97	1035.60	5.63
22+12	Grade Break	1029.90	1035.60	5.70
22+43	Start Engineered Fill (El. 1039.50)	1029.88	1033.60	3.72

Note: a) This Water Surface Elevation is adopted from Camelback South Levee LOMR.

FLOODWAY DATA FOR NEW RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
Cross Section	Distance ¹	Width (ft)	Section Area (sq ft)	Mean Velocity (fps)	With Floodway (ft)	Without Floodway (ft)	Increase (ft)
A	924	1204	7061	5.5	1031.1	1031.1	0.0
B	1670	979	5935	6.6	1032.9	1032.9	0.0
C	2360	1023	6287	6.2	1034.3	1034.3	0.0
D	2790	920	5599	7.0	1035.1	1035.1	0.0
E	3198	901	5590	7.0	1036.1	1036.1	0.0
F	3977	896	5431	7.2	1038.1	1038.1	0.0
G	4167	904	5047	7.7	1038.6	1038.6	0.0
H	5024	878	6304	6.5	1040.1	1040.1	0.0
I	5324	743	4924	8.3	1040.5	1040.5	0.0
J	6124	469	4106	10.0	1043.0	1043.0	0.0
K	6786	397	4319	9.5	1044.9	1044.9	0.0

Note: (1) Feet above confluence with Agua Fria River
 (2) 1929 Datum

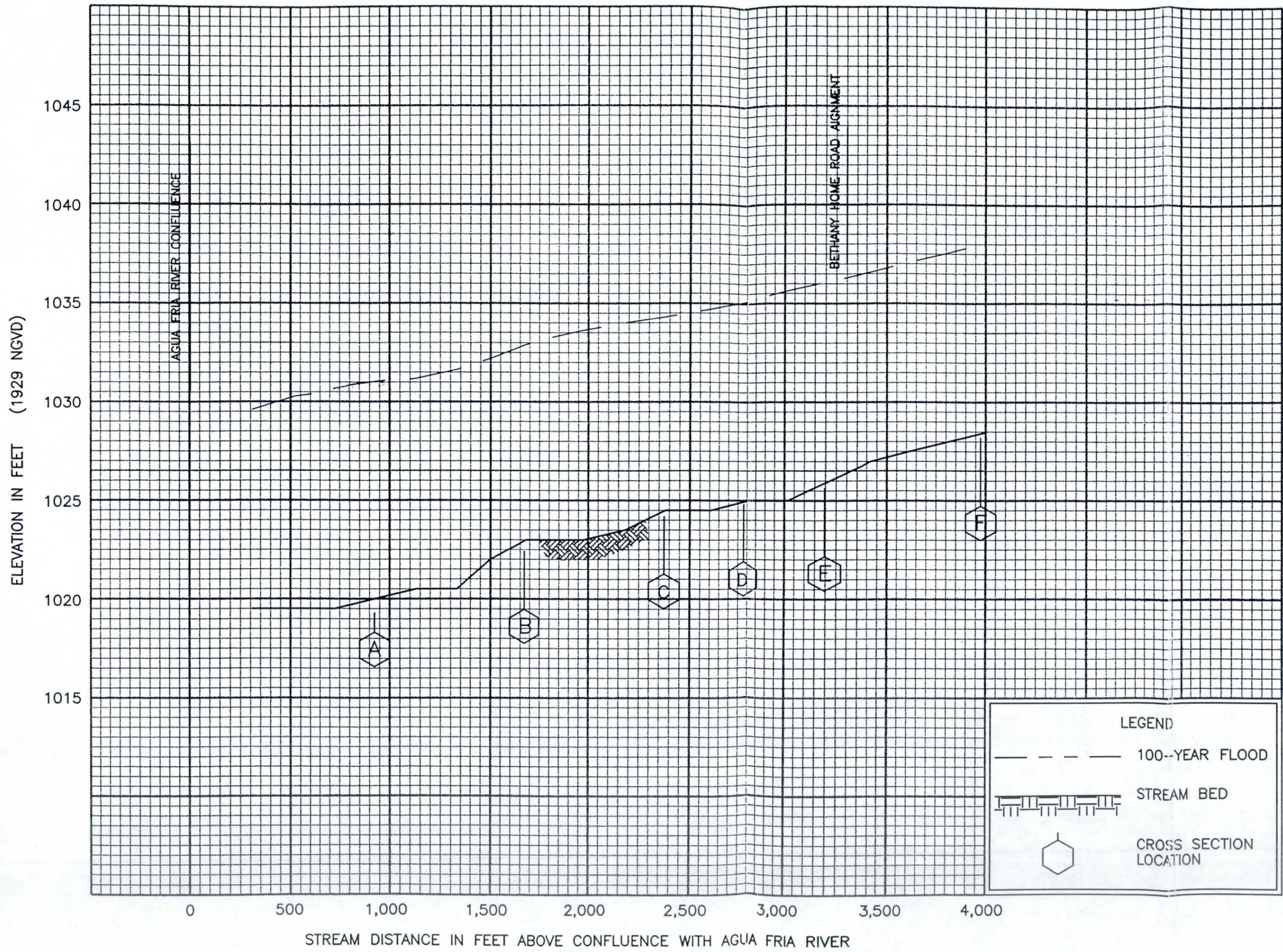
2/9/00

FLOODWAY DATA FOR AGUA FRIA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
Cross Section	Distance ¹	Width (ft)	Section Area (sq ft)	Mean Velocity (fps)	With Floodway (ft)	Without Floodway (ft)	Increase (ft)
BC	9.600	2072.00	9395.00	5.80	1024.49	1024.47	0.02
BD	9.776	1820.00	8651.00	6.30	1026.38	1026.34	0.04
BE	9.953	2203.00	11152.00	4.90	1028.73	1028.70	0.03
BF	10.142	1305.00	5418.00	5.50	1030.51	1030.12	0.39
BG	10.327	1231.00	5331.00	5.60	1033.23	1032.83	0.40
BH	10.521	740.00	3634.00	8.30	1034.82	1034.48	0.34

Note: 1) Miles above confluence with Gila River

2/9/00



FLOOD PROFILES
NEW RIVER CHANNEL

FEDERAL EMERGENCY MANAGEMENT AGENCY
MARICOPA COUNTY, AZ
(FLOOD CONTROL DISTRICT)

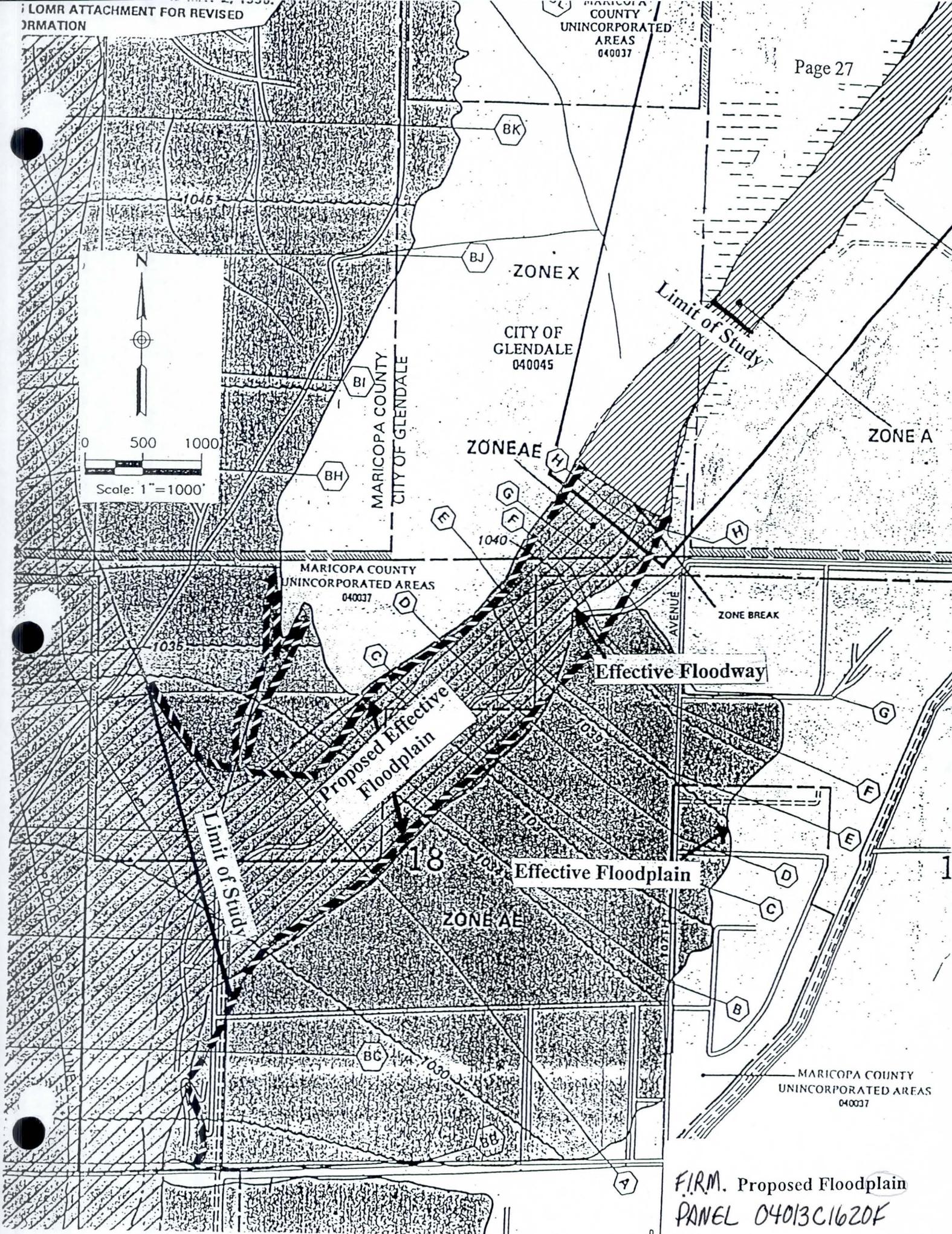
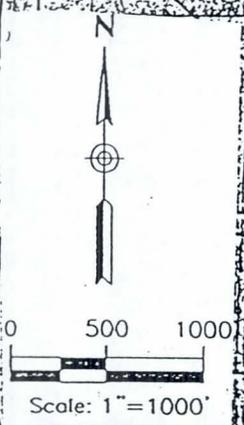


LEGEND

- 100-YEAR FLOOD
-  STREAM BED
-  CROSS SECTION LOCATION

FLOOD PROFILES
NEW RIVER CHANNEL

FEDERAL EMERGENCY MANAGEMENT AGENCY
MARICOPA COUNTY, AZ
(FLOOD CONTROL DISTRICT)



FIRM. Proposed Floodplain
 PANEL 04013C1620F

REVISIONS
REVISED BY LOMR DATED MAY 2, 1995.
MR ATTACHMENT FOR REVISED
FLOOD HAZARD MAPPING

MARICOPA COUNTY
UNINCORPORATED
AREAS
040037

CITY OF
GLENDALE
040045

MARICOPA COUNTY
CITY OF GLENDALE

MARICOPA COUNTY
UNINCORPORATED AREAS
040037

ZONE BREAK

Effective Floodway

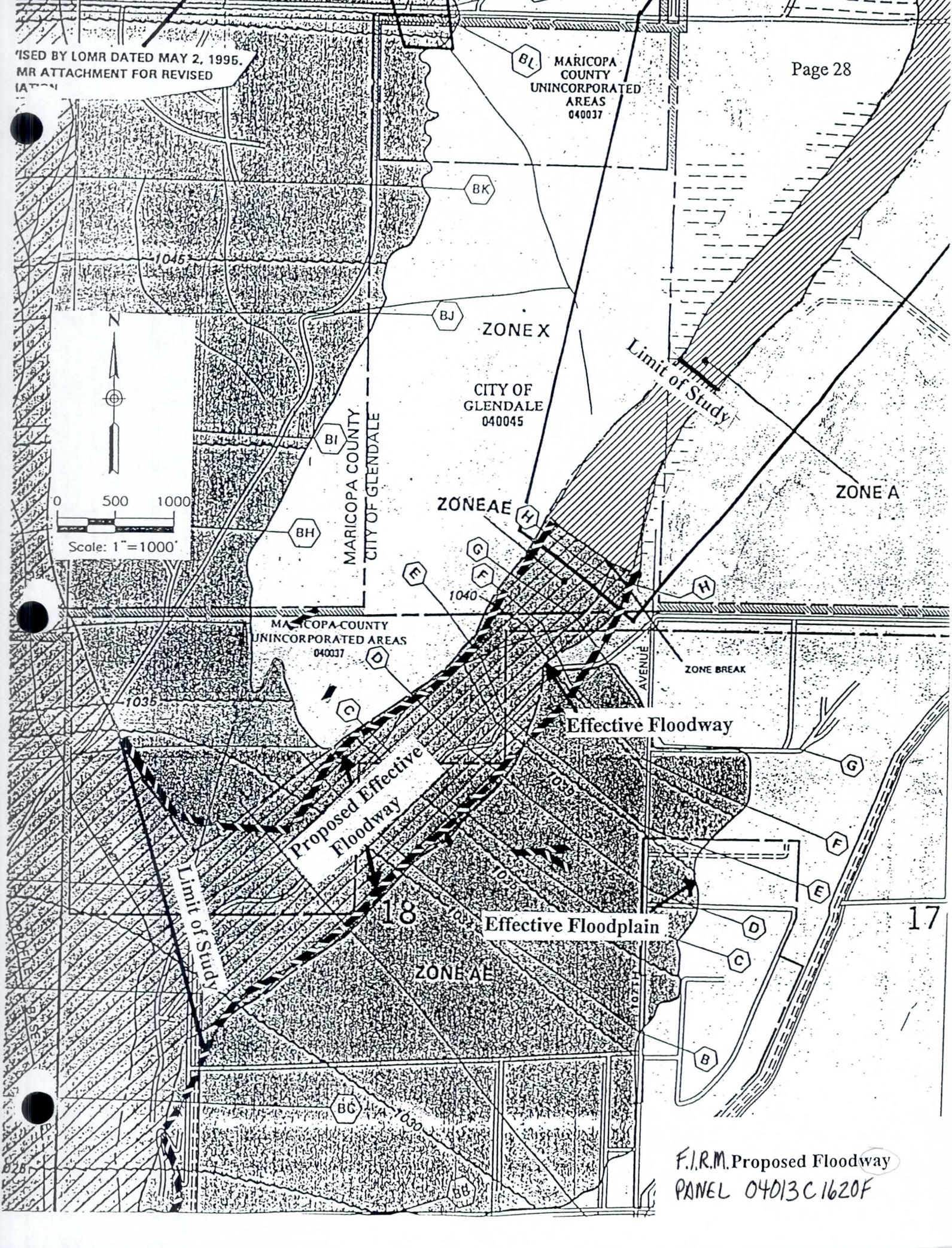
Effective Floodplain

F.I.R.M. Proposed Floodway
PANEL 04013C1620F



0 500 1000

Scale: 1" = 1000'



AGUA FRIA RIVER HEC-2 MODEL INPUT

1. THIS IS REVISED HYDRAULIC ANALYSIS FOR AGUA FRIA RIVER THAT INCLUDES THE PROPOSED LEVEES ON EAST SIDE OF AGUA FRIA RIVER NORTH OF CAMELBACK ROAD: THE CAMELBANK RANCH NORTH LEVEES AND GLENDALE LEVEES. THE STUDY IS PREPARED FOR THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY BY WEST CONSULTANTS, INC., 1999. THE BASIS FOR THIS MODEL IS 1996 MODEL PREPARED BY CVL CONSULTANTS WHICH CORRESPONDS TO THE LOMR DATED AUGUST 5, 1997.

2. THE D/S END OF MODEL IS AT RS 9.266 WHICH IS JUST UPSTREAM FROM THE CAMELBACK ROAD. THIS RIVER STATION IS CONFIRMED IN FAX FROM MIKE DUNCAN FROM FCD OF MC ON 12/17/99. THE UPSTREAM END OF MODEL IS STATE ROUTE 74

3. THE STARTING WATER SURFACE ELEVATION AT RS 9.266 ARE OBTAINED FROM 1996 WORK MAP PREPARED BY CVL CONSULTANTS. THE START. WSE ARE CONF IN TELEPHONE CONVERSATION WITH MIKE DUNCAN FROM FCD OF MC ON 12/17/99. ALSO, IN SAME CONVERSATION, IT IS CONFIRMED THAT THE WEST FLOODWAY AND FLOODPLAIN ENCROACH. OF AGUA FRIA RIVER NORTH OF CAMELBACK ROAD SHOULD STAY AT THE SAME LOCATIONS AS IN 1996 MODEL PREPARED BY CVL. THE EAST FLOODWAY AND FLOODPLAIN ENCROACH. ARE REMOVED FROM THE MODEL AND THE LEVEES ARE PLACED INSTEAD. FOR CROSS SECTION 9.790 THE EAST ENCROACHMENT IS ESTABLISHED BASED ON 1:3 FLOW EXPANSION RATIO.

4. THIS FILE CONTAINS TWO RUNS. ONE RUN IS FOR FLOODPLAIN DELINEATION AND SECOND IS FOR FLOODWAY DELINEATION. THE STARTING WATER SURFACE ELEVATIONS AT RS 9.266 ARE 1023.82 AND 1023.81, RESPECTIVELY. THIS WSE ARE OBTAIN AS DESCRIBED IN NOTE NUMBER 3.

5. PROCEDURE TO MODEL CAMELBACK NORTH LEVEE:
 CAMELBACK NORTH LEVEES ARE MODELED IN GR AND ET CARDS BY SPECIFYING THE LEFT STATION ENCROCHMENT STATION CORRESPONDING TO THE LEVEE STATIONS.
 NOTE 1: THE LEFT ENCROCHMENT FROM ORIGINAL 1996 MODEL IS REPLACED WITH THE LEVEE STATION AND THEREFORE DOES NOT EXIST IN THE MODEL ANYMORE FOR FLOODWAY AS WELL AS FOR FLOODPLAIN ANALYSIS.
 NOTE 2: THE LEVEES TOP ELEVATIONS ARE NOT SPECIFIED IN THIS MODEL AND THE MODEL ASSUMES THAT THE LEVEES ARE HGIH AS HIGH AS WATER LEVEL GOES. THIS IS OK SINCE 100-YR LEVELS ARE WELL BELOW THE TOP OF THE LEVEE. HOWEVER, IF HIGHER FLOWS ARE TO BE MODELED PLESE CHECK WHETHER THE LEVEES ARE OVERTOPED AND IF YES MAKE CHANGES TO THE MODEL ACCORDINGLY.

THE FOLLOWING ARE COMMENTS FROM THE ORIGINAL 1996 STUDY BY CVL CONSULT.

- * 0.160 THE CONTROL LINE ON THE MAIN CHANNEL OF THE AGUA FRIA RIVER IS
- * 0.160 STATION 10,000. ALL SECTIONS ARE STATIONED IN RIVER MILES FROM THE
- * 0.160 CONFLUENCE WITH THE GILA RIVER. ENCROACHMENT CARDS (ET) WERE USED
- * 0.160 IN SOME CASES TO BETTER MODEL DEAD OR NON-EFFECTIVE FLOW AREAS.
- * 0.160 CONSEQUENTLY, "STA" AND "ENDST" DO NOT REPRESENT THE ACTUAL FLOODING
- * 0.160 LIMITS, AND THE DELINEATION WAS ESTABLISHED BASED ON THE CROSS SECTION
- * 0.160 POINT ELEVATIONS AND THE TOPOGRAPHY. IN SOME CASES "TOPWID" DOES NOT
- * 0.160 REPRESENT THE FULL WIDTH OF THE FLOODPLAIN DUE TO NON-EFFECTIVE FLOW
- * 0.160 AREAS OR LOW ISLANDS WITHIN THE FLOODPLAIN. THE RUN WAS STARTED BASED
- * 0.160 SLOPE-AREA METHOD.
- * 0.160 ENCROACHMENTS ARE PLACED ON THE UPSTREAM SECTION OF THE BRIDGES TO
- * 0.160 REPRESENT THE 1:1 CONTRACTION OF FLOW. IN ADDITION, ENCROACHMENTS ARE
- * 0.160 PLACED ON THE DOWNSTREAM SECTION OF THE BRIDGES TO REPRESENT THE 4:1
- * 0.160 EXPANSION OF FLOW.
- * 9.177 *****
- * 9.177 ***** CAMELBACK ROAD *****
- * 9.177 ***** LOW CHORD = 1027.5 *****
- * 9.177 *****
- * 11.410 *****
- * 11.410 ***** GLENDALE ROAD *****
- * 11.410 ***** LOW CHORD = 1057.5 *****
- * 11.410 *****
- * 13.450 *****
- * 13.450 ***** OLIVE AVENUE *****
- * 13.450 ***** LOW CHORD = 1086.4 *****
- * 13.450 *****
- * 16.482 *****

Agua Fria Input

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* 16.482 ***** GRAND AVENUE *****
* 16.482 ***** LOW CHORD = 1126.6 ****
* 16.482 *****
* 16.514 *****
* 16.514 ***** SANTA FE R.R. *****
* 16.514 ***** LOW CHORD = 1129.9 ****
* 16.514 *****
* 18.962 *****
* 18.962 ***** BELL ROAD *****
* 18.962 ***** LOW CHORD = 1160.5 ****
* 18.962 *****
* 29.611 *****
* 29.611 ***** BEARDSLEY CANAL FLUME *
* 29.611 ***** LOW CHORD = 1347.0 ***
* 29.611 *****
* 32.984 *****
* 32.984 ***** STATE ROUTE 74 *****
* 32.984 ***** LOW CHORD = 1427.0 ****
* 32.984 *****

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T1 AGUA FRIA RIVER REVISED HYDRAULIC STUDY
T1 PREPARED FOR THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
T1 PREPARED BY WEST CONSULTANTS, INC.
T2 AGUA FRIA RIVER, RS 9.266 TO THE NEW WADDELL DAM

T3	100-YEAR EVENT	EXISTING CONDITION					FILE NAME - AGUAFRIA				
J1	0	2	0	0	0	0	0	0	1023.82	0	
J2	1	0	-1	0	0	0	-1	0	0	15	
J3	38	43	1	8	3	2	26	5	39	53	
J3	4	54	37		200						
*											
NC	0.05	0.05	0.035	.1	.3						
QT	2	54400	54400								
ET	9.266	9.1	7.1			9069.6	11620	9069.6	11700		
X1	9.266	98	9725.9	11607.3							
GR1024.3	7822.4	1024.5	8138.1	1024.7	8447.1	1024.9	8756.0	1024.2	9035.9		
GR1030.1	9053.6	1030.1	9060.6	1030.1	9069.6	1024.2	9075.5	1024.2	9091.8		
GR1023.4	9402.0	1023.3	9418.1	1024.2	9423.6	1021.6	9432.7	1024.2	9439.6		
GR1022.9	9444.9	1022.4	9529.5	1020.2	9575.9	1022.3	9661.6	1022.1	9725.9		
GR1013.9	9852.8	1017.2	10006.0	1013.9	10058.2	1013.7	10086.7	1017.3	10103.7		
GR1016.8	10209.4	1015.7	10230.4	1016.6	10257.2	1014.7	10308.2	1014.3	10344.1		
GR1018.0	10369.8	1017.8	10486.5	1019.5	10508.4	1021.4	10604.4	1021.3	10654.4		
GR1019.6	10685.0	1019.7	10704.5	1016.3	10751.4	1017.9	10770.7	1021.4	10905.8		
GR1020.8	11021.8	1021.6	11204.6	1020.8	11252.1	1017.1	11283.4	1018.2	11404.6		
GR1017.7	11468.4	1021.5	11607.3	1018.7	11635.1	1017.1	11660.6	1023.1	11704.5		
GR1022.8	11728.9	1017.3	11752.5	1017.5	11789.2	1023.8	11815.8	1024.4	11854.6		
GR1022.1	11954.6	1023.1	12278.8	1021.6	12459.7	1020.1	12472.3	1021.7	12489.4		
GR1020.8	12507.6	1022.4	12660.6	1019.8	12672.3	1019.0	12686.2	1021.1	12714.1		
GR1020.8	12727.1	1022.4	12754.6	1021.7	13004.7	1020.1	13039.2	1022.2	13104.7		
GR1021.4	13173.2	1018.6	13185.1	1018.2	13192.5	1022.7	13202.6	1018.5	13212.1		
GR1019.0	13244.7	1023.0	13254.3	1018.1	13265.2	1019.3	13347.4	1020.2	13359.6		
GR1020.5	13394.8	1018.9	13405.5	1020.6	13454.7	1020.8	13490.7	1022.7	13501.3		
GR1023.2	13532.9	1022.0	13542.7	1022.7	13554.9	1023.2	13887.5	1023.1	14188.9		
GR1023.3	14504.7	1023.0	14515.6	1024.2	14522.5	1023.3	14526.3	1023.2	14854.7		
GR1023.8	15204.7	1024.1	15254.7	1024.1	15454.2						
NC			0.1	0.3							
ET	9.343	9.1	7.1			9108.8	11470	9108.8	12100		
X1	9.343	98	9618.7	11377.4	400	420	407.20				
GR1024.9	7587.8	1024.9	7926.9	1025.2	8234.9	1024.9	8577.0	1025.0	8877.0		
GR1025.0	9076.6	1030.4	9092.8	1030.4	9099.8	1030.4	9108.8	1025.0	9114.2		
GR1025.1	9206.1	1024.5	9368.1	1025.6	9377.1	1024.8	9387.6	1025.6	9394.5		
GR1023.2	9401.8	1026.1	9408.8	1025.1	9413.1	1025.4	9477.1	1024.3	9498.4		
GR1025.4	9523.7	1024.0	9615.6	1022.6	9618.7	1018.1	9653.8	1018.9	9877.1		
GR1017.8	9902.5	1015.5	9910.9	1014.4	9944.6	1015.3	10010.6	1014.7	10059.6		
GR1017.2	10073.7	1016.7	10177.2	1015.4	10217.0	1018.8	10234.4	1019.8	10363.0		
GR1018.7	10378.3	1018.8	10424.4	1019.9	10440.5	1021.2	10627.2	1020.9	10650.2		
GR1021.9	10696.3	1018.5	10731.0	1020.0	10782.7	1019.5	10844.3	1021.8	10927.2		
GR1022.9	11083.8	1022.0	11126.4	1021.2	11128.4	1019.5	11173.0	1020.3	11179.4		
GR1018.2	11194.8	1017.9	11304.7	1020.3	11326.9	1020.1	11354.6	1023.7	11377.4		
GR1024.1	11427.7	1022.8	11453.9	1024.7	11477.3	1022.8	11516.1	1024.4	11527.3		
GR1023.1	11577.3	1022.4	11728.2	1021.6	11734.2	1024.2	11777.2	1023.7	12081.9		

Agua Fria Input

GR1024.4	12170.3	1021.8	12239.3	1021.5	12285.2	1017.9	12350.6	1018.3	12655.5
GR1019.0	12919.1	1022.5	13026.2	1019.4	13073.5	1019.5	13113.7	1022.8	13131.2
GR1024.2	13161.2	1021.4	13172.5	1021.5	13210.4	1024.9	13220.0	1019.4	13231.2
GR1020.6	13297.8	1019.8	13316.4	1019.8	13337.3	1021.0	13348.0	1021.0	13441.1
GR1023.7	13473.5	1021.3	13588.7	1023.6	13727.5	1023.7	14041.5	1023.5	14377.5
GR1023.6	14491.9	1025.1	14496.9	1023.2	14502.0	1023.9	14827.6	1024.3	15128.2
GR1024.8	15759.3	1027.2	15809.2	1026.7	15864.0				
ET 9.435	9.1	7.1				7888.2	11200	7888.2	11839.2
X1 9.435	88	9548.8	11146.3	475	495	482.24			
GR1026.4	7856.0	1031.8	7872.2	1031.8	7879.2	1031.8	7888.2	1026.4	7893.6
GR1026.4	8158.2	1026.9	8488.2	1026.6	8820.8	1026.6	9153.1	1027.0	9359.2
GR1024.3	9366.6	1026.9	9375.9	1025.8	9380.2	1024.1	9489.5	1025.0	9548.8
GR1019.4	9576.8	1019.2	9849.0	1018.4	9908.7	1019.6	9922.6	1015.2	9933.9
GR1015.4	9996.3	1018.3	10046.3	1018.6	10097.9	1017.2	10118.4	1017.3	10146.3
GR1016.2	10155.8	1016.5	10181.7	1020.3	10199.6	1021.2	10546.3	1020.0	10889.1
GR1020.7	11048.3	1019.4	11060.7	1023.5	11095.3	1023.2	11111.6	1025.8	11146.3
GR1025.1	11318.4	1022.3	11346.7	1023.9	11346.8	1025.4	11396.3	1023.4	11715.2
GR1024.4	11799.5	1023.5	11816.9	1031.5	11839.2	1024.4	11854.6	1023.6	12095.2
GR1026.5	12103.4	1023.3	12111.2	1023.4	12173.1	1021.8	12180.1	1025.3	12196.4
GR1026.7	12210.6	1024.4	12279.4	1024.9	12296.3	1023.9	12317.6	1024.1	12372.9
GR1025.8	12381.3	1024.7	12389.2	1026.0	12412.9	1025.1	12426.1	1022.6	12436.7
GR1024.1	12462.4	1023.1	12467.5	1023.5	12488.3	1027.8	12501.1	1023.6	12514.8
GR1024.8	12652.4	1024.8	12948.7	1025.7	13145.7	1023.8	13152.6	1024.7	13198.4
GR1028.4	13207.9	1028.1	13222.0	1024.3	13232.5	1023.0	13249.0	1023.7	13452.5
GR1028.8	13477.7	1028.7	13513.8	1024.3	13534.0	1023.4	13714.2	1020.2	13778.8
GR1020.1	14098.7	1020.7	14275.7	1025.3	14461.9	1025.7	14778.3	1024.9	15117.5
GR1025.7	15440.3	1028.8	15731.5	1030.3	15743.1				
ET 9.519	9.1	7.1				8983.8	11160	8983.8	11803.0
X1 9.519	79	9530.0	11038.2	450	445	445.93			
GR1028.1	8418.7	1026.8	8455.6	1028.1	8480.0	1027.4	8880.0	1026.4	8949.5
GR1032.5	8967.8	1032.5	8974.8	1032.5	8983.8	1026.4	8989.9	1026.4	9183.8
GR1026.6	9339.0	1024.6	9346.8	1027.1	9353.8	1026.0	9360.1	1024.3	9467.6
GR1026.2	9481.6	1024.8	9499.6	1025.3	9530.0	1020.4	9568.8	1021.3	9580.0
GR1019.8	9671.8	1021.8	9680.4	1020.4	9936.5	1017.4	9979.7	1019.0	9997.1
GR1016.3	10080.9	1018.3	10100.5	1017.0	10182.7	1021.0	10206.2	1022.5	10535.4
GR1022.7	10730.0	1020.9	10786.3	1022.2	10830.0	1020.0	10940.9	1020.5	10995.1
GR1024.8	11038.2	1023.8	11093.5	1026.2	11173.8	1025.2	11479.7	1023.5	11509.9
GR1025.0	11530.0	1025.3	11792.0	1030.1	11803.0	1026.0	11807.1	1026.0	12588.1
GR1026.9	12590.0	1024.3	12605.5	1027.6	12686.2	1025.5	12692.0	1025.5	12804.6
GR1029.5	12813.4	1029.4	12829.0	1030.1	12840.4	1025.4	12852.4	1027.0	12976.6
GR1023.0	13084.8	1023.6	13128.6	1025.7	13157.2	1030.6	13170.4	1025.6	13186.4
GR1026.3	13207.1	1035.7	13281.9	1037.3	13313.1	1033.3	13560.9	1028.0	13585.0
GR1027.9	13597.0	1027.0	13597.8	1026.0	13930.0	1025.0	14270.0	1025.5	14580.0
GR1025.4	14890.8	1026.5	15191.1	1027.2	15401.2	1028.4	15667.7	1032.4	15680.4
GR1032.4	15692.0	1028.8	15700.0	1028.5	15707.9	1030.7	15740.9		
ET 9.605	9.1	7.1				8363	11140	8363	11778.8
X1 9.605	70	9528.1	11013.4	450	455	453.02			
GR1026.9	8323.0	1034.9	8347.0	1034.9	8354.0	1034.9	8363.0	1026.9	8371.0
GR1026.9	8906.2	1026.7	9213.4	1027.2	9312.6	1028.5	9317.9	1026.2	9325.5
GR1028.3	9333.1	1026.8	9341.6	1026.9	9449.8	1029.5	9466.0	1025.9	9513.6
GR1026.2	9528.1	1021.3	9552.7	1021.7	9613.6	1020.3	9626.6	1021.4	9691.9
GR1019.1	9885.5	1021.7	9899.7	1019.8	9963.2	1023.8	10013.4	1023.7	10113.7
GR1025.2	10165.4	1018.7	10197.8	1019.1	10296.8	1022.1	10305.6	1023.9	10514.0
GR1022.5	10541.1	1023.4	10563.4	1022.3	10601.0	1021.6	10869.6	1022.5	10977.3
GR1026.7	11013.4	1025.6	11082.0	1027.9	11163.4	1027.7	11233.8	1026.7	11244.8
GR1028.1	11365.2	1026.5	11508.4	1027.7	11513.7	1026.1	11663.4	1027.1	11769.3
GR1030.1	11778.8	1027.1	11785.4	1027.1	12761.9	1027.7	12776.9	1026.2	13095.4
GR1027.1	13134.9	1032.3	13148.8	1026.6	13163.1	1026.8	13386.9	1025.2	13413.4
GR1027.7	13464.6	1026.9	13813.4	1026.9	14115.7	1027.0	14408.4	1028.1	14425.0
GR1026.7	14608.7	1027.7	14613.4	1026.1	14618.2	1027.8	14625.6	1026.4	14628.3
GR1027.6	14632.2	1026.7	14964.5	1027.3	15314.4	1028.3	15663.4	1029.0	15673.3
* CONFLUENCE WITH NEW RIVER									
ET 9.696	9.1	7.1				7850	11080	7850	11702.1
X1 9.696	96	9602.6	10996.2	530	430	484.29			
GR1029.9	7599.1	1029.2	7808.1	1037.8	7834.0	1037.8	7841.0	1037.8	7850.0
GR1029.2	7858.6	1029.2	7912.4	1029.7	8257.2	1030.5	8619.8	1029.9	8831.5
GR1028.9	8845.5	1028.1	8992.0	1029.5	9015.3	1026.3	9041.5	1020.9	9075.8
GR1019.3	9100.8	1019.0	9317.2	1023.7	9420.4	1023.3	9442.7	1024.3	9588.4
GR1026.2	9602.6	1026.1	9618.1	1027.9	9632.9	1026.0	9655.6	1027.2	9668.0

Agua Fria Input

GR1027.6	9692.2	1028.3	9696.5	1026.7	9753.2	1027.0	9818.1	1022.2	9845.3
GR1020.6	9885.0	1022.9	9958.5	1022.2	9970.0	1022.9	9987.3	1022.2	10010.3
GR1024.7	10030.2	1025.6	10107.8	1025.2	10146.5	1024.5	10147.3	1024.7	10232.4
GR1018.7	10247.8	1018.7	10339.8	1020.3	10349.2	1022.2	10433.3	1021.8	10446.8
GR1023.6	10545.7	1023.9	10724.6	1024.9	10739.3	1024.4	10971.5	1026.9	10996.2
GR1028.4	11103.5	1026.2	11181.0	1027.7	11201.0	1027.4	11533.9	1028.1	11659.0
GR1027.1	11690.8	1029.1	11702.1	1024.2	11713.9	1023.4	11748.9	1024.0	11775.8
GR1023.2	12099.7	1024.0	12265.9	1024.8	12280.0	1025.1	12425.6	1022.1	12449.5
GR1021.3	12467.7	1022.9	12487.3	1025.4	12493.6	1025.4	12539.0	1023.3	12552.1
GR1025.5	12557.5	1024.9	12601.6	1025.9	12902.3	1027.4	13067.7	1030.4	13077.2
GR1027.9	13089.0	1026.4	13183.5	1025.5	13215.4	1027.3	13280.3	1028.4	13555.0
GR1027.3	13906.4	1027.2	14209.6	1027.1	14347.5	1028.2	14354.0	1028.0	14669.0
GR1027.3	14730.2	1027.7	15048.9	1028.6	15362.0	1028.8	15462.4	1028.7	15548.9
GR1030.4	15610.3	1034.4	15621.3	1034.8	15633.1	1030.2	15641.5	1029.5	15651.1
GR1030.2	15663.0								

QT 2 30000 30000

* THE FOLOWING FLOOD WAY LEFT ENCROACHMENT IS ADJUSTED TO ACCOUNT FOR LEFT INEFECTIV E

* FLOW AREA BASED ON 1:3 FLOW EXPANSION, WHICH IS 825 FT RIGHT FROM LEVEE STATION.

ET 9.790	9.1	7.1				9250	10924	8425	11950
X1 9.790	95	9555.3	10923.6	570	365	492.77			
GR1033.4	7051.4	1033.3	7056.7	1035.0	7064.0	1034.8	7075.2	1034.0	7078.0
GR1032.1	7149.3	1031.7	7458.3	1030.8	7493.6	1031.4	7524.7	1028.3	7657.8
GR1025.9	7681.4	1026.6	7705.8	1022.0	7986.7	1023.2	8099.4	1024.3	8119.6
GR1023.5	8159.1	1024.2	8159.2	1024.8	8381.1	1034.1	8409.0	1034.1	8416.0
GR1034.1	8425.0	1024.8	8434.3	1024.8	8466.1	1023.4	8634.1	1024.7	8670.4
GR1024.8	8724.6	1027.5	8780.5	1027.7	9035.8	1027.0	9088.0	1030.0	9113.4
GR1029.8	9131.3	1030.6	9136.2	1028.0	9147.7	1029.0	9301.9	1028.1	9331.0
GR1028.6	9383.7	1027.9	9385.7	1027.5	9514.1	1029.1	9555.3	1026.1	9588.2
GR1028.0	9790.4	1026.5	9806.2	1028.5	9821.7	1029.1	9892.3	1023.9	9916.5
GR1021.9	10053.9	1023.8	10065.9	1023.4	10107.6	1020.8	10160.4	1019.6	10166.7
GR1019.5	10222.2	1023.6	10235.1	1023.1	10261.5	1024.5	10277.4	1024.1	10299.7
GR1022.8	10309.0	1022.5	10353.4	1023.6	10369.6	1022.8	10396.5	1025.0	10526.2
GR1025.5	10666.4	1024.6	10799.2	1029.4	10923.6	1029.3	11267.1	1026.9	11558.6
GR1025.9	11569.6	1027.7	11617.1	1027.3	11796.4	1024.9	11817.8	1027.7	11841.5
GR1027.3	11873.4	1025.9	11886.9	1027.0	11916.7	1027.2	12071.6	1029.3	12091.5
GR1030.6	12410.5	1030.2	12717.1	1030.4	12823.6	1028.3	12889.8	1029.1	12917.1
GR1028.0	13014.7	1026.5	13027.1	1028.8	13042.6	1029.8	13067.3	1029.4	13317.1
GR1028.6	13328.2	1029.6	13398.4	1028.5	13404.5	1028.8	13723.6	1029.1	14060.6
GR1028.1	14367.1	1028.2	14717.1	1029.2	15019.0	1030.2	15331.2	1030.5	15407.2
ET 9.885	9.1	7.1				9270	10725	9270	12100
X1 9.885	96	9327.8	10706.6	520	460	503.63			
GR1039.2	7565.7	1040.2	7662.3	1034.6	7685.9	1030.3	7700.2	1031.3	7867.8
GR1029.7	7916.4	1027.5	7931.4	1026.9	7950.4	1030.6	7976.2	1031.5	7997.4
GR1036.9	8022.8	1038.7	8074.4	1037.7	8126.1	1038.6	8229.3	1030.0	8275.0
GR1029.1	8298.7	1024.4	8321.0	1023.7	8351.4	1031.1	8385.8	1031.2	8512.7
GR1033.1	8528.7	1031.2	8560.8	1030.8	8895.1	1030.9	8906.2	1029.6	8919.4
GR1029.8	9072.1	1029.1	9082.1	1030.3	9093.1	1029.6	9210.6	1030.8	9237.8
GR1036.2	9254.0	1036.2	9261.0	1036.2	9270.0	1030.8	9275.4	1032.3	9290.7
GR1030.8	9299.0	1031.3	9327.8	1026.1	9346.9	1027.3	9423.2	1028.4	9430.8
GR1029.2	9506.5	1028.0	9575.4	1029.3	9589.9	1028.9	9891.7	1028.8	9906.9
GR1023.8	9943.1	1021.1	10038.7	1023.4	10078.6	1026.8	10380.8	1027.1	10669.0
GR1029.9	10706.6	1028.7	11026.7	1028.5	11086.3	1027.3	11098.7	1028.9	11111.9
GR1028.5	11220.7	1028.4	11325.3	1027.6	11358.6	1028.7	11372.0	1025.8	11398.6
GR1029.1	11415.3	1028.9	11748.4	1028.5	11808.8	1030.7	11828.7	1031.0	12156.6
GR1030.4	12166.2	1030.1	12236.2	1031.4	12257.8	1031.2	12452.6	1028.4	12472.0
GR1031.1	12656.6	1030.8	12906.6	1029.6	12946.3	1031.2	13006.6	1030.2	13048.4
GR1031.1	13078.7	1029.6	13093.9	1029.3	13107.9	1031.3	13116.8	1030.8	13158.5
GR1028.0	13195.5	1028.6	13366.4	1029.6	13556.6	1029.4	13659.0	1030.3	13959.7
GR1030.6	14219.8	1031.3	14232.5	1030.5	14237.0	1030.7	14250.8	1029.1	14263.3
GR1030.4	14606.6	1030.6	14909.8	1032.2	15157.1	1031.1	15164.5	1035.3	15172.3
GR1035.2	15177.3								
ET 9.981	9.1	7.1				9288	10610	9288	12300
X1 9.981	94	9288.6	10529.4	620	380	504.23			
GR1028.8	7985.5	1027.3	7992.5	1027.4	7998.6	1032.5	8033.4	1033.1	8101.7
GR1031.9	8112.7	1032.2	8131.4	1037.6	8178.1	1038.2	8213.2	1037.3	8220.9
GR1032.6	8240.3	1032.0	8257.9	1033.4	8264.7	1033.1	8586.5	1033.0	8909.7
GR1032.0	8984.7	1030.9	8994.9	1032.0	9003.4	1031.0	9027.0	1032.1	9096.5
GR1031.1	9106.3	1032.8	9124.2	1032.4	9150.5	1030.9	9161.7	1033.5	9288.6

Agua Fria Input

GR1030.9	9317.4	1029.0	9365.9	1029.5	9435.9	1031.0	9448.2	1029.2	9520.4
GR1030.5	9652.6	1031.6	9714.0	1030.4	9816.3	1022.8	9874.0	1025.6	10071.1
GR1023.9	10094.9	1026.5	10310.3	1028.2	10343.2	1027.6	10373.8	1029.0	10418.0
GR1028.2	10494.2	1029.7	10529.4	1030.2	10678.9	1029.0	10690.6	1030.0	10718.8
GR1030.3	10834.8	1029.3	10845.2	1030.2	10856.8	1030.0	11179.6	1029.2	11244.4
GR1026.3	11262.4	1029.2	11279.5	1030.4	11499.2	1030.0	11717.1	1031.2	11733.8
GR1030.9	11764.4	1032.4	11794.0	1033.1	12111.9	1032.8	12234.1	1030.9	12254.0
GR1031.1	12375.2	1030.1	12403.4	1032.2	12472.1	1030.9	12495.7	1031.6	12528.2
GR1030.6	12574.3	1033.0	12629.6	1032.0	12670.6	1032.4	12845.3	1029.6	13000.6
GR1029.2	13074.2	1029.2	13136.4	1028.2	13148.1	1031.5	13279.6	1030.8	13579.6
GR1030.1	13583.7	1032.3	13643.0	1032.7	13879.6	1031.9	13915.8	1032.9	13931.6
GR1031.8	13936.5	1031.0	13959.3	1029.2	13980.9	1030.9	14079.6	1029.6	14113.5
GR1031.1	14118.8	1031.7	14429.6	1032.0	14779.6	1031.3	14933.3	1035.8	14941.6
GR1036.2	14956.7	1031.7	14964.7	1031.0	14972.7	1032.0	14986.6		
ET10.071	9.1	7.1				9289	10520	9170	12311.1
X110.071	91	9289.6	10511.4	625	355	474.54			
GR1042.8	7501.6	1042.9	7530.3	1038.5	7548.7	1037.8	7578.6	1030.4	7612.9
GR1035.3	7648.5	1037.9	7660.3	1035.4	7749.7	1036.1	7818.4	1035.0	7866.0
GR1035.0	8082.1	1033.5	8219.9	1035.0	8254.6	1034.6	8292.0	1032.2	8311.0
GR1032.4	8347.0	1034.5	8360.9	1032.7	8394.8	1033.9	8418.4	1035.3	8718.9
GR1033.9	8784.2	1034.9	8790.9	1032.9	8964.3	1035.7	8986.2	1033.7	9067.0
GR1033.9	9112.6	1033.0	9139.5	1034.1	9213.8	1031.4	9251.6	1031.4	9273.1
GR1032.6	9289.6	1029.7	9332.3	1032.8	9450.2	1029.6	9714.0	1027.9	9724.5
GR1028.8	9745.6	1028.4	9820.1	1026.3	9829.3	1025.1	10105.6	1025.7	10120.0
GR1024.9	10190.0	1028.8	10242.7	1031.5	10511.4	1030.8	10529.2	1031.8	10852.8
GR1031.5	11186.9	1031.2	11469.9	1029.9	11502.5	1033.6	11529.2	1030.8	11574.1
GR1032.6	11593.6	1032.8	11633.6	1031.8	11741.6	1032.1	12052.9	1031.9	12143.8
GR1033.1	12189.0	1032.2	12270.0	1034.0	12294.4	1033.7	12302.4	1035.9	12311.1
GR1032.7	12324.8	1033.0	12336.2	1032.1	12339.7	1033.2	12358.8	1032.5	12368.3
GR1033.5	12459.6	1032.7	12786.8	1033.0	12816.1	1031.0	12838.0	1029.8	12886.4
GR1029.1	13009.0	1030.5	13032.1	1029.1	13093.4	1031.5	13117.5	1030.8	13156.5
GR1031.7	13394.1	1030.1	13454.5	1033.3	13505.0	1032.6	13607.0	1031.6	13617.1
GR1033.4	13747.1	1035.1	13760.6	1033.1	13767.5	1030.0	13826.1	1031.5	13872.6
GR1032.1	14246.5	1031.4	14550.6	1032.1	14701.1	1037.2	14713.9	1037.3	14726.4
GR1032.2	14735.7								
ET10.167	9.1	7.1				9390	10380	9380	11989.1
X110.167	96	9412.5	10272.2	575	400	512.35			
GR1042.3	6815.8	1043.6	6874.3	1036.4	6906.1	1037.1	6911.8	1036.0	6917.8
GR1036.2	7129.0	1037.7	7194.5	1035.7	7205.8	1037.3	7277.2	1037.1	7420.3
GR1039.4	7453.6	1037.1	7485.2	1038.7	7507.3	1037.7	7579.8	1038.3	7590.5
GR1037.3	7594.2	1037.3	7713.7	1036.2	7723.0	1036.4	7888.6	1038.2	7925.2
GR1037.1	7939.2	1035.1	8120.7	1036.1	8128.4	1036.5	8429.0	1035.2	8480.7
GR1037.0	8786.9	1035.9	8921.4	1037.0	8943.4	1036.8	8974.4	1031.8	9018.5
GR1039.2	9040.9	1034.5	9055.3	1033.7	9126.3	1036.7	9148.2	1033.3	9165.5
GR1033.8	9220.1	1033.4	9233.3	1034.7	9240.3	1038.4	9252.7	1035.6	9256.7
GR1033.3	9272.8	1033.5	9412.5	1030.1	9441.5	1028.9	9508.9	1029.9	9773.1
GR1023.3	10025.7	1023.7	10040.0	1025.8	10051.5	1026.7	10190.6	1028.9	10206.1
GR1028.6	10254.0	1031.0	10272.2	1033.1	10498.3	1032.9	10848.3	1033.0	11148.3
GR1032.2	11453.2	1030.3	11467.7	1032.9	11483.3	1032.3	11523.7	1030.0	11546.4
GR1034.0	11563.1	1032.4	11603.2	1032.6	11807.8	1033.8	11846.8	1032.4	11877.0
GR1034.1	11898.4	1033.1	11953.6	1033.7	11977.0	1036.3	11989.1	1031.3	12008.1
GR1033.4	12031.2	1033.2	12088.4	1031.7	12103.8	1033.5	12114.2	1032.3	12117.7
GR1034.5	12198.3	1033.1	12499.2	1032.6	12530.4	1034.2	12592.6	1032.8	12620.5
GR1032.5	12695.9	1030.5	12748.7	1033.1	12905.5	1030.4	13006.4	1032.1	13048.1
GR1033.2	13355.8	1033.5	13581.8	1034.8	13585.3	1031.2	13629.7	1033.4	13936.1
GR1032.9	14248.3	1033.1	14395.7	1037.8	14406.5	1038.1	14419.7	1033.2	14430.0
GR1033.1	14443.1								
ET10.265	9.1	7.1				9620	10360	9550	11664.3
X110.265	93	9737.0	10270.5	515	400	512.41			
GR1042.7	6182.3	1039.6	6281.8	1038.1	6306.3	1036.8	6556.4	1037.5	6667.8
GR1036.8	6706.5	1037.1	6812.6	1037.6	7060.0	1038.5	7106.8	1036.6	7215.8
GR1038.3	7522.5	1038.4	7845.2	1038.6	8157.4	1038.7	8464.0	1038.9	8563.9
GR1035.3	8585.1	1045.6	8610.3	1037.7	8630.1	1036.2	8844.9	1041.2	8863.0
GR1036.6	8886.5	1034.8	8960.3	1036.3	9020.4	1035.0	9102.0	1040.8	9117.3
GR1031.5	9140.9	1030.2	9155.5	1031.9	9162.8	1031.6	9222.5	1040.3	9238.9
GR1029.8	9260.4	1031.5	9281.8	1033.6	9629.0	1032.9	9737.0	1029.3	9753.5
GR1028.8	9974.1	1027.3	10026.3	1028.3	10034.3	1026.4	10062.5	1026.4	10099.9
GR1027.7	10113.4	1028.4	10244.9	1033.7	10270.5	1034.4	10599.6	1034.5	10932.3
GR1034.3	11132.3	1032.5	11177.2	1034.1	11188.2	1033.8	11204.8	1032.2	11212.9

Agua Fria Input

GR1033.8	11262.6	1032.0	11271.1	1031.4	11288.2	1033.8	11302.6	1034.3	11332.3
GR1032.2	11360.1	1036.5	11412.3	1032.8	11426.5	1035.5	11438.9	1033.7	11626.1
GR1032.6	11636.2	1033.5	11649.8	1037.9	11664.3	1034.0	11682.2	1033.1	11715.4
GR1034.7	11734.5	1034.9	11782.3	1033.9	11820.3	1032.9	11824.8	1034.2	11844.0
GR1033.6	12033.4	1035.5	12132.3	1035.3	12421.8	1032.0	12538.6	1034.3	12632.3
GR1032.8	12671.6	1034.3	12782.3	1033.7	12800.6	1034.4	12842.0	1034.1	13173.7
GR1034.0	13330.9	1035.1	13335.7	1032.6	13351.9	1033.2	13370.0	1031.9	13443.8
GR1033.8	13482.3	1033.9	13832.3	1034.2	14077.4	1039.0	14088.5	1039.1	14101.2
GR1034.5	14111.5	1033.9	14119.2	1034.4	14126.8				

* GR POINTS MODIFIED - BOTTOM OF GRAVEL MINE RAISED TO ELIMINATE NON-EFFECTIVE FLOW AREA BETWEEN SECTIONS 10.343 TO 10.538.

NC	.050	.045							
ET10.343	9.1	7.1				9750	10340	9750	11416
X110.343	78	9782.1	10288.8	395	295	411.16			
GR1043.6	5749.1	1044.2	5780.6	1038.7	5851.9	1039.0	6019.2	1039.2	6332.0
GR1039.2	6402.4	1036.8	6515.4	1039.7	6852.7	1039.1	7156.0	1038.6	7398.1
GR1040.0	7472.0	1039.8	7821.6	1039.2	8124.2	1040.1	8426.7	1038.4	8626.1
GR1035.8	8870.7	1039.2	8882.3	1030.0	8906.1	1030.0	9429.5	1031.6	9432.5
GR1033.6	9465.9	1034.3	9531.5	1031.4	9573.0	1031.9	9592.8	1036.7	9615.6
GR1031.8	9659.5	1031.4	9770.7	1032.9	9782.1	1029.4	9854.5	1031.9	9869.3
GR1029.4	9924.3	1030.7	10065.3	1026.7	10247.0	1035.2	10288.8	1036.1	10312.9
GR1035.6	10620.5	1034.8	10841.9	1034.0	10847.5	1034.8	10947.5	1033.8	10988.6
GR1034.1	11072.8	1033.2	11092.4	1035.7	11109.8	1035.9	11151.3	1037.1	11164.0
GR1035.8	11184.6	1036.7	11198.0	1035.1	11214.8	1036.3	11231.4	1034.8	11244.9
GR1035.6	11279.1	1034.4	11296.8	1035.7	11345.3	1033.4	11353.5	1033.1	11388.4
GR1035.0	11390.4	1037.4	11416.6	1035.1	11427.0	1033.9	11612.9	1035.2	11918.3
GR1033.7	12029.0	1035.4	12049.5	1035.0	12282.6	1033.3	12306.7	1034.1	12609.1
GR1035.1	12942.0	1034.8	13067.5	1036.1	13073.7	1034.5	13086.5	1035.2	13108.0
GR1033.0	13133.3	1032.5	13203.6	1034.5	13221.6	1035.3	13542.0	1036.5	13836.8
GR1039.9	13845.1	1040.0	13859.8	1035.3	13871.1				
ET10.442	9.1	7.1				9625	10380	9625.7	11448
X110.442	88	9625.8	10334.1	465	455	528.25			
GR1042.3	5468.7	1039.3	5491.4	1039.3	5808.0	1039.1	6138.5	1040.6	6438.9
GR1038.1	6739.3	1040.2	7039.7	1039.0	7351.4	1039.2	7534.1	1041.2	7607.2
GR1040.7	7936.2	1039.3	8251.6	1037.5	8557.5	1036.0	8599.2	1031.3	8658.3
GR1031.3	9546.2	1033.4	9549.4	1030.1	9585.6	1031.4	9602.2	1041.9	9625.8
GR1030.1	9648.9	1030.9	9659.7	1033.8	9672.3	1032.7	9989.3	1029.4	10112.8
GR1031.4	10126.5	1030.5	10160.2	1032.4	10184.0	1030.1	10296.8	1037.3	10334.1
GR1035.8	10505.2	1037.3	10535.6	1035.3	10581.7	1035.3	10633.6	1036.6	10645.8
GR1036.3	10732.6	1035.1	10793.1	1037.3	10814.5	1035.0	10837.9	1037.6	10872.9
GR1038.3	10917.6	1036.7	10936.9	1038.1	10972.9	1036.9	11019.0	1034.1	11034.0
GR1036.8	11062.7	1035.3	11067.5	1036.6	11137.8	1035.5	11163.7	1037.1	11174.2
GR1035.4	11339.0	1037.2	11371.8	1037.7	11436.7	1041.0	11448.8	1036.4	11467.4
GR1035.3	11500.2	1037.0	11540.9	1037.1	11590.4	1035.8	11597.9	1036.1	11610.8
GR1037.8	11618.4	1034.4	11726.1	1034.9	11793.6	1037.8	11821.3	1037.6	12122.9
GR1035.2	12185.5	1036.9	12206.0	1036.5	12285.4	1035.6	12292.7	1036.9	12300.0
GR1036.6	12622.9	1035.7	12762.1	1037.4	12768.1	1035.7	12779.8	1033.0	12856.5
GR1036.3	12972.9	1035.8	13036.9	1037.5	13058.2	1036.5	13073.0	1035.5	13073.1
GR1037.0	13122.9	1036.5	13469.3	1037.5	13564.5	1041.7	13576.0	1042.0	13590.2
GR1036.5	13599.8	1035.8	13604.8	1036.9	13629.1				
ET10.538	9.1	7.1				9540	10480	9514.9	11058
X110.538	87	9573.5	10478.1	460	530	504.98			
GR1044.3	5184.9	1041.9	5231.3	1040.7	5346.6	1042.0	5381.6	1039.6	5682.2
GR1040.9	5982.8	1040.5	6283.3	1041.2	6595.7	1041.2	6884.5	1041.0	7201.5
GR1041.2	7536.3	1043.3	7856.8	1042.5	7964.9	1043.8	7979.7	1040.8	8090.9
GR1038.3	8289.3	1041.4	8383.5	1047.4	8433.6	1045.1	8442.7	1042.2	8474.3
GR1036.6	8494.1	1039.0	8523.1	1039.3	8623.9	1039.5	8689.3	1037.5	8721.0
GR1032.6	8730.1	1032.6	9358.6	1030.7	9369.0	1031.1	9393.1	1032.6	9397.3
GR1034.7	9485.0	1044.0	9515.0	1032.4	9550.4	1035.0	9573.5	1032.3	9735.6
GR1033.1	9803.1	1031.7	9852.9	1033.8	9961.2	1034.1	10074.0	1033.2	10146.3
GR1034.8	10204.0	1032.3	10314.7	1031.2	10415.1	1033.6	10426.6	1035.0	10466.3
GR1037.9	10478.1	1037.0	10517.7	1038.0	10546.0	1036.8	10585.9	1037.3	10707.3
GR1038.3	10796.1	1039.2	10804.0	1036.6	10849.8	1038.0	10898.1	1036.0	10910.1
GR1037.4	10922.0	1039.0	11058.2	1038.2	11357.2	1035.9	11378.0	1036.5	11469.0
GR1035.7	11506.5	1038.3	11558.5	1039.7	11652.5	1041.5	11661.6	1037.8	11677.8
GR1039.3	11777.4	1037.9	11782.6	1039.3	11801.3	1038.9	11978.3	1036.8	12039.8
GR1038.1	12076.2	1037.0	12092.7	1038.3	12115.4	1037.3	12121.4	1037.7	12452.6
GR1037.2	12566.3	1038.0	12577.1	1035.0	12729.0	1036.0	12746.9	1034.0	12773.6
GR1038.3	12884.7	1038.0	13202.7	1037.9	13388.3	1042.7	13400.0	1042.9	13414.2

Agua Fria Input

GR1037.2	13424.5	1036.8	13435.8						
ET10.632	9.1	7.1				9445	10430	9414.6	10612
X110.632	93	9514.2	10402.3	465	510	496.32			
GR1046.8	5031.2	1045.8	5041.9	1042.1	5047.3	1042.5	5093.6	1040.7	5097.4
GR1042.5	5105.0	1040.6	5110.0	1042.7	5115.6	1041.7	5120.1	1041.7	5209.0
GR1042.3	5457.6	1043.4	5501.6	1042.3	5511.0	1043.6	5531.9	1040.3	5657.9
GR1040.5	5944.9	1042.7	5990.0	1041.4	6002.2	1041.9	6105.6	1042.7	6429.0
GR1042.2	6737.6	1042.6	7050.6	1041.3	7216.0	1042.6	7264.7	1042.7	7569.7
GR1043.8	7806.3	1045.2	7817.4	1043.9	7823.8	1044.8	7832.2	1048.8	7843.2
GR1043.5	7855.8	1043.5	7939.2	1048.8	7950.5	1042.5	7969.8	1041.2	8065.8
GR1039.1	8072.3	1039.6	8095.7	1041.0	8104.0	1039.8	8110.2	1041.5	8125.3
GR1046.3	8144.4	1041.9	8162.5	1040.1	8176.7	1040.1	8542.6	1039.3	8861.3
GR1039.3	9170.4	1037.8	9231.7	1037.9	9336.4	1039.2	9401.4	1043.6	9414.6
GR1035.7	9434.4	1038.8	9458.6	1038.2	9514.2	1035.9	9556.1	1033.6	9757.4
GR1031.7	9772.8	1034.0	9794.5	1032.7	9807.2	1032.7	9834.7	1035.3	9842.4
GR1033.9	9851.1	1033.8	10153.8	1032.5	10365.3	1039.3	10402.3	1038.2	10435.4
GR1040.4	10612.0	1038.4	10623.9	1039.7	10692.8	1038.7	10702.4	1037.7	11007.7
GR1038.7	11174.1	1040.1	11393.3	1039.4	11407.7	1040.4	11432.1	1038.8	11710.8
GR1040.3	11817.9	1038.8	11830.9	1040.0	11845.8	1038.7	11915.1	1039.5	11934.4
GR1038.0	11937.1	1037.5	12006.1	1040.9	12036.8	1037.7	12074.0	1039.5	12082.6
GR1037.7	12107.3	1037.5	12422.8	1036.6	12552.9	1038.5	12570.3	1036.4	12831.5
GR1038.9	12957.9	1039.0	13257.9	1040.0	13273.6				

* FOR PURPOSES OF THIS REPORT, CROSS SECTIONS 10.752 THROUGH 33.82 WERE SKIPPED TO
 * SAVE SPACE. NO CHANGE IN WATER SURFACE ELEVATIONS RESULTED IN THIS MODEL BEYOND
 * CROSS SECTION 10.071.

EJ

T1 AGUA FRIA RIVER REVISED HYDRAULIC STUDY

T1 PREPARED FOR THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

T1 PREPARED BY WEST CONSULTANTS, INC.

T2 AGUA FRIA RIVER, RS 9.266 TO THE NEW WADDELL DAM

T3 100-YEAR EVENT FLOODWAY CONDITION FILE NAME - H2REACH1

J1	0	3	0	0	0	0	0	0	1023.81	0
J2	2	0	-1	0	0	0	-1	0	0	0

AGUA FRIA RIVER HEC-2 MODEL OUTPUT

Agua Fria Output

THIS RUN EXECUTED 28DEC99 17:09:35

HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

EAR EVENT EXISTING CO

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	DEPTH	EG	CRIWS	VCH	10*KS	XLCH	SSTA	TOPWID	ENDST
TWA												
	9.266	54400.00	1023.82	10.12	1024.22	1021.31	5.16	15.79	.00	9239.14	2454.65	11700.00
.00	9.266	54400.00	1023.81	10.11	1024.24	1021.37	5.29	16.65	.00	9243.02	2370.61	11620.00
.00												
	9.343	54400.00	1024.47	10.07	1024.98	1022.11	5.77	20.19	407.20	9397.95	2521.22	12100.00
23.33	9.343	54400.00	1024.49	10.09	1025.02	1022.12	5.84	20.53	407.20	9397.87	1901.76	11470.00
19.94												
	9.435	54400.00	1025.41	10.21	1025.96	1023.14	6.00	20.10	482.24	9363.55	2323.65	11822.23
50.32	9.435	54400.00	1025.45	10.25	1026.01	1022.98	6.05	20.32	482.24	9363.46	1745.95	11141.59
40.13												
	9.519	54400.00	1026.34	10.04	1026.97	1024.44	6.46	24.41	445.93	9340.00	2447.93	11794.39
74.75	9.519	54400.00	1026.38	10.08	1027.03	1024.46	6.52	24.64	445.93	9339.84	1814.06	11160.00
58.37												
	9.605	54400.00	1027.43	8.73	1028.07	1025.29	6.48	23.80	453.02	8370.47	3108.56	11770.34
103.63	9.605	54400.00	1027.49	8.79	1028.12	1025.29	6.42	23.09	453.02	8370.41	2715.37	11140.00
81.88												
	9.696	54400.00	1028.70	10.00	1029.06	1025.81	4.96	16.45	484.29	8882.54	2797.37	11699.83
136.64												

						Agua Fria	Output						
109.93	9.696	54400.00	1028.73	10.03	1029.10	1025.82	5.02	16.70	484.29	8876.77	2184.09	11080.00	
171.25	9.790	30000.00	1029.57	10.07	1029.72	1026.67	3.44	8.39	492.77	8429.53	3489.49	11950.00	
* 132.53	9.790	30000.00	1029.60	10.10	1029.92	1027.03	4.55	14.56	492.77	9250.00	1674.00	10924.00	
* 204.96	9.885	30000.00	1030.12	9.02	1030.61	1029.34	5.87	38.93	503.63	9332.13	2491.34	11823.47	
* 150.31	9.885	30000.00	1030.51	9.41	1031.05	1029.20	5.90	33.91	503.63	9330.69	1394.31	10725.00	
230.55	9.981	30000.00	1031.71	8.91	1032.08	1030.25	5.19	23.71	504.23	9308.28	2526.99	12300.00	
165.80	9.981	30000.00	1032.04	9.24	1032.53	1029.96	5.64	25.42	504.23	9304.82	1305.18	10610.00	
256.58	10.071	30000.00	1032.83	7.93	1033.24	1031.25	5.47	26.61	474.54	9231.61	2994.15	12278.51	
179.49	10.071	30000.00	1033.23	8.33	1033.72	1031.19	5.64	24.86	474.54	9289.00	1231.00	10520.00	
285.01	10.167	30000.00	1033.82	10.52	1034.24	1031.22	5.42	15.36	512.35	9380.00	2573.13	11977.55	
192.42	10.167	30000.00	1034.22	10.92	1034.67	1031.31	5.44	14.20	512.35	9390.00	990.00	10380.00	

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28DEC99 17:09:29

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TWA	SECNO	Q	CWSEL	DEPTH	EG	CRIWS	VCH	10*KS	XLCH	SSTA	TOPWID	ENDST
* 307.68	10.265	30000.00	1034.48	8.08	1035.66	1033.19	8.93	40.95	512.41	9550.00	1910.88	11653.06
* 202.34	10.265	30000.00	1034.82	8.42	1035.98	1033.09	8.75	36.57	512.41	9620.00	740.00	10360.00
321.35	10.343	30000.00	1036.59	9.89	1037.31	1034.85	7.34	39.14	411.16	9750.00	1641.29	11407.72
208.41	10.343	30000.00	1036.67	9.97	1037.75	1034.54	8.44	51.06	411.16	9750.00	590.00	10340.00
	10.442	30000.00	1038.52	9.12	1038.92	1036.33	5.54	24.79	528.25	9632.42	1807.29	11439.71

Agua Fria Output

340.38	10.442	30000.00	1039.14	9.74	1039.73	1036.07	6.21	27.55	528.25	9631.21	748.79	10380.00
216.42												
	10.538	30000.00	1039.65	8.95	1039.96	1036.44	4.66	16.94	504.98	9528.28	1529.72	11058.00
360.18												
*	10.538	30000.00	1040.40	9.70	1040.72	1036.43	4.54	13.86	504.98	9540.00	940.00	10480.00
226.20												
	10.632	30000.00	1040.50	8.80	1040.89	1037.24	5.07	19.61	496.32	9422.37	1189.63	10612.00
375.75												
	10.632	30000.00	1041.10	9.40	1041.44	1037.27	4.71	15.05	496.32	9445.00	985.00	10430.00
237.14												

THIS RUN EXECUTED 28DEC99 17:09:35

HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

EAR EVENT EXISTING CO

SUMMARY PRINTOUT

TWA	SECNO	Q	CWSEL	DEPTH	EG	CRIWS	VCH	10*KS	XLCH	SSTA	TOPWID	ENDST
	9.266	54400.00	1023.82	10.12	1024.22	1021.31	5.16	15.79	.00	9239.14	2454.65	11700.00
.00												
	9.266	54400.00	1023.81	10.11	1024.24	1021.37	5.29	16.65	.00	9243.02	2370.61	11620.00
.00												
	9.343	54400.00	1024.47	10.07	1024.98	1022.11	5.77	20.19	407.20	9397.95	2521.22	12100.00
23.33												
	9.343	54400.00	1024.49	10.09	1025.02	1022.12	5.84	20.53	407.20	9397.87	1901.76	11470.00
19.94												
	9.435	54400.00	1025.41	10.21	1025.96	1023.14	6.00	20.10	482.24	9363.55	2323.65	11822.23
50.32												
	9.435	54400.00	1025.45	10.25	1026.01	1022.98	6.05	20.32	482.24	9363.46	1745.95	11141.59

Agua Fria Output

40.13													
	9.519	54400.00	1026.34	10.04	1026.97	1024.44	6.46	24.41	445.93	9340.00	2447.93	11794.39	
74.75													
	9.519	54400.00	1026.38	10.08	1027.03	1024.46	6.52	24.64	445.93	9339.84	1814.06	11160.00	
58.37													
	9.605	54400.00	1027.43	8.73	1028.07	1025.29	6.48	23.80	453.02	8370.47	3108.56	11770.34	
103.63													
	9.605	54400.00	1027.49	8.79	1028.12	1025.29	6.42	23.09	453.02	8370.41	2715.37	11140.00	
81.88													
	9.696	54400.00	1028.70	10.00	1029.06	1025.81	4.96	16.45	484.29	8882.54	2797.37	11699.83	
136.64													
	9.696	54400.00	1028.73	10.03	1029.10	1025.82	5.02	16.70	484.29	8876.77	2184.09	11080.00	
109.93													
	9.790	30000.00	1029.57	10.07	1029.72	1026.67	3.44	8.39	492.77	8429.53	3489.49	11950.00	
171.25													
*	9.790	30000.00	1029.60	10.10	1029.92	1027.03	4.55	14.56	492.77	9250.00	1674.00	10924.00	
132.53													
*	9.885	30000.00	1030.12	9.02	1030.61	1029.34	5.87	38.93	503.63	9332.13	2491.34	11823.47	
204.96													
*	9.885	30000.00	1030.51	9.41	1031.05	1029.20	5.90	33.91	503.63	9330.69	1394.31	10725.00	
150.31													
	9.981	30000.00	1031.71	8.91	1032.08	1030.25	5.19	23.71	504.23	9308.28	2526.99	12300.00	
230.55													
	9.981	30000.00	1032.04	9.24	1032.53	1029.96	5.64	25.42	504.23	9304.82	1305.18	10610.00	
165.80													
	10.071	30000.00	1032.83	7.93	1033.24	1031.25	5.47	26.61	474.54	9231.61	2994.15	12278.51	
256.58													
	10.071	30000.00	1033.23	8.33	1033.72	1031.19	5.64	24.86	474.54	9289.00	1231.00	10520.00	
179.49													
	10.167	30000.00	1033.82	10.52	1034.24	1031.22	5.42	15.36	512.35	9380.00	2573.13	11977.55	
285.01													
	10.167	30000.00	1034.22	10.92	1034.67	1031.31	5.44	14.20	512.35	9390.00	990.00	10380.00	
192.42													

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17:09:29

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TWA	SECNO	Q	CWSEL	DEPTH	EG	Agua Fria CRIWS	Output VCH	10*KS	XLCH	SSTA	TOPWID	ENDST
* 307.68	10.265	30000.00	1034.48	8.08	1035.66	1033.19	8.93	40.95	512.41	9550.00	1910.88	11653.06
* 202.34	10.265	30000.00	1034.82	8.42	1035.98	1033.09	8.75	36.57	512.41	9620.00	740.00	10360.00
321.35	10.343	30000.00	1036.59	9.89	1037.31	1034.85	7.34	39.14	411.16	9750.00	1641.29	11407.72
208.41	10.343	30000.00	1036.67	9.97	1037.75	1034.54	8.44	51.06	411.16	9750.00	590.00	10340.00
340.38	10.442	30000.00	1038.52	9.12	1038.92	1036.33	5.54	24.79	528.25	9632.42	1807.29	11439.71
216.42	10.442	30000.00	1039.14	9.74	1039.73	1036.07	6.21	27.55	528.25	9631.21	748.79	10380.00
360.18	10.538	30000.00	1039.65	8.95	1039.96	1036.44	4.66	16.94	504.98	9528.28	1529.72	11058.00
* 226.20	10.538	30000.00	1040.40	9.70	1040.72	1036.43	4.54	13.86	504.98	9540.00	940.00	10480.00
375.75	10.632	30000.00	1040.50	8.80	1040.89	1037.24	5.07	19.61	496.32	9422.37	1189.63	10612.00
237.14	10.632	30000.00	1041.10	9.40	1041.44	1037.27	4.71	15.05	496.32	9445.00	985.00	10430.00

* FOR PURPOSES OF THIS REPORT, CROSS SECTIONS 10.752 THROUGH 33.82 WERE OMITTED TO SAVE SPACE.
 * NO CHANGE IN WATER SURFACE ELEVATIONS RESULTED IN THIS MODEL UPSTREAM OF CROSS SECTION 10.071.

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 9.790 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 9.885 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

Agua Fria Output

WARNING SECNO= 9.885 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 10.265 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 10.265 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 10.538 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

FLOODWAY DATA, EAR EVENT EXISTING CO
 PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	MEAN VELOCITY	WATER SURFACE ELEVATION		
				WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
9.266	2377.	10688.	5.1	1023.8	1023.8	.0
9.343	2072.	9395.	5.8	1024.5	1024.5	.0
9.435	1778.	9084.	6.0	1025.4	1025.4	.0
9.519	1820.	8651.	6.3	1026.3	1026.3	.0
9.605	2770.	9160.	5.9	1027.5	1027.4	.1
9.696	2203.	11152.	4.9	1028.7	1028.7	.0
9.790	1674.	6886.	4.4	1029.6	1029.6	.0
9.885	1394.	5092.	5.9	1030.5	1030.1	.4
9.981	1305.	5418.	5.5	1032.0	1031.7	.3
10.071	1231.	5331.	5.6	1033.2	1032.8	.4
10.167	990.	5705.	5.3	1034.2	1033.8	.4
10.265	740.	3634.	8.3	1034.8	1034.5	.3
10.343	590.	3638.	8.2	1036.7	1036.6	.1
10.442	749.	4886.	6.1	1039.1	1038.5	.6
10.538	940.	6654.	4.5	1040.4	1039.7	.7
10.632	985.	6513.	4.6	1041.1	1040.5	.6

NEW RIVER HEC-2 MODEL INPUT

New River Input

T1 NEW RIVER CLOMR STUDY, PHASE II
 T1 PREPARED FOR THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 T1 PREPARED BY WEST CONSULTANTS, INC., 12/20/99 - ADAPTED FROM A MODEL
 T1 ORIGINALLY PREPARED BY SIMONS, LI & ASSOCIATES, INC., 03/20/1998
 * *****
 * ADAPTED BY WEST CONSULTANTS, INC., DEC 1999 FOR USE WITH CLOMR FCD 95-15. *
 * TWO CROSS SECTIONS WERE ADDED: 0.1 AND 0.5. THE TOPOGRAPHY FOR THESE *
 * TWO CROSS SECTIONS WERE TAKEN FROM TWO DIFFERENT MODELS. STATION 0.1 WAS *
 * ADAPTED FROM STATION 9.519 IN RESTUDY BY COE AND VAN LOO ON THE AGUA FRIA *
 * RIVER DATED 10/31/96 (FCD CONTRACT 95-05). STATION 0.5 WAS ADAPTED FROM *
 * STATION #10 IN AN FIS STUDY BY COE AND VAN-LOO ON THE NEW RIVER DATED 1986. *
 * OTHER CHANGES INCLUDE THE ADDITION OF THE CAMELBACK RANCH LEVEE. THE *
 * STARTING WATER SERFACE ELEVATIONS FOR BOTH THE FLOODPLAIN AND FLOODWAY WERE *
 * DETERMINED BY UPDATING THE AGUA FRIA MODEL TO ACCOUNT FOR CAMELBACK RANCH *
 * LEVEE. HYDROLOGY COMES FROM THE TWO EFFECTIVE FIS: 39000 CFS TAKEN FROM *
 * THE 1986 NEW RIVER STUDY BY COE AND VAN LOO, AND 41000 CFS FROM THE 1992 *
 * LOMR FOR THE NEW RIVER CHANNELIZATION PROJECT ALSO BY COE AND VAN LOO. *
 * *****

T2 NEW RIVER 100-YEAR FLOW W/NEW WADDEL DAM
 T3 PROPOSED FLOODPLAIN CONDITION

J1	0	2	0	0	0	0	0	0	1026.34	0
J2	1	0	-1	0	0	0	-1	0	0	15
J3	38	43	1	8	3	2	26	5	39	53
J3	4	54	42		200					
QT	2	54400	54400							
NC	0.05	0.05	0.035	0.1	0.3					

* ENCROACHMENT METHOD FROM AGUA FRIA HEC-2 MODEL USED AT THIS CROSS SECTION ONLY

ET	0.1	9.1	7.1				8983.8	11160	8983.8	11803.0
X1	0.1	79	9530.0	11038.2						
GR1028.1	8418.7	1026.8	8455.6	1028.1	8480.0	1027.4	8880.0	1026.4	8949.5	
GR1032.5	8967.8	1032.5	8974.8	1032.5	8983.8	1026.4	8989.9	1026.4	9183.8	
GR1026.6	9339.0	1024.6	9346.8	1027.1	9353.8	1026.0	9360.1	1024.3	9467.6	
GR1026.2	9481.6	1024.8	9499.6	1025.3	9530.0	1020.4	9568.8	1021.3	9580.0	
GR1019.8	9671.8	1021.8	9680.4	1020.4	9936.5	1017.4	9979.7	1019.0	9997.1	
GR1016.3	10080.9	1018.3	10100.5	1017.0	10182.7	1021.0	10206.2	1022.5	10535.4	
GR1022.7	10730.0	1020.9	10786.3	1022.2	10830.0	1020.0	10940.9	1020.5	10995.1	
GR1024.8	11038.2	1023.8	11093.5	1026.2	11173.8	1025.2	11479.7	1023.5	11509.9	
GR1025.0	11530.0	1025.3	11792.0	1030.1	11803.0	1026.0	11807.1	1026.0	12588.1	
GR1026.9	12590.0	1024.3	12605.5	1027.6	12686.2	1025.5	12692.0	1025.5	12804.6	
GR1029.5	12813.4	1029.4	12829.0	1030.1	12840.4	1025.4	12852.4	1027.0	12976.6	
GR1023.0	13084.8	1023.6	13128.6	1025.7	13157.2	1030.6	13170.4	1025.6	13186.4	
GR1026.3	13207.1	1035.7	13281.9	1037.3	13313.1	1033.3	13560.9	1028.0	13585.0	
GR1027.9	13597.0	1027.0	13597.8	1026.0	13930.0	1025.0	14270.0	1025.5	14580.0	
GR1025.4	14890.8	1026.5	15191.1	1027.2	15401.2	1028.4	15667.7	1032.4	15680.4	
GR1032.4	15692.0	1028.8	15700.0	1028.5	15707.9	1030.7	15740.9			

* NO ENCROACHMENT METHOD WAS APPLIED AT THIS CROSS SECTION. THERE COULD BE
 * ENCROACHMENT ON THE LEFT SIDE SET EQUAL TO THE LEVEE, BUT THIS IS NOT REALLY
 * NECESSARY WITH NO GEOMETRY DEFINED BEYOND THE TOP OF THE LEVEE ANYWAY.

QT	2	39000	39000							
NC	0.045	0.045	0.035	0.1	0.3					
X1	0.5	40	9205	10960	330	2200	1010			

* INEFFECTIVE FLOW ON RIGHT SIDE DEFINED BY 3:1 EXPANSION FROM CROSS SECTION #1
 * WITH ELENCR CHOSEN WELL ABOVE REASONABLE WATER SURFACE ELEVATION. RESULT
 * IS NO EFFECTIVE FLOW TO RIGHT OF STENCR UNDER ANY CIRCUMSTANCES.

GR1032.9	9205	1027.9	9210	1028	9244	1029	9252	1028	9260
GR 1027	9495	1028	9730	1029	9744	1028	9758	1026	9775
GR 1025	9812	1026	9850	1028	9895	1030	9910	1031	9915
GR 1030	9920	1028	9923	1026	9926	1024	9929	1022	9932
GR 1020	9935	1019	10000	1020	10043	1022	10106	1024	10182
GR 1026	10280	1027	10435	1026	10590	1025	10648	1026	10705
GR 1028	10825	1029	10960	1028	11095	1026	11140	1024	11240
GR 1022	11495	1021	11550	1022	11600	1024	11640	1024	11750

New River Input

ET		9.1	9.1					1387.07	3056.23	
X1	1	90	1387.07	3056.23	200	600	386			
X3	10									
GR	1028	1277.92	1028.5	1294.83	1029	1358.2	1032	1367.2	1033.5	1371.75
GR	1033.5	1387.07	1031	1392.07	1029	1396.04	1028.5	1461.66	1028	1477.78
GR	1027.5	1492.83	1027.5	1654.93	1028	1675.32	1027.5	1700.49	1024.5	1851.51
GR	1022	1977.37	1021	2027.69	1021	2053.82	1021.5	2080.85	1021.5	2105.82
GR	1021	2107.73	1020	2113.88	1019.5	2117.5	1019.5	2180.57	1020	2203.01
GR	1020.5	2217.95	1021	2230.07	1021.5	2237.03	1021.5	2244.9	1021	2278.36
GR	1021	2284.62	1021.5	2295.03	1022	2306.34	1022.5	2323.18	1023	2351.13
GR	1023.5	2374.01	1024	2378.11	1024.5	2382.75	1025	2388.91	1025.5	2395.95
GR	1026	2403.19	1026.5	2406.16	1027	2406.66	1027.5	2413.97	1028	2422.58
GR	1028.5	2434.52	1028.5	2437.74	1028	2439.95	1027.5	2441.98	1027	2444.23
GR	1026.5	2446.8	1026.5	2450.87	1027	2457.65	1027	2473.46	1026.5	2487.42
GR	1026	2523.34	1026	2575.56	1026.5	2582.49	1027	2587.59	1027.5	2592.49
GR	1028	2596.66	1028.5	2600.96	1029	2604.95	1029	2611.21	1028.5	2648.23
GR	1028.5	2747.55	1028	2757.27	1028	2757.43	1028.5	2767.46	1028.5	2800.36
GR	1029	2870.35	1029	2958.59	1029.5	2974.64	1030	3013.59	1032.5	3024.19
GR	1033	3026.39	1034	3031.07	1035.5	3038.31	1036.5	3043.24	1037	3045.77
GR	1038	3050.96	1039	3056.23	1039	3107.77	1038.5	3113.21	1037.5	3124.25
GR	1037	3129.92	1036.5	3136.31	1036	3143.02	1035.5	3150.1	1034.5	3165.02

ET		9.1	9.1					1433.95	2868.73	
X1	2	90	1433.95	2868.73	203.06	317.7	209.72			
X3	10									
GR	1032	1307.65	1028.5	1335.86	1029	1403.13	1030	1406.15	1030.5	1407.65
GR	1031.5	1410.67	1032	1412.17	1032.5	1413.68	1033.5	1416.68	1034	1418.17
GR	1034	1433.95	1031	1439.89	1030.5	1440.87	1029.5	1442.85	1029	1443.83
GR	1028.5	1523.54	1028	1595.63	1028	1688.32	1026	1789.12	1025.5	1814.3
GR	1024.5	1864.7	1024	1889.89	1023.5	1915.05	1023	1940.22	1022.5	1965.42
GR	1022	1990.58	1021.5	2015.72	1021.5	2041.65	1022	2068.67	1022.5	2095.7
GR	1023	2122.72	1023	2148.85	1022.5	2150.93	1022	2152.8	1021	2156.48
GR	1020.5	2158.37	1020	2160.48	1019.5	2162.89	1019.5	2180.39	1020	2209.21
GR	1020.5	2215.19	1021	2227.65	1021.5	2239.66	1022	2251.9	1022	2302.4
GR	1022.5	2329.46	1023	2421.75	1023.5	2499.64	1024	2585.42	1024.5	2604.3
GR	1025	2609.2	1026	2618.74	1026.5	2623.11	1027	2638.47	1027.5	2651.97
GR	1027.5	2776.34	1027.5	2800.56	1028.5	2824.08	1029	2835.95	1029	2845.12
GR	1029.5	2846.3	1030	2847.49	1031	2849.85	1031.5	2851.04	1035	2859.3
GR	1035.5	2860.47	1036.5	2862.83	1037	2864.01	1039	2868.73	1039	2889.59
GR	1038.5	2891.39	1038	2893.2	1037.5	2895	1037	2896.8	1036.5	2898.61
GR	1036	2900.41	1035.5	2902.21	1035	2904.01	1034.5	2905.81	1034	2907.62
GR	1033.5	2909.42	1033	2911.24	1032.5	2913.07	1032	2914.9	1031.5	2916.74
GR	1031	2918.59	1030.5	2920.44	1030	2922.29	1029	2925.99	1032	2940.81

ET		9.1	9.1					1445.85	2799.58	
X1	3	90	1445.85	2799.58	200.53	229.87	206.77			
X3	10									
GR	1032	1308.38	1028.5	1347.72	1029	1349.58	1029.5	1353.66	1030	1416.22
GR	1031.5	1420.76	1033	1425.31	1034.5	1429.85	1034.5	1445.85	1033	1448.87
GR	1031.5	1451.9	1030.5	1453.91	1030	1474.67	1029.5	1475.75	1029	1476.91
GR	1029	1479.5	1029.5	1480.71	1030	1481.78	1030	1561.12	1029.5	1599.01
GR	1029	1636.87	1028.5	1676.79	1028	1702.03	1027	1752.05	1026.5	1777.02
GR	1026	1802.09	1025.5	1826.93	1024.5	1876.44	1024	1901.25	1023.5	1926.16
GR	1022.5	1976.04	1022	2000.95	1022	2026.71	1024	2131.78	1024.5	2158.16
GR	1024.5	2173.5	1023.5	2177.18	1022.5	2180.88	1022	2182.74	1021.5	2187.43
GR	1020.5	2195.2	1020	2198.25	1019.5	2200.72	1019.5	2202.65	1020	2234.93
GR	1020.5	2247.4	1021	2259.09	1021.5	2273.86	1022	2292.16	1022.5	2318.3
GR	1023	2351.85	1023	2378.26	1022.5	2388.37	1022.5	2401.58	1023	2420.53
GR	1023.5	2448.49	1024	2544.06	1024.5	2650.64	1025	2660.41	1025.5	2664.61
GR	1026	2668.76	1026.5	2672.89	1027	2676.99	1027.5	2682.18	1028	2692.15
GR	1028.5	2699.32	1028.5	2710.39	1028	2752.85	1029.5	2756.39	1030	2757.58
GR	1031	2759.94	1033	2764.68	1035.5	2770.59	1036	2771.78	1038.5	2777.69
GR	1039	2778.88	1039	2799.58	1036.5	2808.46	1035.5	2812	1033.5	2819.1
GR	1033	2820.88	1030.5	2829.75	1029	2835.08	1028.5	2836.85	1028.5	2869.23
GR	1028	2878.98	1028	2892.82	1028.5	2896.87	1029	2900.67	1032.0	2904.49

ET		9.1	9.1					1444.17	2704.46
X1	4	90	1444.17	2704.46	197.59	229.66	200.44		

New River Input

X3	10								
GR1028.5	1349.09	1029	1360.78	1029.5	1371.07	1029.5	1411.42	1030.5	1414.46
GR 1031	1415.99	1032.5	1420.56	1033.5	1423.62	1034	1425.14	1035	1428.2
GR 1035	1444.17	1034	1446.15	1033.5	1447.13	1032	1450.1	1031.5	1451.08
GR1029.5	1455.04	1029.5	1477.06	1029.5	1641.76	1029	1666.6	1028.5	1691.43
GR1026.5	1790.79	1025.5	1840.49	1025	1865.35	1024.5	1890.2	1022.5	1989.64
GR1022.5	2017.35	1023.5	2068.27	1024	2093.74	1024.5	2119.2	1025.5	2170.15
GR 1026	2195.65	1026	2199.35	1025	2204.32	1024.5	2207.6	1024	2211.29
GR1023.5	2216.01	1023	2220.57	1022.5	2224.66	1022	2228.52	1021.5	2232.21
GR 1021	2235.74	1020.5	2238.82	1020	2269.16	1020	2271.07	1020.5	2279.51
GR 1021	2290.81	1021.5	2310.25	1022	2322.35	1022	2341.9	1022.5	2347.76
GR 1023	2354.27	1023.5	2362.5	1024	2468.29	1024.5	2500.4	1024.5	2504.99
GR 1024	2510.56	1023.5	2517.64	1023.5	2542.25	1024	2549.87	1024.5	2573.8
GR1024.5	2615.36	1025	2617.23	1025.5	2619.12	1025.5	2619.96	1025	2621.99
GR1024.5	2635.91	1024.5	2640.52	1025.5	2642.88	1026	2644.07	1027.5	2647.61
GR 1028	2648.98	1029.5	2652.34	1030	2653.53	1032	2658.25	1032.5	2659.44
GR 1034	2662.98	1034.5	2664.17	1036	2667.71	1036.5	2668.9	1038	2672.44
GR1038.5	2673.63	1039	2674.81	1039	2704.46	1038.5	2717.2	1038	2729.31
GR1037.5	2741.33	1037	2753.29	1036.5	2766.4	1036	2783.94	1035.5	2802.01

ET	9.1	9.1						1461.11	2550.34
X1	5	90	1461.11	2550.34	204.87	256.82	204.57		

X3	10								
GR 1029	1368.86	1029.5	1379.31	1030	1396.05	1030.5	1429.91	1031	1431.41
GR1031.5	1432.92	1032	1434.42	1034	1440.46	1034.5	1441.99	1035.5	1445.03
GR1035.5	1461.11	1034.5	1463.13	1033.5	1465.17	1033	1466.18	1030.5	1471.28
GR 1030	1603.32	1029.5	1658.56	1028.5	1708.54	1027.5	1758.54	1027	1783.55
GR1025.5	1858.55	1025	1883.56	1023.5	1958.56	1023	1983.57	1023	2011.47
GR1023.5	2036.47	1024	2061.48	1024.5	2086.48	1025	2111.49	1026.5	2186.52
GR1026.5	2198.92	1026	2200.55	1025.5	2202.3	1025	2204.17	1024.5	2206.11
GR 1024	2208.04	1023.5	2209.97	1023	2211.91	1023	2212.44	1023.5	2216.78
GR 1024	2221.13	1024.5	2225.49	1025	2229.86	1025	2249.7	1023	2255.82
GR1022.5	2257.36	1022	2258.89	1021.5	2260.43	1021	2261.97	1020.5	2263.52
GR1020.5	2299.49	1021	2304.98	1021.5	2314.9	1022	2333.23	1022.5	2353.09
GR1022.5	2382.36	1023	2391.01	1023.5	2406.07	1024	2438.47	1024.5	2464.6
GR 1025	2469.79	1025	2506.83	1024.5	2510.7	1024	2514.85	1024.5	2516.03
GR 1025	2517.21	1025.5	2518.4	1026.5	2520.76	1027	2521.95	1028.5	2525.49
GR 1029	2526.68	1030	2529.04	1030.5	2530.23	1031	2531.41	1031.5	2532.59
GR 1032	2533.78	1032.5	2534.96	1033	2536.14	1033.5	2537.33	1034	2538.51
GR1034.5	2539.69	1035	2540.88	1036.5	2544.42	1037	2545.61	1037.5	2546.79
GR 1038	2547.97	1038.5	2549.16	1039	2550.34	1039	2608.57	1038.5	2646.86

ET	9.1	9.1						1504.60	2465.18
X1	6	90	1504.6	2465.18	210	200	200		

X3	10								
GR 1031	1472.81	1032	1475.89	1033	1478.97	1033.5	1480.51	1034.5	1483.59
GR1035.5	1486.67	1035.5	1504.6	1035	1505.63	1034.5	1506.65	1034	1507.68
GR1033.5	1508.71	1032	1511.8	1031.5	1512.82	1031	1513.85	1030.5	1623
GR 1030	1657.26	1029.5	1682.48	1029	1707.71	1028.5	1732.93	1028	1758.16
GR1027.5	1783.41	1027	1808.66	1026.5	1833.92	1026	1859.22	1025.5	1884.54
GR 1025	1909.84	1024.5	1935.17	1024	1960.53	1023.5	1985.9	1023.5	2016.33
GR 1024	2041.22	1024.5	2066.04	1025.5	2115.64	1026.5	2165.26	1027.5	2214.88
GR1027.5	2240.35	1027	2243.75	1026.5	2247.37	1026	2258.25	1025.5	2261.78
GR 1025	2264.83	1024.5	2270.34	1024	2276.6	1023.5	2281.68	1023	2282.29
GR1022.5	2282.9	1022	2283.51	1021.5	2284.11	1021	2284.72	1020.5	2285.33
GR1020.5	2339.15	1021	2343.47	1021.5	2347.04	1022	2368.44	1022.5	2374.59
GR1022.5	2391.66	1023	2399.27	1023.5	2403.3	1024	2421.89	1024	2429.81
GR1023.5	2431.87	1023.5	2434.29	1024.5	2436.27	1025	2437.25	1025.5	2438.24
GR 1026	2439.22	1026.5	2440.21	1027	2441.2	1027.5	2442.18	1028	2443.17
GR1028.5	2444.16	1029	2445.14	1029.5	2446.13	1030	2447.12	1030.5	2448.1
GR 1031	2449.09	1031.5	2450.07	1032	2451.07	1032.5	2452.08	1033	2453.08
GR1033.5	2454.09	1035	2457.12	1035.5	2458.12	1036	2459.13	1036.5	2460.14
GR 1037	2461.15	1037.5	2462.15	1038	2463.16	1038.5	2464.17	1039	2465.18

ET	9.1	9.1						1513.27	2481.27
X1	7	90	1513.27	2481.27	193.09	150.18	169.55		

X3	10								
GR1032.5	1498.27	1032	1499.23	1031.5	1499.59	1031.5	1499.9	1032.5	1502.68
GR 1033	1504.12	1033.5	1505.65	1034	1507.17	1034.5	1508.7	1035	1510.22

New River Input

GR1035.5	1511.75	1036	1513.27	1036	1529.99	1034.5	1533.05	1034	1534.07
GR1033.5	1535.08	1032.5	1537.12	1032	1538.14	1031.5	1630.61	1031	1642.19
GR1030.5	1653.84	1030	1677.28	1029.5	1702.72	1029	1728.16	1028.5	1753.6
GR 1028	1779.03	1026.5	1855.35	1026	1880.81	1025.5	1906.28	1025	1931.76
GR1024.5	1957.26	1024	1982.77	1024	2022.94	1024.5	2047.77	1025	2072.59
GR1025.5	2097.4	1026	2122.14	1026.5	2146.84	1027	2171.57	1028	2221.11
GR1028.5	2245.87	1028.5	2246.42	1028	2250.45	1027.5	2254.5	1026	2266.68
GR1025.5	2270.74	1025	2276.99	1024.5	2289.64	1024	2295.67	1023.5	2300.28
GR1023.5	2314.68	1024	2316.85	1024	2319.1	1023.5	2319.64	1023	2319.78
GR1022.5	2326.68	1022	2362.15	1022	2364.03	1022.5	2384.33	1023	2402.5
GR1023.5	2411.1	1023.5	2418.74	1023.5	2446.78	1024	2447.87	1024.5	2448.98
GR 1025	2450.09	1025.5	2451.21	1026	2452.32	1026.5	2453.44	1027	2454.55
GR1027.5	2455.67	1028	2456.78	1028.5	2457.9	1029.5	2460.12	1030	2461.24
GR1030.5	2462.35	1031	2463.46	1031.5	2464.58	1032	2465.69	1032.5	2466.81
GR1033.5	2469.03	1034	2470.15	1035	2472.37	1035.5	2473.49	1036	2474.6
GR 1037	2476.82	1037.5	2477.94	1038	2479.05	1038.5	2480.16	1039	2481.27

ET	9.1	9.1						1525.08	2540.42
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X1	8	90	1525.08	2540.42	201.71	180.49	180.15		
X3	10								

GR1032.5	1512.97	1033	1514.48	1033.5	1516	1034	1517.51	1034.5	1519.03
GR1035.5	1522.05	1036	1523.57	1036.5	1525.08	1036.5	1540.7	1036	1541.71
GR 1035	1543.73	1034.5	1544.74	1033.5	1546.76	1033	1547.77	1032.5	1548.78
GR 1032	1549.79	1032	1598.75	1031.5	1622.28	1031	1648	1030.5	1673.73
GR 1030	1699.46	1029.5	1725.2	1029	1750.93	1028.5	1776.66	1028	1802.41
GR1027.5	1828.17	1027	1853.95	1026.5	1879.74	1026	1905.53	1025.5	1931.33
GR 1025	1957.13	1024.5	1982.93	1024.5	2029.58	1025	2054.37	1025.5	2079.16
GR 1026	2103.96	1026.5	2128.75	1027	2153.57	1027.5	2178.39	1028	2203.24
GR1028.5	2228.08	1028.5	2250.31	1028	2258.68	1027.5	2263.58	1027	2266.54
GR1026.5	2269.57	1026	2272.64	1025.5	2278.45	1025	2291.81	1024.5	2297.6
GR 1024	2304.17	1023.5	2311.3	1023	2348.13	1023	2391.8	1023	2416.59
GR 1023	2428.72	1023.5	2432.81	1024	2436.91	1024.5	2441	1025	2462.63
GR1025.5	2465.78	1025.5	2501.37	1025.5	2510.46	1026	2511.57	1026.5	2512.68
GR 1027	2513.79	1027.5	2514.9	1028	2516.01	1028.5	2517.12	1029	2518.23
GR1029.5	2519.34	1030	2520.45	1030.5	2521.56	1031	2522.67	1031.5	2523.78
GR 1032	2524.89	1032.5	2526	1033	2527.1	1033.5	2528.21	1034	2529.32
GR1034.5	2530.43	1035	2531.54	1035.5	2532.65	1036	2533.76	1036.5	2534.87
GR 1037	2535.98	1037.5	2537.09	1038	2538.2	1038.5	2539.31	1039	2540.42

ET	9.1	9.1						1520.29	2549.59
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X1	9	90	1520.29	2549.59	178.06	86.8	130.98		
X3	10								

GR 1033	1508.28	1034	1511.28	1034.5	1512.78	1035	1514.28	1035.5	1515.78
GR 1036	1517.29	1036.5	1518.79	1037	1520.29	1037	1535.67	1036.5	1536.68
GR 1036	1537.68	1035.5	1538.68	1035	1539.68	1034.5	1540.68	1034	1541.68
GR1033.5	1542.69	1033	1543.69	1032.5	1587.02	1032	1612.53	1031.5	1638.03
GR 1031	1663.53	1030.5	1689.03	1030	1714.54	1029.5	1740.04	1029	1765.55
GR1028.5	1791.07	1028	1816.59	1027.5	1842.15	1027	1867.78	1026.5	1893.42
GR 1026	1919.05	1025.5	1944.69	1025	1970.32	1024.5	1995.96	1024.5	2011.42
GR 1025	2036.21	1025.5	2061.01	1026	2085.8	1026.5	2110.6	1027	2135.39
GR1027.5	2160.18	1028	2184.96	1028.5	2209.74	1028.5	2210.13	1028	2215.67
GR1027.5	2218.01	1027	2220.5	1026.5	2223.03	1026	2225.57	1026	2227.51
GR 1026	2240.99	1025.5	2251	1025	2258.34	1024.5	2265.92	1024	2273.17
GR1023.5	2319.69	1023	2390.65	1023	2398.82	1023.5	2402.68	1024	2406.52
GR1024.5	2417.07	1025	2437.55	1025.5	2445.61	1026	2521.88	1026.5	2522.95
GR 1027	2524.01	1027.5	2525.08	1028	2526.14	1028.5	2527.21	1029	2528.27
GR1029.5	2529.34	1030	2530.41	1030.5	2531.47	1031	2532.54	1031.5	2533.6
GR 1032	2534.67	1032.5	2535.73	1033	2536.8	1033.5	2537.86	1034	2538.93
GR1034.5	2540	1035	2541.06	1035.5	2542.13	1036	2543.19	1036.5	2544.26
GR 1037	2545.32	1037.5	2546.39	1038	2547.46	1038.5	2548.52	1039	2549.59

ET	9.1	9.1						1505.00	2571.90
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X1	10	90	1505	2571.9	184.54	130.29	162.52		
X3	10								

GR1033.5	1493	1035	1497.5	1035.5	1499	1036	1500.5	1036.5	1502
GR 1037	1503.5	1037.5	1505	1037.5	1521.26	1037	1522.26	1036.5	1523.26
GR 1036	1524.26	1035.5	1525.26	1035	1526.26	1034.5	1527.26	1034	1528.26
GR1033.5	1529.26	1033	1583.69	1032.5	1609.27	1032	1634.86	1031.5	1660.45
GR 1031	1686.04	1030.5	1711.62	1030	1737.21	1029.5	1762.83	1029	1788.47

New River Input

GR1028.5	1814.11	1028	1839.8	1027.5	1865.57	1027	1891.35	1026.5	1917.12
GR 1026	1942.9	1025.5	1968.67	1025	1994.45	1025	2021.49	1025.5	2046.29
GR 1026	2071.09	1026.5	2095.88	1027	2120.68	1027.5	2145.48	1028	2170.28
GR 1028	2177.72	1027.5	2181.74	1027	2185.76	1026.5	2189.77	1026	2195.56
GR1025.5	2203.46	1025	2209.77	1024.5	2215.91	1024	2222.24	1024	2228.2
GR 1024	2274.22	1023.5	2280.72	1023	2363.53	1023	2369.87	1023.5	2388.7
GR 1024	2391.19	1024.5	2393.71	1025	2396.3	1025.5	2402.08	1026	2433.55
GR1026.5	2475.72	1027	2508.79	1027	2539.04	1026.5	2541.85	1026.5	2545.79
GR 1027	2546.84	1027.5	2547.88	1028	2548.93	1028.5	2549.97	1029	2551.01
GR1029.5	2552.06	1030	2553.1	1030.5	2554.15	1031	2555.19	1031.5	2556.24
GR 1032	2557.28	1032.5	2558.32	1033	2559.37	1033.5	2560.41	1034	2561.46
GR1034.5	2562.5	1035	2563.55	1035.5	2564.59	1036	2565.63	1036.5	2566.68
GR 1037	2567.72	1037.5	2568.76	1038	2569.81	1038.5	2570.85	1039	2571.9

ET	9.1	9.1						1474.85	2585.94
X1	11	90	1474.85	2585.94	201.64	212.25	206.89		
X3	10								

GR 1034	1462.85	1034.5	1464.35	1035	1465.85	1036	1468.85	1036.5	1470.35
GR 1037	1471.85	1038	1474.85	1038	1492.2	1037.5	1493.2	1036	1496.2
GR 1035	1498.2	1034.5	1499.2	1034	1500.2	1033.5	1585.62	1033	1611.43
GR1032.5	1637.11	1032	1662.8	1031.5	1688.46	1031	1714.09	1030.5	1739.73
GR 1030	1765.38	1029.5	1791.03	1029	1816.69	1028.5	1842.33	1028	1867.94
GR1027.5	1893.55	1027	1919.15	1026.5	1944.74	1026	1970.34	1025.5	1995.93
GR1025.5	2024.07	1026	2048.91	1026.5	2073.72	1027	2098.53	1027	2120.64
GR1026.5	2123.62	1026	2127.02	1025.5	2130.34	1025	2140.05	1024.5	2149.35
GR 1024	2203.23	1024	2229.38	1024	2249.3	1024	2285.1	1024.5	2290.39
GR1024.5	2291.71	1024	2298.45	1023.5	2305.15	1023.5	2309.08	1024	2315.55
GR1024.5	2320.05	1024.5	2323.23	1024	2330.36	1024	2331.92	1024.5	2336.96
GR 1025	2341.98	1025.5	2361.52	1026	2382.34	1026.5	2438.73	1026.5	2460.57
GR 1026	2464.1	1026	2475.2	1026.5	2482.73	1027	2501.43	1027.5	2510.64
GR 1028	2517.37	1028	2542.95	1028	2563.82	1028.5	2564.83	1029	2565.83
GR1029.5	2566.84	1030	2567.85	1030.5	2568.85	1031	2569.86	1031.5	2570.86
GR 1032	2571.87	1032.5	2572.87	1033	2573.88	1033.5	2574.88	1034	2575.89
GR1034.5	2576.89	1035	2577.9	1035.5	2578.9	1036	2579.91	1036.5	2580.91
GR 1037	2581.92	1037.5	2582.92	1038	2583.93	1038.5	2584.93	1039	2585.94

ET	9.1	9.1						1465.27	2583.35
X1	12	90	1465.27	2583.35	200	200	200		
X3	10								

GR1035.0	1360.95	1035	1437.23	1037.5	1444.73	1039	1449.23	1039	1465.27
GR 1035	1473.27	1034.5	1501.95	1034	1583.67	1033.5	1608.79	1033	1633.9
GR 1032	1684.12	1031.5	1709.22	1030	1784.55	1029.5	1809.65	1027.5	1910.09
GR 1027	1935.19	1026.5	1960.3	1026	1985.41	1026	2014.37	1026.5	2039.42
GR1026.5	2056.69	1026	2058.87	1025.5	2071.36	1025	2084.07	1024.5	2097.47
GR1024.5	2138.7	1025	2142.78	1025	2149.59	1024.5	2174.11	1024.5	2219.2
GR 1025	2221.77	1025.5	2224.32	1026	2229.07	1026.5	2242.16	1026.5	2282.42
GR1026.5	2290.04	1027	2306.81	1027	2352.34	1026.5	2366.82	1026.5	2371.93
GR 1027	2378.07	1027	2399.06	1026.5	2402.88	1026.5	2409.94	1027	2414.42
GR 1027	2419.8	1026.5	2437.63	1026.5	2453.09	1027	2464.78	1027.5	2490.31
GR 1028	2522.48	1028.5	2538.46	1029	2539.56	1029.5	2540.68	1030	2541.81
GR1030.5	2542.96	1031	2544.22	1031.5	2545.67	1032	2547.74	1032.5	2549.47
GR 1033	2551	1033.5	2552.46	1034	2553.83	1034.5	2555.13	1035	2556.43
GR1035.5	2557.72	1036	2559.02	1036.5	2560.29	1037	2561.52	1037.5	2562.61
GR 1038	2563.63	1039	2565.65	1039	2583.35	1038.5	2587.63	1038	2592.03
GR1037.5	2596.43	1037	2600.83	1036.5	2605.19	1036	2609.54	1035.5	2613.82
GR 1035	2617.42	1034.5	2620.36	1034	2622.42	1033	2626.64	1032.5	2628.75
GR 1032	2630.85	1031.5	2632.96	1031	2635.06	1030.5	2637.16	1035	2639.28

ET	9.1	9.1						1450.23	2541.66
X1	13	90	1450.23	2541.66	190.98	274.46	225.57		
X3	10								

GR 1035	1337	1035.5	1436.72	1038.5	1445.72	1039	1447.22	1039.5	1448.73
GR 1040	1450.23	1040	1466.45	1039.5	1467.45	1039	1468.46	1038	1470.46
GR1037.5	1471.47	1036	1474.47	1035.5	1475.48	1035	1562.86	1034.5	1588.3
GR1033.5	1638.34	1033	1663.37	1032	1713.41	1031.5	1738.44	1029.5	1838.52
GR 1028	1913.55	1026.5	1988.55	1026.5	2038.55	1026	2044.87	1025.5	2050.62
GR 1025	2055.51	1025	2092.93	1024.5	2170.18	1024.5	2191.4	1025	2196.27
GR1025.5	2202.12	1026	2212.79	1026.5	2222.54	1027	2246.06	1027	2286.05
GR1027.5	2292.37	1028	2311.78	1028.5	2337.36	1028.5	2358.04	1028	2368.13

New River Input

GR1027.5	2371.93	1027.5	2378.7	1028	2385.11	1028	2470.5	1028.5	2482.22
GR 1029	2492.72	1029.5	2500.15	1030	2503.03	1030.5	2505.09	1031	2506.94
GR1031.5	2508.39	1032	2509.66	1033	2511.86	1033.5	2512.97	1035.5	2517.37
GR 1036	2518.48	1036.5	2519.62	1037	2520.83	1037.5	2522.09	1038	2523.44
GR1038.5	2524.81	1039	2526.2	1039.5	2527.6	1040.5	2530.42	1041	2532.26
GR1041.5	2535.4	1041.5	2541.66	1041.5	2555.28	1041	2557.3	1040.5	2560.7
GR 1040	2563.37	1039.5	2565.13	1039	2566.79	1038.5	2568.44	1038	2570.1
GR1037.5	2571.78	1037	2573.54	1036.5	2575.4	1036	2577.47	1035.5	2579.65
GR1034.5	2584.03	1033.5	2588.39	1033	2590.54	1032.5	2592.64	1031.5	2596.84
GR 1031	2598.96	1030.5	2601.11	1030	2603.3	1029.5	2605.48	1035	2612.14

ET	9.1	9.1						1488.24	2523.99
X1	14	90	1488.24	2523.99	204.26	204.4	203.59		
X3	10								

GR 1036	1359.88	1036.5	1457.73	1039	1465.23	1039.5	1466.74	1041	1471.24
GR 1041	1488.24	1039.5	1491.24	1039	1492.25	1038	1494.25	1037.5	1495.26
GR1036.5	1497.26	1036	1537.28	1035.5	1569.8	1035	1594.6	1034.5	1619.42
GR 1034	1644.26	1033.5	1669.09	1033	1693.91	1032.5	1718.7	1031.5	1768.26
GR 1031	1793.04	1030.5	1817.83	1030	1842.63	1029.5	1867.44	1029	1892.28
GR1028.5	1917.12	1027.5	1966.82	1027	1991.66	1026.5	2014.97	1026.5	2019.09
GR 1027	2019.9	1027	2020.24	1026.5	2023.8	1026	2027.36	1025.5	2030.92
GR1025.5	2039.78	1026	2044.44	1026	2053.95	1025.5	2066	1025	2073.76
GR 1025	2109.29	1025.5	2165.95	1026	2171.12	1026.5	2187.08	1027	2207.82
GR1027.5	2236.48	1028	2273.26	1028.5	2306.07	1028.5	2349.8	1028	2361.5
GR 1028	2374.78	1028.5	2395.93	1029	2428.89	1029.5	2457.2	1030	2491.79
GR1030.5	2493.4	1031	2495	1031.5	2496.6	1032	2498.2	1032.5	2499.81
GR 1033	2501.41	1033.5	2503.01	1034	2504.62	1034.5	2506.23	1035	2507.83
GR 1036	2511.05	1037	2514.27	1037.5	2515.88	1039.5	2522.36	1040	2523.99
GR 1040	2548.43	1039.5	2550.52	1038.5	2554.82	1038	2556.97	1037.5	2559.13
GR 1037	2561.28	1036.5	2563.44	1036	2565.59	1035	2569.91	1034.5	2572.06
GR 1034	2574.22	1033.5	2576.38	1033	2578.53	1032.5	2580.69	1032	2582.85
GR1031.5	2585	1031	2587.16	1030.5	2589.31	1030	2591.75	1036.0	2594.36

ET	9.1	9.1						1514.58	2544.38
X1	15	90	1514.58	2544.38	209.27	229.7	207.93		
X3	10								

GR 1036	1398	1036	1406.18	1036.5	1409.41	1037	1422.94	1037.5	1484.26
GR 1038	1486.25	1038.5	1487.76	1040	1492.26	1040.5	1493.77	1041.5	1496.77
GR 1042	1498.28	1042.5	1500.78	1042.5	1514.58	1042	1515.9	1041	1517.9
GR1040.5	1518.91	1039.5	1520.91	1039	1521.92	1038	1523.92	1037.5	1533.46
GR 1037	1555.27	1036.5	1562.34	1036	1564.6	1034.5	1639.27	1033.5	1689.05
GR 1033	1713.95	1031	1813.51	1030.5	1838.41	1030	1863.29	1029.5	1888.18
GR 1028	1962.82	1027.5	1987.69	1027.5	2032.23	1027	2043.67	1026.5	2054.95
GR 1026	2058.25	1025.5	2061.57	1025	2093.29	1025	2100.72	1025.5	2128.34
GR 1026	2161.9	1026.5	2170.34	1027	2178.83	1027.5	2188.9	1028	2198.13
GR1028.5	2212.39	1028.5	2264.68	1028	2272.71	1028	2278.53	1028.5	2292.11
GR1028.5	2360.3	1029	2376.15	1029.5	2400.14	1029.5	2457.82	1030	2489.49
GR1030.5	2490.56	1031	2491.77	1031.5	2493.1	1032	2495.27	1032.5	2497.52
GR 1033	2499.14	1033.5	2500.64	1034	2502.13	1034.5	2503.54	1035.5	2506.2
GR 1036	2507.52	1037	2510.18	1037.5	2511.5	1038.5	2514.16	1039	2515.48
GR 1040	2518.14	1040	2544.38	1039.5	2547.8	1039	2550.79	1038.5	2553.82
GR 1038	2556.83	1037.5	2559.82	1037	2562.78	1036.5	2565.69	1035.5	2571.49
GR 1035	2574.39	1034.5	2577.3	1034	2580.22	1033.5	2583.12	1033	2586
GR1032.5	2588.89	1032	2591.79	1031.5	2594.69	1031	2597.84	1036.0	2602.96

ET	9.1	9.1						1513.51	2541.31
X1	16	90	1513.51	2541.31	205.1	195.34	201.34		
X3	10								

GR1037.0	1424	1036.5	1428.23	1037	1493.98	1037.5	1495.48	1038	1496.99
GR1039.5	1501.49	1040	1503	1041.5	1507.5	1042	1509.01	1043.5	1513.51
GR1043.5	1528.86	1042.5	1530.86	1042	1531.87	1041.5	1532.87	1041	1533.88
GR 1040	1535.88	1039.5	1536.89	1038.5	1538.89	1038	1539.9	1037.5	1540.9
GR 1037	1551.36	1036.5	1575.29	1036	1599.2	1035.5	1623.1	1035	1647.01
GR 1033	1742.61	1032.5	1766.47	1031.5	1814.13	1031	1837.95	1030.5	1861.76
GR 1030	1885.58	1029.5	1909.39	1029	1933.21	1028	1980.83	1028	2011.38
GR1027.5	2013.27	1027.5	2039.72	1027	2055.76	1026.5	2062.86	1026	2070.05
GR 1026	2072.7	1026.5	2081.48	1026.5	2086.81	1026	2088.54	1026	2120.01
GR1026.5	2124.43	1027	2133.2	1027.5	2146.85	1028	2160.02	1028	2225.95
GR 1028	2263.08	1028.5	2272.47	1029	2291.97	1029	2308.1	1028.5	2311.16

New River Input

GR 1028	2314.19	1028	2339.67	1028.5	2343.18	1029	2346.82	1029.5	2440.83
GR 1030	2474.2	1030.5	2475.27	1031	2476.36	1031.5	2477.46	1032	2478.59
GR1032.5	2479.87	1033	2481.27	1033.5	2482.8	1034	2484.73	1034.5	2487.33
GR 1035	2489.62	1035.5	2491.47	1036	2493.32	1036.5	2495.39	1037	2497.48
GR1037.5	2499.54	1038	2501.55	1038.5	2503.53	1039	2505.47	1039.5	2507.38
GR 1040	2509.25	1040	2541.31	1039.5	2556.13	1039	2563.5	1038.5	2569.46
GR 1038	2575.54	1037.5	2581.59	1037	2587.58	1036.5	2593.52	1037	2599.43

ET	9.1	9.1						1525.52	2529.54
X1	17	90	1525.52	2529.54	200	200	200		
X3	10								
GR1037.5	1415.51	1038	1418.13	1038.5	1420.91	1038.5	1422.59	1038	1422.99
GR1037.5	1423.33	1037.5	1427.47	1038	1427.96	1038.5	1428.98	1038.5	1441.53
GR1038.5	1508.99	1039.5	1511.99	1040	1513.5	1041.5	1518	1042	1519.51
GR1043.5	1524.01	1044	1525.52	1044	1541.66	1043.5	1542.66	1043	1543.67
GR 1041	1547.67	1040.5	1548.68	1038.5	1552.68	1038	1553.69	1037.5	1563.63
GR 1037	1586.77	1036.5	1610.06	1036	1633.52	1035.5	1656.9	1035	1680.31
GR1034.5	1703.76	1033.5	1750.58	1033	1774.02	1032.5	1797.49	1032	1820.93
GR1030.5	1891.07	1030	1914.63	1029.5	1938.54	1028.5	1986.42	1028.5	2036.52
GR 1028	2055.85	1027.5	2064.04	1027	2067.38	1027	2075.7	1027.5	2086.86
GR1027.5	2121.56	1028	2127.04	1028	2217.24	1028.5	2223.83	1028.5	2262.67
GR 1028	2268.99	1028	2273.11	1028.5	2280.16	1029	2287.06	1029	2287.48
GR1028.5	2289.97	1028	2302.22	1028	2327.84	1028.5	2332.34	1029	2336.92
GR1029.5	2348.63	1030	2388.94	1030.5	2473.08	1031	2474.66	1031.5	2476.23
GR 1032	2477.81	1032.5	2479.39	1033	2480.96	1034	2484.12	1034.5	2485.69
GR 1035	2487.27	1035.5	2488.84	1036.5	2492	1037	2493.57	1037.5	2495.13
GR 1038	2496.68	1038.5	2498.22	1039	2499.74	1039.5	2501.25	1040	2502.74
GR 1040	2529.54	1039.5	2532.51	1039.5	2539.64	1040	2548.44	1040.5	2557.69
GR1040.5	2603.05	1040	2614.05	1039.5	2621.9	1039	2630.17	1038.5	2639.46

ET	9.1	9.1						1533.12	2516.23
X1	18	90	1533.12	2516.23	213.29	152.74	195.19		
X3	10								
GR1037.5	1399.71	1038	1499.27	1041	1508.27	1044	1517.27	1044	1533.12
GR 1044	1533.73	1040.5	1540.73	1039.5	1542.73	1039	1543.73	1038.5	1544.73
GR 1038	1547.17	1037.5	1558.24	1037	1583.41	1036.5	1608.57	1036	1633.74
GR1035.5	1658.9	1035	1684.04	1034.5	1709.15	1034	1734.19	1033.5	1759.21
GR 1033	1784.25	1032.5	1809.32	1032	1834.41	1031.5	1859.47	1031	1884.45
GR1030.5	1909.39	1030	1934.31	1029.5	1959.23	1029	1984.14	1029	2019.43
GR 1029	2033.72	1028.5	2040.56	1028	2047.48	1027.5	2054.42	1027.5	2056.94
GR 1028	2066.14	1028.5	2077.82	1028.5	2085.89	1028.5	2134.78	1029	2147.47
GR1029.5	2155.76	1029.5	2156.63	1029	2171.4	1028.5	2178.99	1028	2183.35
GR 1028	2222.71	1028	2288.28	1028	2288.29	1028	2294.05	1028.5	2299.29
GR1028.5	2315.37	1028.5	2320.18	1029	2328.23	1029.5	2333.03	1030	2341.83
GR1030.5	2359.74	1031	2388.18	1031.5	2462.42	1032	2463.59	1032.5	2464.81
GR 1033	2466.08	1033.5	2467.4	1034	2468.78	1034.5	2470.2	1035	2471.8
GR1035.5	2473.49	1036	2475.17	1036.5	2476.86	1037	2478.54	1037.5	2480.23
GR 1038	2481.92	1038.5	2483.6	1039	2485.29	1039.5	2486.97	1040	2489.05
GR1040.5	2491.92	1040.5	2516.23	1040	2518.17	1039.5	2521.22	1039	2524.26
GR1038.5	2527.28	1038.5	2557.04	1039	2567.49	1039.5	2573.92	1040	2581.27
GR1040.5	2592.28	1041	2603.18	1041	2634.36	1040.5	2645.97	1040	2656.54

ET	9.1	9.1						1506.36	2489.17
X1	19	90	1506.36	2489.17	229.09	162.22	199.96		
X3	10								
GR 1038	1374.38	1038.5	1472.94	1039	1474.45	1039.5	1475.95	1040	1477.46
GR1040.5	1478.96	1041	1480.47	1041.5	1481.97	1042	1483.48	1043	1486.48
GR1043.5	1487.99	1044	1489.49	1044	1506.36	1043.5	1507.36	1043	1508.37
GR 1042	1510.37	1041.5	1511.37	1041	1512.38	1040	1514.38	1039.5	1515.39
GR1038.5	1517.39	1038	1565.33	1037.5	1589.83	1036	1663.3	1035.5	1687.8
GR 1035	1712.29	1034.5	1736.79	1034	1761.28	1033.5	1785.78	1033	1810.29
GR1032.5	1834.79	1032	1859.3	1031	1908.3	1030.5	1932.82	1030	1957.38
GR1029.5	1981.97	1029.5	2035.47	1029	2038.14	1029	2071.18	1028.5	2080.87
GR1028.5	2096.62	1028.5	2101.62	1029	2123.25	1029	2149.64	1028.5	2161.67
GR 1028	2168.89	1028	2220.05	1028	2250.85	1028.5	2255.4	1029	2259.94
GR1029.5	2269.35	1029.5	2296.68	1030	2303.55	1030.5	2310.36	1031	2329.01
GR1031.5	2345.29	1031.5	2400.55	1031.5	2451.53	1032	2453.19	1032.5	2454.86
GR1035.5	2464.82	1036	2466.48	1036.5	2468.13	1037.5	2471.45	1038	2473.1
GR1038.5	2474.76	1039.5	2478.06	1040	2479.71	1040.5	2481.35	1041	2483.27

New River Input										
GR	1041	2487.16	1041	2489.17	1041	2505.64	1040.5	2508.45	1040	2511.31
GR	1039.5	2514.42	1039	2517.86	1038.5	2521.07	1038	2524.55	1037.5	2528.08
GR	1037.5	2534.48	1038	2549.77	1038.5	2563.27	1039	2579.02	1039.5	2591.93
GR	1040	2601.24	1040.5	2609.64	1041	2618.56	1041.5	2628.05	1041.5	2633.13
ET		9.1	9.1						1474.87	2507.08
X1	20	90	1474.87	2507.08	200.47	202.9	199.13			
X3	10									
GR	1038	1379.07	1038.5	1441.16	1041	1448.66	1041.5	1450.17	1042	1451.67
GR	1042.5	1453.18	1043	1454.68	1043.5	1456.19	1044	1457.69	1044	1474.87
GR	1043	1476.87	1042.5	1477.88	1041	1480.88	1040.5	1481.89	1039.5	1483.89
GR	1039	1484.89	1038.5	1485.9	1038.5	1558.74	1038	1583.81	1037.5	1608.87
GR	1037	1633.96	1036.5	1659.09	1036	1684.31	1035.5	1709.67	1035	1735
GR	1034.5	1760.32	1034	1785.6	1033.5	1810.89	1033	1836.1	1032.5	1861.4
GR	1032	1886.82	1031.5	1912.31	1031	1937.84	1030.5	1963.38	1030	1988.92
GR	1030	2028.5	1029.5	2034.52	1029	2040.34	1028.5	2051.4	1028.5	2140.88
GR	1029	2154.76	1029.5	2172.29	1029.5	2240.32	1029.5	2249.56	1030	2255.28
GR	1030	2261.33	1030.5	2272.42	1031	2287.03	1031.5	2308.1	1032	2382.58
GR	1032	2419.74	1031.5	2441.45	1031.5	2454.13	1032	2456.66	1032.5	2458.23
GR	1033	2463.78	1033.5	2464.98	1034	2466.15	1034.5	2467.31	1035	2468.48
GR	1035.5	2469.62	1036	2470.78	1036.5	2471.91	1037	2473	1038	2475.16
GR	1038.5	2476.25	1040	2479.49	1040.5	2480.57	1041	2481.65	1041.5	2482.73
GR	1041.5	2507.08	1041	2510.73	1040.5	2514.32	1040	2517.64	1039.5	2520.33
GR	1038.5	2525.43	1038	2528.01	1037.5	2530.6	1037	2533.23	1037	2539.82
GR	1037.5	2555.92	1038	2571.58	1038.5	2582.29	1039	2589.78	1039.5	2599.9
GR	1040	2610.07	1040.5	2620.25	1041	2631.51	1041.5	2643.63	1042	2656.96
ET		9.1	9.1						1437.04	2483.82
X1	21	90	1437.04	2483.82	251.66	137.09	194.33			
X3	10									
GR	1038	1365.48	1038.5	1366.14	1039	1366.84	1039.5	1367.6	1040	1368.3
GR	1040.5	1380.47	1040.5	1410.03	1041	1411.55	1041.5	1413.07	1043	1417.6
GR	1043.5	1419.1	1044	1420.61	1044.5	1422.11	1044.5	1437.04	1044	1437.09
GR	1043.5	1437.13	1042.5	1437.23	1042	1437.27	1041	1437.37	1040	1437.49
GR	1039.5	1464.3	1039	1511.65	1038.5	1552.52	1038	1575.87	1037.5	1578.47
GR	1037	1582	1037	1586.71	1037.5	1589.12	1038	1590.72	1038	1601.01
GR	1037.5	1626.35	1037	1651.68	1036.5	1677	1036	1702.32	1035.5	1727.64
GR	1035	1752.98	1034.5	1778.31	1033.5	1828.95	1033	1854.26	1032.5	1879.58
GR	1031.5	1930.26	1031	1955.6	1030.5	1980.94	1030	2079.8	1030	2202.37
GR	1030.5	2206.37	1031	2218.45	1031.5	2241.5	1032	2264.04	1032.5	2301.68
GR	1033	2416.54	1033	2432.1	1033.5	2433.73	1034	2435.36	1034.5	2437
GR	1035	2438.65	1036	2441.97	1036.5	2443.64	1037	2445.32	1038	2448.7
GR	1038.5	2450.4	1039	2452.09	1039.5	2453.78	1040	2455.48	1040.5	2457.17
GR	1041	2458.86	1041.5	2460.56	1042	2462.25	1042	2483.82	1041.5	2487.11
GR	1041	2490.22	1040.5	2493.23	1040	2496.2	1039	2502.22	1038.5	2505.23
GR	1038	2508.24	1037.5	2511.25	1037	2514.28	1036.5	2517.33	1036.5	2517.92
GR	1037	2541.11	1037.5	2552.73	1038	2562.34	1038.5	2570.4	1039	2579.06
GR	1039.5	2590.03	1040	2599.9	1040.5	2609.9	1041	2623.42	1041.5	2634.89
ET		9.1	9.1						1392.40	2438.85
X1	22	80	1392.40	2438.85	230	160	190			
X3	10									
GR	1040.5	1271.22	1040.5	1286.91	1040	1314.9	1039.5	1339.01	1040	1379.01
GR	1040.5	1380.51	1041	1382	1041.5	1383.49	1042	1384.98	1042.5	1386.47
GR	1043	1387.95	1043.5	1389.43	1044	1390.92	1044.5	1392.4	1044	1408.78
GR	1043.5	1409.78	1043	1410.78	1042.5	1411.79	1042	1412.79	1041.5	1413.79
GR	1041	1414.8	1040.5	1415.8	1040	1416.81	1039.5	1417.82	1039.5	1420.34
GR	1039.5	1442.56	1039	1444.49	1038.5	1446.41	1038	1448.34	1037.5	1450.14
GR	1037	1451.74	1036.5	1453.18	1036	1454.96	1035.5	1463.01	1035.5	1604.93
GR	1035	1607.23	1034.5	1609.78	1034	1612.43	1033.5	1615.17	1033	1617.73
GR	1032.5	1620.33	1032	1622.98	1031	1628.75	1030.5	1655.87	1030	1675.64
GR	1029.5	1680.02	1029	1684.46	1028.5	1703.01	1028.5	1711.29	1029	1716.16
GR	1029.5	1717.13	1030	1717.9	1030.5	1718.67	1030.5	1984.66	1030	2057.3
GR	1029.5	2068.43	1029.5	2081.63	1030	2092.66	1030.5	2104.25	1031	2166.68
GR	1031.5	2173.97	1032.5	2224.33	1034.5	2402.07	1035	2403.76	1036	2407.14
GR	1037	2410.52	1037.5	2412.22	1038.5	2415.62	1039	2417.34	1040	2420.78
GR	1041.5	2425.97	1042	2427.7	1042.5	2438.85	1042.5	2446.24	1041.5	2452.41
GR	1040.5	2459.6	1040	2463.16	1039.5	2466.66	1039	2470.21	1041.0	2481.26

New River Input

ET		9.1	9.1					1387.54	2401.08
X1	23	67	1387.54	2401.08	241.22	170.62	197.65		
X3	10								
GR	1040	1263.65	1039	1285.73	1039.5	1313.79	1040	1342.25	1040.5 1359.65
GR	1042	1364.19	1043.5	1368.72	1044.5	1371.73	1044.5	1387.54	1043 1390.52
GR	1041	1394.52	1041	1399.23	1041.5	1427.71	1041.5	1460.51	1041 1464.3
GR1040.5		1467.36	1040	1470.36	1039.5	1473.11	1039	1475.63	1038 1479.25
GR	1037	1482.81	1036.5	1484.55	1036	1486.15	1035.5	1487.81	1035 1489.51
GR	1034	1492.96	1033	1496.61	1032.5	1498.45	1031	1504.04	1031 1567
GR1030.5		1579.13	1030	1586.34	1029.5	1589.34	1029.5	1604.63	1030 1617.21
GR1030.5		1630.69	1030.5	1925.7	1030	1936	1030	1941.32	1030.5 1942.21
GR	1031	1942.74	1031	1947.11	1030.5	1994.99	1030.5	2017.81	1031 2022.33
GR1031.5		2100.31	1032	2147.61	1032.5	2180.75	1033	2222.87	1033.5 2300.59
GR1033.5		2347.98	1035	2352.47	1036	2355.52	1036.5	2357.14	1037 2358.84
GR1037.5		2360.6	1038	2362.66	1038.5	2364.94	1039.5	2369.41	1040 2371.59
GR1040.5		2373.44	1042	2378.67	1042	2401.08	1040	2415.66	1040.0 2418.74
GR	1039	2420.92	1040	2425.06					

ET		9.1	9.1					1378.56	2360.72
X1	24	59	1378.56	2360.72	242.23	197.47	210		
X3	10								
GR	1043	1273	1043	1277.75	1042.5	1285.68	1041	1293.28	1040 1298.59
GR	1039	1302.87	1039	1328.19	1039.5	1337.13	1040	1339.28	1041.5 1345.3
GR	1042	1347.79	1042.5	1351.23	1043.5	1359.4	1044	1363.78	1044.5 1369.11
GR1045.5		1371.37	1045.5	1378.56	1043.5	1412.41	1043	1420.62	1042 1433.43
GR1041.5		1436.89	1040.5	1441.61	1038.5	1453.56	1035.5	1471.66	1033.5 1483.45
GR	1033	1485.88	1032	1489.41	1031.5	1492.56	1030	1499.8	1030 1502.97
GR	1031	1508.55	1031	1511.86	1028.5	1522.17	1028.5	1526.44	1029 1535.58
GR1029.5		1544.3	1030.5	1555.88	1031.5	1946.58	1031	1992.86	1031 1993.9
GR1031.5		1996.7	1032	2017.6	1032.5	2086.84	1032.5	2112.63	1032 2141.35
GR	1032	2180.2	1032.5	2198.63	1033	2228.53	1033.5	2334.62	1035 2338.84
GR	1036	2341.75	1038.5	2349.05	1040.5	2354.89	1042.5	2360.72	1042.5 2391.95
GR1041.5		2398.83	1041	2402.09	1040.5	2404.73	1043.0	2414.88	

QT	2	41000	41000						
NC	.045	.045	.035	0.2	0.4				
X1	44.00	16	9485.8	10384.1	231.97	289.42	258.6		
GR1044.9		9485.8	1030.75	9514.1	1030.75	9573	1031.5	9575	1032.0 9625
GR1032.0		9753	1032.0	9815	1034.0	9863	1034.0	9917	1032.0 9988
GR1031.8		10000	1032.0	10033	1034.0	10233	1035.06	10362	1044.0 10383
GR1045.1		10384.1							
X1	47.00	14	596	1357	300	300	300		
GR1045.0		596	1031.0	624	1031.0	682	1034.0	690	1034.0 740
GR1034.0		835	1034.0	897	1032.9	1000	1034.0	1099	1034.0 1184
GR1034.0		1194	1035.6	1336	1044.0	1356	1045.0	1357	
X1	51.50	13	760.8	1309.7	450	450	450		
GR1045.7		760.8	1031.4	789.4	1031.4	877.8	1034.0	883	1034.0 907
GR1034.0		962	1034.0	985	1033.9	1000	1034.0	1042	1035.3 1205
GR1036.0		1300	1040.0	1304	1045.7	1309.7			
X1	55.0	10	260	741.3	350	350	350		
GR	1047	260	1031.9	290	1031.9	450	1036.6	472.	1036.2 500
GR1036.0		525	1034.6	663	1034.3	716	1035.7	730	1047.0 741.3
X1	58.12	10	758	1163	662	662	662		
GR1049.1		758	1032.1	775	1032.1	1000	1032.1	1009	1036.6 1018
GR1036.0		1110	1036.0	1126	1038.0	1148	1040.0	1154	1049.0 1163
EJ									

T1 NEW RIVER CLOMR STUDY, PHASE II
T1 PREPARED FOR THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
T1 PREPARED BY WEST CONSULTANTS, INC., 12/20/99 - ADAPTED FROM A MODEL
T1 ORIGINALLY PREPARED BY SIMONS, LI & ASSOCIATES, INC., 03/20/1998
T2 NEW RIVER 100-YEAR FLOW W/NEW WADDEL DAM
T3 PROPOSED FLOODWAY CONDITION

J1	0	3	0	0	0	0	0	0	1026.38	0
J2	2	0	-1	0	0	0	-1	0	0	0

ER

NEW RIVER HEC-2 MODEL OUTPUT

New River Output

THIS RUN EXECUTED 28DEC99 14:48:40

 HEC-2 WATER SURFACE PROFILES
 Version 4.6.2; May 1991

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SED FLOODPLAIN CONDITION

SUMMARY PRINTOUT

ELMIN	SECNO	Q	CWSEL	DEPTH	EG	CRIWS	VCH	10*KS	XLCH	SSTA	TOPWID	ENDST
016.30	.100	54400.00	1026.34	10.04	1026.97	1024.42	6.46	24.46	.00	9340.01	2447.89	11794.38 1
016.30	.100	54400.00	1026.38	10.08	1027.03	1024.45	6.53	24.71	.00	9339.86	1814.00	11160.00 1
019.00	.500	39000.00	1029.38	10.38	1029.64	1026.76	3.79	16.32	1010.00	9208.53	2525.83	11750.00 1
019.00	.500	39000.00	1029.41	10.41	1029.66	1026.74	3.77	15.91	1010.00	9208.50	2526.14	11750.00 1
019.50	1.000	39000.00	1030.08	10.58	1030.55	1027.54	5.54	24.04	386.00	1393.90	1620.02	3013.92 1
019.50	1.000	39000.00	1030.09	10.59	1030.57	1027.53	5.52	23.79	386.00	1393.87	1620.11	3013.98 1
019.50	2.000	39000.00	1030.56	11.06	1030.93	1026.95	4.87	12.98	209.72	1440.74	1408.08	2848.82 1
019.50	2.000	39000.00	1030.57	11.07	1030.94	1026.95	4.86	12.90	209.72	1440.72	1408.12	2848.85 1
019.50	3.000	39000.00	1030.81	11.31	1031.22	1027.24	5.17	14.31	206.77	1453.29	1306.20	2759.49 1
019.50	3.000	39000.00	1030.82	11.32	1031.23	1027.24	5.16	14.26	206.77	1453.28	1306.23	2759.51 1
020.00	4.000	39000.00	1031.07	11.07	1031.55	1027.74	5.53	16.10	200.44	1451.93	1204.13	2656.06 1

						New River Output							
020.00	4.000	39000.00	1031.08	11.08	1031.55	1027.74	5.52	16.05	200.44	1451.92	1204.15	2656.07	1
020.50	5.000	39000.00	1031.34	10.84	1032.00	1028.56	6.53	23.80	204.57	1469.58	1062.63	2532.20	1
020.50	5.000	39000.00	1031.34	10.84	1032.00	1028.56	6.53	23.73	204.57	1469.57	1062.65	2532.21	1
020.50	6.000	39000.00	1031.74	11.24	1032.60	1029.50	7.46	31.36	200.00	1512.33	938.22	2450.55	1
020.50	6.000	39000.00	1031.74	11.24	1032.60	1029.50	7.45	31.29	200.00	1512.32	938.24	2450.56	1
022.00	7.000	39000.00	1032.27	10.27	1033.13	1029.97	7.46	31.00	169.55	1537.60	928.69	2466.29	1
022.00	7.000	39000.00	1032.27	10.27	1033.13	1029.97	7.46	30.96	169.55	1537.59	928.70	2466.29	1
023.00	8.000	39000.00	1032.94	9.94	1033.61	1030.12	6.57	21.76	180.15	1547.88	979.10	2526.98	1
023.00	8.000	39000.00	1032.95	9.95	1033.62	1030.12	6.57	21.74	180.15	1547.88	979.10	2526.98	1
023.00	9.000	39000.00	1033.28	10.28	1033.89	1030.14	6.28	19.04	130.98	1543.12	994.28	2537.40	1
023.00	9.000	39000.00	1033.28	10.28	1033.89	1030.14	6.28	19.03	130.98	1543.12	994.29	2537.41	1

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	SECNO	Q	CWSEL	DEPTH	EG	CRIWS	VCH	10*KS	XLCH	SSTA	TOPWID	ENDST	
ELMIN													
023.00	10.000	39000.00	1033.63	10.63	1034.19	1030.22	6.00	17.19	162.52	1529.00	1031.67	2560.68	1
023.00	10.000	39000.00	1033.63	10.63	1034.19	1030.22	6.00	17.18	162.52	1529.00	1031.68	2560.68	1
023.50	11.000	39000.00	1034.01	10.51	1034.54	1030.45	5.85	16.74	206.89	1500.19	1075.70	2575.90	1
023.50	11.000	39000.00	1034.01	10.51	1034.54	1030.45	5.85	16.73	206.89	1500.19	1075.70	2575.90	1
	12.000	39000.00	1034.32	9.82	1034.92	1031.06	6.20	19.00	200.00	1531.66	1023.00	2554.66	1

New River Output

024.50	12.000	39000.00	1034.32	9.82	1034.92	1031.06	6.20	19.00	200.00	1531.56	1023.10	2554.66	1
024.50	13.000	39000.00	1034.71	10.21	1035.40	1031.77	6.69	21.71	225.57	1577.68	937.95	2515.63	1
024.50	13.000	39000.00	1034.71	10.21	1035.40	1031.77	6.68	21.71	225.57	1577.65	937.98	2515.63	1
024.50	14.000	39000.00	1035.13	10.13	1035.89	1032.40	6.97	24.27	203.59	1588.45	919.78	2508.23	1
025.00	14.000	39000.00	1035.13	10.13	1035.89	1032.40	6.97	24.26	203.59	1588.43	919.80	2508.23	1
025.00	15.000	39000.00	1035.64	10.64	1036.39	1032.90	6.93	23.97	207.93	1582.70	923.86	2506.56	1
025.00	15.000	39000.00	1035.64	10.64	1036.39	1032.90	6.93	23.97	207.93	1582.68	923.88	2506.56	1
026.00	16.000	39000.00	1036.12	10.12	1036.87	1033.31	6.98	23.72	201.34	1593.33	900.50	2493.83	1
026.00	16.000	39000.00	1036.12	10.12	1036.87	1033.31	6.98	23.72	201.34	1593.32	900.51	2493.83	1
027.00	17.000	39000.00	1036.58	9.58	1037.37	1033.88	7.12	24.84	200.00	1605.98	886.30	2492.28	1
027.00	17.000	39000.00	1036.58	9.58	1037.37	1033.88	7.12	24.84	200.00	1605.98	886.30	2492.28	1
027.50	18.000	39000.00	1037.07	9.57	1037.86	1034.39	7.12	25.27	195.19	1579.88	898.90	2478.78	1
027.50	18.000	39000.00	1037.07	9.57	1037.86	1034.39	7.12	25.26	195.19	1579.85	898.93	2478.78	1
028.00	19.000	39000.00	1037.57	9.57	1038.38	1034.94	7.22	26.02	199.96	1586.67	884.99	2471.66	1
028.00	19.000	39000.00	1037.57	9.57	1038.38	1034.94	7.22	26.02	199.96	1586.67	884.99	2471.66	1
028.50	20.000	39000.00	1038.09	9.59	1038.90	1035.48	7.18	25.93	199.13	1579.43	895.92	2475.35	1
028.50	20.000	39000.00	1038.09	9.59	1038.90	1035.48	7.18	25.93	199.13	1579.43	895.92	2475.35	1
030.00	21.000	39000.00	1038.58	8.58	1039.50	1036.47	7.73	33.52	194.33	1546.26	904.39	2450.66	1

						New River Output								
030.00	21.000	39000.00	1038.58	8.58	1039.50	1036.47	7.73	33.52	194.33	1546.26	904.39	2450.66	1	
*	22.000	39000.00	1039.44	10.94	1039.90	1035.61	5.42	11.36	190.00	1442.79	976.07	2418.86	1	
028.50	22.000	39000.00	1039.44	10.94	1039.90	1035.61	5.42	11.36	190.00	1442.79	976.07	2418.86	1	
028.50	23.000	39000.00	1039.66	10.16	1040.10	1035.26	5.35	9.77	197.65	1472.23	897.89	2370.11	1	
029.50	23.000	39000.00	1039.66	10.16	1040.10	1035.26	5.35	9.77	197.65	1472.23	897.89	2370.11	1	
029.50	24.000	39000.00	1039.87	11.37	1040.31	1035.54	5.38	10.10	210.00	1445.40	907.64	2353.04	1	
028.50	24.000	39000.00	1039.87	11.37	1040.31	1035.54	5.38	10.10	210.00	1445.40	907.64	2353.04	1	
028.50	44.000	41000.00	1040.08	9.33	1040.73	1036.90	6.50	17.04	258.60	9495.45	878.34	10373.78	1	
030.75	44.000	41000.00	1040.08	9.33	1040.73	1036.90	6.50	17.04	258.60	9495.45	878.34	10373.78	1	
030.75	47.000	41000.00	1040.50	9.50	1041.58	1038.34	8.33	31.08	300.00	605.02	742.63	1347.65	1	
031.00	47.000	41000.00	1040.50	9.50	1041.58	1038.34	8.33	31.08	300.00	605.02	742.63	1347.65	1	
031.00														

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	SECNO	Q	CWSEL	DEPTH	EG	CRIWS	VCH	10*KS	XLCH	SSTA	TOPWID	ENDST	
ELMIN													
031.40	51.500	41000.00	1041.75	10.35	1043.34	1039.77	10.10	38.70	450.00	768.70	537.05	1305.75	1
031.40	51.500	41000.00	1041.75	10.35	1043.34	1039.77	10.10	38.70	450.00	768.70	537.05	1305.75	1
031.90	55.000	41000.00	1043.01	11.11	1044.56	1040.35	9.98	31.22	350.00	267.93	469.38	737.31	1
031.90	55.000	41000.00	1043.01	11.11	1044.56	1040.35	9.98	31.22	350.00	267.93	469.38	737.31	1
	58.120	41000.00	1044.88	12.78	1046.28	1040.78	9.49	21.32	662.00	762.22	396.66	1158.88	1

New River Output

032.10 58.120 41000.00 1044.88 12.78 1046.28 1040.78 9.49 21.32 662.00 762.22 396.66 1158.88 1
 032.10

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SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 22.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO= 22.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

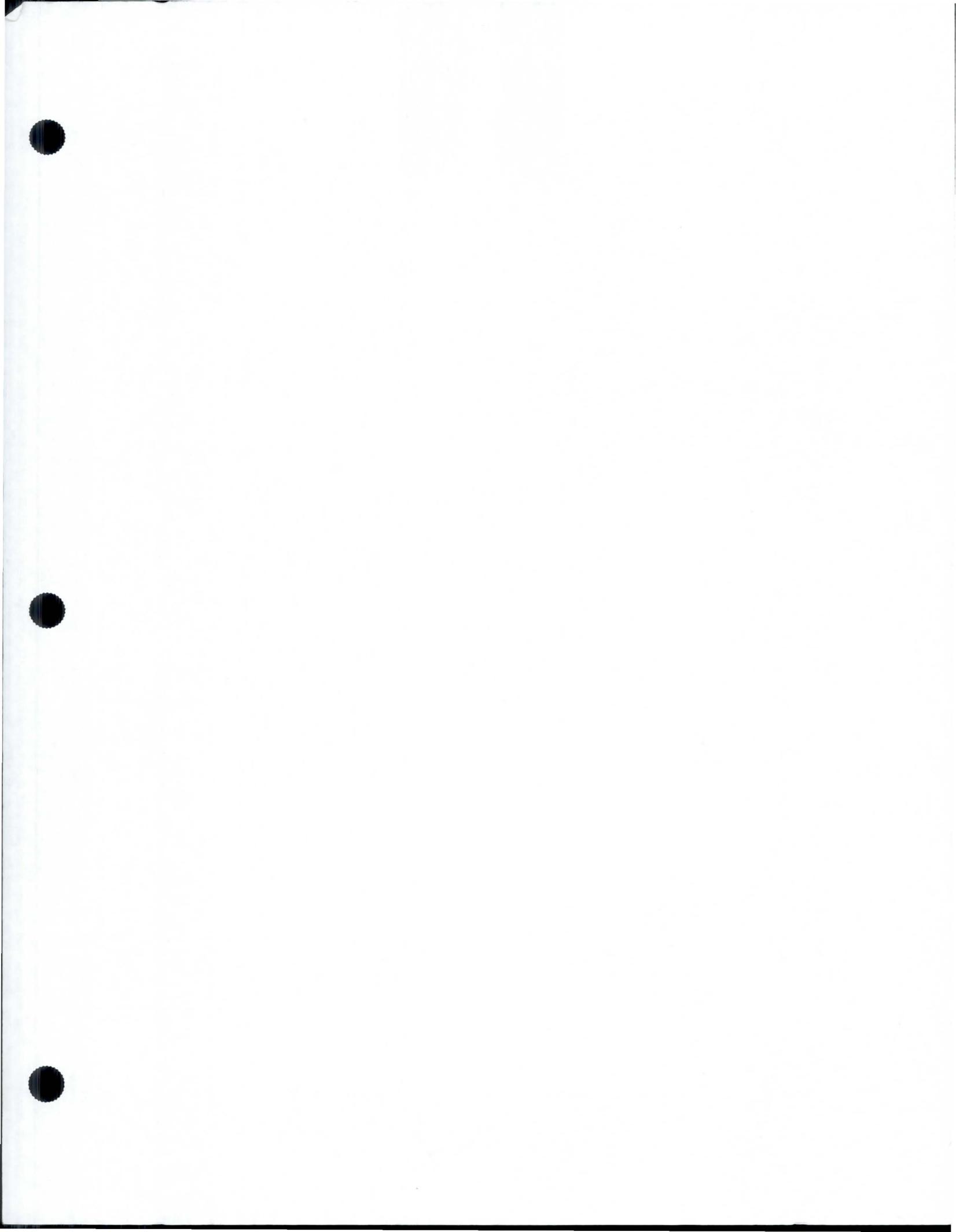
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 28DEC99 14:48:39

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FLOODWAY DATA, SED FLOODPLAIN CONDITION
 PROFILE NO. 2

STATION	FLOODWAY		MEAN VELOCITY	WATER SURFACE ELEVATION		DIFFERENCE
	WIDTH	SECTION AREA		WITH FLOODWAY	WITHOUT FLOODWAY	
.100	1820.	8643.	6.3	1026.3	1026.3	.0
.500	2542.	9762.	4.0	1029.4	1029.4	.0
1.000	1620.	7062.	5.5	1030.1	1030.1	.0
2.000	1408.	8023.	4.9	1030.6	1030.6	.0
3.000	1306.	7557.	5.2	1030.8	1030.8	.0
4.000	1204.	7061.	5.5	1031.1	1031.1	.0
5.000	1063.	5975.	6.5	1031.3	1031.3	.0
6.000	938.	5234.	7.5	1031.7	1031.7	.0
7.000	929.	5228.	7.5	1032.3	1032.3	.0
8.000	979.	5935.	6.6	1032.9	1032.9	.0
9.000	994.	6214.	6.3	1033.3	1033.3	.0
10.000	1032.	6504.	6.0	1033.6	1033.6	.0
11.000	1076.	6665.	5.9	1034.0	1034.0	.0
12.000	1023.	6287.	6.2	1034.3	1034.3	.0
13.000	938.	5834.	6.7	1034.7	1034.7	.0
14.000	920.	5599.	7.0	1035.1	1035.1	.0

							New River Output
15.000	924.	5629.	6.9	1035.6	1035.6	.0	
16.000	901.	5590.	7.0	1036.1	1036.1	.0	
17.000	886.	5477.	7.1	1036.6	1036.6	.0	
18.000	899.	5481.	7.1	1037.1	1037.1	.0	
19.000	885.	5398.	7.2	1037.6	1037.6	.0	
20.000	896.	5431.	7.2	1038.1	1038.1	.0	
21.000	904.	5047.	7.7	1038.6	1038.6	.0	
22.000	976.	7201.	5.4	1039.4	1039.4	.0	
23.000	898.	7289.	5.4	1039.7	1039.7	.0	
24.000	908.	7249.	5.4	1039.9	1039.9	.0	
44.000	878.	6304.	6.5	1040.1	1040.1	.0	
47.000	743.	4924.	8.3	1040.5	1040.5	.0	
51.500	537.	4058.	10.1	1041.8	1041.8	.0	
55.000	469.	4106.	10.0	1043.0	1043.0	.0	
58.120	397.	4319.	9.5	1044.9	1044.9	.0	



Section 3 -- WORK MAPS

Two 24" x 36" drawings of the revised floodplain.

One 11" x 17" detail drawing of the terminus of the Glendale Airport outlet channel.

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
FLOOD DELINEATION STUDY OF
CAMELBACK RANCH LEVEE NORTH

F.C.D. CONTRACT NO. 1999C048

LEGEND

100-YR FLOODPLAIN BOUNDARY	
100-YR FLOODWAY BOUNDARY	
HYDRAULIC BASE LINE	
CROSS SECTION	FP=100 YR WSE 0.54 FW=100 YR WSE
BASE FLOOD ELEVATIONS	1221
ZONE DESIGNATIONS	ZONE AE
ELEVATION REFERENCE MARKS	ERM10

ELEVATION REFERENCE MARKS

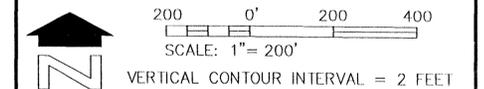
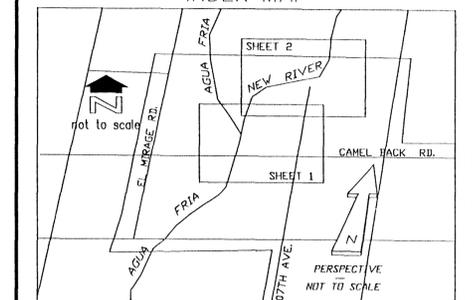
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

LD. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM18	1033.41	COTTON PICKER SPINDLE AT CENTERLINE OF CAMELBACK ROAD AND APPROX. 109TH AVE.
ERM20	1042.55	1/2" REBAR WITH ALUMINUM CAP ON WEST SIDE OF BIRM FOR FENCE AROUND AIRPORT.

NOTES

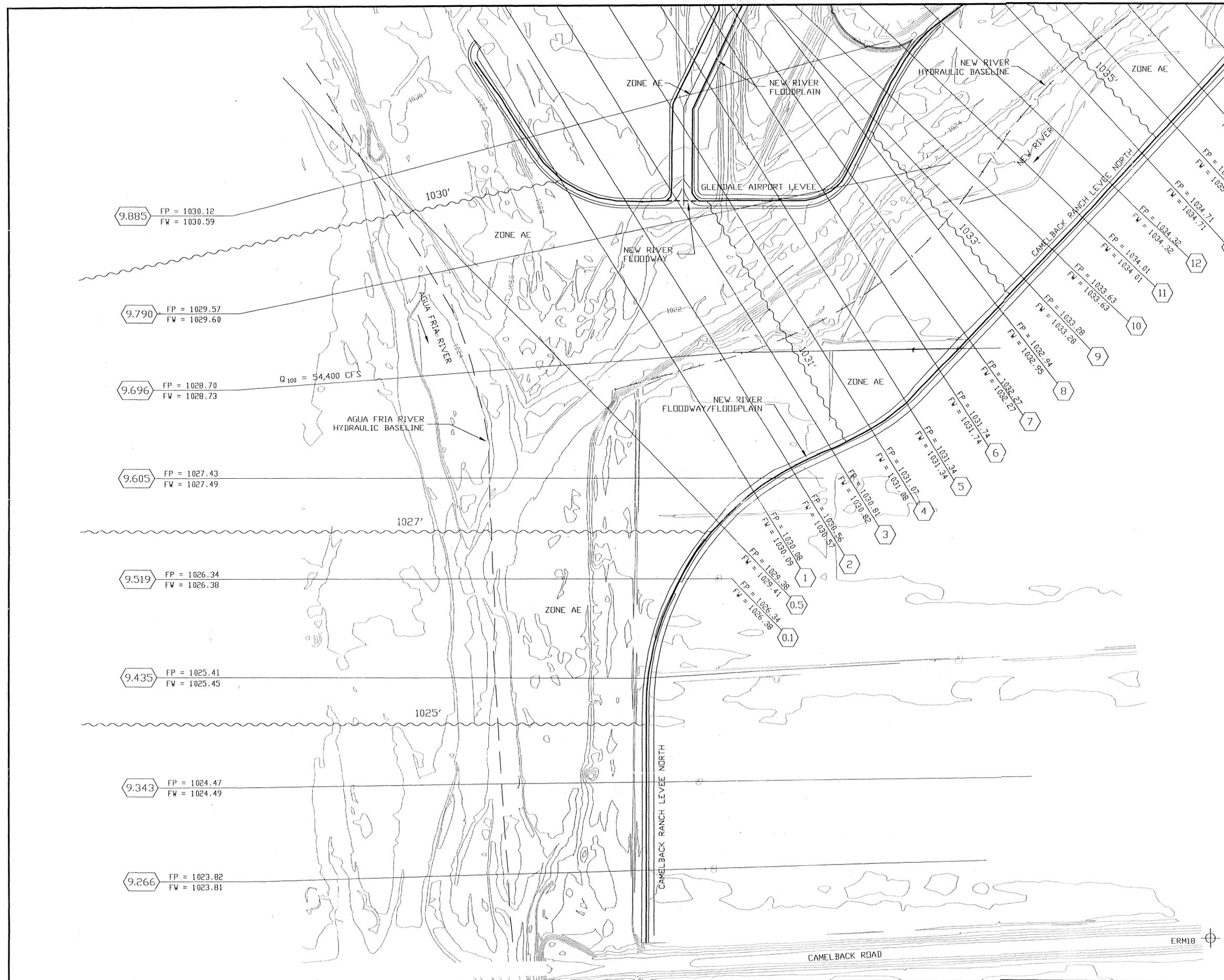
STARTING WATER SURFACE ELEVATION FOR NEW RIVER SECTION 0.1 TAKEN FROM REVISED AGUA FRIA RIVER SECTION 9.519 (WEST CONSULTANTS, 1/00)

INDEX MAP



WEST Consultants, Inc.

DESIGN	BY	DATE	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	---	---	RECOMMENDED BY: _____ DATE: _____
PLANS	JEH	01/00	APPROVED BY: _____ DATE: _____
PLANS CHK.	DLR	01/00	CHIEF ENGINEER AND GENERAL MANAGER
SUBMITTED BY:		DATE:	SHEET 1 OF 2



FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
FLOOD DELINEATION STUDY OF
CAMELBACK RANCH LEVEE NORTH

F.C.D. CONTRACT NO. 1999C048

LEGEND

100-YR FLOODPLAIN BOUNDARY	
100-YR FLOODWAY BOUNDARY	
HYDRAULIC BASE LINE	
CROSS SECTION	0.54
BASE FLOOD ELEVATIONS	1221
ZONE DESIGNATIONS	ZONE AE
ELEVATION REFERENCE MARKS	ERM10

ELEVATION REFERENCE MARKS

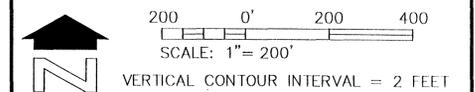
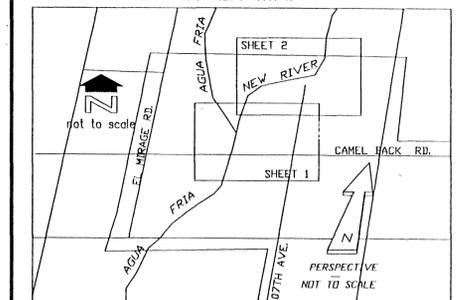
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

ID. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM18	1033.41	COTTON PICKER SPINDLE AT CENTERLINE OF CAMELBACK ROAD AND APPROX. 109TH AVE.
ERM20	1042.55	1/2" REBAR WITH ALUMINUM CAP ON WEST SIDE OF BIRM FOR FENCE AROUND AIRPORT.

NOTES

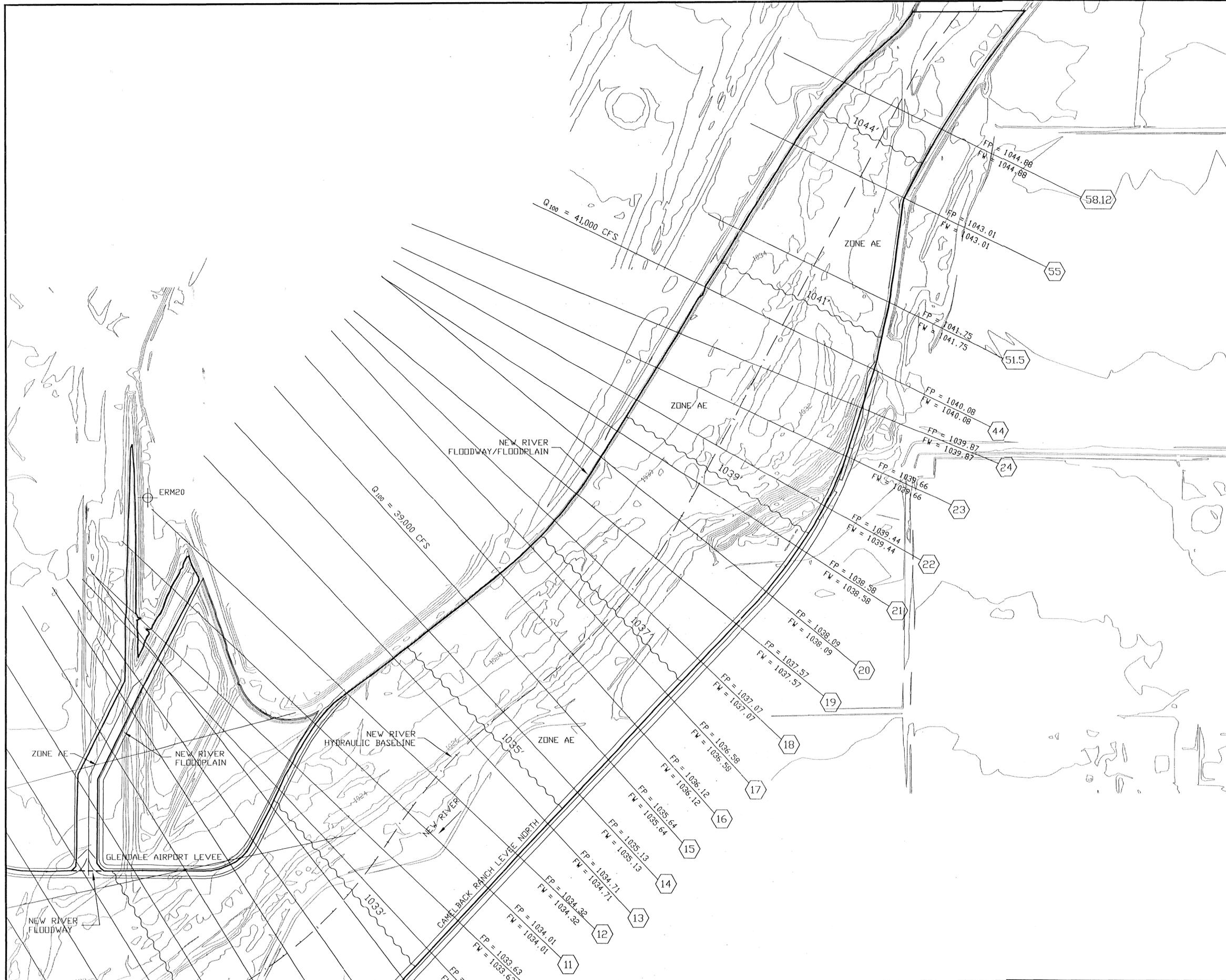
STARTING WATER SURFACE ELEVATION FOR NEW RIVER SECTION 0.1 TAKEN FROM REVISED AGUA FRIA RIVER SECTION 9.519 (WEST CONSULTANTS, 1/00)

INDEX MAP



WEST Consultants, Inc.

DESIGN	BY	DATE	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	---	---	
PLANS	JEH	01/00	RECOMMENDED BY: _____ DATE: _____
PLANS CHK.	DLR	01/00	APPROVED BY: _____ DATE: _____
SUBMITTED BY:			CHEF ENGINEER AND GENERAL MANAGER
			SHEET 2 OF 2



**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY**
FLOOD DELINEATION STUDY OF
CAMELBACK RANCH LEVEE NORTH

F.C.D. CONTRACT NO. 1999C048

LEGEND

100-YR FLOODPLAIN BOUNDARY	—————
100-YR FLOODWAY BOUNDARY	- - - - -
HYDRAULIC BASE LINE	—————
CROSS SECTION	FP=100 YR WSE (0.54) FW=100 YR WSE
BASE FLOOD ELEVATIONS	1221
ZONE DESIGNATIONS	ZONE AE
ELEVATION REFERENCE MARKS	ERM10

ELEVATION REFERENCE MARKS

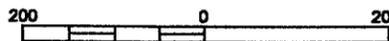
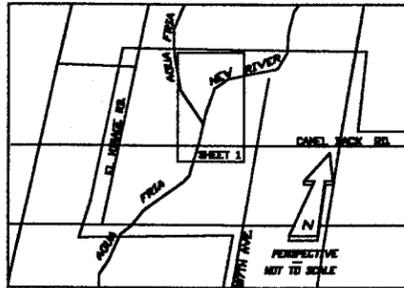
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

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ERM20	1042.55	1/2" REBAR WITH ALUMINUM CAP ON WEST SIDE OF BURN FOR FENCE AROUND AIRPORT.

NOTES

STARTING WATER SURFACE ELEVATION FOR NEW RIVER SECTION 0.1 TAKEN FROM REVISED AGUA FRIA RIVER SECTION 9.519 (WEST CONSULTANTS, 1/00)

INDEX MAP

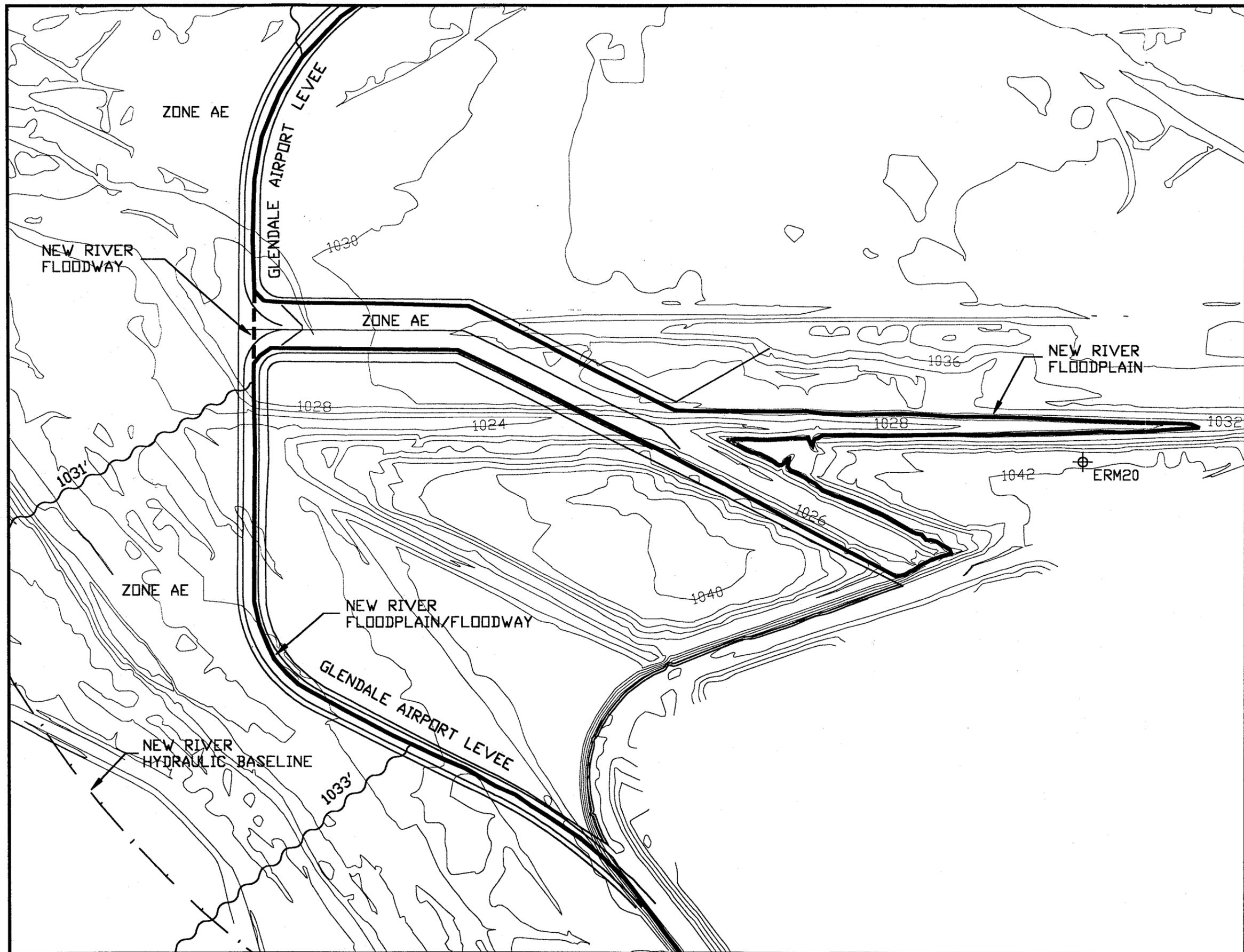


SCALE: 1" = 200'

VERTICAL CONTOUR INTERVAL = 2 FEET

WEST Consultants, Inc.

DESIGN	BY	DATE	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY	
DESIGN CHK.	---	---	RECOMMENDED BY	DATE
PLANS	JEH	01/00	APPROVED BY	DATE
PLANS CHK.	DLR	01/00	DRY RUBBER AND GENERAL MANAGER	
SUBMITTED BY:	DATE	SHEET	1	of 1

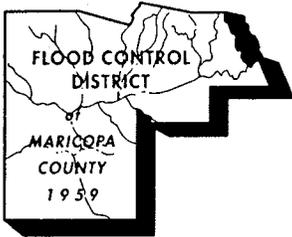


PHOTOGRAMMETRY BY KENNEY AERIAL MAPPING, INC. FLIGHT DATE 2/21/98



Section 4 --PUBLIC NOTICE LETTERS

Only two private property owners are affected by the proposed LOMR, and only two communities are affected. Copies of these four notices follow.



FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

January 6, 2000

John and Mary Long
P O Box 14029
Phoenix, AZ 85063

Subject: Notice of Intent to Revise Floodplain and Floodway

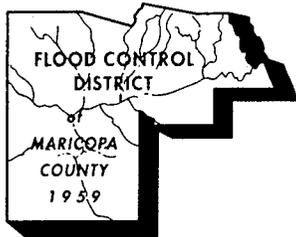
- Affected Areas:
- (1) Both sides of New River from the vicinity of Bethany Home Road alignment to Agua Fria River, and
 - (2) East side of Agua Fria River from New River to Camelback Road

As part of the Federal Emergency Management Agency (FEMA) review and approval process, we are sending this public notice to affected property owners and jurisdictions. Based on the recently completed Camelback Ranch Levee - North and the Glendale Airport Levee, the Flood Control District is pursuing the revision of the related floodplain and floodway. After approval, the revisions will be applied to FEMA's Flood Insurance Rate Maps.

The revised locations of the floodplain boundaries and floodway boundaries will be at the river-facing sides of the levees. If you would like to point out any relevant technical information, or have any questions about these revisions, please contact me at 602-506-4732.

Sincerely,

Michael Duncan, P.E.
Project Manager



FLOOD CONTROL DISTRICT
of
Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009-6399
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

January 6, 2000

Johnson Enterprises
1564 N. Alma School Road
Mesa, AZ 85201

Subject: Notice of Intent to Revise Floodplain and Floodway

Affected Areas:

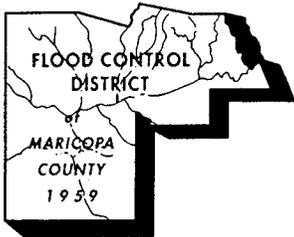
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Michael Duncan, P.E.
Project Manager



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Maricopa County

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BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

January 6, 2000

Grant Anderson, Floodplain Manager
City of Glendale
5850 W. Glendale Av.
Glendale, AZ 85301

Subject: Notice of Intent to Revise Floodplain and Floodway

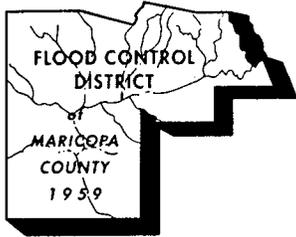
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Sincerely,

Michael Duncan, P.E.
Project Manager



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Maricopa County

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Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5897

BOARD OF DIRECTORS
Jan Brewer
Fulton Brock
Andrew Kunasek
Don Stapley
Mary Rose Garrido Wilcox

January 6, 2000

Cindy White, Floodplain Manager
City of Phoenix, 5th Floor
200 W. Washington St.
Phoenix, AZ 85003

Subject: Notice of Intent to Revise Floodplain and Floodway

- Affected Areas:
- (1) Both sides of New River from the vicinity of Bethany Home Road alignment to Agua Fria River, and
 - (2) East side of Agua Fria River from New River to Camelback Road

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Sincerely,

Michael Duncan, P.E.
Project Manager



Section 5 -- 404 PERMIT

A copy of the Section 404 Permit for the project, obtained from the Corps of Engineers in February 1999, follows.

DEPARTMENT OF THE ARMY PERMIT

Permittee:

Maricopa County Flood Control District
ATTN: Mr. Robert B. Stevens
2801 W. Durango Street
Phoenix, Arizona 85009

Permit Number: 984042600

Issuing Office: Los Angeles District

Note: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

1. The Glendale Airport Levee: To construct a soil cement levee on the west side of New River (approximately 5.5 acres within the jurisdictional waters of New River), immediately north of its confluence with the Agua Fria River, to the southwest of the existing Glendale Airport, in order to enable the extension of the Airport runway and to provide flood protection for the Airport expansion; the levee will have a base width of approximately 9-feet, a height of approximately 10-feet above ground surface, and a depth of approximately 20-feet below ground surface; the levee wraps back up an outfall channel using 60-foot radius curves while transitioning from a 1:1 slope face on New River to a 4:1 slope face on the outfall channel over the length of the curve; the Airport outfall channel bisects the levee, and discharges into New River; the levee terminates upstream at the existing gabion levee on the west side of New River, and it terminates downstream on the east bank of the Agua Fria River at the southwest side of the West Area Wastewater Reclamation Facility; approximately 111,056 cubic yards of embankment material will be needed to construct the levee and to backfill behind the levee for the Airport expansion; a total of 22,894 cubic yards of sand and gravel will be removed from New River for this embankment, and the balance will be imported from approved sources, or from the adjacent proposed channel expansion. Additionally, an El Paso Natural Gas line, which crosses New River in the location of the Glendale

Permit Conditions

General Conditions:

1. The time limit for completing the authorized activity ends on January 20, 2004. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification from this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of your permit.

Special Conditions: See attached sheet.

4. **Reliance on Applicant's Data:** The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. **Reevaluation of Permit Decision.** This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

- a. You fail to comply with the terms and conditions of this permit.
- b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
- c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measure ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. **Extensions.** General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give you favorable consideration to a request for an extension of this time limit.

SPECIAL CONDITIONS
PERMIT NO. 984042600

1. The permittee shall comply with all requirements and conditions in the letter of state water quality certification that the Arizona Department of Environmental Quality signed on September 11, 1998. This certification demonstrates that the permittee has complied with Section 401(a) of the Clean Water Act. A copy of this letter is enclosed.
2. Should previously unknown historic or archaeological remains be discovered while accomplishing activities authorized by this permit, the permittee shall immediately cease work in the area of discovery and this office shall be immediately notified. The permittee is restricted from entering any archeological sites on or adjacent to the project area.
3. No fill, or leveling is permitted in the watercourse, outside the boundaries of the 9.91 acre work area. Work shall be contained within the boundaries of this work area. The work area shall be clearly marked prior to the start of construction, and shall be maintained throughout construction.
4. Heavy equipment traffic is restricted from entering the watercourse, outside the boundaries of the permitted work area and the excavation site. Appropriate barricades shall be installed to preclude this activity. Access to the work area shall be by a single route.
5. During construction the work site shall be maintained such that no construction debris or material spillover is allowed in the watercourse. Upon completion of the work all construction debris and excess material shall be removed from the jobsite, and outside of the Corps' jurisdictional area.
6. During construction provide appropriate measures to accommodate flows within the watercourses, such that waters are not diverted outside the Ordinary High Water Mark.
7. Equipment shall not operate in the flowing waters of the watercourse. During flow events excavation/ construction shall cease, and all equipment shall be removed from within the ordinary high water mark until the area is dried out.
8. Pollution from the operation, repair, maintenance, and storage of equipment in the construction area shall be immediately removed from and properly disposed outside of the Corps' jurisdictional area. Spills shall be immediately cleaned up and properly disposed. Substances such as fuel, lubricants, solvents, and other hazardous materials shall not be stored within the Corps' jurisdictional area.



Section 6 -- MAINTENANCE PLANS

The inspection and maintenance procedures and schedules for Camelback Ranch Levee North follow.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Maintenance Procedures
Prepared for the Camelback Ranch Levee - North and South

SUBJECT: Maintenance of Channels, Basins and Structures

PURPOSE: To insure the integrity of the project is preserved and will function as designed.

PROCEDURE A:

1. Vegetation

Remove or destroy woody vegetation within the flow area of the channel/basin, collection ditches, or side inlet basins. Also remove trash or other objects that will impede flows in these areas. If grasses are established, maintain the height to a maximum of six inches.

2. Sediment Deposits

Remove deposits of loose material to obtain designed grades and cross sections. Loose deposited materials shall not be used within the channel/basin unless tested to meet the earthfill criteria in the construction specifications.

3. Erosion

Make repairs of eroded areas by replacing lost material with compacted earth, or other suitable erosion resistant material, in accordance with the original construction specifications.

PROCEDURE B: If the project has been landscaped, preserve the integrity of the landscape design.

PROCEDURE C: Rodent Control

1. Gophers can damage the structure by burrowing deep holes with more than one outlet. These can be identified by fresh mounds of soil.
2. Ground squirrels can also damage structures even with insignificant numbers and must be treated.
3. A licensed pesticide applicator shall apply the appropriate pesticide and the MSDS shall be with the licensed applicator.
4. After rodent activity has been controlled, holes are to be filled and compacted.

PROCEDURE D: Graffiti Removal

Graffiti needs to be removed as soon as possible to discourage repeated application.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division
Operation and Maintenance Procedure
CAMELBACK RANCH LEVEE-NORTH

Inspections:

1. Quarterly Operational Inspections:
 - a. List any discrepancies
 - b. Review for action required
 - c. Schedule necessary repairs

2. Annual Maintenance Inspection:
 - a. List all needed maintenance and repairs
 - b. Assign work orders for the noted repairs

3. Formal Annual Inspection:
 - a. Inspect project to insure all maintenance and repairs are completed satisfactorily.
 - b. Complete annual inspection reports for file.

4. Major Storm Event:
 - a. Inspect project during or after a major storm event
 - b. List any problems
 - c. Record impoundment depth.

5. Citizen Complaints/ Inquires:
 - a. Investigate area of complaint
 - b. Respond to citizen within 48 hours
 - c. Take action if in-house/refer to proper agency ,if not

O&M Responsibilities:

- CSA Levees
- All concrete and rip rap flood control structures and associated metal work (repair/refurbish and debris removal).
- Erosion repairs
- Debris removal
- Fencing and access gates
- Maintenance and access roads
- Flood Control District signs
- Safety hazards
- Rodent control
- Vandalism

OPERATIONAL INSPECTIONS SCHEDULE-2000:

O&M INSPECTIONS:	*JANUARY-2000	*APRIL-2000	*JULY-2000	*OCTOBER-2000
10st.Wash Basins				
48th St. Drain				
ACDC-REACH1-4				
ACDC/Cave Creek Arm				
Adobe Dam				
Agua Fria Fldwy.				
Alma School Drain				
Apache Jct.FRS/Fldwy.				
Buckeye #1				
Buckeye #2				
Buckeye #3				
Bulldog Fldwy.				
Camelback Rd. Ranch Levee				
Casandro Dam				
Cave Buttes/Cave Creek Dam				
Centennial Diversion				
Colter Channel				
Dreamy Draw Dam				
Dysart Drain				
E.M.F.				
East Fork Cave Creek				
East Valley Drains				
El Mirage Drain				
Guadalupe Dam				
Guadalupe Rd.Box				
Harquahala Fldwy.				
Harquahala FRS				
Holly Acres				
IBW-Greenbelt				
IBW-Inlet/Interceptor				
IBW-Outlet				
IBW-Side Drains/Collector				
Indian School Drain				
Laveen Basin				
McMicken Dam				
McMicken Fldwy.				
New River Channel				
New River Dam				
Old X-Cut Canal				
Pass Mtn.Div./Fldwy.				
Perryville Riprap				
Powerline Fldwy.				
Powerline FRS				
RID Overchute				
Rittenhouse FRS				
Rittenhouse Rd. Channel				
Saddleback Fldwy.				
Saddleback FRS				
Salt River Channel-Rio Salado				
Salt River Warning Signs				
Scatter.Wash				
Signal Butte Fldwy.				
Signal Butte FRS				
Skunk Creek Channelization				
Skunk Creek@I-17				
Sossaman Drain				
Spookhill FRS/Outlet				
Sun City Drains				
Sun City West Drains				
Sunnycove FRS				
Sunset FRS				
Sunset/Sunnycove Pipeline				
Vineyard FRS				
White Tanks #3				
White Tanks #4				

INSPECTION SCHEDULE FOR 2000

State Dam#	C.O.E. Structures (Dams)	Last Inspection-1999	Annual Inspection-2000	Informal Inspection-2000
#07.57	Adobe Dam	May-99	May-00	Dec-00
#07.56	Dreamy Draw Dam	May-99	May-00	Dec-00
#07.58	Cave Buttes/Cave Creek Dam	May-99	May-00	Dec-00
#07.55	New River Dam	May-99	May-00	Dec-00
	C.O.E. Channels & Floodways			
	A.C.D.C. & Cave Creek JOINT	May-99	May-00	Dec-00
	Skunk Creek @I-17	May-99	May-00	Dec-00
	Skunk Creek/New River Fldwy.	May-99	May-00	Dec-00
	SCS Structures (FRS)			
#07.52	Saddleback	Mar-99	Mar-00	
#07.53	Harquahala	Mar-99	Mar-00	
#07.48	Sunnycove	Sep-99	Sep-00	
#07.49	Sunset	Sep-99	Sep-00	
#07.28	White Tanks-3	Sep-99	Sep-00	
#07.29	White Tanks-4	Sep-99	Sep-00	
#07.42	Buckeye-1	Aug-99	Aug-00	
#07.44	Buckeye-2	Aug-99	Aug-00	
#07.45	Buckeye-3	Aug-99	Aug-00	
#11.02	Powerline	Jun-99	Jun-00	
#11.12	Rittenhouse	Jun-99	Jun-00	
#11.11	Vineyard	Jun-99	Jun-00	
#07.43	Guadalupe JOINT	Oct-99	Oct-00	
#07.50	Spookhill	Oct-99	Oct-00	
#07.60	Signal Butte	Oct-99	Oct-00	
#07.61	Apache Jct.	Oct-99	Oct-00	
	SCS Floodways			
	Harquahala Fldwy.	Mar-99	Mar-00	
	Saddleback Fldwy.	Mar-99	Mar-00	
	Powerline Fldwy.	Jun-99	Jun-00	
	Spookhill Fldwy./Basin	Nov-99	Dec-00	
	E.M.F. JOINT	Nov-99	Dec-00	
	Signal Butte Fldwy.	Nov-99	Dec-00	
	Bulldog Fldwy.	Nov-99	Dec-00	
	SCS DIVERSIONS			
	Centennial Levee	Mar-99	Mar-00	
	Pass Mountain Fldwy.	Nov-99	Dec-00	
	FCD Structures, Channels & Floodways			
	Holly Acres Rip Rap	Jan-99	Jan-00	
	Perryville Rip Rap	Jan-99	Jan-00	
	Salt/Gila Low Flow	Jan-99	Jan-00	
	Colter Channel	Jan-99	Jan-00	
#07.65	Cassandra Dam	Sep-99	Sep-00	
	Rio Salado	Jan-99	Jan-00	
	Alma School Drain	Apr-99	Apr-00	
	Agua Fria Floodway	Apr-99	Apr-00	
	Indian School Drain	Apr-99	Apr-00	
	48th St. Drain	Apr-99	Apr-00	
	Dysart Drain	Apr-99	Apr-00	
	El Mirage Drain	Apr-99	Apr-00	
#07.21	McMicken Dam	Jun-99	Jun-00	
	McMicken Floodway	Jun-99	Jun-00	
	Indian Bend Wash (C.O.E.) JOINT	Jul-99	Jul-00	
	Scatter Wash	Jul-99	Jul-00	
	East Fork/Cave Creek	Jul-99	Jul-00	
	Old Cross Cut JOINT	Jul-99	Jul-00	
	10th St. Basins JOINT	Jul-99	Jul-00	
	Sossaman Rd. Drain	Jun-99	Jun-00	
	Guadalupe Channel Box	Jun-99	Jun-00	
	Sun City Drains	Feb-99	Feb-00	
	Sun City West Drains	Feb-99	Feb-00	
	Paradise Valley Ret. Basin#4	Feb-99	Feb-00	
	Rittenhouse Rd. Channel	Feb-99	Feb-00	
	R.I.D. Overchute	Feb-99	Feb-00	
	Camelback Ranch Levee's	Feb-99	Feb-00	



Section 7 -- COMPACTION REPORTS

In-place-density test reports for fill and native materials follow.



Maxim Technologies, Inc.
 7031 W. Oakland St.
 Chandler, Arizona 85226
 Telephone: (480) 961-1169
 FAX: (480) 940-0952

**REPORT OF
 IN-PLACE DENSITY**

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 2

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 81953
 DATE OF SERVICE: 5/17/99
 AUTHORIZATION:
 REPORT DATE: 5/25/99

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction
METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
SPECIFICATION:
 DENSITY: 98% Min.
 MOISTURE:

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 6

TEST OF	MATERIALS	MOISTURE/DENSITY RELATIONS	REFERENCE REPORT NO
		OPTIMUM MOISTURE %	MAXIMUM DENSITY pcf
backfill/levee	Soil-cement fill	9.2	129.7

REPORT OF TESTS

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
1.	Sta 27+00 @ 17.5' below finish grade	11.7	9.2	141.7	126.9	129.7	98
2.	Sta 23+00 @ 14.5' below finish grade	11.3	9.2	142.6	128.1	129.7	99
3.	Sta 21+50 @ 14.5' below finish grade	11.3	9.2	142.8	128.3	129.7	99
4.	Sta 35+50 @ 17' below finish grade	9.2	9.2	141.9	129.9	129.7	100

Report Of Tests Continued On Page 2

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FLOOD CONTROL DISTRICT
 PROJECT NO. 9901047
 DATE OF SERVICE: 5/17/99

REPORT NO. 81953
 PAGE 2 OF 2

REPORT OF TESTS (Continued)

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
5.	Sta 29+00 @ 18' below finish grade	9.4	9.2	139.3	127.3	129.7	98
6.	Sta 21+00 @ 14' below finish grade	8.1	9.2	142.7	132.0	129.7	102
7.	Sta 31+00 @ 19' below finish grade	12.1	9.2	142.9	127.5	129.7	98
8.	Sta 15+00 @ 15.4' below finish grade	9.6	9.2	143.1	130.6	129.7	101

Test results on this report meet project specifications as noted on page 1.

Technician: Clifford Swindle
 Sr Engineering Technician

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Robert M. Anderson
 Robert M. Anderson, S.E.T.
 Laboratory Supervisor

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REPORT OF IN-PLACE DENSITY

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 82456
 DATE OF SERVICE: 6/09/99
 AUTHORIZATION:
 REPORT DATE: 6/11/99

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction

METHOD OF TEST:

DENSITY: ASTM D2922
 MOISTURE: ASTM D3017

SPECIFICATION:

DENSITY: 95% Min.
 MOISTURE:

GAUGE:

GAUGE SERIAL NO.:

STANDARD COUNTS

MOISTURE - CURRENT:

PREVIOUS:

DENSITY - CURRENT:

PREVIOUS:

TEST MODE: Direct Transmission

PROBE DEPTH (in.): 6

MOISTURE/DENSITY RELATIONS

OPTIMUM

MAXIMUM

MOISTURE %

DENSITY pcf

REFERENCE
REPORT NO

TEST OF	MATERIALS
East levee toe trench	Native

8.0

126.5

REPORT OF TESTS

TEST NO	LOCATION	FIELD	OPTIMUM	FIELD DENSITY		MAXIMUM	DENSITY (% max)
		MOISTURE (%)	MOISTURE (%)	WET	DRY	DENSITY (Pcf)	
1.	In middle of trench, approx. 30'W of centerline of levee @ Sta 82+00 @ 26' below finish grade	5.4	8.0	137.4	130.3	126.5	103
2.	Middle of trench approx. 30'W of centerline of levee @ Sta 76+00 @ 22' below finish grade	4.4	8.0	133.8	128.2	126.5	101

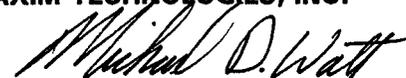
Test results on this report meet project specifications as noted above.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:

- (1) FLOOD CONTROL DISTRICT
- (1) FCD of Maricopa County
- (1) FNF Construction

MAXIM TECHNOLOGIES, INC.



Michael Watt

Sr Engineering Technician

REPORT OF IN-PLACE DENSITY

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT NO.: 9901047
 REPORT NO.: 82504
 DATE OF SERVICE: 6/10/99
 AUTHORIZATION:
 REPORT DATE: 6/11/99

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction
METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
SPECIFICATION:
 DENSITY: 95% Min.
 MOISTURE:

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 6

MOISTURE/DENSITY RELATIONS	
OPTIMUM MOISTURE %	MAXIMUM DENSITY pcf
11.0	114.0

REFERENCE
REPORT NO

TEST OF	MATERIALS
Levee embankment	Native

REPORT OF TESTS

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
1.	Approx. 15'W of centerline of Glendale levee @ Sta 36+00 @ 3' below finish grade	7.7	11.0	118.2	109.8	114.0	96
2.	Approx. 10'W of centerline, Glendale levee @ Sta 30+00 @ 3' below finish grade	7.7	11.0	117.6	109.2	114.0	96
3.	Approx. 10'E of centerline, E levee @ Sta 40+00 @ 1' below finish grade	7.9	11.0	121.1	112.2	114.0	98

Test results on this report meet project specifications as noted above.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael Watt
 Sr Engineering Technician



Maxim Technologies, Inc.
 7031 W. Oakland St.
 Chandler, Arizona 85226
 Telephone: (480) 961-1169
 FAX: (480) 940-0952

**REPORT OF
 IN-PLACE DENSITY**

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 2

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 82638
 DATE OF SERVICE: 6/15/99
 AUTHORIZATION:
 REPORT DATE: 6/17/99

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction
 METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
 SPECIFICATION:
 DENSITY: 95% Min.
 MOISTURE:

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 6

MOISTURE/DENSITY RELATIONS		REFERENCE
OPTIMUM	MAXIMUM	REPORT NO
MOISTURE %	DENSITY pcf	
8.3	126.5	
9.3	132.5	

TEST OF	MATERIALS
levee toe trench	Native
levee embankment	Native

REPORT OF TESTS

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
1.	In middle of trench @ Sta 38+00 @ 21' below finish grade	4.8	8.3	128.6	122.7	126.5	97
2.	In middle of trench @ Sta 43+00 @ 25' below finish grade	4.3	8.3	135.0	129.4	126.5	102
3.	Approx. 15'W of centerline of levee @ Sta 74+00 @ 6' below finish grade	10.0	9.3	142.4	129.5	132.5	98

Report Of Tests Continued On Page 2

FLOOD CONTROL DISTRICT
PROJECT NO. 9901047
DATE OF SERVICE: 6/15/99

REPORT NO. 82638
PAGE 2 OF 2

REPORT OF TESTS (Continued)

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
4.	Approx. 15' W of centerline of levee @ Sta 69+00 @ 8' below finish grade	7.7	9.3	143.4	133.1	132.5	100
5.	Approx. 15' W of centerline of levee @ Sta 43+00 @ 25' below finish grade	8.9	9.3	140.8	129.3	132.5	98
6.	Approx. 15' W of centerline of levee @ Sta 39+00 @ 20' below finish grade	10.4	9.3	145.9	132.1	132.5	100

Test results on this report meet project specifications as noted on page 1.

Technician: Robert Cowan
Engineering Technician

Report Distribution:
FLOOD CONTROL DISTRICT
FCD of Maricopa County
PNF Construction

MAXIM TECHNOLOGIES, INC.



Michael Watt
Sr Engineering Technician

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REPORT OF IN-PLACE DENSITY

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 2

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 83021
 DATE OF SERVICE: 6/30/99
 AUTHORIZATION:
 REPORT DATE: 7/01/99

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction

METHOD OF TEST:

DENSITY: ASTM D2922

MOISTURE: ASTM D3017

SPECIFICATION:

DENSITY: 98% Min.

MOISTURE:

GAUGE:

GAUGE SERIAL NO.:

STANDARD COUNTS

MOISTURE - CURRENT:

PREVIOUS:

DENSITY - CURRENT:

PREVIOUS:

TEST MODE: Direct Transmission

PROBE DEPTH (in.): 6

MOISTURE/DENSITY RELATIONS

OPTIMUM

MAXIMUM

MOISTURE %

DENSITY pcf

REFERENCE
REPORT NO

TEST OF

MATERIALS

Glendale levee
embankment

Soil-cement fill

8.4

134.2

REPORT OF TESTS

TEST NO	LOCATION	FIELD	OPTIMUM	FIELD DENSITY		MAXIMUM	DENSITY (% max)
		MOISTURE (%)	MOISTURE (%)	(pcf) WET	(pcf) DRY	DENSITY (Pcf)	
1.	Approx. 15'S of centerline of levee @ Sta 10+50 @ 5' below finish grade	6.8	8.4	143.1	134.0	134.2	100
2.	Approx. 15'S of centerline of levee @ Sta 15+00 @ 9' below finish grade	7.1	8.4	140.9	131.5	134.2	98
3.	Approx. 15'S of centerline of levee @ Sta 20+00 @ 15' below finish grade	10.3	8.4	145.2	131.6	134.2	98

Report Of Tests Continued On Page 2

FLOOD CONTROL DISTRICT
PROJECT NO. 9901047
DATE OF SERVICE: 6/30/99

REPORT NO. 83021
PAGE 2 OF 2

REPORT OF TESTS (Continued)

TEST NO	LOCATION	FIELD MOISTURE	OPTIMUM MOISTURE	FIELD DENSITY (pcf)		MAXIMUM DENSITY	DENSITY
		(%)	(%)	WET	DRY	(Pcf)	(% max)
4.	Approx. 15'S of centerline of levee @ Sta 25+00 @ 16' below finish grade	9.5	8.4	143.5	131.0	134.2	98
5.	Approx. 15' S of centerline of levee @ Sta 12+00 @ 7' below finish grade	8.2	8.4	143.2	132.4	134.2	99
6.	Approx. 12'S of centerline of levee @ Sta 17+00 @ 7.5' below finish grade	9.9	8.4	144.9	131.9	134.2	98
7.	Approx. 12'S of centerline of levee @ Sta 20+00 @ 14' below finish grade	11.8	8.4	146.5	131.0	134.2	98
8.	Approx. 12'S of centerline of levee @ Sta 24+00 @ 14' below finish grade	9.0	8.4	144.6	132.6	134.2	99

Test results on this report meet project specifications as noted on page 1.

Technician: Robert Cowan
Engineering Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.



Michael Watt
Sr Engineering Technician

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Maxim Technologies, Inc.
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 FAX: (480) 940-0952

**REPORT OF
 IN-PLACE DENSITY**

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 2

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 83283
 DATE OF SERVICE: 7/13/99
 AUTHORIZATION:
 REPORT DATE: 7/15/99

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction
 METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
 SPECIFICATION:
 DENSITY: 95% Min.
 MOISTURE:

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 6

MOISTURE/DENSITY RELATIONS		REFERENCE
OPTIMUM	MAXIMUM	REPORT NO
MOISTURE %	DENSITY pcf	
9.5	126.5	

TEST OF	MATERIALS
Engineered Fill	Native

REPORT OF TESTS

TEST NO	LOCATION	FIELD	OPTIMUM	FIELD DENSITY		MAXIMUM	DENSITY
		MOISTURE (%)	MOISTURE (%)	WET	DRY	DENSITY (Pcf)	DENSITY (% max)
1.	100'E & 200'N of Glendale levee @ Sta. 20+75 @ 1' below finish grade	5.7	9.5	126.6	119.8	126.5	95
2.	150'E & 750'N of Glendale levee @ Sta. 22+00 @ 1' below finish grade	6.8	9.5	132.8	124.4	126.5	98
3.	400'E & 1000'N of Glendale levee @ Sta. 25+50 @ 1' below finish grade	9.3	9.5	132.8	121.5	126.5	96

Report Of Tests Continued On Page 2

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FLOOD CONTROL DISTRICT
 PROJECT NO. 9901047
 DATE OF SERVICE: 7/13/99

REPORT NO. 83283
 PAGE 2 OF 2

REPORT OF TESTS (Continued)

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
4.	425'E & 700'N of Glendale levee @ Sta. 27+50 @ 1' below finish grade	4.7	9.5	129.4	123.6	126.5	98
5.	350'E & 400'N of Glendale levee @ Sta. 26+50 @ 1' below finish grade	10.4	9.5	136.5	123.6	126.5	98
6.	30'W of centerline of Glendale levee @ Sta. 30+75 @ 1' below finish grade	5.9	9.5	130.8	123.5	126.5	98
7.	50'W of centerline of Glendale levee @ Sta. 33+25 @ 1' below finish grade	6.8	9.5	128.7	120.5	126.5	95

Test results on this report meet project specifications as noted on page 1.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:
 FLOOD CONTROL DISTRICT
 CD of Maricopa County
 NF Construction

MAXIM TECHNOLOGIES, INC.

Michael D. Watt
 Michael Watt

Sr Engineering Technician

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**REPORT OF
 IN-PLACE DENSITY**

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT NO.: 9901047
 REPORT NO.: 83300
 DATE OF SERVICE: 7/14/99
 AUTHORIZATION:
 REPORT DATE: 7/15/99

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction
METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
SPECIFICATION:
 DENSITY: 95% Min
 MOISTURE:

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 6

TEST OF	MATERIALS	MOISTURE/DENSITY RELATIONS		REFERENCE REPORT NO
		OPTIMUM MOISTURE %	MAXIMUM DENSITY pcf	
Glendale levee toe trench	Native	9.5	126.5	

REPORT OF TESTS

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
1.	Center of trench @ Sta 28+50 @ 30' below finish grade	4.4	9.5	134.8	129.1	126.5	102
2.	Center of trench @ Sta. 34+50 @ 30' below finish grade	2.9	9.5	127.8	124.2	126.5	98

Test results on this report meet project specifications as noted above.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael D. Watt
 Michael Watt
 Sr Engineering Technician

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**REPORT OF
 IN-PLACE DENSITY**

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
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 PHOENIX, AZ 85009

PAGE 1 OF 2

PROJECT NO.: 9901047
 REPORT NO.: 83301
 DATE OF SERVICE: 7/14/99
 AUTHORIZATION:
 REPORT DATE: 7/15/99

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction

METHOD OF TEST:

DENSITY: ASTM D2922

MOISTURE: ASTM D3017

SPECIFICATION:

DENSITY: 98% Min.

MOISTURE:

GAUGE:

GAUGE SERIAL NO.:

STANDARD COUNTS

MOISTURE - CURRENT:

DENSITY - CURRENT:

TEST MODE: Direct Transmission

PROBE DEPTH (in.): 6

PREVIOUS:

PREVIOUS:

MOISTURE/DENSITY RELATIONS

OPTIMUM
MOISTURE %

MAXIMUM
DENSITY pcf

REFERENCE
REPORT NO

TEST OF MATERIALS
 Glendale levee Native

8.4

132.4

REPORT OF TESTS

TEST NO	LOCATION	FIELD	OPTIMUM	FIELD DENSITY		MAXIMUM	DENSITY (% max)
		MOISTURE (%)	MOISTURE (%)	WET	DRY	DENSITY (Pcf)	
1.	15'E of centerline of levee @ Sta. 28+00 @ 23' below finish grade	6.4	8.4	138.9	130.6	132.4	99
2.	15'E of centerline of levee @ Sta. 34+50 @ 20' below finish grade	8.5	8.4	143.6	132.4	132.4	100
3.	15'E of centerline of levee @ Sta. 28+55 @ 21' below finish grade	8.1	8.4	141.8	131.2	132.4	99

Report Of Tests Continued On Page 2



FLOOD CONTROL DISTRICT
 PROJECT NO. 9901047
 DATE OF SERVICE: 7/14/99

REPORT NO. 83301
 PAGE 2 OF 2

REPORT OF TESTS (Continued)

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
4.	15'E of centerline of levee @ 19' below finish grade	8.2	8.4	141.3	130.6	132.4	99
5.	15'E of centerline of levee @ Sta. 27+50 @ 18' below finish grade	7.5	8.4	139.8	130.1	132.4	98
6.	12'E of centerline of levee @ Sta. 32+00 @ 17' below finish grade	7.9	8.4	139.4	129.2	132.4	98
7.	12'E of centerline of levee A Sta. 27+75 @ 16' below finish grade	6.7	8.4	141.4	132.5	132.4	100

Test results on this report meet project specifications as noted on page 1.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:
 FLOOD CONTROL DISTRICT
 FCD of Maricopa County
 FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael Watt
 Sr Engineering Technician

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REPORT OF IN-PLACE DENSITY

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 83426
 DATE OF SERVICE: 7/20/99
 AUTHORIZATION:
 REPORT DATE: 7/26/99

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 6

METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
 SPECIFICATION:
 DENSITY: 98% Min.
 MOISTURE:

MOISTURE/DENSITY RELATIONS		REFERENCE REPORT NO
OPTIMUM MOISTURE %	MAXIMUM DENSITY pcf	
8.4	132.4	

TEST OF	MATERIALS
Glendale levee	Soil-cement fill

REPORT OF TESTS

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
1.	Approx. 8'W of centerline of levee @ Sta 28+50 @ 7' below finish grade	8.2	8.4	141.2	130.5	132.4	99
2.	Approx. 8'W of centerline of levee @ Sta 28+00 @ 5' below finish grade	6.8	8.4	139.0	130.2	132.4	98
3.	Approx. 8'W of centerline of levee @ Sta 33+00 @ 8' below finish grade	6.7	8.4	138.8	130.1	132.4	98

Test results on this report meet project specifications as noted above.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael D. Watt
 Michael Watt

Sr Engineering Technician

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Maxim Technologies, Inc.
 7031 W. Oakland St.
 Chandler, Arizona 85226
 Telephone: (480) 961-1169
 FAX: (480) 940-0952

**REPORT OF
 IN-PLACE DENSITY**

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 2

PROJECT NO.: 9901047
 REPORT NO.: 83461
 DATE OF SERVICE: 7/21/99
 AUTHORIZATION:
 REPORT DATE: 7/26/99

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

SERVICES:

PROJECT DATA

CONTRACTOR: FNF Construction

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 6

METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
 SPECIFICATION:
 DENSITY: 95% Min.
 MOISTURE:

MOISTURE/DENSITY RELATIONS		REFERENCE
OPTIMUM	MAXIMUM	REPORT NO
MOISTURE %	DENSITY pcf	
8.4	134.2	

TEST OF	MATERIALS
Glendale levee	Soil-cement fill

REPORT OF TESTS

TEST NO	LOCATION	FIELD	OPTIMUM	FIELD DENSITY		MAXIMUM	DENSITY (% max)
		MOISTURE (%)	MOISTURE (%)	WET	DRY	DENSITY (Pcf)	
1.	Approx. 4' W of centerline of levee @ Sta 27+50 @ 3' below finish grade	7.7	8.4	140.5	130.4	134.2	97
2.	Approx. 4' W of centerline of levee @ Sta 32+20 @ 5' below finish grade	6.9	8.4	144.5	135.2	134.2	101
3.	Approx. 4' W of centerline of levee @ Sta 27+00 @ 1.5' below finish pad	6.9	8.4	144.5	135.2	134.2	101

Report of Tests Continued On Page 2



FLOOD CONTROL DISTRICT
 PROJECT NO. 9901047
 DATE OF SERVICE: 7/21/99

REPORT NO. 83461
 PAGE 2 OF 2

REPORT OF TESTS (Continued)

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
4.	Approx. 4' W of centerline of levee @ Sta 31+50 @ 4' below finish grade	6.7	8.4	140.8	131.9	134.2	98
5.	Approx. 4' W of centerline of levee @ Sta 26+50 @ finish grade	7.4	8.4	142.9	133.1	134.2	99
6.	Approx. 6' W of centerline of levee @ Sta 31+00 @ 2' below finish grade	6.9	8.4	140.0	131.0	134.2	98

Test results on this report meet project specifications as noted on page 1.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:
 FLOOD CONTROL DISTRICT
 of Maricopa County
 Construction

MAXIM TECHNOLOGIES, INC.

Michael D. Watt

Michael Watt
 Sr Engineering Technician

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REPORT OF IN-PLACE DENSITY

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PAGE 1 OF 1

PROJECT NO.: 9901047
 REPORT NO.: 83497
 DATE OF SERVICE: 7/22/99
 AUTHORIZATION:
 REPORT DATE: 7/26/99

FLOOD CONTROL DISTRICT RECEIVED	
AUG 02 1999	
CHENG:	<input checked="" type="checkbox"/> P & R/M
PROJ:	REG:
ADMIN:	PW/LMGR
FINANCE:	CONTRACT
O & M:	FILE
ENGR:	1/ [Signature] 8/3/99
REMARKS:	12/CS

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction
METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
SPECIFICATION:
 DENSITY: 98% Min.
 MOISTURE:

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 6

TEST OF	MATERIALS	MOISTURE/DENSITY RELATIONS	REFERENCE REPORT NO
		OPTIMUM MOISTURE %	MAXIMUM DENSITY pcf
Glendale levee	Soil-cement fill	8.4	134.2

REPORT OF TESTS

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
1.	Approx. 4' W of centerline of levee @ Sta 38+00 @ finish grade	8.6	8.4	143.9	132.5	134.2	99
2.	Approx. 4' W of centerline of levee @ Sta 31+00 @ finish grade	7.8	8.4	143.1	132.7	134.2	99

Test results on this report meet project specifications as noted above.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael D. Watt

Michael Watt
 Sr Engineering Technician

REPORT OF IN-PLACE DENSITY

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 83526
 DATE OF SERVICE: 7/23/99
 AUTHORIZATION:
 REPORT DATE: 7/28/99

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction
METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
SPECIFICATION:
 DENSITY: 95% Min.
 MOISTURE:

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 10

TEST OF	MATERIALS	MOISTURE/DENSITY RELATIONS		REFERENCE REPORT NO
		OPTIMUM MOISTURE %	MAXIMUM DENSITY pcf	
Glendale levee, outfall channel for trench	Native	8.5	126.5	

REPORT OF TESTS

TEST NO	LOCATION	FIELD	OPTIMUM	FIELD DENSITY		MAXIMUM	DENSITY
		MOISTURE (%)	MOISTURE (%)	WET	DRY	DENSITY (Pcf)	DENSITY (% max)
1.	Middle of trench along Sta 22+00 of levee, approx. 60' N of centerline @ 1.5' below finished grade	9.4	8.5	136.5	124.8	126.5	99

Test results on this report meet project specifications as noted above.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:
 FLOOD CONTROL DISTRICT
 FCD of Maricopa County
 FNF Construction

MAXIM TECHNOLOGIES, INC.



Michael Watt
 Sr Engineering Technician

REPORT OF IN-PLACE DENSITY

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 2

PROJECT NO.: 9901047
 REPORT NO.: 83527
 DATE OF SERVICE: 7/23/99
 AUTHORIZATION:
 REPORT DATE: 7/28/99

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction
 METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
 SPECIFICATION:
 DENSITY: 98% Min.
 MOISTURE:

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 8

TEST OF	MATERIALS	MOISTURE/DENSITY RELATIONS	REFERENCE REPORT NO
		OPTIMUM MOISTURE %	MAXIMUM DENSITY pcf
Glendale levee, outfall channel along Sta 22+00	Soil-cement fill	8.4	134.2
	Soil-cement fill	8.5	126.5

REPORT OF TESTS

TEST NO	LOCATION	FIELD	OPTIMUM	FIELD DENSITY		MAXIMUM	DENSITY
		MOISTURE (%)	MOISTURE (%)	WET	DRY	DENSITY (Pcf)	DENSITY (% max)
1.	Approx. 60' N of centerline of levee in middle of channel @ .5' below finished grade	9.1	8.4	144.4	132.3	134.2	99
2.	Approx. 70' N of centerline on East side of channel @ 5' below finished grade	9.3	8.5	140.3	128.4	126.5	102
3.	Approx. 70' N of centerline on West side of channel @ 6' below finished grade	9.1	8.4	146.3	134.1	134.2	100

Report Of Tests Continued On Page 2

MAXIM

FLOOD CONTROL DISTRICT
PROJECT NO. 9901047
DATE OF SERVICE: 7/23/99

REPORT NO. 83527
PAGE 2 OF 2

REPORT OF TESTS (Continued)

TEST NO	LOCATION	FIELD	OPTIMUM	FIELD DENSITY		MAXIMUM	DENSITY
		MOISTURE (%)	MOISTURE (%)	(pcf) WET	DRY	DENSITY (Pcf)	(% max)
4.	Approx. 70'N of centerline on East side of channel @ 4' below finished grade	6.5	8.5	137.9	129.5	126.5	102

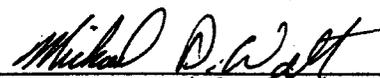
Test results on this report meet project
specifications as noted on page 1.

Technician: Robert Cowan
Engineering Technician

Report Distribution:

(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.


Michael Watt

Sr Engineering Technician

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REPORT OF IN-PLACE DENSITY

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 2

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 83558
 DATE OF SERVICE: 7/26/99
 AUTHORIZATION:
 REPORT DATE: 7/29/99

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction

METHOD OF TEST:

DENSITY: ASTM D2922
 MOISTURE: ASTM D3017

SPECIFICATION:

DENSITY: 98% Min.
 MOISTURE:

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 6

MOISTURE/DENSITY RELATIONS	
OPTIMUM	MAXIMUM
MOISTURE %	DENSITY pcf
8.5	130.5

REFERENCE
 REPORT NO.

TEST OF	MATERIALS
Glendale levee outfall channel opening	Soil-cement fill

REPORT OF TESTS

TEST NO	LOCATION	FIELD	OPTIMUM	FIELD DENSITY		MAXIMUM	DENSITY (% max)
		MOISTURE (%)	MOISTURE (%)	WET	DRY	DENSITY (Pcf)	
1.	Approx. 60'N of centerline of levee along Sta 22+00 on W side @ 5' below finished grade	10.2	8.5	140.9	127.9	130.5	98
2.	Approx. 60'N of centerline of levee along Sta 22+00 on E side @ 4' below finished grade	6.5	8.5	140.0	131.4	130.5	101
3.	Approx. 60'N of centerline of levee along Sta 22+00 on W side @ 4' below finished grade	8.5	8.5	138.5	127.6	130.5	98

Report Of Tests Continued On Page 2



FLOOD CONTROL DISTRICT
 PROJECT NO. 9901047
 DATE OF SERVICE: 7/26/99

REPORT NO. 83558
 PAGE 2 OF 2

REPORT OF TESTS (Continued)

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
4.	Approx. 60'N of centerline of levee along Sta 22+00 on E side @ 2' below finished grade	8.1	8.5	137.6	127.3	130.5	98
5.	Approx. 60'N of centerline of levee along Sta 22+00 on W side @ 2.5' below finished grade	8.0	8.5	138.0	127.8	130.5	98
6.	Approx. 60'N of centerline of levee on E side @ finished grade	8.9	8.5	140.8	129.3	130.5	99
7.	Approx. 60'N of centerline of levee on N side @ finished grade	8.1	8.5	139.3	128.9	130.5	99

Test results on this report meet project specifications as noted on page 1.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael D. Watt
 Michael Watt

Sr Engineering Technician

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REPORT OF IN-PLACE DENSITY

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PAGE 1 OF 2

PROJECT NO.: 9901047
 REPORT NO.: 83606
 DATE OF SERVICE: 7/27/99
 AUTHORIZATION:
 REPORT DATE: 8/02/99

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction
 METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
 SPECIFICATION:
 DENSITY: 95% Min.
 MOISTURE:

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 10

TEST OF	MATERIALS	MOISTURE/DENSITY RELATIONS	REFERENCE REPORT NO
		OPTIMUM MOISTURE %	MAXIMUM DENSITY pcf
Glendale levee fill	Native	9.5	126.5

REPORT OF TESTS

TEST NO	LOCATION	FIELD	OPTIMUM	FIELD DENSITY		MAXIMUM	DENSITY (% max)
		MOISTURE (%)	MOISTURE (%)	WET	DRY	DENSITY (Pcf)	
1.	Approx. 375'W of centerline of levee along Sta 35+25 @ finished grade	6.6	9.5	129.0	121.0	126.5	96
2.	Approx. 225'E of centerline of new channel along Sta 22+00 @ finished grade	6.9	9.5	128.2	119.9	126.5	95
3.	Approx. 100'E of centerline of new channel along Sta 23+50 @ finished grade	6.9	9.5	134.5	125.8	126.5	99

Report Of Tests Continued On Page 2



FLOOD CONTROL DISTRICT
 PROJECT NO. 9901047
 DATE OF SERVICE: 7/27/99

REPORT NO. 83606
 PAGE 2 OF 2

REPORT OF TESTS (Continued)

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
4.	Approx. 100'E of centerline of new channel along Sta 20+00 @ finished grade	9.5	9.5	132.6	121.1	126.5	96
5.	Approx. 125'E of centerline of new channel along Sta 15+00 @ finished grade	9.5	9.5	135.0	123.3	126.5	97
6.	Approx. 100'N of centerline of levee along Sta 22+50 @ finished grade	10.1	9.5	132.7	120.5	126.5	95
7.	Approx. 150'N of centerline of levee along Sta 26+00 @ finished grade	11.1	9.5	133.6	120.2	126.5	95
8.	Approx. 325'W of centerline of levee along Sta 31+00 @ finished grade	5.5	9.5	129.6	122.8	126.5	97
9.	Approx. 350'W of centerline of levee along Sta 32+50 @ finished grade	11.2	9.5	135.2	121.6	126.5	96
10.	Approx. 150'NW of centerline of levee along Sta 28+75 @ finished grade	8.0	9.5	133.8	123.9	126.5	98
11.	Approx. 100'W of centerline of levee along Sta 31+50 @ finished grade	10.4	9.5	135.9	123.1	126.5	97
12.	Approx. 100'W of centerline of levee along Sta 35+00 @ finished grade	9.6	9.5	136.4	124.4	126.5	98

Test results on this report meet project specifications as noted on page 1.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.


 Michael Watt
 Sr Engineering Technician

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REPORT OF IN-PLACE DENSITY

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PAGE 1 OF 2

PROJECT NO.: 9901047
 REPORT NO.: 83675
 DATE OF SERVICE: 7/29/99
 AUTHORIZATION:
 REPORT DATE: 8/03/99

FLOOD CONTROL DISTRICT	
RECEIVED	
AUG 09 1999	
CHENG	X P & PM
P/O	REG.
ADMIN	ENVLMGT
FINANCE	CONTRACT
99 & M	FILE
LEADER	1
REMARKS	2, 25

SERVICES: Perform in-place density and moisture content tests to determine the degree of field compaction.

PROJECT DATA

CONTRACTOR: FNF Construction
METHOD OF TEST:
 DENSITY: ASTM D2922
 MOISTURE: ASTM D3017
SPECIFICATION:
 DENSITY: 95% Min.
 MOISTURE:

GAUGE:
 GAUGE SERIAL NO.:
 STANDARD COUNTS
 MOISTURE - CURRENT: PREVIOUS:
 DENSITY - CURRENT: PREVIOUS:
 TEST MODE: Direct Transmission
 PROBE DEPTH (in.): 6

MOISTURE/DENSITY RELATIONS		REFERENCE
OPTIMUM	MAXIMUM	REPORT NO
MOISTURE %	DENSITY pcf	
11.0	114.0	

TEST OF	MATERIALS
Embankment fill Outfall channel, E side	Native

REPORT OF TESTS

TEST NO	LOCATION	FIELD MOISTURE (%)	OPTIMUM MOISTURE (%)	FIELD DENSITY (pcf)		MAXIMUM DENSITY (Pcf)	DENSITY (% max)
				WET	DRY		
1.	Approx. 75'W of centerline of channel @ Sta 13+00 @ 2' below finished grade	11.4	11.0	129.3	116.1	114.0	102
2.	Approx. 50'W of centerline of channel @ Sta 16+00 @ 2' below finished grade	12.6	11.0	126.1	112.0	114.0	98
3.	Approx. 60'N of centerline of channel @ Sta 12+75 @ finished grade	9.3	11.0	122.0	111.6	114.0	98

Report Of Tests Continued On Page 2



FLOOD CONTROL DISTRICT
 PROJECT NO. 9901047
 DATE OF SERVICE: 7/29/99

REPORT NO. 83675
 PAGE 2 OF 2

REPORT OF TESTS (Continued)

TEST NO	LOCATION	FIELD MOISTURE	OPTIMUM MOISTURE	FIELD DENSITY (pcf)		MAXIMUM DENSITY	DENSITY
		(%)	(%)	WET	DRY	(Pcf)	(% max)
4.	Approx. 50'W of centerline of channel @ Sta 16+50 @ finished grade	8.0	11.0	124.5	115.3	114.0	101
5.	Approx. 150'NW of centerline of new channel along Sta 21+00 @ finished grade	10.1	11.0	125.9	114.3	114.0	100

Test results on this report meet project specifications as noted on page 1.

Technician: Robert Cowan
 Engineering Technician

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael D. Watt

Michael Watt
 Sr Engineering Technician

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Section 8 -- SOIL CEMENT STRENGTH REPORTS

The specified minimum compressive strength for the project was 750 psi.

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 81860
 DATE OF SERVICE: 5/13/99
 AUTHORIZATION:
 REPORT DATE: 5/20/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

FLOOD CONTROL DISTRICT RECEIVED	
MAY 25 1999	
CHENG	AP & PM
PIO	REC
ADMIN	INWLMGT
FINANCE	CONTRACT
O & M	2 25
ENTER	
REMARKS	<i>[Signature]</i>

5/20/99

PROJECT DATA

CONTRACTOR: FNF Construction
 SPECIFICATION REQUIREMENTS
 STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/13/99 TIME:
 TIME SAMPLED: TIME MOLDING COMPLETE:
 OPT. MOISTURE (%): 9.2 MAX. DENSITY (pcf): 129.7
 SAMPLED BY: Clifford Swindle
 LOCATION: Sta. 25+00 @ 18.4' below
 finish grade

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 0
 SAMPLE MOISTURE CONTENT: 10.2%
 SAMPLE SIZE: 4x4
 CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
1A	5/20/99	7	136.6	12.66	12970	1025
1B	5/20/99	7	135.5	12.57	11870	945
1C	5/20/99	7	134.0	12.57	10780	860
1D	6/10/99	28				

Average 7 day compressive strength results comply with specified strength.

Technician: Bruce Nicholls

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Robert M. Anderson
 Robert M. Anderson, S.E.T.
 Laboratory Supervisor

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 81886A
DATE OF SERVICE: 5/14/99
AUTHORIZATION:
REPORT DATE: 5/21/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

MIXING COMPLETE - DATE: 05/14/99 TIME:
TIME SAMPLED: 9:50AM TIME MOLDING COMPLETE:
OPT. MOISTURE (%): 9.2 MAX. DENSITY (pcf): 129.7
SAMPLED BY: Bruce Nicholls
LOCATION: Sta. 12+45 @ 16' below finish
grade

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 0
SAMPLE MOISTURE CONTENT: 9.5%
SAMPLE SIZE: 4x4
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

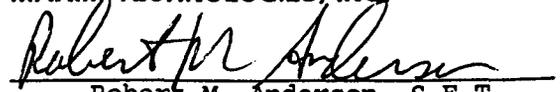
SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
2A	5/21/99	7	142.7	12.62	16660	1320
2B	5/21/99	7	141.0	12.69	15760	1240
2C	5/21/99	7	141.1	12.58	15970	1270
2C	HOLD					

Technician: Bruce Nicholls

Report Distribution:

- (1) FLOOD CONTROL DISTRICT
- (1) FCD of Maricopa County
- (1) FNF Construction

MAXIM TECHNOLOGIES, INC.


Robert M. Anderson, S.E.T.
Laboratory Supervisor

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 81886B
 DATE OF SERVICE: 5/14/99
 AUTHORIZATION:
 REPORT DATE: 5/21/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
 compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
 SPECIFICATION REQUIREMENTS
 STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/14/99 TIME:
 TIME SAMPLED: 11:50A TIME MOLDING COMPLETE:
 OPT. MOISTURE (%): 9.2 MAX. DENSITY (pcf): 129.7
 SAMPLED BY: Bruce Nicholls
 LOCATION: Sta. 26+00 @ 15' below finish
 grade

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 0
 SAMPLE MOISTURE CONTENT: 11.4%
 SAMPLE SIZE: 4x4
 CURING: Moist

REPORT OF TESTS

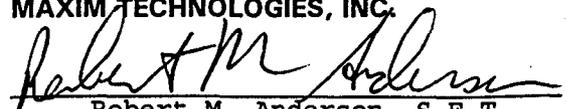
SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
3A	5/21/99	7	142.4	12.81	12700	990
3B	5/21/99	7	142.6	12.79	12160	950
3C	5/21/99	7	143.3	13.01	12330	950
3D	HOLD					

Technician: Bruce Nicholls

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.


 Robert M. Anderson, S.E.T.
 Laboratory Supervisor

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PAGE 1 OF 1

PROJECT NO.: 9901047
 REPORT NO.: 81886C
 DATE OF SERVICE: 5/14/99
 AUTHORIZATION:
 REPORT DATE: 5/21/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

SPECIFICATION REQUIREMENTS
 STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/14/99 TIME:
 TIME SAMPLED: 1:30PM TIME MOLDING COMPLETE:
 OPT. MOISTURE (%): 9.2 MAX. DENSITY (pcf): 129.7
 SAMPLED BY: Bruce Nicholls
 LOCATION: Sta. 16+00 @ 14.5' below
 finish grade

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 0
 SAMPLE MOISTURE CONTENT: 12.3%
 SAMPLE SIZE: 4x4
 CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
4A	5/21/99	7	141.0	13.05	10950	840
4B	5/21/99	7	142.3	12.91	10390	805
4C	5/21/99	7	141.7	12.76	10870	850
4D	HOLD					

Technician: Bruce Nicholls

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC

Robert M. Anderson
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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 81920
 DATE OF SERVICE: 5/17/99
 AUTHORIZATION:
 REPORT DATE: 5/24/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

SPECIFICATION REQUIREMENTS
 STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/17/99 TIME:
 TIME SAMPLED: 7:25A TIME MOLDING COMPLETE:
 OPT. MOISTURE (%): 9.2 MAX. DENSITY (pcf): 129.7
 SAMPLED BY: Bruce Nicholls
 LOCATION: Sta. 21+50 @ 14.5' below
 finish grade

TEMPERATURE - AIR (DegF): 0
 SAMPLE MOISTURE CONTENT: 12.1%
 SAMPLE SIZE: 4x4
 CURING: Moist

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
1A	5/24/99	7	140.8	12.96	10510	810
1B	5/24/99	7	142.8	12.67	10370	820
1C	5/24/99	7	140.1	12.95	10950	845
1D	HOLD					

Technician: Bruce Nicholls

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Robert M. Anderson
 Robert M. Anderson, S.E.T.
 Laboratory Supervisor

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 81920A
 DATE OF SERVICE: 5/17/99
 AUTHORIZATION:
 REPORT DATE: 5/24/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
 SPECIFICATION REQUIREMENTS
 STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/17/99 TIME:
 TIME SAMPLED: 9:40A TIME MOLDING COMPLETE:
 OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
 SAMPLED BY: Bruce Nicholls
 LOCATION: Sta. 35+00 @ 15' below finish
 grade

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 0
 SAMPLE MOISTURE CONTENT: 9.8%
 SAMPLE SIZE: 4X4
 CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
2A	5/24/99	7	142.0	12.60	18920	1500
2B	5/24/99	7	140.9	12.60	18470	1465
2C	5/24/99	7	140.1	12.66	17400	1375
2D	HOLD					

Technician: Bruce Nicholls

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Robert M. Anderson
 Robert M. Anderson, S.E.T.
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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 81920B
DATE OF SERVICE: 5/17/99
AUTHORIZATION:
REPORT DATE: 5/24/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/17/99 TIME:
TIME SAMPLED: 12:20P TIME MOLDING COMPLETE:
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Bruce Nicholls
LOCATION: Sta. 26+00 @ 13' below finish
grade

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 0
SAMPLE MOISTURE CONTENT: 11.9%
SAMPLE SIZE: 4x4
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

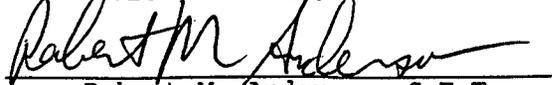
SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
3A	5/24/99	7	141.7	12.63	12260	970
3B	5/24/99	7	141.5	12.79	11490	900
3C	5/24/99	7	142.6	12.85	12140	945
3D	HOLD					

Technician: Bruce Nicholls

Report Distribution:

- (1) FLOOD CONTROL DISTRICT
- (1) FCD of Maricopa County
- (1) FNF Construction

MAXIM TECHNOLOGIES, INC.


Robert M. Anderson, S.E.T.
Laboratory Supervisor

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 81920C
DATE OF SERVICE: 5/17/99
AUTHORIZATION:
REPORT DATE: 5/24/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/17/99 TIME:
TIME SAMPLED: 2:00P TIME MOLDING COMPLETE:
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Bruce Nicholls
LOCATION: Sta. 28+00 @ 13' below finish
grade

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 0
SAMPLE MOISTURE CONTENT: 11.3%
SAMPLE SIZE: 4x4
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

<u>SPECIMEN NUMBER</u>	<u>DATE TESTED</u>	<u>AGE (days)</u>	<u>COMPACTED WET WEIGHT (pcf)</u>	<u>AREA (Sq.In.)</u>	<u>MAX. LOAD (lbs-Force)</u>	<u>COMPRESSIVE STRENGTH (psi)</u>
4A	5/24/99	7	142.0	12.79	12320	965
4B	5/24/99	7	144.1	12.67	13070	1030
4C	5/24/99	7	142.9	12.64	12850	1015
4D	HOLD					

Technician: Bruce Nicholls

Report Distribution:

- (1) FLOOD CONTROL DISTRICT
- (1) FCD of Maricopa County
- (1) FNF Construction

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 81956
 DATE OF SERVICE: 5/18/99
 AUTHORIZATION:
 REPORT DATE: 5/25/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

SPECIFICATION REQUIREMENTS
 STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/18/99 TIME:
 TIME SAMPLED: 7:35A TIME MOLDING COMPLETE: 7:48A
 OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
 SAMPLED BY: Bruce Nicholls
 LOCATION: Sta. 24+50 @ 13.5' below
 finish grade

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 74
 SAMPLE MOISTURE CONTENT: 4.8%
 SAMPLE SIZE: 4x4
 CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
1A	5/25/99	7	143.9	12.73	18930	1485
1B	5/25/99	7	144.5	12.81	19430	1515
1C	5/25/99	7	143.6	12.74	18760	1470
1D	HOLD					

Technician: Bruce Nicholls

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Robert M. Anderson
 Robert M. Anderson, S.E.T.
 Laboratory Supervisor

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 81956A
DATE OF SERVICE: 5/18/99
AUTHORIZATION:
REPORT DATE: 5/25/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/18/99 TIME:
TIME SAMPLED: 9:20A TIME MOLDING COMPLETE: 9:40A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Bruce Nicholls
LOCATION: Sta. 25+50 @ 13' below finish
grade

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 78
SAMPLE MOISTURE CONTENT: 5.0%
SAMPLE SIZE:
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

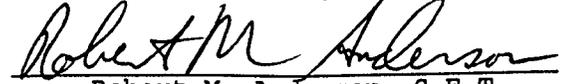
SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
2A	5/25/99	7	143.0	12.79	15610	1220
2B	5/25/99	7	143.0	12.67	16430	1295
2C	5/25/99	7	143.1	12.79	15620	1220
2D	HOLD					

Technician: Bruce Nicholls

Report Distribution:

(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 81956B
 DATE OF SERVICE: 5/18/99
 AUTHORIZATION:
 REPORT DATE: 5/25/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
 compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
 SPECIFICATION REQUIREMENTS
 STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/18/99 TIME:
 TIME SAMPLED: 11:05A TIME MOLDING COMPLETE: 11:25A
 OPT.MOISTURE (%): 0.0 MAX.DENSITY (pcf): 0.0
 SAMPLED BY: Bruce Nicholls
 LOCATION: Sta. 22+00 @ 13' below finish
 grade

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 84
 SAMPLE MOISTURE CONTENT: 5.3%
 SAMPLE SIZE: 4x4
 CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX.LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
3A	5/25/99	7	143.6	12.89	13350	1035
3B	5/25/99	7	142.3	12.76	13110	1025
3C	5/25/99	7	142.6	12.86	13140	1020
3D	HOLD					

Technician: Bruce Nicholls

Report Distribution:

- (1) FLOOD CONTROL DISTRICT
- (1) FCD of Maricopa County
- (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Robert M. Anderson
 Robert M. Anderson, S.E.T.
 Laboratory Supervisor

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 81956C
 DATE OF SERVICE: 5/18/99
 AUTHORIZATION:
 REPORT DATE: 5/25/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
 compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
 STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/18/99 TIME:
 TIME SAMPLED: 12:50P TIME MOLDING COMPLETE: 1:05P
 OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
 SAMPLED BY: Bruce Nicholls
 LOCATION: Sta. 29+00 @ 16' below finish
 grade

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 88
 SAMPLE MOISTURE CONTENT: 5.1%
 SAMPLE SIZE: 4x4
 CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

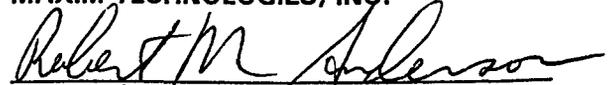
SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
4A	5/25/99	7	142.3	12.65	14530	1150
4B	5/25/99	7	143.2	12.69	15280	1205
4C	5/25/99	7	142.9	12.69	14700	1160
4D	HOLD					

Technician: Bruce Nicholls

Report Distribution:

- (1) FLOOD CONTROL DISTRICT
- (1) FCD of Maricopa County
- (1) FNF Construction

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT NO.: 9901047
REPORT NO.: 81995
DATE OF SERVICE: 5/19/99
AUTHORIZATION:
REPORT DATE: 5/26/99

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

MIXING COMPLETE - DATE: 05/19/99 TIME:
TIME SAMPLED: 6:45A TIME MOLDING COMPLETE: 7:05A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Bruce Nicholls
LOCATION: Sta. 28+00 @ 12.5' below
finish grade

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

TEMPERATURE - AIR (DegF): 74
SAMPLE MOISTURE CONTENT: 10.9%
SAMPLE SIZE: 4x4
CURING: Moist

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

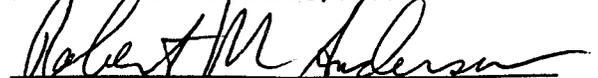
SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
1A	5/26/99	7	140.9	12.82	12510	975
1B	5/26/99	7	141.3	12.88	12890	1000
1C	5/26/99	7	140.9	12.88	13010	1010
1D	HOLD					

Technician: Bruce Nicholls

Report Distribution:

(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.


Robert M. Anderson, S.E.T.
Laboratory Supervisor

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 81995A
 DATE OF SERVICE: 5/19/99
 AUTHORIZATION:
 REPORT DATE: 5/26/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

MIXING COMPLETE - DATE: 05/19/99 TIME:
 TIME SAMPLED: 9:15A TIME MOLDING COMPLETE: 9:35A
 OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
 SAMPLED BY: Bruce Nicholls
 LOCATION: Sta. 24+00 @ 12' below finish
 grade

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

TEMPERATURE - AIR (DegF): 80
 SAMPLE MOISTURE CONTENT: 11.0%
 SAMPLE SIZE: 4x4
 CURING: Moist

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

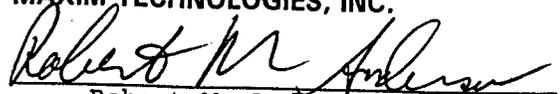
SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
2A	5/26/99	7	144.2	12.76	20300	1590
2B	5/26/99	7	143.2	12.63	19630	1555
2C	5/26/99	7	143.7	12.69	19530	1540
2D	HOLD					

Technician: Bruce Nicholls

Report Distribution:

- (1) FLOOD CONTROL DISTRICT
- (1) FCD of Maricopa County
- (1) FNF Construction

MAXIM TECHNOLOGIES, INC.



Robert M. Anderson, S.E.T.
 Laboratory Supervisor

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 81995B
DATE OF SERVICE: 5/19/99
AUTHORIZATION:
REPORT DATE: 5/26/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

MIXING COMPLETE - DATE: 05/19/99 TIME:
TIME SAMPLED: 11:04A TIME MOLDING COMPLETE: 11:20A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Bruce Nicholls
LOCATION: Sta. 31+20 @ 15' below finish
grade

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

TEMPERATURE - AIR (DegF): 82
SAMPLE MOISTURE CONTENT: 10.8%
SAMPLE SIZE: 4x4
CURING: Moist

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

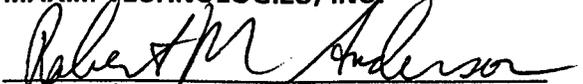
<u>SPECIMEN NUMBER</u>	<u>DATE TESTED</u>	<u>AGE (days)</u>	<u>COMPACTED WET WEIGHT (pcf)</u>	<u>AREA (Sq. In.)</u>	<u>MAX. LOAD (lbs-Force)</u>	<u>COMPRESSIVE STRENGTH (psi)</u>
3A	5/26/99	7	143.0	12.76	14260	1120
3B	5/26/99	7	141.6	12.63	14010	1110
3C	5/26/99	7	142.7	12.88	14410	1120
3D	HOLD					

Technician: Bruce Nicholls

Report Distribution:

(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.



Robert M. Anderson, S.E.T.
Laboratory Supervisor

REPORT OF SOIL CEMENT COMPRESSION STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT NO.: 9901047
REPORT NO.: 81995C
DATE OF SERVICE: 5/19/99
AUTHORIZATION:
REPORT DATE: 5/26/99

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/19/99 TIME:
TIME SAMPLED: 12:32P TIME MOLDING COMPLETE: 12:50P
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Bruce Nicholls
LOCATION: Sta. 34+10 @ 15' below finish
grade

METHOD OF TEST

MOLDING: ADOT
COMPRESSION STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 84
SAMPLE MOISTURE CONTENT: 10.2%
SAMPLE SIZE: 4x4
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSION STRENGTH

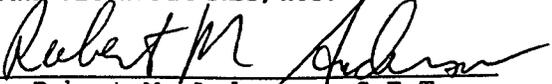
SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSION STRENGTH (psi)
4A	5/26/99	7	141.8	12.76	14280	1120
4B	5/26/99	7	142.4	12.82	14350	1120
4C	5/26/99	7	142.5	12.82	13660	1065
4D	HOLD					

Technician: Bruce Nicholls

Report Distribution:

- (1) FLOOD CONTROL DISTRICT
- (1) FCD of Maricopa County
- (1) FNF Construction

MAXIM TECHNOLOGIES, INC.


Robert M. Anderson, S.E.T.
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TECHNOLOGIES INC

Maxim Technologies, Inc.
7031 W. Oakland St.
Chandler, Arizona 85226
Telephone: (480) 861-1169
FAX: (480) 940-0952

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 822051
DATE OF SERVICE: 5/27/99
AUTHORIZATION:
REPORT DATE: 6/03/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

MIXING COMPLETE - DATE: 05/27/99 TIME: 7:35A
TIME SAMPLED: 7:45A TIME MOLDING COMPLETE: 8:15A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mike L. Montoya
LOCATION: STA. 52+00 @ 29.5' BELOW
FINISH GRADE

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 90
SAMPLE MOISTURE CONTENT: 11.9%
SAMPLE SIZE: 4X4
CURING: MOIST

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
1A	6/03/99	7	143.4	12.57	11260	895
1B	6/03/99	7	141.2	12.50	10660	855
1C	6/03/99	7	142.5	12.50	10330	825
1D	HOLD					

Technician: Mike L. Montoya
Lab Technician

Report Distribution:

- (1) FLOOD CONTROL DISTRICT
- (1) FCD of Maricopa County
- (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT NO.: 9901047

REPORT NO.: 822052

DATE OF SERVICE: 5/27/99

AUTHORIZATION:

REPORT DATE: 6/03/99

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/27/99 TIME: 9:38A
TIME SAMPLED: 9:48A TIME MOLDING COMPLETE: 10:18A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mike L. Montoya
LOCATION: STA. 55+00 @ 28.5 BELOW FINISH
GRADE

METHOD OF TEST

MOLDING: ADOT

COMPRESSIVE STRENGTH: ASTM D1633

CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 90

SAMPLE MOISTURE CONTENT: 10.9%

SAMPLE SIZE: 4X4

CURING: MOIST

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
2A	6/03/99	7	141.0	12.57	10810	860
2B	6/03/99	7	143.9	12.50	10260	820
2C	6/03/99	7	144.3	12.50	10530	840
2D	HOLD					

Technician: Mike L. Montoya
Lab Technician

Report Distribution:

(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.

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Telephone: (480) 961-1169
FAX: (480) 940-0952

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT NO.: 9901047
REPORT NO.: 822053
DATE OF SERVICE: 5/27/99
AUTHORIZATION:
REPORT DATE: 6/03/99

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

MIXING COMPLETE - DATE: 05/27/99 TIME: 12:45A
TIME SAMPLED: 12:55A TIME MOLDING COMPLETE: 1:25A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mike L. Montoya
LOCATION: STA. 62+00 @ 29.5' BELOW
FINISH GRADE

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 92
SAMPLE MOISTURE CONTENT: 11.6%
SAMPLE SIZE: 4X4
CURING: MOIST

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
3A	6/03/99	7	143.9	12.50	10370	830
3B	6/03/99	7	143.0	12.44	10040	805
3C	6/03/99	7	144.0	12.50	10100	810
3D	HOLD					

Technician: Mike L. Montoya
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Robert M. Anderson, S.E.T.
Laboratory Supervisor

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7031 W. Oakland St.
Chandler, Arizona 85226
Telephone: (480) 981-1169
FAX: (480) 940-0952

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 822054
DATE OF SERVICE: 5/27/99
AUTHORIZATION:
REPORT DATE: 6/03/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 05/27/99 TIME: 1:33P
TIME SAMPLED: 1:45P TIME MOLDING COMPLETE: 2:10P
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mike L. Montoya
LOCATION: STA. 65+?? @ 28.5' BELOW
FINISH GRADE

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 93
SAMPLE MOISTURE CONTENT: 12.5%
SAMPLE SIZE: 4X4
CURING: MOIST

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
4A	6/03/99	7	142.6	12.63	12800	1015
4B	6/03/99	7	141.4	12.57	11850	945
4C	6/03/99	7	142.8	12.57	12160	970
4D	HOLD					

Technician: Mike L. Montoya
Lab Technician

Report Distribution:

- (1) FLOOD CONTROL DISTRICT
- (1) FCD of Maricopa County
- (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

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7031 W. Oakland St.
Chandler, Arizona 85226
Telephone: (480) 961-1169
FAX: (480) 940-0952

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 822531
DATE OF SERVICE: 6/01/99
AUTHORIZATION:
REPORT DATE: 6/08/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

CONTRACTOR: FNF Construction

PROJECT DATA

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 06/01/99 TIME: 08:35A
TIME SAMPLED: 08:45A TIME MOLDING COMPLETE: 08:15A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mike L. Montoya
LOCATION: Sta 66+50 @ 28' below finish
grade

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 76
SAMPLE MOISTURE CONTENT: 9.8%
SAMPLE SIZE: 4 x 4
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
1A	6/08/99	7	139.4	12.57	13640	1085
1B	6/08/99	7	140.6	12.50	14740	1180
1C	6/08/99	7	138.6	12.50	14220	1135
1D	HOLD					

Technician: Mike L. Montoya
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.

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TECHNOLOGIES INC

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7031 W. Oakland St.
Chandler, Arizona 85226
Telephone: (480) 961-1169
FAX: (480) 940-0952

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 822532
DATE OF SERVICE: 6/01/99
AUTHORIZATION:
REPORT DATE: 6/08/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

MIXING COMPLETE - DATE: 06/01/99 TIME: 10:50A
TIME SAMPLED: 11:00A TIME MOLDING COMPLETE: 11:30A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mike L. Montoya
LOCATION: Sta 61+00 @ 28' below finish
grade

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

TEMPERATURE - AIR (DegF): 89
SAMPLE MOISTURE CONTENT: 9.4%
SAMPLE SIZE: 4 x 4
CURING: Moist.

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
2A	6/08/99	7	138.6	12.57	12330	980
2B	6/08/99	7	137.8	12.50	11930	955
2C	6/08/99	7	137.8	12.57	12050	960
2D	HOLD					

Technician: Mike L. Montoya
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Robert M. Anderson, S.E.T.
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TECHNOLOGIES INC

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Chandler, Arizona 85226
Telephone: (480) 961-1169
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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 822533
DATE OF SERVICE: 6/01/99
AUTHORIZATION:
REPORT DATE: 6/08/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

METHOD OF TEST

MOLDING: ADOT

COMPRESSIVE STRENGTH: ASTM D1633

CURING: ASTM D1633

MIXING COMPLETE - DATE: 06/01/99 TIME: 01:50P
TIME SAMPLED: 02:00P TIME MOLDING COMPLETE: 02:30P
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mike L. Montoya
LOCATION: Sta 62+60 @ 26' below finish
grade

TEMPERATURE - AIR (DegF): 92
SAMPLE MOISTURE CONTENT: 9.1%
SAMPLE SIZE: 4 x 4
CURING: Moist.

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
3A	6/08/99	7	135.6	12.50	10930	875
3B	6/08/99	7	134.8	12.50	9470	755
3C	6/08/99	7	132.7	12.50	9930	795
3D	HOLD					

Technician: Mike L. Montoya
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

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Chandler, Arizona 85226
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FAX: (480) 940-0952

**REPORT OF
SOIL CEMENT COMPRESSIVE STRENGTH**

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009
PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PAGE 1 OF 1

PROJECT NO.: 9901047
REPORT NO.: 822534
DATE OF SERVICE: 6/01/99
AUTHORIZATION:
REPORT DATE: 6/08/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 06/01/99 TIME: 02:50P
TIME SAMPLED: 03:00P TIME MOLDING COMPLETE: 03:30P
OPT.MOISTURE (%): 0.0 MAX.DENSITY (pcf): 0.0
SAMPLED BY: Mike L. Montoya
LOCATION: Sta 60+00 @ 23' below finish
grade

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 91
SAMPLE MOISTURE CONTENT: 9.9%
SAMPLE SIZE: 4 x 4
CURING: Moist.

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

<u>SPECIMEN NUMBER</u>	<u>DATE TESTED</u>	<u>AGE (days)</u>	<u>COMPACTED WET WEIGHT (pcf)</u>	<u>AREA (Sq.In.)</u>	<u>MAX.LOAD (lbs-Force)</u>	<u>COMPRESSIVE STRENGTH (psi)</u>
4A	6/08/99	7	141.4	12.57	14490	1155
4B	6/08/99	7	141.8	12.50	14930	1195
4C	6/08/99	7	141.4	12.50	14910	1190
4D	HOLD					

Technician: Mike L. Montoya
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Tim W. Anderson, P.E.
Geotechnical Engineer

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 82296
 DATE OF SERVICE: 6/02/99
 AUTHORIZATION:
 REPORT DATE: 6/09/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
 compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
 SPECIFICATION REQUIREMENTS
 STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 06/02/99 TIME: 07:35A
 TIME SAMPLED: 07:45A TIME MOLDING COMPLETE: 08:15A
 OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
 SAMPLED BY: Mike L. Montoya
 LOCATION: STA. 68+00 @ 25' BELOW FINISH
 GRADE

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 76
 SAMPLE MOISTURE CONTENT: 9.1%
 SAMPLE SIZE: 4 X 4
 CURING: MOIST

REPORT OF TESTS

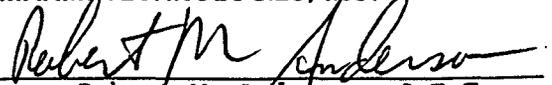
SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.in.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
1A	6/09/99	7	140.9	12.57	11410	910
1B	6/09/99	7	138.9	12.57	10330	820
1C	6/09/99	7	140.5	12.50	13240	1060
1D	HOLD					

Technician: Mike L. Montoya
 Lab Technician

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.


 Robert M. Anderson, S.E.T.
 Laboratory Supervisor

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 823362
 DATE OF SERVICE: 6/03/99
 AUTHORIZATION:
 REPORT DATE: 6/10/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
 compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
 STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 06/03/99 TIME: 09:30A
 TIME SAMPLED: 09:40A TIME MOLDING COMPLETE: 10:20A
 OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
 SAMPLED BY: Mike L. Montoya
 LOCATION: STA 66+00 @ 24' below finish
 grade

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 79
 SAMPLE MOISTURE CONTENT: 9.3%
 SAMPLE SIZE: 4 x 4
 CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.in.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
2A	6/10/99	7	139.0	12.57	13450	1070
2B	6/10/99	7	117.4	12.50	13840	1105
2C	6/10/99	7	138.2	12.50	13120	1050
2D	HOLD					

Technician: Mike L. Montoya
 Lab Technician

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Robert M. Anderson
 Robert M. Anderson, S.E.T.
 Laboratory Supervisor

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT NO.: 9901047
REPORT NO.: 823363
DATE OF SERVICE: 6/03/99
AUTHORIZATION:
REPORT DATE: 6/10/99

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 06/03/99 TIME: 12:30P
TIME SAMPLED: 12:40P TIME MOLDING COMPLETE: 01:20P
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mike L. Montoya
LOCATION: STA 67+00 @ 23' below finish
grade

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 85
SAMPLE MOISTURE CONTENT: 12.7%
SAMPLE SIZE: 4 x 4
CURING: Moist

REPORT OF TESTS

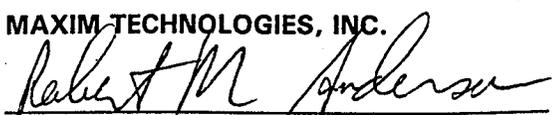
SOIL CEMENT COMPRESSIVE STRENGTH

<u>SPECIMEN NUMBER</u>	<u>DATE TESTED</u>	<u>AGE (days)</u>	<u>COMPACTED WET WEIGHT (pcf)</u>	<u>AREA (Sq.In.)</u>	<u>MAX. LOAD (lbs-Force)</u>	<u>COMPRESSIVE STRENGTH (psi)</u>
3A	6/10/99	7	142.0	12.63	12930	1025
3B	6/10/99	7	142.8	12.57	12760	1015
3C	6/10/99	7	142.4	12.57	13030	1035
3D	HOLD					

Technician: Mike L. Montoya
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.


Robert M. Anderson, S.E.T.
Laboratory Supervisor

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 823591
 DATE OF SERVICE: 6/04/99
 AUTHORIZATION:
 REPORT DATE: 6/11/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

MIXING COMPLETE - DATE: 06/04/99 TIME: 07:36A
 TIME SAMPLED: 07:46A TIME MOLDING COMPLETE: 08:16A
 OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
 SAMPLED BY: M. Browning
 LOCATION: Sta 57+00 @ 18' below finish
 grade

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

TEMPERATURE - AIR (DegF): 68
 SAMPLE MOISTURE CONTENT: 11.7%
 SAMPLE SIZE: 4 x 4
 CURING: moist

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
1A	6/11/99	7	145.5	12.63	12830	1015
1B	6/11/99	7	144.0	12.57	12580	1000
1C	6/11/99	7	145.4	12.63	12660	1000
1D	HOLD					

Technician: Mark A. Browning
 Lab Technician

Report Distribution:

- (1) FLOOD CONTROL DISTRICT
- (1) FCD of Maricopa County
- (1) FNF Construction

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Michael Watt
 Sr Engineering Technician

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 823592
DATE OF SERVICE: 6/04/99
AUTHORIZATION:
REPORT DATE: 6/11/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 06/04/99 TIME: 09:00A
TIME SAMPLED: 09:10A TIME MOLDING COMPLETE: 09:40A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: M. Browning
LOCATION: STA 56+25 @ 13' below finish
grade

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 76
SAMPLE MOISTURE CONTENT: 8.7%
SAMPLE SIZE: 4 x 4
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

<u>SPECIMEN NUMBER</u>	<u>DATE TESTED</u>	<u>AGE (days)</u>	<u>COMPACTED WET WEIGHT (pcf)</u>	<u>AREA (Sq.In.)</u>	<u>MAX. LOAD (lbs-Force)</u>	<u>COMPRESSIVE STRENGTH (psi)</u>
2A	6/11/99	7	140.3	12.50	14510	1160
2B	6/11/99	7	140.5	12.50	13720	1095
2C	6/11/99	7	141.4	12.50	13890	1110
2D	HOLD					

Technician: Mark A. Browning
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

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Sr Engineering Technician

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REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
 OF MARICOPA COUNTY
 ATTN: FRED FULLER
 2801 WEST DURANGO STREET
 PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
 & Glendale Airport Ext. Levee
 FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
 REPORT NO.: 823594
 DATE OF SERVICE: 6/04/99
 AUTHORIZATION:
 REPORT DATE: 6/11/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
 compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

SPECIFICATION REQUIREMENTS
 STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 06/04/99 TIME: 02:05P
 TIME SAMPLED: 02:25P TIME MOLDING COMPLETE: 02:45P
 OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
 SAMPLED BY: M. Browning
 LOCATION: STA 52+00 @ 13' below finish
 grade

METHOD OF TEST

MOLDING: ADOT
 COMPRESSIVE STRENGTH: ASTM D1633
 CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 75
 SAMPLE MOISTURE CONTENT: 9.9%
 SAMPLE SIZE: 4 x 4
 CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
4A	6/11/99	7	143.9	12.57	14240	1135
4B	6/11/99	7	144.5	12.57	14260	1135
4C	6/11/99	7	145.0	12.63	14740	1165
4D	HOLD					

Technician: Mark A. Browning
 Lab Technician

Report Distribution:
 (1) FLOOD CONTROL DISTRICT
 (1) FCD of Maricopa County
 (1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael D. Watt

Michael Watt
 Sr Engineering Technician

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MAXIM

TECHNOLOGIES INC

Maxim Technologies, Inc.
7031 W. Oakland St.
Chandler, Arizona 85226
Telephone: (480) 961-1169
FAX: (480) 940-0952

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 825411
DATE OF SERVICE: 6/11/99
AUTHORIZATION:
REPORT DATE: 6/18/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 06/11/99 TIME: 06:50A
TIME SAMPLED: 07:00A TIME MOLDING COMPLETE: 07:30A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mark A. Browning
LOCATION: Sta 76+00 @ 22' below finish
grade

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 73
SAMPLE MOISTURE CONTENT: 5.3%
SAMPLE SIZE: 4 x 4
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
1A	6/18/99	7	142.6	12.50	12430	995
1B	6/18/99	7	142.0	12.50	11220	895
1C	6/18/99	7	142.9	12.50	12640	1010
1D	HOLD					

Technician: Mark A. Browning
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael Watt
Sr Engineering Technician

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7031 W. Oakland St.
Chandler, Arizona 85226
Telephone: (480) 961-1169
FAX: (480) 940-0952

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 825412
DATE OF SERVICE: 6/11/99
AUTHORIZATION:
REPORT DATE: 6/18/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 28 Days

MIXING COMPLETE - DATE: 06/11/99 TIME: 10:00A
TIME SAMPLED: 10:10A TIME MOLDING COMPLETE: 10:40A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mark A. Browning
LOCATION: Sta 75+00 @ 21.5' below
finish grade

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 84
SAMPLE MOISTURE CONTENT: 11.2%
SAMPLE SIZE: 4 x 4
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
2A	6/18/99	7	143.6	12.57	12890	1025
2B	6/18/99	7	144.0	12.50	12450	995
2C	6/18/99	7	144.8	12.50	12350	990
2D	HOLD					
2E	6/12/99	1	144.4	12.50	10660	855
2F	6/14/99	3	144.2	12.50	10660	855

Technician: Mark A. Browning
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael Watt
Sr Engineering Technician

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TECHNOLOGIES INC

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7031 W. Oakland St.
Chandler, Arizona 85226
Telephone: (480) 961-1169
FAX: (480) 940-0952

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 825413
DATE OF SERVICE: 6/11/99
AUTHORIZATION:
REPORT DATE: 6/18/99

SERVICES: Sample soil-cement mixture from construction area, mold and test
compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 06/11/99 TIME: 11:30A
TIME SAMPLED: 11:40A TIME MOLDING COMPLETE: 12:10P
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mark A. Browning
LOCATION: Sta 80+00 @ 18' below finish
grade

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 90
SAMPLE MOISTURE CONTENT: 9.7%
SAMPLE SIZE: 4 x 4
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
3A	6/18/99	7	138.1	12.50	9910	795
3B	6/18/99	7	136.4	12.50	10330	825
3C	6/18/99	7	139.3	12.50	10850	870
3D	HOLD					
3E	6/12/99	1	137.6	12.50	8950	715
3F	6/14/99	3	137.4	12.50	9520	760

Technician: Mark A. Browning
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael Watt
Sr Engineering Technician

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7031 W. Oakland St.
Chandler, Arizona 85226
Telephone: (480) 961-1169
FAX: (480) 940-0952

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 825414
DATE OF SERVICE: 6/11/99
AUTHORIZATION:
REPORT DATE: 6/18/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction

MIXING COMPLETE - DATE: 06/11/99 TIME: 01:10P
TIME SAMPLED: 01:20P TIME MOLDING COMPLETE: 01:50P
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mark A. Browning
LOCATION: Sta 77+50 @ 19' below finish
grade

SPECIFICATION REQUIREMENTS

STRENGTH: 750 psi @ 7 Days

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 93
SAMPLE MOISTURE CONTENT: 10.8%
SAMPLE SIZE: 4 x 4
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq.In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
4A	6/18/99	7	144.1	12.63	12160	965
4B	6/18/99	7	144.0	12.63	11450	905
4C	6/18/99	7	145.0	12.57	11410	910
4D	HOLD					
4E	6/12/99	1	144.0	12.57	10740	855
4F	6/14/99	3	142.9	12.50	10620	850

Technician: Mark A. Browning
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.

Michael Watt
Sr Engineering Technician

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7031 W. Oakland St.
Chandler, Arizona 85226
Telephone: (480) 961-1169
FAX: (480) 940-0952

REPORT OF SOIL CEMENT COMPRESSIVE STRENGTH

CLIENT: FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ATTN: FRED FULLER
2801 WEST DURANGO STREET
PHOENIX, AZ 85009

PAGE 1 OF 1

PROJECT: Camelback Ranch Levee North
& Glendale Airport Ext. Levee
FCD Contract 98-28, Assign. #1

PROJECT NO.: 9901047
REPORT NO.: 825415
DATE OF SERVICE: 6/11/99
AUTHORIZATION:
REPORT DATE: 6/18/99

SERVICES: Sample soil-cement mixture from construction area, mold and test compressive strength specimens.

PROJECT DATA

CONTRACTOR: FNF Construction
SPECIFICATION REQUIREMENTS
STRENGTH: 750 psi @ 7 Days

MIXING COMPLETE - DATE: 06/11/99 TIME: N/A
TIME SAMPLED: N/A TIME MOLDING COMPLETE: N/A
OPT. MOISTURE (%): 0.0 MAX. DENSITY (pcf): 0.0
SAMPLED BY: Mark A. Browning
LOCATION: N/A

METHOD OF TEST

MOLDING: ADOT
COMPRESSIVE STRENGTH: ASTM D1633
CURING: ASTM D1633

TEMPERATURE - AIR (DegF): 90
SAMPLE MOISTURE CONTENT: 0.0%
SAMPLE SIZE: 4 x 4
CURING: Moist

REPORT OF TESTS

SOIL CEMENT COMPRESSIVE STRENGTH

SPECIMEN NUMBER	DATE TESTED	AGE (days)	COMPACTED WET WEIGHT (pcf)	AREA (Sq. In.)	MAX. LOAD (lbs-Force)	COMPRESSIVE STRENGTH (psi)
5A	6/18/99	7	141.1	12.57	10040	800
5B	6/18/99	7	141.4	12.50	11810	945
5C	6/18/99	7	142.4	12.57	11580	920
5D	HOLD					
5E	6/12/99	1	140.2	12.57	10180	810

ADDITIONAL COMMENTS:

Moisture content not available

Technician: Mark A. Browning
Lab Technician

Report Distribution:
(1) FLOOD CONTROL DISTRICT
(1) FCD of Maricopa County
(1) FNF Construction

MAXIM TECHNOLOGIES, INC.

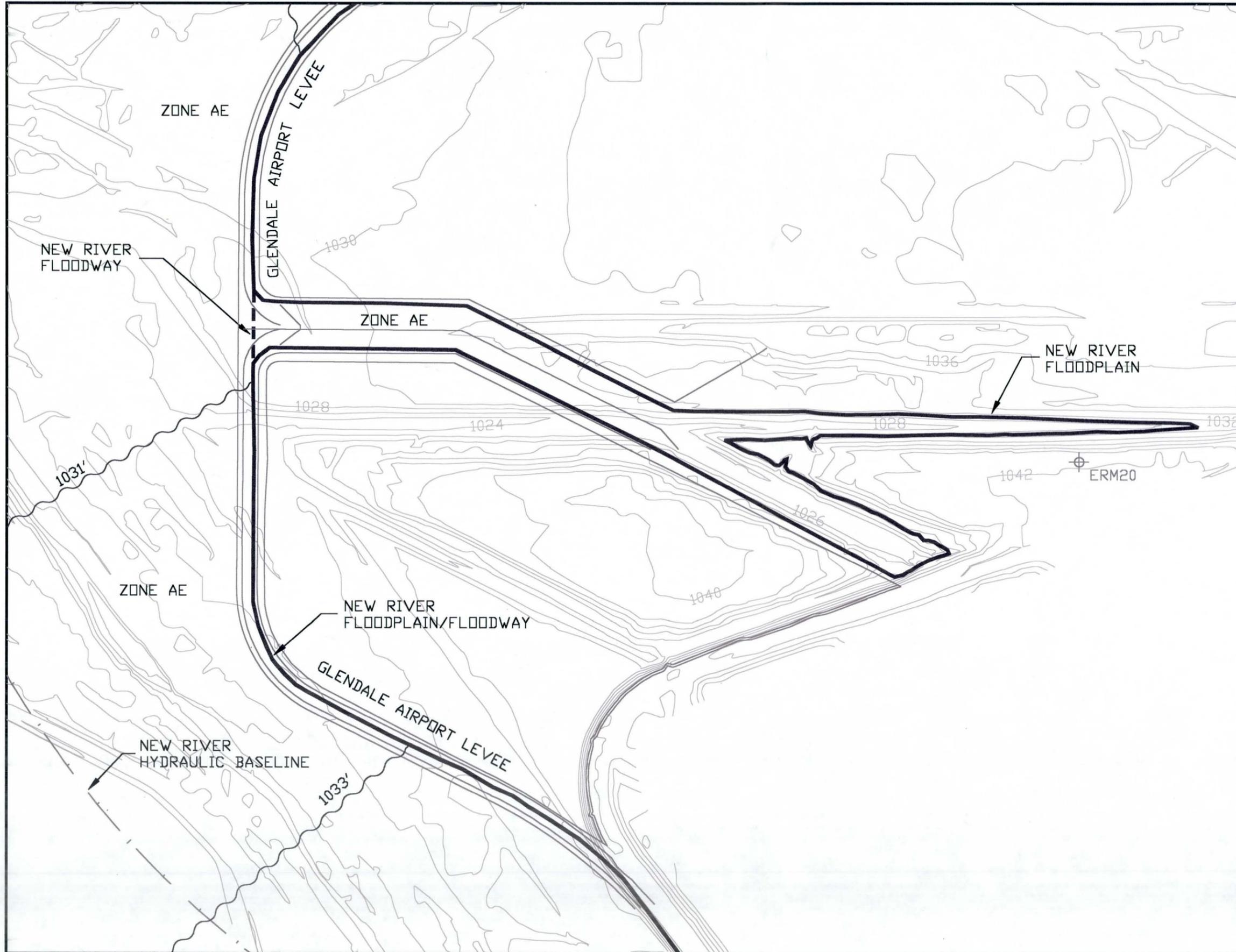
Michael Watt
Sr Engineering Technician

Our letters and reports are for the exclusive use of the client to whom they are addressed and shall not be reproduced except in full without the approval of the testing laboratory. The use of our name must receive our written approval. Our letters and reports apply only to the sample tested and/or inspected, and are not indicative of the quantities of apparently identical or similar products.



Section 9 -- AS-BUILT PLANS

The roll of as-built plans for the project is packaged separately.



**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY**
FLOOD DELINEATION STUDY OF
CAMELBACK RANCH LEVEE NORTH

F.C.D. CONTRACT NO. 1999C048

LEGEND

100-YR FLOODPLAIN BOUNDARY	
100-YR FLOODWAY BOUNDARY	
HYDRAULIC BASE LINE	
CROSS SECTION	FP=100 YR WSE FW=100 YR WSE
BASE FLOOD ELEVATIONS	1221
ZONE DESIGNATIONS	ZONE AE
ELEVATION REFERENCE MARKS	ERM10

ELEVATION REFERENCE MARKS

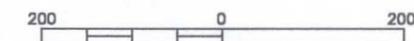
NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM20	1042.55	1/2" REBAR WITH ALUMINUM CAP ON WEST SIDE OF BIRM FOR FENCE AROUND AIRPORT.

NOTES

STARTING WATER SURFACE ELEVATION FOR NEW RIVER SECTION 0.1 TAKEN FROM REVISED AGUA FRIA RIVER SECTION 9.519 (WEST CONSULTANTS, 1/00)

INDEX MAP

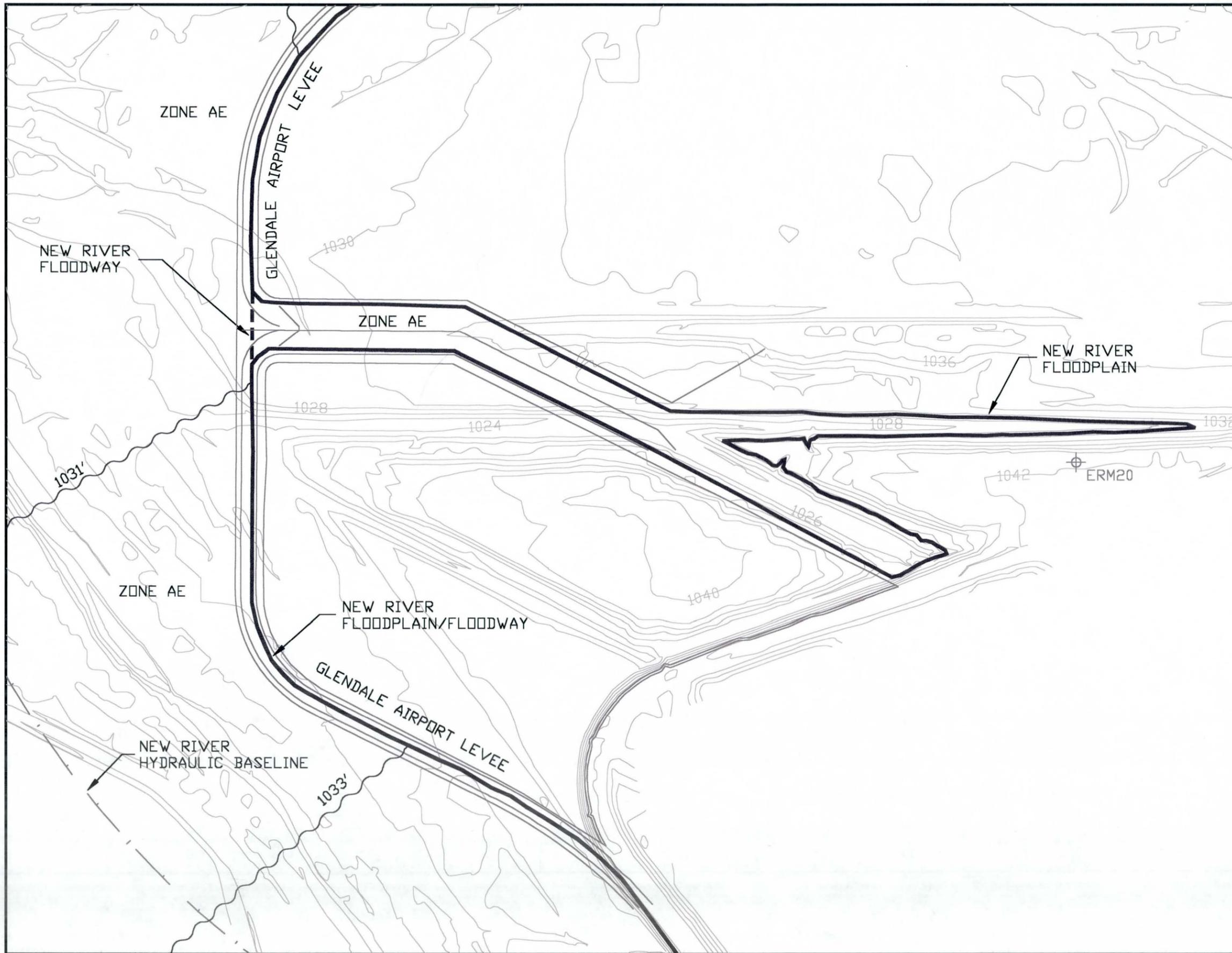


SCALE: 1" = 200'

VERTICAL CONTOUR INTERVAL = 2 FEET

WEST Consultants, Inc.

DESIGN	BY	DATE	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.	---	---	RECOMMENDED BY:
PLANS	JEH	01/00	APPROVED BY: DATE
PLANS CHK.	DLR	01/00	DATE
SUBMITTED BY:			CIVIL ENGINEER AND GENERAL MANAGER
	DATE		SHEET 1 OF 1



**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY**
FLOOD DELINEATION STUDY OF
CAMELBACK RANCH LEVEE NORTH

F.C.D. CONTRACT NO. 1999C048

LEGEND

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ELEVATION REFERENCE MARKS

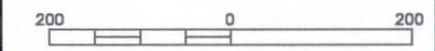
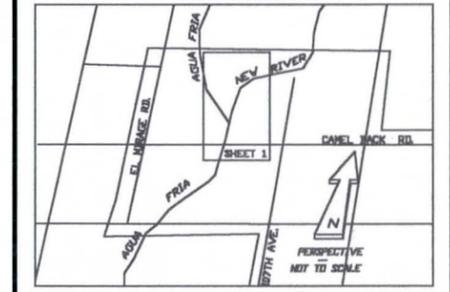
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DESIGN	BY	DATE	FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN CHK.			RECOMMENDED BY: _____ DATE: _____
PLANS	JEH	01/00	APPROVED BY: _____ DATE: _____
PLANS CHK.	DLR	01/00	CHEF ENGINEER AND GENERAL MANAGER
SUBMITTED BY:		DATE: _____	SHEET 1 OF 1

PHOTOGRAMMETRY BY KENNEY AERIAL MAPPING, INC. FLIGHT DATE 2/28/95