FOUNTAIN HILLS NORTH

FLOODPLAIN DELINEATION STUDY

FCD 92-04

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FEMA FORMS

Prepared By

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2801 West Durango Street
Phoenix, Arizona 85009
(602) 506-1501

1994

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FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM**	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

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.

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*
   - ☐ Physical change
     - ☐ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☐ Improved data
   - ☐ Floodway revision
   - ☒ Other New Study

     Explain This is the first delineation of this watercourse
2. Flooding Source: Ashbrook Wash
3. Project Name/Identifier: Fountain Hills North Floodplain Delineation Study FCD 92-04
4. FEMA zone designations affected: X
   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy,City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
04013	Maricopa County	Maricopa	AZ	04013C	1300 E	9-4-91
	Fountain Hills, Town				1750 E	9-4-91
					1270 D	

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding

- ☐ Riverine
- ☐ Coastal
- ☐ Alluvial Fan
- ☐ Shallow Flooding *(e.g. Zones AO and AH)*
- ☐ Lakes

Affected by wind/wave action
- ☐ Yes
- ☐ No

Structures

- ☐ Channelization
- ☐ Levee/Floodwall
- ☐ Bridge/Culvert
- ☐ Dam
- ☐ Coastal
- ☐ Fill
- ☐ Pump Station
- ☐ None
- ☐ Channel Relocation
- ☐ Excavation
- ☐ Other *(describe)*

Disciplines*

- ☐ Water Resources
  - ☒ Hydrology
  - ☒ Hydraulics
  - ☐ Sediment Transport
  - ☐ Interior Drainage
- ☐ Structural
- ☐ Geotechnical
- ☐ Land Surveying
- ☐ Other *(describe)*

☐ Other(describe)

*** Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☐ Yes ☒ No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM ☒ Yes ☐ No

   If yes, give reason: New Study, this is the first delineation of this watercourse

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions. See attached articles and announcements

9. 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.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? ☐ Yes ☐ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☐ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (*or other surcharge limit if community or state has adopted more stringent criteria*)? ☐ Yes ☐ No

If the answer to either Items 1B or 2B is yes, please provide 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.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒ Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒ Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐ Yes ☐ No N/A New study

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by the owner and the State (entity) with a maximum interval of 36 months between inspections for the State and four months for the owner.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by the owner (Town of Fountain Hills) (entity) to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☒ has ☐ has not been prepared for the flood control structure.

See Emergency Action Plan attached to Form 11.

D. The community is willing to assume responsibility for ☐ performing ☒ overseeing compliance with the maintenance and operation plans of the Golden Eagle Park Dam (No. 4) and Aspen Dam (No. 6) (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.

Attach operation and maintenance plans see attached Report with Form 11.

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

_____a. CLOMR — A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*.

_____b. LOMR — A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. I Parts 60 and 65.)*

X c. PMR — A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. I, Parts 60 and 65.)*

_____d. Other: Describe_____

8. FORMS INCLUDED

17. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

• Hydrologic analysis for flooding source differs from that used to develop FIRM	☒ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine /Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☒ Bridge/Culvert Form (Form 7)
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☒ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. ☐ Yes ☐ No

Initial fee amount: $ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. ☐ Yes ☐ No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. ☒ Yes ☐ No

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

Ron Neuitt
Signature of Revision Requester

Ron Neuitt/Program Mgr. NFIP
Printed Name and Title of Revision Requester

Flood Control District of Maricopa Co.
Company Name

(602) 506-1501 1-29-97
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.

Randy L Havel
Signature of Community Official

Randy L Havel, Town Engr.
Printed Name and Title of Community Official

Fountain Hills
Community Name

1-22-97
Date

Does this request impact any other communities? ☐ Yes ☐ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

11-22-95

No big problems in County floodplain study

If you've ever wondered what would happen in Fountain Hills in the event of a 100-year flood, Maricopa County has just completed a study that will tell you.

Representatives of Maricopa County Flood Control District were on hand for an open house at Town Hall on Thursday, Oct. 16. They were there to explain and answer questions concerning the Fountain Hills Flood Delineation Study.

The study defines the areas that would be inundated in the event of a 100-year storm and flood.

There was not a big turnout for the two-hour session, but a few residents dropped by to ask about their own particular concerns.

Town Engineer Randy Harrel said the study indicates no significant problems for individual homeowners. Some residents have property which lies within the flood area, but few if any structures are threatened.

One area of concern that town officials will look at is the Baptist Church on Saguaro Boulevard. In the event of a significant 100-year flooding event all of the church buildings and the parking lot would be under water. It is a low flat area which Nicklaus and Cypress washes flow into.

A Sanitary District pumping station adjacent to the church is apparently not within the flood plain.

Sanitary District Manager Ron Huber said no flood study was done when the pumping facility was constructed. But he said the pump building is significantly higher than the church buildings.

Huber also said that pump station is scheduled to be abandoned in the near future.

Harrel said the town will use the study to consider its options for protecting citizens and property during such a flood.

There are 26 street crossings the town wants to study further besides the area around the church, Harrel said. The options that may be considered would include culvert work and possibly diversion or containment structures.

Those further studies are to begin in the near future.

Nearly all of the area included in the 100-year flood plain will belong to the Town of Fountain Hills once the wash property transfer between the town and MCO Properties is completed in the near future.

Fountain Hills Vice Mayor Peg Tibbetts, center, discusses the county's floodplain study with Flood Control District representatives Ron Nevitt and Sandy Walchuk.

However, Harrel said the flood plain delineation will not significantly impact what the town may choose to do with the washes in the way of public use.

Harrel said no structures would be built in the washes, and measures can be taken to protect whatever facilities might be placed in the washes.

The Maricopa County Flood Control District has spent about two years on the study.

NOTICE OF REGULAR SESSION

OF THE

FOUNTAIN HILLS TOWN COUNCIL

WHEN: NOVEMBER 16, 1995

TIME: **6:30 P.M.

WHERE: TOWN HALL COUNCIL CHAMBERS

Pursuant to A.R.S. 38-431.02, notice is hereby given to the members of the Town Council of Fountain Hills and to the general public that the Town Council of Fountain Hills will hold a regular session open to the public on Thursday, November 16, 1995 at 6:30 p.m. in the Council Chambers of the Fountain Hills Town Hall, located at 16836 E. Palisades Blvd., Building C, Fountain Hills, Arizona.

*** Prior to the regularly scheduled Council meeting, the Flood Control District of Maricopa County and the Town of Fountain Hills Engineering Department will host an open public meeting presenting the results of the Fountain Hills Floodplain Delineation Studies. The public meeting will be held in the conference room from 4:00 to 6:30 p.m.*

RULES FOR ADDRESSING THE COUNCIL - ADOPTED 1/18/90

It is the Council's desire to hear public comment on agenda items. As it is important to maintain order during the meeting, please adhere to the following rules of order if you wish to speak:

1.) All citizens wishing to speak must first be recognized by the Mayor.
2.) The Mayor will not call for public comment on an item until after a motion has been made and seconded and the Council has had adequate opportunity to discuss the item.
3.) Please stand and state your name and address after being called on to speak.
4.) All comments must be directed to the Mayor.
5.) TIME LIMIT - 3 MINUTES PER PERSON PER ITEM.
6.) Statements should not be repetitive.
7.) Persons or groups wishing to make longer presentations, should see the Town Clerk prior to the meeting.

The agenda for the meeting is as follows:

1.) Meeting called to order, pledge to the flag, invocation and roll call.

Consent Agenda:

All items listed with an asterisk (*) are considered to be routine, non-controversial matters and will be enacted by one motion and one roll call vote of the Council. There will be no separate discussion of these items unless a Councilmember or member of the public so requests. If a Councilmember or member of the public wishes to discuss an item on the consent agenda, they may request so prior to the motion to accept the consent agenda. The item will be removed from the Consent Agenda and considered in its normal sequence on the agenda.

Open house Thursday on floodplain

A public open house will be held Thursday, Nov. 16, to review results of floodplain delineation studies performed in Fountain Hills.

The open house will be held from 4 to 6:30 p.m. at Town Hall's conference room.

Floodplain delineation involves developing detailed topographic maps to determine where water goes while incorporating the results of rainfall patterns to determine typical and peak amounts of runoff.

Along with extensive surveying and aerial mapping, drainage factors such as slope, vegetation, soil composition and land use are analyzed and included.

The studies will be used to better manage the floodplain to reduce or prevent flood damage and maintain the integrity of the floodplains.

Areas designated for further analysis in an upcoming area drainage master study also will be presented.

Results obtained in the north and south delineation studies will be displayed at the open house.

Representatives from the Flood Control District of Maricopa County, the Town of Fountain Hills' Engineering Department and the engineering consulting firms will be available to discuss the results and answer questions.

PUBLIC NOTICE
YOUR RIGHT TO KNOW

ANNOUNCEMENT OF FLOOD HAZARD STUDY

Flood Control District of Maricopa County, under authority he National Flood Insurance Act of 1968 (P.L. 90 448), as nded, and the Flood Disaster Protection Act of 1973 (p.L. 93-34), is funding a detailed study of flood hazard areas in The Town f Fountain Hills, Arizona.

study is being performed for the Flood Control District by K Engineers and George V. Sabel Consulting Engineers. he purpose of this study is to examine and evaluate flood hazard reas which are developed or which are likely to be developed or ich are likely to be developed and to determine flood elevations hose areas. Flood elevations will be used by Maricopa County arry our floodplain management objectives of the National lood Insurance Program. They will also be used as the basis for etermining appropriate flood insurance premium rates applile for buildings and their contents.

s announcement is intended to notify all interested persons of e commencement of this study so that they may have an pportunity to bring any relevant facts and technical data concern-local flood hazards to the attention of the Flood Control rict for consideration in the course of this study. Such rmation should be addressed to Mr. Tim Murphy or Ms. Sandy tory, Flood Control District of Maricopa County, 2801 W. urango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

lished FH Times 1/13,1/20/93.

AFFIDAVIT OF PUBLICATION

The Times
OF FOUNTAIN HILLS AND RIO VERDE, ARIZONA

A publication of Western States Publishers, Inc.

STATE OF ARIZONA
COUNTY OF MARICOPA } ss.

L. ALAN CRUIKSHANK, being first duly sworn, upon oath deposes and says: That he is the publisher of

THE TIMES OF FOUNTAIN HILLS AND RIO VERDE

a newspaper of general circulation in the County of Maricopa and the State of Arizona, published at Fountain Hills, Arizona, and that the copy hereto attached is a true copy of the advertisement as published weekly in The Times of Fountain Hills and Rio Verde on the following dates:

Jan. 13, 1993
Jan 20, 1993

Sworn to before me this

23 day of

February A.D. 19 93

Karen Kirkendoll
Notary Public

OFFICIAL SEAL
KAREN KIRKENDOLL
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My comm. expires May 14, 1993

Meeting on flood plain plan

Find out where flood waters go on Dec. 17

An open house to inform Fountain Hills residents of floodplain delineation studies being performed on over 30 washes flowing through the community will be held on Thursday, Dec. 17.

The meeting will be held from 5 to 8 p.m. at the Town Hall Conference Room, 16836 E. Palisades Blvd.

The public is invited to come by the Town Hall anytime during the three-hour open house to share their experience and observations of local flooding and hear details about the studies.

Details will include how the study is conducted, what kind of information is being gathered and how the information will be used.

Mapping floodplains involves developing detailed topographic maps to determine where water goes and studying rainfall patterns to determine typical amounts of runoff. The studies and resulting maps will be used to better manage the floodplain so as to reduce or prevent flood damage and maintain the integrity of the floodplains.

Extensive surveying and aerial mapping is involved in the studies, but other factors influencing drainage also must be considered, including soil composition, slope and vegetation and land use.

The Fountain Hills studies are expected to take 12 months to complete, after which time a second open house will be held to inform residents of the results of the studies.

Questions or additional information regarding the studies can be obtained by writing or calling Jim Phipps or Tim Murphy of the Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone 506-1501, or Randy Harrel, town engineer, Town of Fountain Hills, 16836 E. Palisades Blvd, Fountain Hills, AZ 85268, telephone 837-2003.

Audit tops Sanitary agenda

The annual audit report will be the major topic on the agenda for the Sanitary District board of directors when it meets Thursday, Dec. 10.

The report is a routine document prepared each year, according to District Manager Ron Huber.

The board will also select a new chairman for the coming calendar year.

The job of chairman has simply rotated under the current board, and that being the case Director Dennis Regeski will be leading the board for the next year. Director Bruce Hansen is the outgoing chairman.

Huber said monthly staff reports will also be presented at the meeting, and he has a few carryover items to update the board on.

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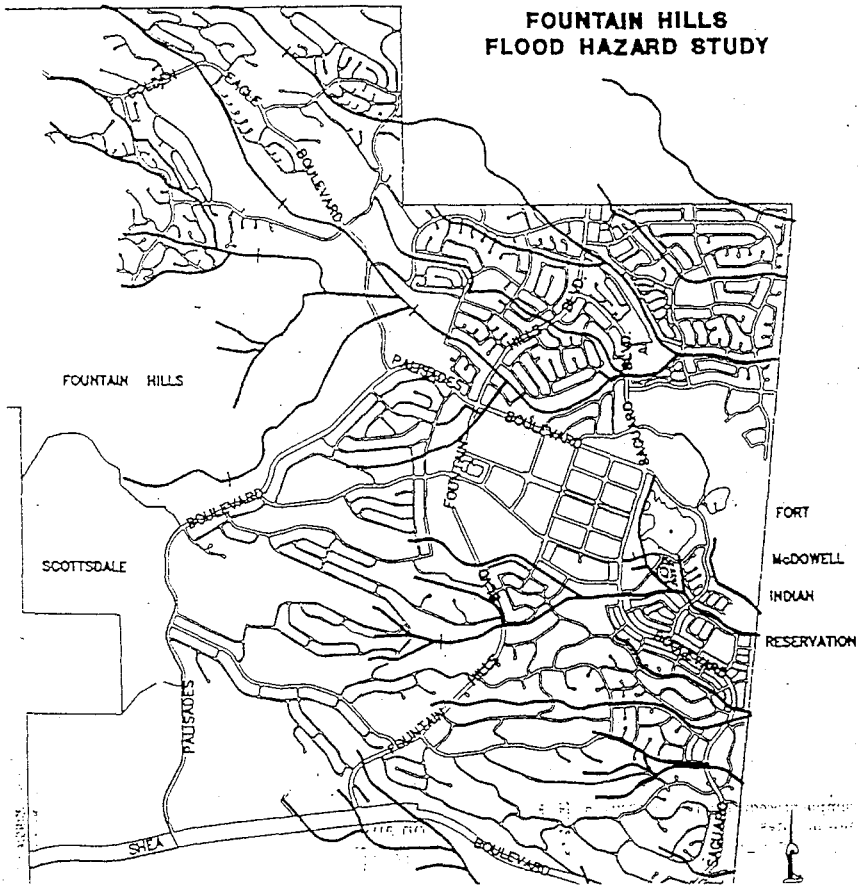

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Systems Specialists
Dana West.....
implements the unique MARKETING SYSTEMS designed to get m
SOLD quickly! She keeps my LISTERS advised of the progress on th
Administration Specialist
Carol Talty.....
handles all mailings/brochures and assists with special projects.

The Times of Fountain Hills

12-9-92

INVOICE NO. 93008

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by AGK Engineers and George V. Sabol Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed and to determine flood elevations for those areas. Flood elevations will be used by Maricopa County to carry out floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Story, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published: Arizona Republic, January 13, 20, 1993.

AFFIDAVIT OF PUBLICATION

The Arizona Republic/The Phoenix Gazette

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

JOAN LOHR, being first duly sworn, upon oath deposes and says: That she is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic and The Phoenix Gazette, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

~~The Arizona Republic~~
The Phoenix Gazette

JANUARY 13, 20, 1993

Joan Lohr

Sworn to before me this

25TH day of

JANUARY 93 A.D. 19

OFFICIAL SEAL
MARY LEE BOOHER
NOTARY PUBLIC STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1995

Mary Lee Booher
Notary Public

FEDERAL EMERGENCY MANAGEMENT AGENCY

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM

O.M.B. Burden No. 3067-0148
Expires July 31, 1997

FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average . 23 hour 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.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Hydrology, Hydraulics
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 25 years experience in the expertise listed above.
4. I have ☒ prepared ☒ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
   Hydrologic analysis and floodplain delineation
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.
   b. ☐ Compared plans and specifications with as-built survey information.
   c. ☐ Examined plans and specifications and compared with completed projects.
   d. ☐ Other _____
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: George V. Sabol
(please print or type)

Title: Sr. Associate, SFC Engineering Company
(please print or type)

Registration No. 17928 Expiration Date: 30 June 1998

State Arizona

Type of License Professional Engineer

George Sabol
Signature

23 January 1997
Date

Registered Professional Engineer (Civil) CERTIFICATE NO. 17928 GEORGE V. SABOL Date Signed 23 Jan ARIZONA, U.S.A.

Seal
(Optional)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply.

FEDERAL EMERGENCY MANAGEMENT AGENCY **HYDROLOGIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.67 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ASHBROOK WASH
(One form for each flooding source)

Project Name /Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. HYDROLOGIC ANALYSIS IN FIS

☐ Approximate study stream (Zone A)
☒ Detailed study stream (briefly explain methodology) The analysis was performed using HEC-1.

2. REASON FOR NEW HYDROLOGIC ANALYSIS

☒ No existing analysis
☐ Improved data *(see data revision on page 3)*
☐ Changed physical conditions of watershed *(explain)* _____

☐ Alternative methodology *(justify why the revised model is better than model used in the effective FIS)*

☐ Evaluation of proposed conditions (CLOMRs only) (explain) _____

☐ Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100 - and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

☒ Approval of hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., Flood Control District of Maricopa County)
Attach evidence of approval.

☐ Approval of the hydrologic analysis is not required by any local, State, or Federal Agency.

4. REVIEW OF RESULTS

Stream: ASHBROOK WASH

Comparison of 100-year Discharges *

Location:	Drainage area (Sq mi.)	FIS (cfs):	Revised (cfs):

* SEE ATACHED COMPARISON SHEET.

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review.

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made *(attach separate sheet if necessary)*

ATTACH A COMPLETED REVIEW OF RESULTS PAGE FOR EACH FLOODING SOURCE.

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS *(i.e. no changed hydraulic conditions)*? ☐ Yes ☒ No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No N/A New study

FEMA does not normally revise NFIP maps solely due to insignificant flow changes where changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? ☐ Yes ☒ No

If yes, provide the following:

Location along flooding source: _____

Maximum peak discharge: _____ cfs

Second highest peak discharge: _____ cfs

Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site *(along flooding source or similar watershed; specify)*

UNAVAILABLE

Gaging Station: _____

Drainage area at gage: _____ mi^2

Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as new data (*New*) or as revising existing data (*Revised*). *(If necessary, attach a separate sheet.)*

Data Parameter	New	Revised	Data Source
Subbasin Areas	☒	☐	USGS/FOUNTAIN HILLS MAPPING
Lag time, L, Lca, Slope, Kn	☒	☐	USGS/FOUNTAIN HILLS MAPPING
Green + Ampt Parameters	☒	☐	FCDMC HYDROLOGIC MANUAL
Routing Reach Parameters	☒	☐	FCDMC HYDROLOGIC MANUAL
	☐	☐	

- Data source can be from a Federal, State, or local government agency, or from a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source *(i.e., certified statement, report, bibliographical reference to a published document)*. In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

☐ Statistical Analysis of Gage Records (*use Attachment A*)

☐ Regional Regression Equations *(use Attachment B)*

☒ Precipitation/Runoff Model *(use Attachment C)*

☐ Other *(specify; attach backup computations and supporting data)* _____

ATTACHMENT A: STATISTICAL ANALYSIS OF GAGE RECORDS

Gaging Station: N/A

Gage Location (latitude and longitude): _____

	FIS:	Revised:
1. Number of years of data		
Systematic		
Historical		
2. Homogeneous data	☐ Yes ☐ No	☐ Yes ☐ No
3. Data adjustments	☐ Yes ☐ No	☐ Yes ☐ No
4. Number of high outliers		
Low outliers		
Zero events		
5. Generalized skew		
6. Station skew		
7. Adopted skew		
8. Probability distribution used (justify if log-Pearson III was not used)		
9. Transfer equations to ungaged sites		☐ Yes ☐ No

If yes, specify method

_____

_____

_____

10. Expected probability* ☐ Yes ☐ No

11. Comparison of results with other analyses ☐ Yes ☐ No

If yes, describe comparison

_____

_____

_____

*FEMA does not accept expected probability analyses for the purpose of reflecting flood hazard information in a FIS.

If any data is not available, indicate by N/A.

Attach analysis including plot of flood frequency curve.

ATTACHMENT B: REGIONAL REGRESSION EQUATIONS

1. Bibliographical Reference: N/A

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. Gaged or ungaged stream: _____

3. Hydrologic region(s): _____
   Attach backup map.

4. Provide parameters, values, and source of data used to define parameters.

		FIS:		Revised:	
5.	Urbanized conditions calculations	☐ Yes	☐ No	☐ Yes	☐ No
6	Percent of watershed urbanization	_____		_____	
7.	Is the watershed controlled?	☐ Yes	☐ No	☐ Yes	☐ No
8.	Comparison with other analyses	☐ Yes	☐ No	☐ Yes	☐ No

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

		FIS:	Revised
1.	Method or model used:	N/A	HEC-1
	Version:	N/A	4.0.1E
	Date:	N/A	MAY 1991
2.	Source of rainfall depth:	N/A	NOAA ATLAS 2
3.	Source of rainfall distribution:	N/A	FCDMC Hydrologic Manual
4.	Rainfall duration:	N/A	6 + 24 Hr.
5.	Areal adjustment to precipitation (%):	N/A	DEPENDS UPON SUBBASIN AREA
6.	Maximum overland flow length	N/A	1.467 mi. (207G TABLE S-7)
7.	Hydrograph development method:	N/A	CLARK UNIT GRAPH
8.	Loss rate method:	N/A	GREEN - AMPT
	Source of soils information:	N/A	SCS SOIL SURVEY
	Source of land use information	N/A	AERIAL PHOTOS
9.	Channel routing method:	N/A	NORMAL DEPTH
10.	Reservoir routing:	☐ Yes ☐ No	☒ Yes ☐ No
11.	Baseflow considerations:	☐ Yes ☐ No	☐ Yes ☒ No

If yes, explain how baseflow was determined:

12. Snowmelt considerations: ☐ Yes ☐ No ☐ Yes ☒ No

13. Model calibration: ☐ Yes ☐ No ☒ Yes ☐ No

If yes, explain how calibration was performed The model was calibrated by comparing USGS gage data, runoff volume checks upstream from dams, results with estimates using a USGS regional regression eqn. and modeled results with results of other M.C. studies. (Section 3.2.3)

14. Future land use condition: ☐ Yes ☒ No

If yes, explain why

NOTE: FEMA policy is to base flooding on existing conditions.
If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

See the Hydrology Report

ATTACHMENT D: CONFIDENCE LIMITS EVALUATION

Stream: N/A

Select one location for Confidence Limits Evaluation (*describe location*): _____

_____

Discharges for selected location:

Exceedance Probability		FIS	Revised
10%	(10-year)	_____ cfs	_____ cfs
2%	(50-year)	_____ cfs	_____ cfs
1%	(100-year)	_____ cfs	_____ cfs
0.2%	(500-year)	_____ cfs	_____ cfs

1% (100-year) Flood Confidence Intervals

90% Confidence Interval: 5% limit _____ cfs

95% limit _____ cfs

50% Confidence Interval: 25% limit _____ cfs

75% limit _____ cfs

If the value of the 100-year frequency flood in the FIS is beyond the 50% confidence interval but within the 90% confidence interval, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No

An example of confidence limits analysis can be found in Appendix 9 of Bulletin 17B.

Attach Confidence Limits Analysis.

Comparison of 100-year Discharges

Location:	Drainage area (Sq. mi.)	FIS (cfs.):	Revised (cfs):
Town Limit (North); C556	1.64	N/A	1752
At Golden Eagle Blvd; C557	1.85	N/A	1879
Above Aspen Dam	1.97	N/A	1989
Below Aspen Dam	2.15	N/A	287
Above Golden Eagle Park Dam	2.27	N/A	294
Below Golden Eagle Park Dam	7.13	N/A	970
Below Confluence with Arrow Wash	7.93	N/A	1380
Below Confluence with Legend Wash	8.78	N/A	2053
Below Confluence with Balboa Wash	13.06	N/A	3180
Town Limit (East); C627	13.32	N/A	3190

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ASHBROOK WASH
(One form for each flooding source)

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. REACH TO BE REVISED

Downstream limit: TOWN LIMIT (EAST)

Upstream limit: TOWN LIMIT (NORTH)

2. EFFECTIVE FIS

☒ Not studied

☐ Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

☐ Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

☐ Floodway delineated

Downstream limit of Floodway _____

Upstream limit of Floodway _____

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

☒ Not studied in FIS

☐ Improved hydrologic data/analysis. Explain: _____

☐ Improved hydraulic analysis. Explain: _____

☐ Flood control structure. Explain: _____

☐ Other. Explain: _____

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete 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 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 for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model — Natural ☐ Floodway ☐

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 requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor'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 ☐ Floodway ☐

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 ☐ Floodway ☐

The duplicate effective or corrected 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 or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☐

The existing or pre-project conditions model *(or duplicate effective 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 proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. — Natural ☒ Floodway ☒

6. Hydraulic Analyses (Only if Hydraulic Models are not developed)

See Hydraulics Report.

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS *(from model used to revise 100-year water surface elevation)*

1. Discharges:

	Upstream Limit	Downstream Limit
10-year		
50-year		
100-year	1752 cfs	3187 cfs
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined

CRITICAL DEPTH

3. Give range of friction loss coefficients (*Manning's "N"*) Channel ..... 0.025 - .125

Overbanks ..... 0 - .124

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

Location	FIS	Revised
N/A		

Explain: NEW STUDY

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

The cross-sections were determined photogrammetrically by the aerial mapping company. All cross-sections are stationed from left to right looking downstream with the thalweg set at station 10,000.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☒ Yes ☐ No If no, explain why not:

6. Explain how reach lengths for channel and overbanks were determined:

Channel reach lengths were measured along the thalweg and overbank reach lengths were measured along the anticipated path of the center of mass of the overbank flow.

5. RESULTS *(from model used to revise 100-year water surface elevations)*

1. Do the results indicate:

a. Water surface elevations higher than end points of cross sections? ..... ☐ Yes ☒ No

b. Supercritical depth? ..... ☐ Yes ☒ No

c. Critical depth? ..... ☒ Yes ☐ No

d. Other unique situations ..... ☐ Yes ☒ No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps. FOR THOSE CROSS-SECTIONS WHERE THE HEC-2 MODEL DEFAULTED TO CRITICAL DEPTH THE CRITICAL DEPTH WATER SURFACE ELEVATIONS ARE PLOTTED ON THE PROFILES AND MAPS.

2. What is the maximum change in energy gradient between cross-sections? 30.42

Specify location ..... SECNO 4.839

3. What is the distance between the cross-sections in 2 above? 1067.60

4. What is the maximum distance between cross-sections? 1552.03

Specify location ..... SECNO 4.058

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? ..... 1 foot

b. What is the maximum surcharge for the revised conditions? ..... N/A foot

Specify location ..... NEW STUDY

c. What is the maximum velocity? ..... 15.09 fps

Specify location ..... SECNO 2.405

d. Are there any negeative surcharge values at any cross-section? ☐ Yes ☒ No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain:

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? ..... ☐ Yes ☒ No

If Yes, explain:

7. Do 100-year water surface elevations increase at any location? ..... ☐ Yes ☐ No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

N/A NEW STUDY

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

N/A NEW STUDY

A. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section_____ within_____feet *(vertical)* and upstream of the project at cross section_____within_____feet *(vertical)*.

N/A NEW STUDY

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section_____within_____feet *(vertical)* and upstream of the project at cross section_____ within_____feet *(vertical)*.

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

THE PROFILES ARE LOCATED IN THE HYDRAULIC ANALYSIS NOTEBOOK.

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

Proceed to Riverine /Coastal Mapping Form

FEDERAL EMERGENCY MANAGMENT AGENCY
WATER SURFACE ELEVATION CHECK

N/A NEW STUDY

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
MARICOPA COUNTY, ARIZONA	ASHBROOK WASH	FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]

COMMENTS:

1-100-year (natural) Water Surface Elevation 2-Encroachment (floodway) Water Surface Elevation 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ASHBROOK WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable)*:

		Included		
A.	Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☒ N/A
B.	Revised detailed 100- and 500-year floodplain boundaries	☐ Yes	☐ No	☒ N/A
C.	Revised 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
D.	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated	☒ Yes	☐ No	☐ N/A
E.	Stream alignments, road and dam alignments	☒ Yes	☐ No	☐ N/A
F.	Current community boundaries	☒ Yes	☐ No	☐ N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map	☐ Yes	☐ No	☒ N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
I.	The requestor's property boundaries and community easements	☐ Yes	☐ No	☒ N/A
J.	The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
K.	Location and description of reference marks	☒ Yes	☐ No	☐ N/A
L.	Vertical datum (example: NGVD, ~~NAVD etc.~~) NGVD 1929	☒ Yes	☐ No	☐ N/A
M.	Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
N.	Location and alignment of all coastal transects used to revise the coastal analyses	☐ Yes	☐ No	☒ N/A

If any of the items above are marked no or N/A, please explain: THIS IS THE FIRST STUDY DONE IN FOUNTAIN HILLS, THEREFORE THERE ARE NO EXISTING FLOODPLAIN AND FLOODWAY DELINEATIONS.

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? AERIAL MAPPING AUGUST 1991

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS N/A scale N/A Contour interval
   b. Revision Request 1" = 200' scale 2 FOOT Contour interval

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

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.

   Attach additional pages if needed.

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's? ☐ Yes ☐ No

If yes, please give the location of shift or increase and an explanation for the increase.

N/A This is the first study of the area, therefore, there isn't an existing 100-year floodplain delineation.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? ..... ☐ Yes ☐ No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase? _____

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? ..... ☐ Yes ☐ No

If yes, explain:

N/A This is the first study of the area, therefore, there isn't an existing floodway delineation.

7. If a V- zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? N/A ☐ Yes ☐ No

If no, explain:

8. Manual or digital map submission:

☒ Manual

☐ Digital

Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

IF REQUESTED A DIGITIZED MAP CAN BE SUPPLIED.

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.

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_____

   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, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? N/A ☐ 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.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ASHBROOK WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: SIERRA MADRE DRIVE
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 4.349
3. This revision reflects *(check one of the following)*:

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed) _____

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
5 - 10' x 3' BOX CULVERTS

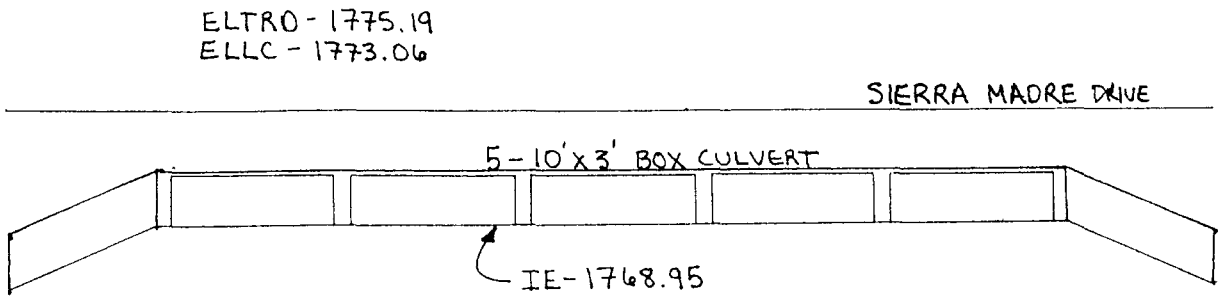
2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments)
30° - 75° WING WALLS ; NO INLET TOP EDGE BEVEL

3. Hydraulic model used to analyze the structure *(e.g., HEC-2 with special bridge routine, WSPRO, HY8)*
HEC-2 SPECIAL CULVERT METHOD

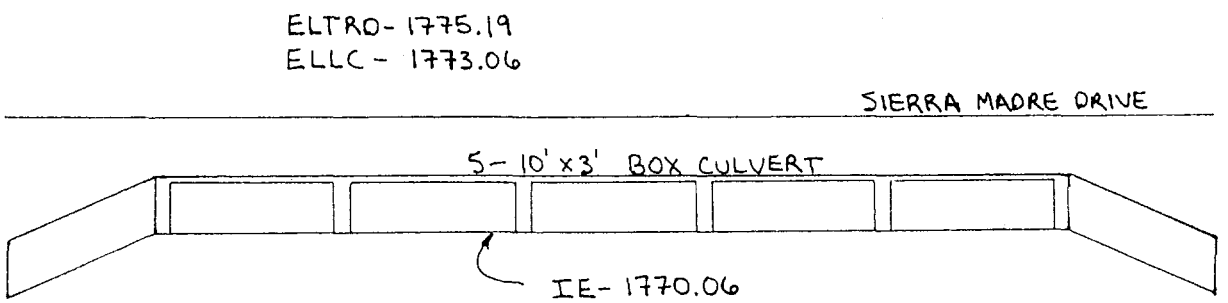
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

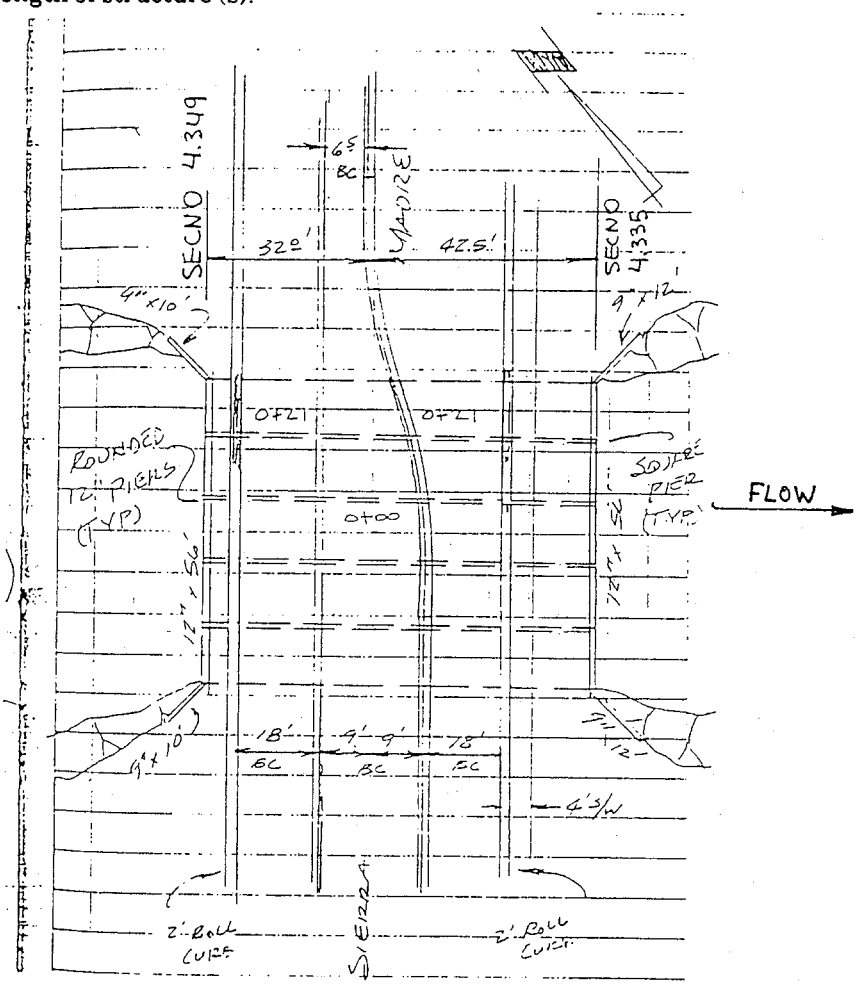
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	74.5 ft.
Calculated culvert/bridge area (ft ²) by the hydraulic model, if applicable	150 ft²
Total culvert/bridge area (ft ²)	150 ft.²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1775	1775
Downstream face	1772.6	1772.6

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1775.19	1775.19
Downstream face	1775.19	1775.19

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1771.68	1771.88
Downstream face	1769.16	1769.47

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	300	N/A	N/A	300

The maximum depth of flow over the roadway/railroad (ft.) ..... N/A

Weir length (ft.) ..... N/A

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	52	52	52
Downstream face	52	52	52

Loss Coefficients

Entrance loss coefficient	0.5
Manning's "n" value assigned to the structure(s)	0.013
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	N/A
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport *(including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ASHBROOK WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: GOLDEN EAGLE BOULEVARD
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 4.110
3. This revision reflects *(check one of the following)*:

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed) _____

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
2- 8' x 4' BOX CULVERT

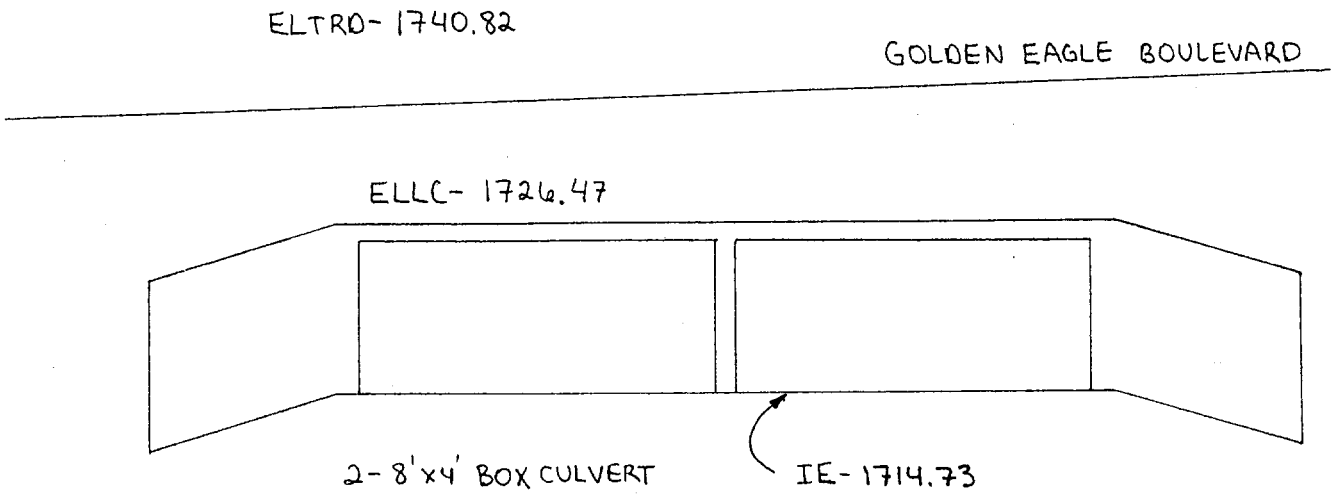
2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments)
30°-75° WING WALLS; NO INLET TOP EDGE BEVEL

3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
HEC-2 Special Culvert Method

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



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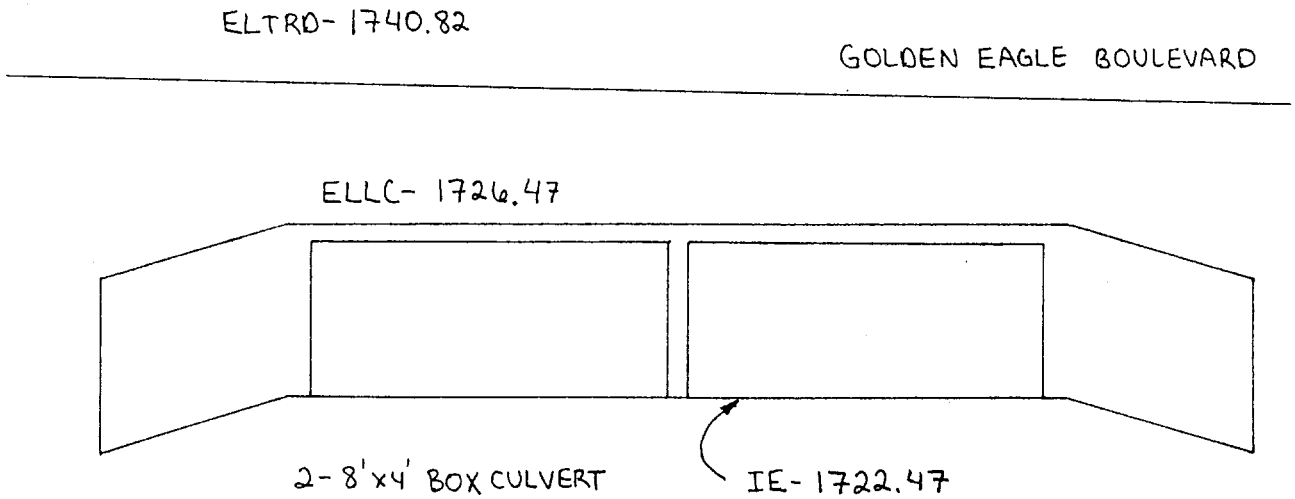
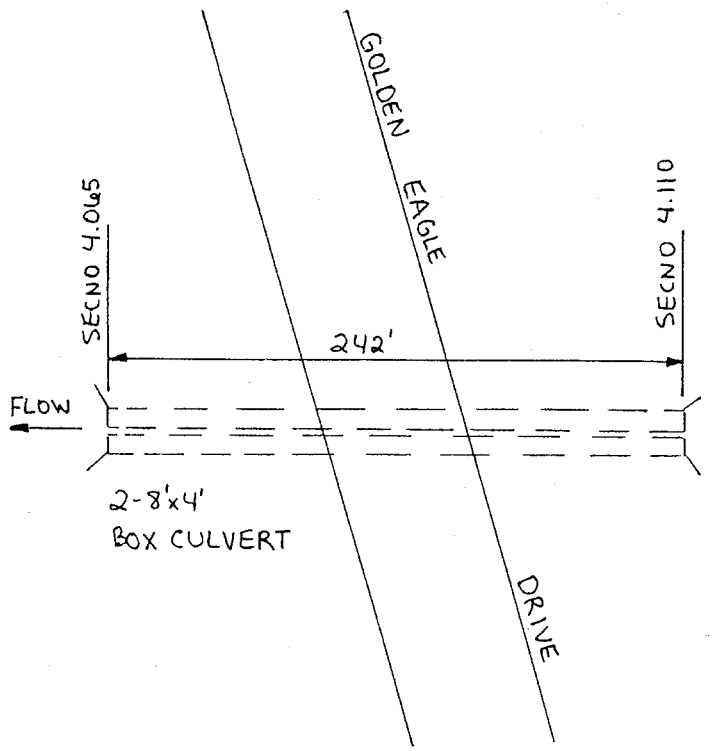


Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	242ft.
Calculated culvert/bridge area (ft 2) by the hydraulic model, if applicable	64 ft.^{2}
Total culvert/bridge area (ft 2)	64 ft.^{2}

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1739.78	1739.78
Downstream face	1731.4	1731.4

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1740.82	1740.82
Downstream face	1740.82	1740.82

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1725.23	1726.30
Downstream face	1717.22	1717.83

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	300	N/A	N/A	300

The maximum depth of flow over the roadway/railroad (ft.) ..... N/A

Weir length (ft.) ..... N/A

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	40	16	40
Downstream face	25	16	25

Loss Coefficients

Entrance loss coefficient	0.5
Manning's "n" value assigned to the structure(s)	0.013
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	N/A
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment (*bed material*) load?
   _____cfs (*attach gradation curve*)

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ASHBROOK WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: HAMPSTEAD DRIVE
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 3.531
3. This revision reflects *(check one of the following)*:
   - ☒ New bridge/culvert not modeled in the FIS
   - ☐ Modified bridge/culvert previously modeled in the FIS
   - ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
3-10'x7' BOX CULVERT

2. Entrance geometry of culvert/type of bridge opening (e.g. 30°-75° wing walls with square top edge, sloping embankments and vertical abutments)
30°-75° WING WALLS ; NO INLET TOP EDGE BEVEL

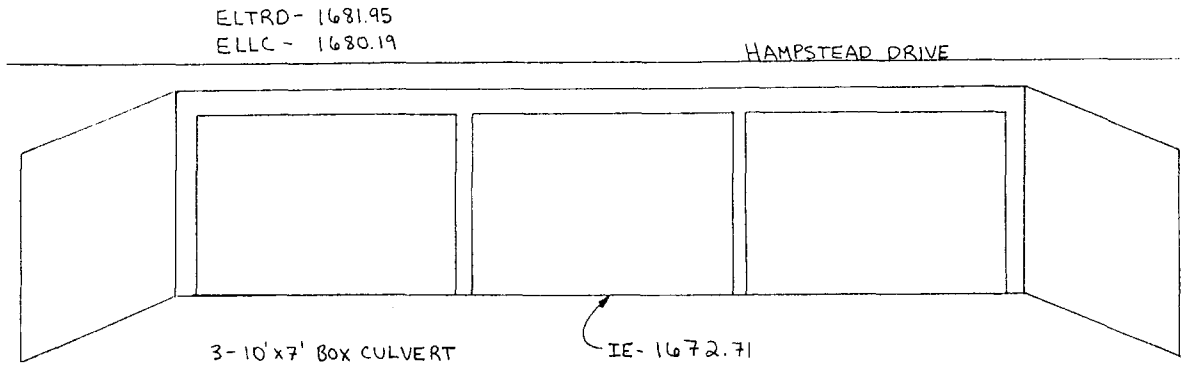
3. Hydraulic model used to analyze the structure *(e.g., HEC-2 with special bridge routine, WSPRO, HY8)*
HEC-2 Special Culvert Method

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

3. ANALYSIS

Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



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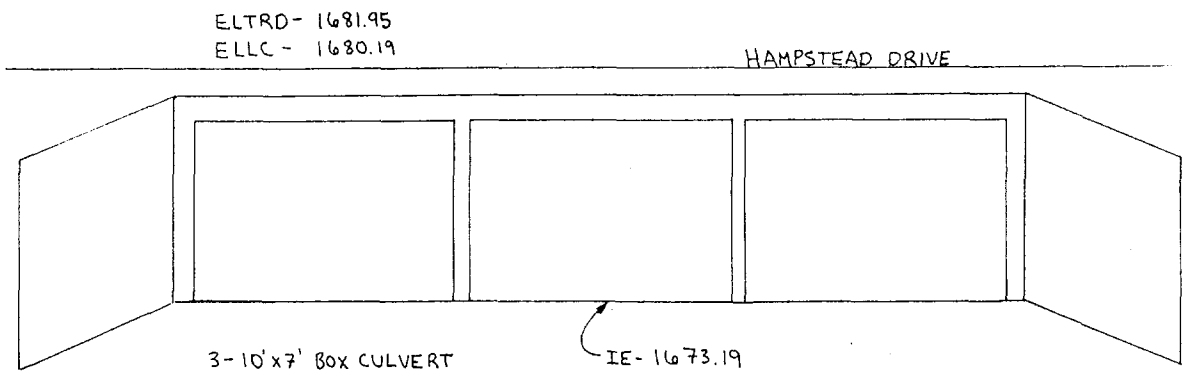
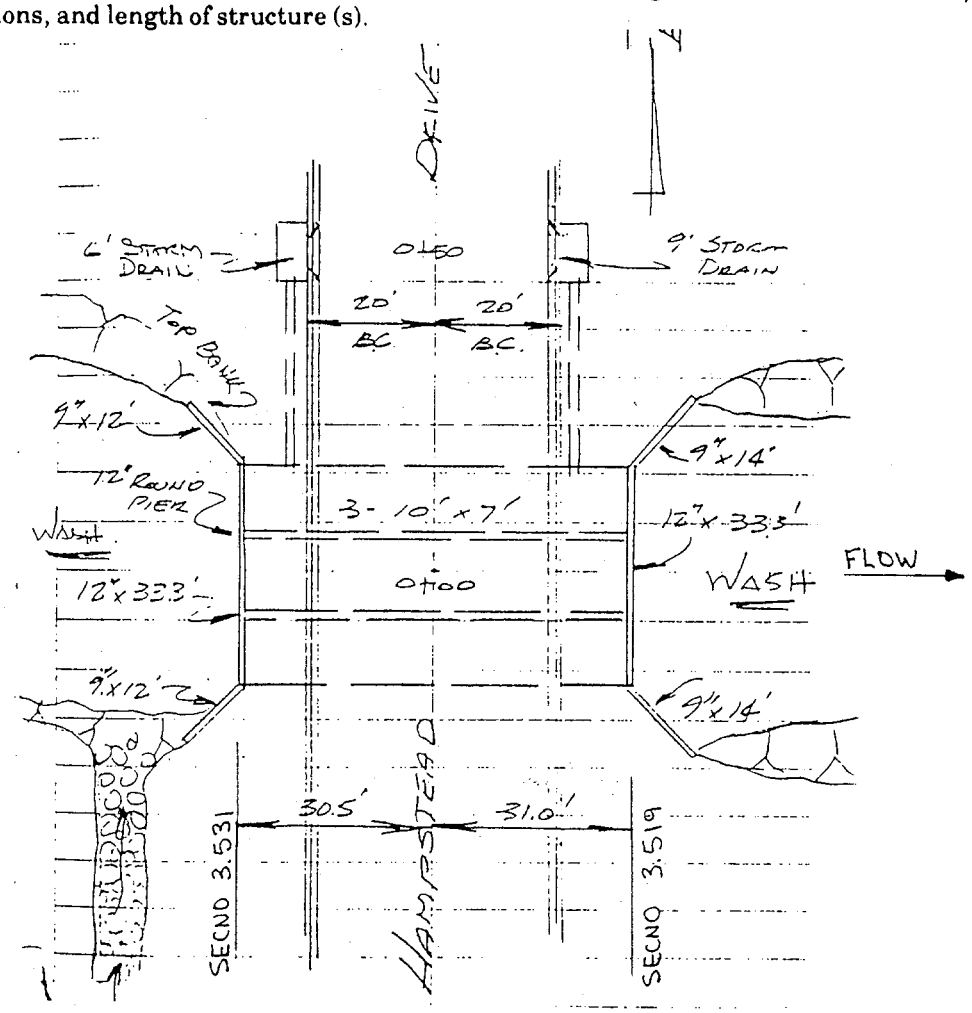


Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	61.5 ft.
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	210 ft.²
Total culvert/bridge area (ft²)	210 ft.²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1681.57	1681.57
Downstream face	1678.5	1678.5

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1681.95	1681.95
Downstream face	1681.95	1681.95

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1678.39	1678.77
Downstream face	1674.04	1675.70

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	970	N/A	N/A	970

The maximum depth of flow over the roadway/railroad (ft.) ..... N/A

Weir length (ft.) ..... N/A

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	130	30	130
Downstream face	80	30	80

Loss Coefficients

Entrance loss coefficient	0.5
Manning's "n" value assigned to the structure(s)	0.013
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	N/A
Pier coefficient	N/A
Contraction loss coefficient	0.1
Expansion loss coefficient	0.3

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment (*bed material*) load?
   _____cfs (*attach gradation curve*)

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ASHBROOK WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: GOLDEN EAGLE BLVD.
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 5.563
3. This revision reflects *(check one of the following)*:

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
1-60" CMP

2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments)
PIPE PROJECTING FROM FILL

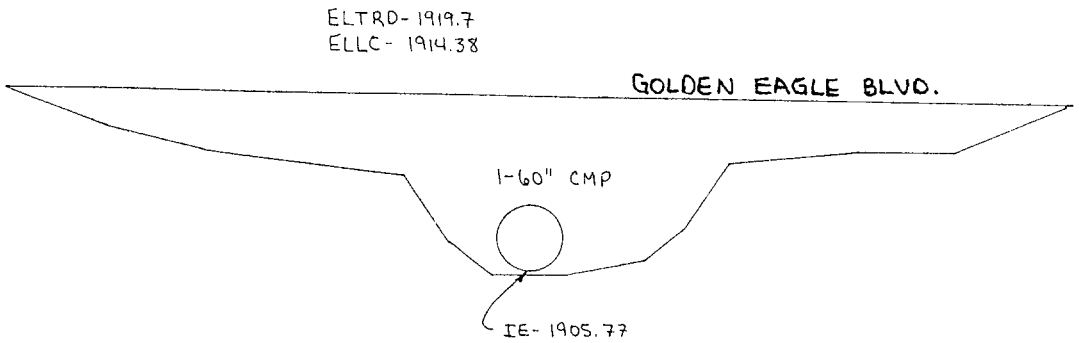
3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
HEC-2 SPECIAL CULVERT METHOD

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

3. ANALYSIS

Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



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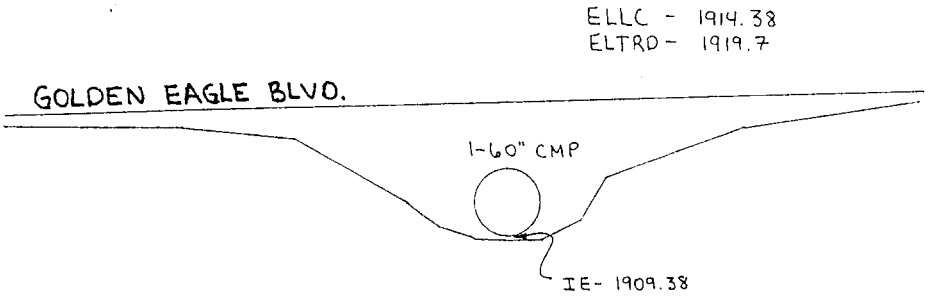
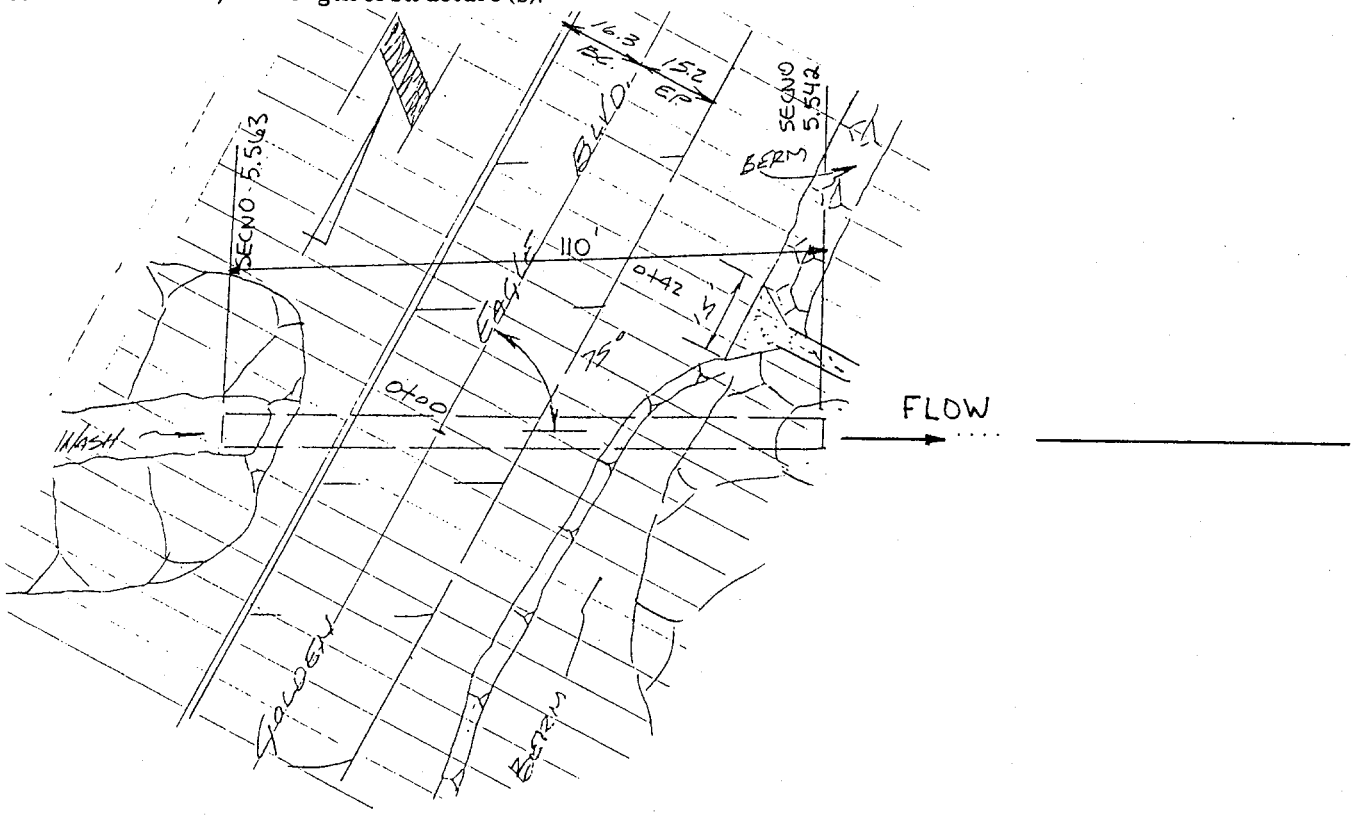


Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	110 ft.
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	19.6 ft.²
Total culvert/bridge area (ft²)	19.6 ft.²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1919.55	1919.55
Downstream face	1911.5	1911.5

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1919.7	1919.7
Downstream face	1919.7	1919.7

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1923.04	1923.19
Downstream face	1915.73	1917.66

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	279	1601	1880

The maximum depth of flow over the roadway/railroad (ft.) ..... 3.5 ft.

Weir length (ft.) ..... 154 ft.

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	140	140	140
Downstream face	55	55	55

Loss Coefficients

Entrance loss coefficient	0.9
Manning's "n" value assigned to the structure(s)	0.024
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment (*bed material*) load?
   _____cfs (*attach gradation curve*)

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ASHBROOK WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: BAYFIELD DRIVE
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 2.545
3. This revision reflects *(check one of the following)*:

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
3-60" CMP's

2. Entrance geometry of culvert/type of bridge opening (e.g. 30 ° - 75 ° wing walls with square top edge, sloping embankments and vertical abutments)
PIPE PROTECTING FROM FILL

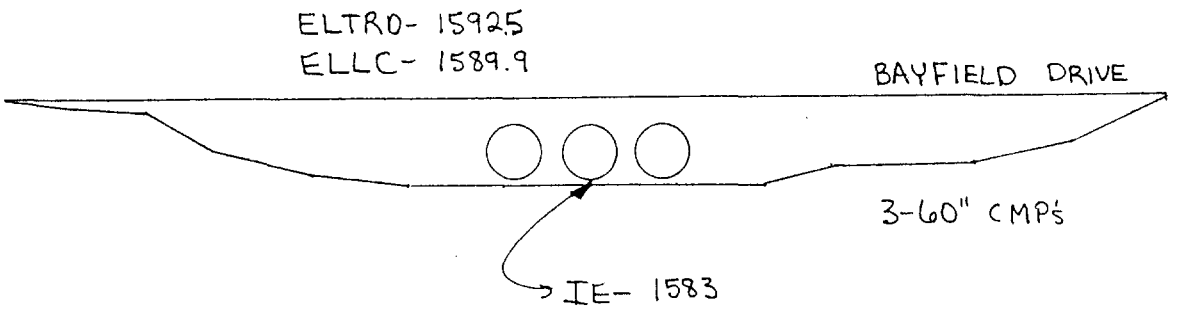
3. Hydraulic model used to analyze the structure *(e.g., HEC-2 with special bridge routine, WSPRO, HY8)*
HEC-2 SPECIAL CULVERT METHOD

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

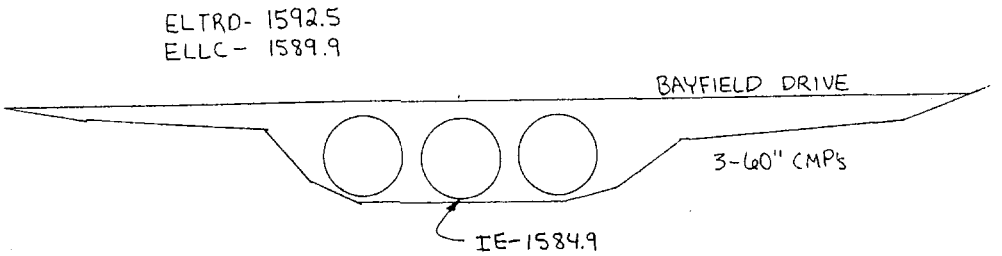
Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

3. ANALYSIS

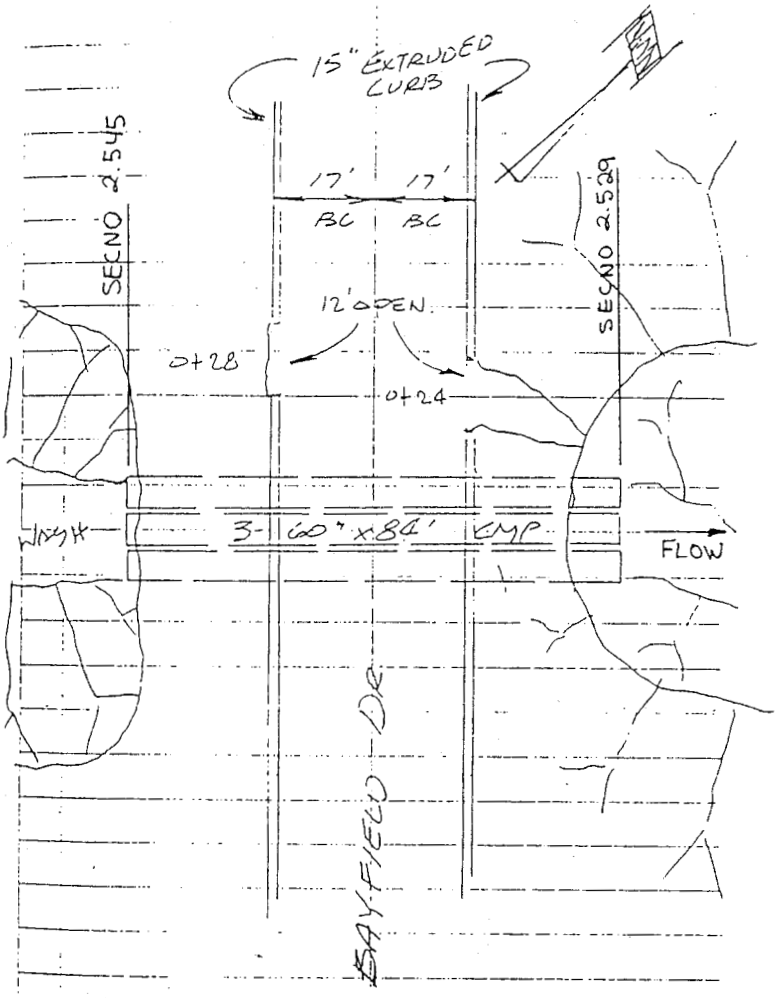
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	84 ft.
Calculated culvert/bridge area (ft ²) by the hydraulic model, if applicable	58.9 ft.²
Total culvert/bridge area (ft ²)	58.9 ft.²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1592.2	1592.2
Downstream face	1589.9	1589.9

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1592.5	1592.5
Downstream face	1592.5	1592.5

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1594.26	1594.49
Downstream face	1588.82	1591.59

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	654	740	1380

The maximum depth of flow over the roadway/railroad (ft.) ..... 2 ft.

Weir length (ft.) ..... 110 ft.

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	110	110	110
Downstream face	85	15	85

3. ANALYSIS (Cont'd)

Loss Coefficients

Entrance loss coefficient	0.9
Manning's "n" value assigned to the structure(s)	0.024
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ASHBROOK WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: SAGUARO BOULEVARD
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 2.428
3. This revision reflects *(check one of the following)*:

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed) _____

2. BACKGROUND

Provide the following information about the structure:

1. Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway) 3-60" CMP's
2. Entrance geometry of culvert/type of bridge opening (e.g. 30 ^{0} - 75 ^{0} wing walls with square top edge, sloping embankments and vertical abutments) PIPE PROJECTING FROM FILL
3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*) HEC-2 SPECIAL CULVERT METHOD

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1584.06	1584.06
Downstream face	1581.98	1581.98

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1584	1584
Downstream face	1584	1584

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1586.54	1586.61
Downstream face	1581.00	1584.54

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	714	1328	2050

The maximum depth of flow over the roadway/railroad (ft.) ..... 2.5 ft.

Weir length (ft.) ..... 245 ft.

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	245	245	245
Downstream face	110	110	110

Loss Coefficients

Entrance loss coefficient	0.9
Manning's "n" value assigned to the structure(s)	0.024
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport *(including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **DAM FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 0.5 hour 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.

Community Name: Maricopa County, Arizona (Town of Fountain Hills)

Flooding Source: Ashbrook Wash

Project Name/Identifier: Fountain Hills North Floodplain Delineation Study FCD 92-04

IDENTIFIER

Name of Dam: Golden Eagle Park Dam (Dam #4)

Location of dam along flood source (in terms of stream distance or cross section identifier):

SEC NO. 3.764

Check one of the following:

- [x] Existing dam
- [ ] New dam
- [ ] Modifications of existing dam (describe modifications)_____

Was the dam designed by _____Federal agency _____State agency

_____Local government agency _X_ Private organization?

BACKGROUND

Does the dam have dedicated flood control storage? [x] Yes [ ] No

Does the project involve revised hydrology? This is the first study of the area [x] Yes [ ] No

If yes, complete Hydrologic Analysis Form and include calculations of the 100-year inflow flood hydrograph routed through the dam with the beginning pool at the normal pool elevation (spillway crest elevation for ungated spillway). Include any inflow hydrograph bulking by watershed sediment yield and provide necessary debris and sediment yield analysis.
See the Hydrology Report.

Does the revised hydrology affect the 100-year water-surface elevation behind the dam or downstream of the dam? [x] Yes [ ] No

New Study

If yes, complete the Riverine Hydraulic Analysis Form and complete the table shown on the following page. Also see the Hydraulics Report

	Stillwater Elevation Behind the Dam	
	FIS	Revised
10-year		
50-year		
100-year	N/A	1715.8
500-year		
Normal Pool Elevation		None (Empty)

Was long term sediment accumulation taken into consideration in determining the normal pool elevation? ☒ Yes ☐ No

Was the dam designed to withstand the hydrostatic and hydrodynamic forces associated with floods greater than the 100-year flood? ☒ Yes ☐ No

If no, and the dam has a reasonable probability of failure during the 100-year flood, please attach dam break analysis.

Provide the following data on the dam:

Dimensional Height: 20 ft
Crest Elevation of top of dam: 1721.5
100-year flood storage capacity: 95 ac-ft
Freeboard (measured from 100-year water surface elevation): 5.7 ft

Spillway(s):

Type: ☐ gated ☒ ungated

Dimensional Width: 300 ft
Dimensional Height: 6 ft
Crest Elevation of top of spillway: 1714.9

Outlet(s):

Type: ☐ gated ☒ ungated

Two PIPES
Width: —
Height —
Diameter: 60"
Invert Elevation: 1695.1 & 1695.24

Explain flow regulation plan: This is a flood retarding structure which uses two ungated pipes to reduce the peak dicharge. During a flood event, no human intervention is needed for the operation of this structure.

Are the project features, including the emergency spillway, designed to accommodate the 100-year flood discharge without overtopping the dam? ☒ Yes ☐ No

Was the dam designed in accordance with all currently applicable local, State, and Federal regulations? ☒ Yes ☐ No

If no, please provide explanation.

FEMA may request a list of regulations that have been complied with and supporting documentation demonstrating compliance with these regulations.

Attach copy of formal operation and maintenance plan — See attached licenses from the State and the Emergency Action Plan Report.

Answer N/A to any questions which are not applicable

State of Arizona
DEPARTMENT OF WATER RESOURCES

LICENSE OF APPROVAL

Pursuant to Title 45 - Waters, Chapter 6, Article 1, of the Arizona Revised Statutes, the DIRECTOR, Department of Water Resources issues this License of Approval to:

TOWN OF FOUNTAIN HILLS

Authorizing the use of: FOUNTAIN HILLS #4 *Dam and Reservoir, File Number:* 07.33

Located in Section 10 *, Twp.* 3N *, Rge.* 6E *, G. & S.R. B. & M.,* MARICOPA *County, State of Arizona, to impound water in accordance with and subject to the following conditions:*

1) Use shall be only as a flood retarding structure, limited to temporary storage during periods of flooding.

2) Temporary fence fabric which crosses the emergency spillway shall be attached to the fence poles no sooner than two hours prior to the football game.

3) Temporary fence fabric which crosses the emergency spillway shall be removed from the fence poles no later than two hours after the game is over.

This License of Approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and seal of the Arizona Department of Water Resources

this 6th *day of* September *,* 1995

Herb Dishlip, Assistant Director
Surface Water Division

State of Arizona

DEPARTMENT OF WATER RESOURCES

LICENSE OF APPROVAL

Pursuant to Title 45-Waters, Chapter 6, Article 1, of the Arizona Revised Statutes, the DIRECTOR, Department of Water Resources issues this License of Approval to: TOWN OF FOUNTAIN HILLS

Authorizing the use of: FOUNTAIN HILLS #4 *Dam and Reservoir, File Number:* 07.33

Located in Section 10 *, Twp.* 3N *, Rge.* 6E *, G. & S.R. B. & M.,* MARICOPA *County, State of Arizona,*

to impound water in accordance with and subject to the following terms and conditions:

Use shall be only as a flood retarding structure, limited to temporary storage during periods of flood and for such additional time as may be required to completely evacuate the floodwaters through the outlet conduits

This License of Approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and seal of the Arizona Department of Water Resources

this 20th *day of* April *,* 1993

C. Laurence Linser, P.E. No. 9528
Deputy Director, Engineering

State of Arizona

DEPARTMENT OF WATER RESOURCES

LICENSE OF APPROVAL

Pursuant to Chapter 6, Title 45-Waters, of the Arizona Revised Statutes, the DIRECTOR, Department of Water Resources issues this License of Approval to: MCO Properties

authorizing the use of: Fountain Hills #4 Dam (07.33)

Located in Sec. 10, *Tp.* 3N, *R.* 6E, *G. & S.R.B. & M.* Maricopa *County, State of Arizona to impound water in accordance with and subject to the following terms and conditions:*

Use shall be only as a flood retarding structure, limited to temporary storage during periods of flood and for such additional time as may be required to completely evacuate the flood waters through the outlet conduits.

This license of approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and seal of the Arizona Department of Water Resources

22nd *day of* February, *19* 91.

Doug Toy, P.E. No. 15154

Deputy Director, Engineering

State of Arizona
OFFICE OF THE STATE WATER ENGINEER
Supervision of Safety of Dams

License of Approval

Pursuant to Chapter 3, Title 45 (Waters), of the Arizona Revised Statutes, the STATE WATER ENGINEER has found that the FOUNTAIN HILLS DAM #4 *Dam and Reservoir, State Application Number* 7-33*, located in Sec.* 10*, Tp.* 3N*, R.* 6E*, G. & S. R. B & M,* Maricopa *County, State of Arizona, are safe to impound water; and the use of said dam and reservoir to impound water in accordance with and subject to the following terms and conditions is hereby authorized:* Use shall be only as a flood retarding structure, limited to temporary storage during periods of flood and for such additional time as may be required to completely evacuate the flood waters through the outlet conduit.

This license of approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and the seal of the Arizona Water Commission of the State of Arizona this 13th *day of* December*,* 19 73

STATE WATER ENGINEER

Benson G. Scott

By Chief, Supervision of Safety of Dams

OCT 8
ERING

Town of Fountain Hills
Maricopa County, Arizona

Fountain Hills Retardation Structure
Golden Eagle Park Dam (#4)

EMERGENCY ACTION PLAN

August 1996

Prepared by:

Town of Fountain Hills
Randy L. Harrel, Town Engineer

in conjunction with:
Fountain Hills Unified School District
Don E. Combrink, Construction Manager

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I. PURPOSE

The purpose of this Emergency Action Plan is to define responsibilities and provide procedures to identify unusual and unlikely conditions which may endanger the integrity of one of the seven Flood Retardation Structures north of Shea Blvd. This identification process should be done in time to take remedial action and to notify the appropriate public officials of possible impending, or actual failure of one or more of the structures.

The EAP for the Retardation Structure also includes sections from the Town of Fountain Hills Emergency Operations Plan. The Town will be the main vehicle for carrying out of the emergency response and evacuation of public entities threatened by the breaching or failure of the structure. The initial detection of potential problems and the evaluation of the risks associated with those problems will fall upon both the Fountain Hills School District and the Town of Fountain Hills under the inspection, maintenance and emergency action plan procedures outlined in this plan.

The Retardation Structure evaluated herein is Golden Eagle Park Dam (Structure No. 4). The distribution of ownership is 50% - Town of Fountain Hills and 50% - Fountain Hills School District.

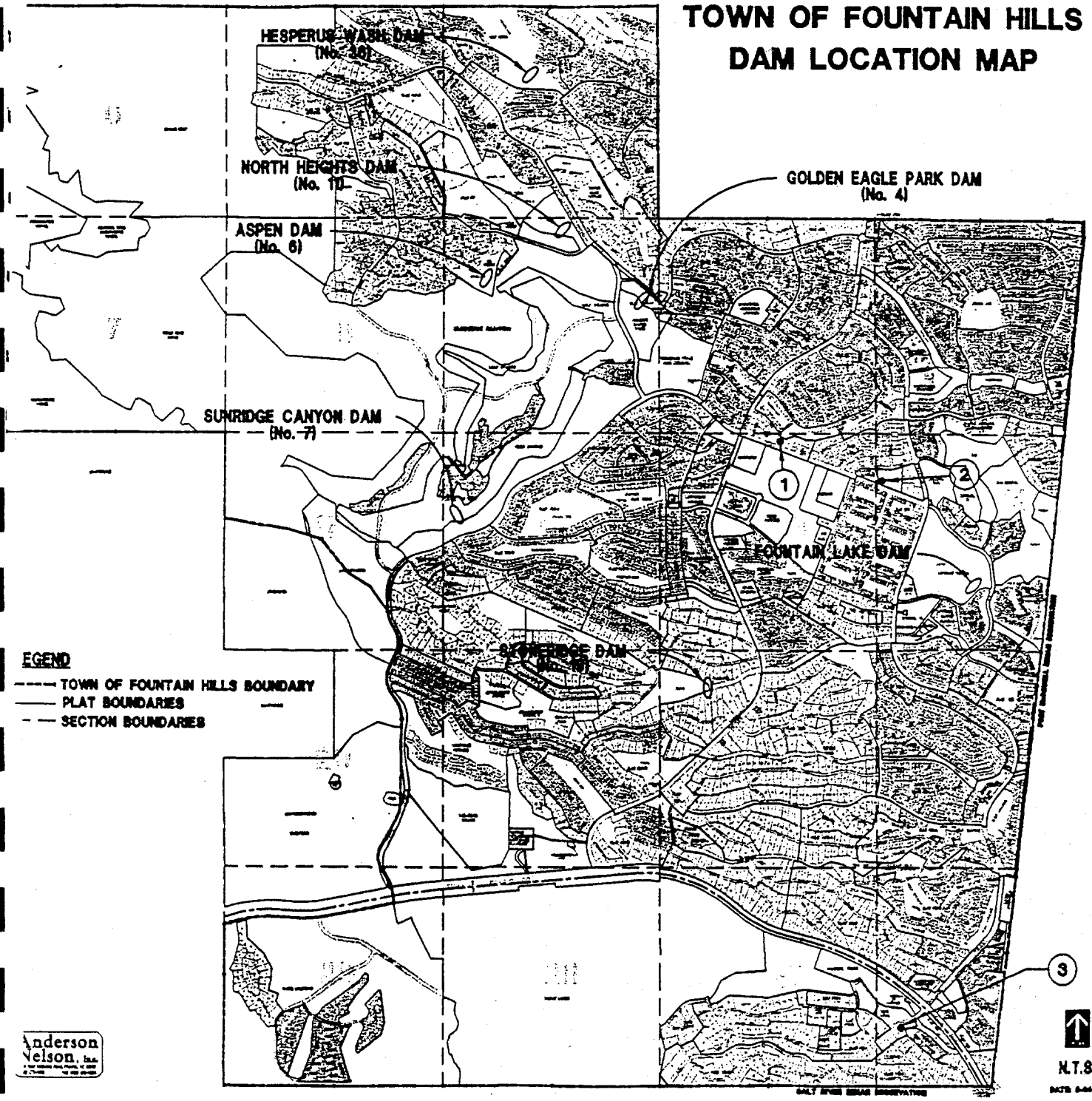
II.

LOCATION OF EMERGENCY SERVICES

(1) TOWN OFFICES, TOWN MARSHALL, & MCO

(2) FIRE DEPARTMENT

(3) MARICOPA COUNTY SHERRIF'S OFFICE



III. RESPONSIBILITIES

Mr. Don Clark of the Town of Fountain Hills Parks & Recreation Department will have the responsibility for the day to day monitoring of the dam structure. He will also be responsible for monitoring this structure during any severe storm event. Mr. Clark will report directly to Mr. Pat Harvey, Town of Fountain Hills Street Superintendent. Mr. Harvey will analyze the situation and take the appropriate remedial action and/or the notification of local authorities of any imminent potential danger. However, under certain circumstances, such as when failure is imminent or has already occurred, Mr. Clark will have the authority for notification. Warning and evacuation will be handled and coordinated through the Town of Fountain Hills under their Emergency Operation Plan. Facilities located directly below the dam structures (see listing on following page) would be notified immediately by the Town of Fountain Hills so as to insure adequate time for evacuation. This procedure will be coordinated with the appropriate public officials. To accomplish this task Mr. Harvey will contact the lead coordinator for the Town of Fountain Hills (see Emergency Response Organization Notification Flow Chart) to ensure the proper line of succession is established for dissemination of emergency information.

Mr. Randy Harrel, as Town Engineer, will be designated as the EAP coordinator. He will be responsible for all EAP related activities, including preparing revisions to the EAP, establishing training for new field personnel, coordinating EAP drills, etc. Mr. Harvey will be the person to contact should there be any questions concerning the EAP.

PRIMARY CONTACT	Mr. Pat Harvey, Street Superintendent	
	Work	837-2003
	Pager	408-2244
	Mobile	(602) 377-0115
	Home	837-9685
SECONDARY CONTACT	Mr. Don Clark, Park Maintenance Worker	
	Office	837-2003 ext. 149
	Pager	593-8528
	Mobile	
	Home	268-5347
TERTIARY CONTACT	Mr. Randy Harrel, P.E., Town Engineer	
	Work	837-2003
	Mobile	(602) 810-2487
	Home	979-2321

FACILITIES LOCATED WITHIN THE PROJECTED FLOOD INUNDATION AREA

	Facility and Location	Telephone Number and Contact
1.	Fire Station	911 Dispatch
2.	Fountain Hills High School 16000 E. Palisades Blvd.	837-0690 Don Combrink
3.	F.H. Sanitary District 16941 E. Pepperwood Crl.	837-9444 Ron Huber
4.	Fort McDowell Sand & Gravel El Pueblo & Grande	837-2358 Shift Boss
5.	Ft. McDowell Casino Ft. McDowell Road and Beeline Highway	837-1424 Mr. Kinsley

TOWN OF FOUNTAIN HILLS
DAM STRUCTURE
QUARTERLY INSPECTION REPORT

Structure Name:_____

Inspection Date_____ Date of Last Inspection_____

Inspectors:_____

Indication of Recent Rainfall or Impoundment: Yes [ ] No [ ]

Existing weather conditions:_____

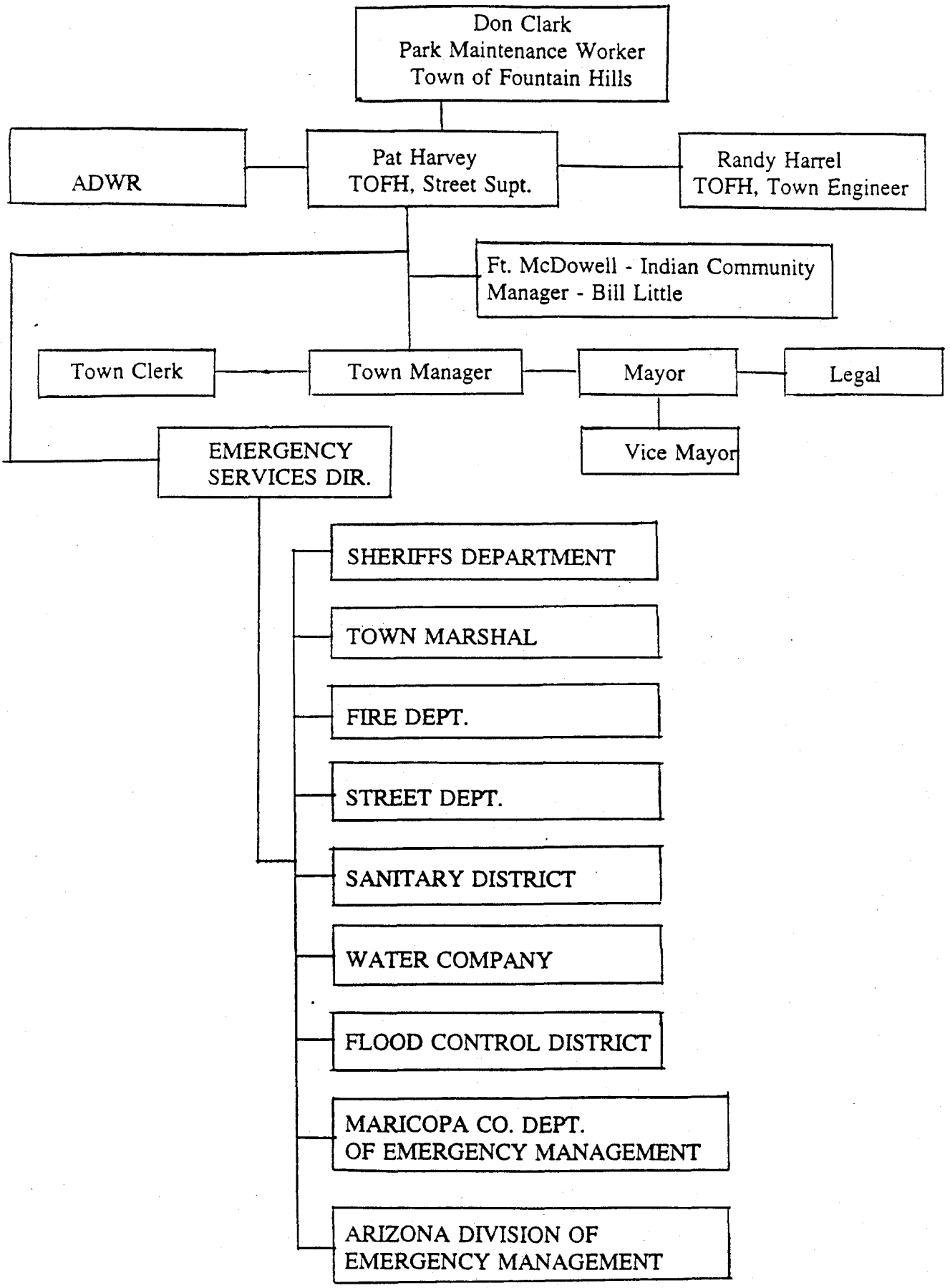
DAM

Yes	No	
		Access Road and Entrance
[ ]	[ ]	Existence of holes or deterioration of pavement. Comments:_____
[ ]	[ ]	Existence of rock or debris on roadway. Comments:_____
[ ]	[ ]	Existence of obstructive vegetative growth interfering with the view of vehicles entering and exiting the entrance area. Comments:_____
[ ]	[ ]	Existence of dislocated boulders and landscape rock Comments:_____
[ ]	[ ]	Existence of vandalized or dead cacti or plants. Comments:_____
		Inlet & Outlet Structure
[ ]	[ ]	Existence of obstruction or damage at the inlet. Comments:_____
[ ]	[ ]	Downstream slope of the dam. Existence of erosion, vehicle trespass, sloughing, suspicious areas, dislocated boulders, and rodent activity. Comments:_____
[ ]	[ ]	Principal Outlet Structure - Stilling Basin - Outlet Channel Existence of debris, silt, or obstructions in the box. Comments:_____
[ ]	[ ]	Existence of cracking, spalled areas, or stress of concrete. Comments:_____
[ ]	[ ]	Existence of damaged security fencing - vandalism. Comments:_____
[ ]	[ ]	Existence of obstructive vegetative growth or silt accumulation interfering with designed grade of outlet channel. Comments:_____

Yes	No	
[ ]	[ ]	Existence of illegal vehicular trespassing or dumping in the area. Comments:_____
[ ]	[ ]	Existence of down or damaged "No Trespassing" and "No Dumping" signs. Comments:_____
[ ]	[ ]	Existing access roads unsuitable for maintenance vehicles. Comments:_____
		Principal outlet structure - intake
[ ]	[ ]	Existence of accumulation of trash, debris, or dead wood. Comments:_____
[ ]	[ ]	Existence of settlement, spalled areas, or cracking of structure. Comments:_____
[ ]	[ ]	Existence of deterioration of paint on the wood grates, physical damage. Comments:_____
		Principal outlet conduit
[ ]	[ ]	Existence of debris, cracking, settlement, loss of joint material. Comments:_____
[ ]	[ ]	Existence of silt accumulation at the intake structure above the invert of the intake. Comments:_____
		Impound Area and Inflow Channel
[ ]	[ ]	Existence of unwanted vegetative growth, dead wood, and obstructions. Comments:_____
		Impound Area - Signing
[ ]	[ ]	"No Trespassing" and "No Dumping", existing signs down or damaged. Comments:_____
		Upstream Slope of Dam
[ ]	[ ]	Existence of erosion, vehicle trespass, sloughing, dislocated boulders, or rodent activity. Comments:_____
[ ]	[ ]	**Seepage along toe of Dam and/or downstream slope.** Comments:_____
		Emergency Spillway Area
[ ]	[ ]	Concrete sill, existence of cracking and stress damage. Comments:_____
[ ]	[ ]	Upstream and downstream slopes - existence of obstructive vegetative growth or obstructions. Comments:_____
[ ]	[ ]	Access roads - unsuitable for maintenance vehicles. Comments:_____

EMERGENCY RESPONSE ORGANIZATION

IV. NOTIFICATION FLOW CHART



FOUNTAIN HILLS SCHOOL DISTRICT

EMERGENCY ORGANIZATION CHART

POSITION	NAME	TELEPHONE NUMBER(S)
Superintendent	Walt Dunne	837-0690 Work 837-4208 Home 996-4368 Mother's House 615-5054 Mobile
Associate Superintendent	Maria Menconi	837-0690 Work 482-1628 Home 320-6474 Mobile
Facilities/Construction Mgr.	Don Combrink	837-0690 Work 942-8445 Home 376-6274 Mobile
Maintenance (District Wide)	Rich Dobson	837-0690 Work 837-4247 Home 448-4351 Mobile 450-2372 Pager
Maintenance (High School)	Bill Pageau	837-7758 Work 837-0731 Home

EMERGENCY TELEPHONE CONTACT LIST - EMERGENCY ACTION PLAN

FORT McDOWELL INDIAN COMMUNITY

POSITION	NAME	TELEPHONE NUMBER
Manager	Bill Little	Pager (520) 421-5608
President	Clinton Pattea	837-5121
Tribal Police	Duty Officer	837-1091

TOWN OF FOUNTAIN HILLS

Position	Name	Address	Telephone Number
Key Staff Personnel:			
Town Manager	Paul Nordin	14614 Dickens Dr.	837-3035
Admin. Asst. To Manager	Diana Nottingham	Not available	314-5347
Town Clerk	Cassie Hansen	15716 E. Sunburst Dr.	837-0437
Emergency Services Dir.	Randy Harrel	Not available	979-2321
MCSO Dist 4	Jerry Sheridan	Not available	256-1742
Town Marshal	Steve Gendler	Not available	837-0118
Fire Chief	Scott Wheelwright	16810 E. Glenbrook Blvd.	837-3651 817-0817 pager
Asst. Fire Chief	Tony Lombardi	Not Available	837-2003
Street Superintendent	Gordon "Pat" Harvey	Not available	837-9685 450-3346 pager
Sanitary District	Ron Huber	Not available	867-4874
Chaparral City Water Co.	Rob Kuta	Not available	837-9522
Maricopa County Flood Control Dist.	Steve Waters	2801 W. Durango	273-1411

Position	Name	Address	Telephone Number
Council Members:			
Mayor	Jerry Miles	16317 E. Inca Ave.	837-3214
Council*	William J. O'Brian	16680 E. Hawk Dr.	837-8941
Council*	Sidney Apps	14481 LaCosta	816-0021 203-0285
Vice Mayor*	Don Lawrence	15528 E. Cholla Dr.	837-2256
Council*	Marianne Wiggshoff	Que-Jav-He-Ma, Rocky Mt. Place	837-8460
Council*	Albert Poma	11219 N. Woodpecker Bay	837-1739
Council*	Penfield Mower	15957 E. Ponderosa Dr.	837-8055
Legal:			
Attorney	Bill Farrell	Not Available	661-6044
Other Emergency Telephone Numbers			
State Fire Marshal		1540 W. Van Buren Street	255-4964
State Land Department		1616 W. Adams Street	255-4052
Arizona Dept. of Water Resources Statewide Flood Warning Section	Wayne Cooley	500 North 3rd Street	417-2400 ext. 7197
MCO Water Operations Mgr.	Robert Kuta	Not available	837-9660, ext 317
MCO Field Supervisor	Paul Miller	Not available	837-9522, ext 17
MCO Vice President	Greg Bielli	Not available	837-9660 ext. 319

* Vice Mayor position is periodically shared by each Council member.

FOUNTAIN HILLS EFFLUENT LAKES NO. 27-1 & 28-3
V. EMERGENCY ACTION TABLE

PROBLEM	HOW TO EVALUATE	EMERGENCY ACTION	REQUIRED EQUIPMENT, MATERIALS, AND LABOR	NOTIFICATION	DATA TO RECORD
Flooding	Flood Protection				
	a. Large spillway releases.	During and after any unusual spillway use a special inspection shall be made. If any problems are found, see appropriate items for evaluation, emergency action, and notification procedures. Lower the reservoir by pumping at the maximum rate with no effluent inflow.		Dam operator notifies Effluent Systems Engineer & ADWR.	Discharge, headwater and tailwater elevations, and duration of spill. Complete special inspection checklist.
	b. Headwater is within one foot of the top of dam.	Make a special inspection of the dam; see above.		Dam operator is to notify Effluent Systems Engineer & ADWR.	Discharge, headwater and tailwater elevations, & duration of spill. Complete special inspection checklist.
	c. Flood to approach or exceed top of dam.	Make a special inspection of the dam; see above.		Dam operator initiates notification process and notifies ADWR.	Discharge, rate of rise, time when dam is overtopped, and time of failure. Complete special inspection checklist.
Seepage					
a. Water - Uncontrolled leakage.	Not Serious - Uncontrolled leak without the removal of fines. Rate of flow not increasing.	None required.		Notify the Effluent Sys. Engr. & ADWR.	Size and location of area, approximate flow.
	Serious - Rate of flow is increasing. Tailwater flows and elevation are increasing without the removal of fines and no increase in spillway discharge.	Lower the reservoir. Coordinate with Effluent Sys. Engr. for discharge instructions. Place a ring of sandbags top towards natural drainage to monitor flow. If boil becomes too large to build a dike around it; place a blanket filter over the area. Blanket of material to be coarse sand at bottom to large gravel 2-4" at top. Blanket to be 3-5' thick. Safety precaution: in no case shall the personnel making the repairs be placed in danger.	Materials: Sand and bags; see materials list.	Notify the Effluent Sys. Engr. and immediately notify ADWR if seepage rate is increasing. Begin notification process.	Size and location of area, approximate flow and how rapidly flow is increasing.
	Failure Imminent - Emerging water is muddy; rate of flow is increasing and an upstream whirlpool develops in reservoir. Tailwater flows and elevation increasing with no increase in spillway discharge.	Lower reservoir by pumping at maximum rate. Notify the Effluent Sys. Engr. Control loss of material by using sandbags to sufficient height to provide back pressure to prevent loss of materials. Safety precaution: In no case shall the personnel making the repairs be placed in danger.	Equipment: Shovels, trucks, dozer, and crane. Materials: Sand, bags, gravel, bales of straw or hay and rip rap. Labor: Equipment operators, 2 or 3 laborers.	For failure in less than 1 day, initiate notification process immedialtely and notify ADWR.	Size, location rate of flow is increasing for boil. Also, size and location of the whirlpool.

TOWN OF FOUNTAIN HILLS RETARDATION STRUCTURES
EMERGENCY ACTION PLAN

MATERIALS LIST
(Streets & Parks Depts.)

Heavy Equipment

1 - Dump Truck, 5 yd
1 - 1-1/2 ton Flat bed Dump
2 - Tractor w/front bucket & Gannons
1 - Backhoe Attachment
1 - Flail Mower Attachment
1 - Sweeper (Athey)
1 - 3-5 ton Roller Vibratory

Vehicles

3 - Pickup Trucks (3/4 ton)
1 - Pickup Trucks (1/2 ton)
2 - Pickup Trucks (1 ton)
1 - Gator 4x2 Dumpstyle

Power Equipment

2 - Truck Mounted Lighted Arrow Boards
1 - Truck Mounted Air Compressor
1 - Jackhammers
1 - Tampers

Communications

15 - Hand Held Radios
0 - Truck Mountain Radios
4 - Mobile Telephones
17 - Digital Pagers

Materials

Surplus Fill
Surplus Rip Rap
Road Barricades
Warning Cones
Emergency Flares
Misc. Hand Tools (i.e., shovels, picks, etc.)

Labor

1 - Street Superintendent
3 - Field Supervisor/Crew Chief
7 - Additional Field Laborers (Streets & Parks)
1 - Mechanic

VI. INSPECTION AND MAINTENANCE PROCEDURES

The inspection and maintenance of the dams should be performed in accordance with this EAP. All unusual or abnormal conditions that may adversely affect operations, maintenances or safety should be reported promptly.

During the initial or any subsequent rapid filling of the reservoir, the downstream slope of the dam and the foundation contacts should be inspected for indications of any abnormal conditions. Special inspections should be performed after all unusual occurrences, such as heavy rainfall, excessive runoff, and high winds.

The down stream slopes should be carefully inspected for indications of cracks, slides, sloughs, subsidence, impairment of slope protection, springs, seeps or boggy areas caused by seepage from the reservoir. The upstream slope should be carefully inspected for adequate protection.

The maintenance of the embankment consists of removing debris from the upstream face of the dams, replacing disintegrated rip rap, repairing eroded material, proper grading of access roads and controlling undesirable vegetation and rodents.

The dam will be on a triennial inspection schedule with the Arizona Department of Water Resources.

VII. DEFINITIONS

Boil: A flow of soil, usually fine sand or silt, into the bottom of a depression or excavation; forced in by water or water and air under pressure. A spring is a boil with very little sand in the flow.

Boggy Areas: Wet spongy ground; poorly drained area.

Emergency: A situation arising with or without warning, causing or threatening death, injury or disruption to normal life for numbers of people in excess of those which can be dealt with by the public services operating under normal conditions, and which requires special mobilization and organization of those forces.

Emergency Action Plan (EAP): An Emergency Action Plan is a formal plan that identifies potential emergency conditions at a dam and prescribes the procedures to be followed to minimize property damage and loss of life. An Emergency in terms of dam operation is defined as a condition which develops unexpectedly, endangers he structural integrity of the dam and/or downstream property and human life, and requires immediate action.

Emergency Operations Plan (EOP): Multi-hazard, functional plan that treats emergency management activities generally, with the unique aspects of individual disasters contained in hazard-specific annexes. It describes the emergency organization and the means of coordination with other entities. It assigns functional responsibilities and details tasks to be carried out as accurately as permitted by the situation.

Emergency Response Organization: Key personnel responding to emergencies and/or disasters, composed of the Mayor and his executive group which acts as advisors and the operations group which will man and operate the EOC.

Eminent Danger: Potential danger standing out as to be readily perceived or noted

Evacuation: Government recommended or ordered movement of persons and property from a hazard area to an area of safety.

Response: The efforts to minimize the risks created in an emergency by protecting the people, the environment, and property, and the efforts to return the scene to normal pre-emergency conditions.

Seepage: The process of seeping; oozing; a quantity of fluid that has seeped through porous material.

Seepage Hole: An area containing porous soil whereby water seeps through the soil collecting at the surface. Also see definition of boil.

Sink Hole: An opening in the ground surface leading to a subsurface cavity or a hole produced by the caving in of the roof of a subsurface cavity.

Slides: A sliding down of the soil on a slope due to an increase of load (due to rain or a new structure), or the removal of support at the foot due to excavation or erosion. Clays are particularly liable to sliding.

Slope Failure: The breakdown of soil cohesion between soil particles of an earthen slope. Slope failure produces a slide.

Sloughs: Pertaining to an earthen slope; a portion of the ground sliding or breaking off.

Subsidence: Downward movement of the ground surface for any reason. Subsidence is usually caused by the compression or movement of the soil below it. (syn; settlement).

Weather-Related Definitions:

WATCH: Severe weather or flash flood WATCH means that conditions are such that a storm or flood of significant magnitude is likely to occur. Persons within the area alerted should take precautionary steps.

WARNING: Announcement that threatening conditions (thunderstorm, high winds, tornado, flooding, dam or levee failure) are occurring or are imminent, and are expected to have a harmful effect upon the area alerted. Persons within the area must take immediate steps to protect themselves.

FEDERAL EMERGENCY MANAGEMENT AGENCY **DAM FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 0.5 hour 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.

Community Name: Maricopa County, Arizona (Town of Fountain Hills)

Flooding Source: Ashbrook Wash

Project Name/Identifier: Fountain Hills North Floodplain Delineation study FCD 92-04

IDENTIFIER

Name of Dam: Aspen Dam (Dam # 6)

Location of dam along flood source (in terms of stream distance or cross section identifier):

SECNO 4.637

Check one of the following:

- [x] Existing dam
- [ ] New dam
- [ ] Modifications of existing dam (describe modifications) _____

Was the dam designed by ____ Federal agency ____ State agency

____ Local government agency ___X___ Private organization?

BACKGROUND

Does the dam have dedicated flood control storage? [x] Yes [ ] No

Does the project involve revised hydrology? This is the first study of the area [x] Yes [ ] No

If yes, complete Hydrologic Analysis Form and include calculations of the 100-year inflow flood hydrograph routed through the dam with the beginning pool at the normal pool elevation (spillway crest elevation for ungated spillway). Include any inflow hydrograph bulking by watershed sediment yield and provide necessary debris and sediment yield analysis.

Also see the Hydrology Report

Does the revised hydrology affect the 100-year water-surface elevation behind the dam or downstream of the dam? New study [x] Yes [ ] No

If yes, complete the Riverine Hydraulic Analysis Form and complete the table shown on the following page. Also see the Hydraulics Report

State of Arizona
DEPARTMENT OF WATER RESOURCES
Division of Safety of Dams

LICENSE OF APPROVAL

Pursuant to Chapter 3, Title 45-Waters, of the Arizona Revised Statutes, the DIRECTOR, Department of Water Resources authorizes the use of: FOUNTAIN HILLS FRS #6 *Dam and Reservoir, Application Number* 07.39 *Located in Sec.* 4 *, Tp.* 3N *, R.* 6E *, G. & S.R.B. & M.* Maricopa *County, State of Arizona to impound water in accordance with and subject to the following terms and conditions:*

(1) Use shall be only as a flood retarding structure, limited to temporary storage during periods of flood and for such additional time as may be required to completely evacuate the flood waters through the outlet conduit, (2) The owner shall take reasonable actions toward removal of deficiencies present at the dam in a timely manner.

This license of approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and seal of the Arizona Department of Water Resources

6th *day of* December *, 19* 84 *.*

Wesley E. Steiner

WESLEY E. STEINER
DIRECTOR

State of Arizona
OFFICE OF THE STATE WATER ENGINEER
Supervision of Safety of Dams

License of Approval

Pursuant to Chapter 3, Title 45 (Waters), of the Arizona Revised Statutes, the STATE WATER ENGINEER has found that the FOUNTAIN HILLS DAM #6 *Dam and Reservoir, State Application Number* 7-39, *located in Sec.* 4, *Tp.* 3N, *R.* 6E, *G. & S. R. B & M,* Maricopa *County, State of Arizona, are safe to impound water; and the use of said dam and reservoir to impound water in accordance with and subject to the following terms and conditions is hereby authorized:* Use shall be only as a flood retarding structure, limited to temporary storage during periods of flood and for such additional time as may be required to completely evacuate the flood waters through the outlet conduit.

This license of approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and the seal of the Arizona Water Commission of the State of Arizona this 13th *day of* December, *19*73.

STATE WATER ENGINEER

Benson G. Scott

By [illegible] *Supervision of Safety of Dams*

OCT 23

Town of Fountain Hills
Maricopa County, Arizona

Fountain Hills Retardation Structures
Aspen Dam (No. 6)
Fountain Lake Dam
Hesperus Wash Dam (No. 36)
Stoneridge Dam (No. 19)

EMERGENCY ACTION PLAN

June 1996

Prepared for:

MCO Properties Inc.
16838 E. Palisades Blvd.
Fountain Hills, Arizona 85268

Prepared by:

Anderson-Nelson, Inc.
4441 East McDowell Road
Phoenix, Arizona 85008
(602) 273-1850

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I. PURPOSE

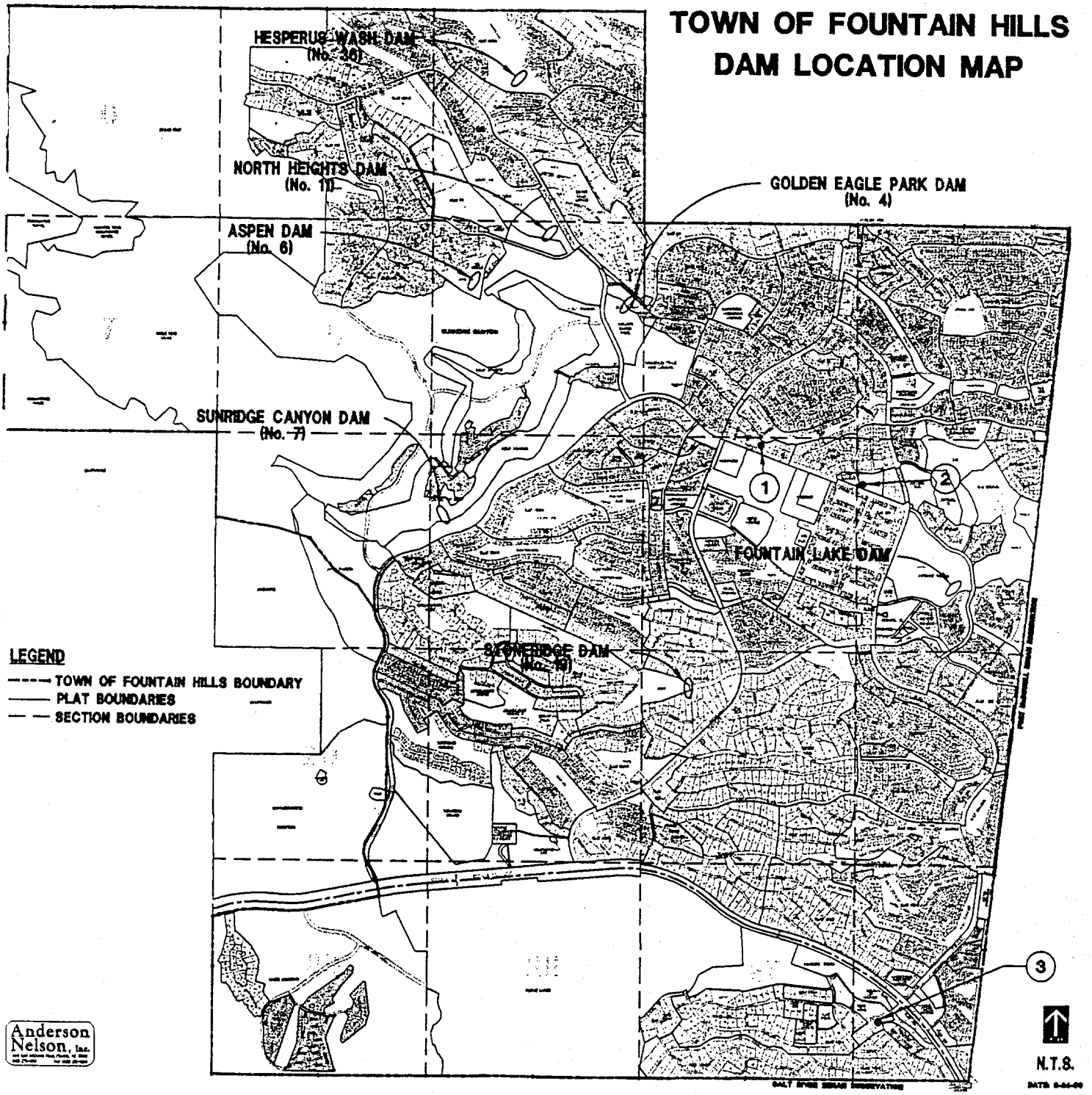
The purpose of this Emergency Action Plan is to define responsibilities and provide procedures to identify unusual and unlikely conditions which may endanger the integrity of the seven Flood Retardation Structures north of Shea Blvd. This identification process should be done in time to take remedial action and to notify the appropriate public officials of possible impending, or actual failure of one or more of the structures.

The EAP for the four Retardation Structures also includes sections from the Town of Fountain Hills Emergency Operations Plan. The Town will be the main vehicle for carrying out of the emergency response and evacuation of public entities threatened by the breaching or failure of the structures. The initial detection of potential problems and the evaluation of the risks associated with those problems will fall upon both MCO Properties Inc. and the Town of Fountain Hills under the inspection, maintenance and emergency action plan procedures outlined in this plan.

The Retardation Structures evaluated are Hesperus Wash Dam (Structure No. 36), Aspen Dam (Structure No. 6), Stoneridge Dam (Structure No. 19) and Fountain Lake Dam.

LOCATION OF EMERGENCY SERVICES

1. TOWN OFFICES, TOWN MARSHALL, & MCO
2. FIRE DEPARTMENT
3. MARICOPA COUNTY SHERRIF'S OFFICE



III. RESPONSIBILITIES

Mr. Paul Miller of MCO Properties Inc., will have the responsibility for the day to day monitoring of the dam structures. He will monitor the initial filling and operations of these structures. In addition he will also be responsible for monitoring these structures during any severe storm event. Mr. Miller will report directly to Mr. Robert Kuta, Water Operations Manager for MCO Properties Inc. Mr. Kuta will analyze the situation and take the appropriate remedial action and/or the notification of local authorities of any imminent potential danger. However, under certain circumstances, such as when failure is imminent or has already occurred, Mr. Miller will have the authority for notification. Warning and evacuation will be handled and coordinated through the Town of Fountain Hills under their Emergency Operation Plan. Facilities located directly below the dam structures (see listing on following page) would be notified immediately by MCO Properties Inc. so as to insure adequate time for evacuation. This procedure will be coordinated with the appropriate public officials. To accomplish this task Mr. Miller will contact the lead coordinator for the Town of Fountain Hills (see Emergency Response Organization Notification Flow Chart) to ensure the proper line of succession is established for dissemination of emergency information.

Mr. Kuta, as Water Operations Manager, will be designated as the EAP coordinator. He will be responsible for all EAP related activities, including preparing revisions to the EAP, establishing training for new field personnel, coordinating EAP drills, etc. Mr. Kuta will be the person to contact should there be any questions concerning the EAP.

PRIMARY CONTACT

Field Supervisor:	Mr. Paul Miller	
	Work	837-9522 ext. 17
	Pager	590-3423
	Mobile	(602) 810-1034
	Home	483-1058

SECONDARY CONTACT

EAP Coordinator:	Mr. Robert Kuta, Water Operations Manager	
	Office	837-9666 ext. 317
	Pager	590-3400
	Mobile	316-6588
	Home	940-0608

TERTIARY CONTACT

MCO Properties Inc.:	Mr. Greg Bielli, Vice President	
	Office	837-9660 ext. 319
	Mobile	309-3717
	Home	860-0848

FACILITIES LOCATED WITHIN THE PROJECTED FLOOD INUNDATION AREA

	Facility and Location	Telephone Number and Contact
1.	Fire Station	911 Dispatch
2.	Sheriff Station 16833 E. Saguaro Blvd.	911 Dispatch
3.	Fountain Hills High School 16000 E. Palisades Blvd.	837-0690 Don Combrink
4.	F.H. Sanitary District 16941 E. Pepperwood Crl.	837-9444 Ron Huber
5.	Fort McDowell Sand & Gravel El Pueblo & Grande	837-2358 Shift Boss
6.	Ft. McDowell Casino Ft. McDowell Road and Shea Blvd.	837-1424 Mr. Kinsley

MCO PROPERTIES INC.
DAM STRUCTURE
QUATERLY INSPECTION REPORT

Structure Name:_____

Inspection Date:_____

Date of Last Inspection:_____

Inspectors:_____

Indication of Recent Rainfall or Impoundment: Yes [ ] No [ ]

Existing weather conditions:_____

DAM

Yes	No	**Access Road and Entrance**
[ ]	[ ]	Existence of holes or deterioration of pavement.
		See Comments:_____
[ ]	[ ]	Existence of rock or debris on roadway.
		See Comments:_____
[ ]	[ ]	Existence of obstructive vegetative growth interfering with the view of vehicles entering and exiting the entrance area.
		See Comments: _____
[ ]	[ ]	Existence of dislocated boulders and landscape rock
		See Comments: _____
[ ]	[ ]	Existence of vandalized or dead cacti or plants.
		See Comments: _____

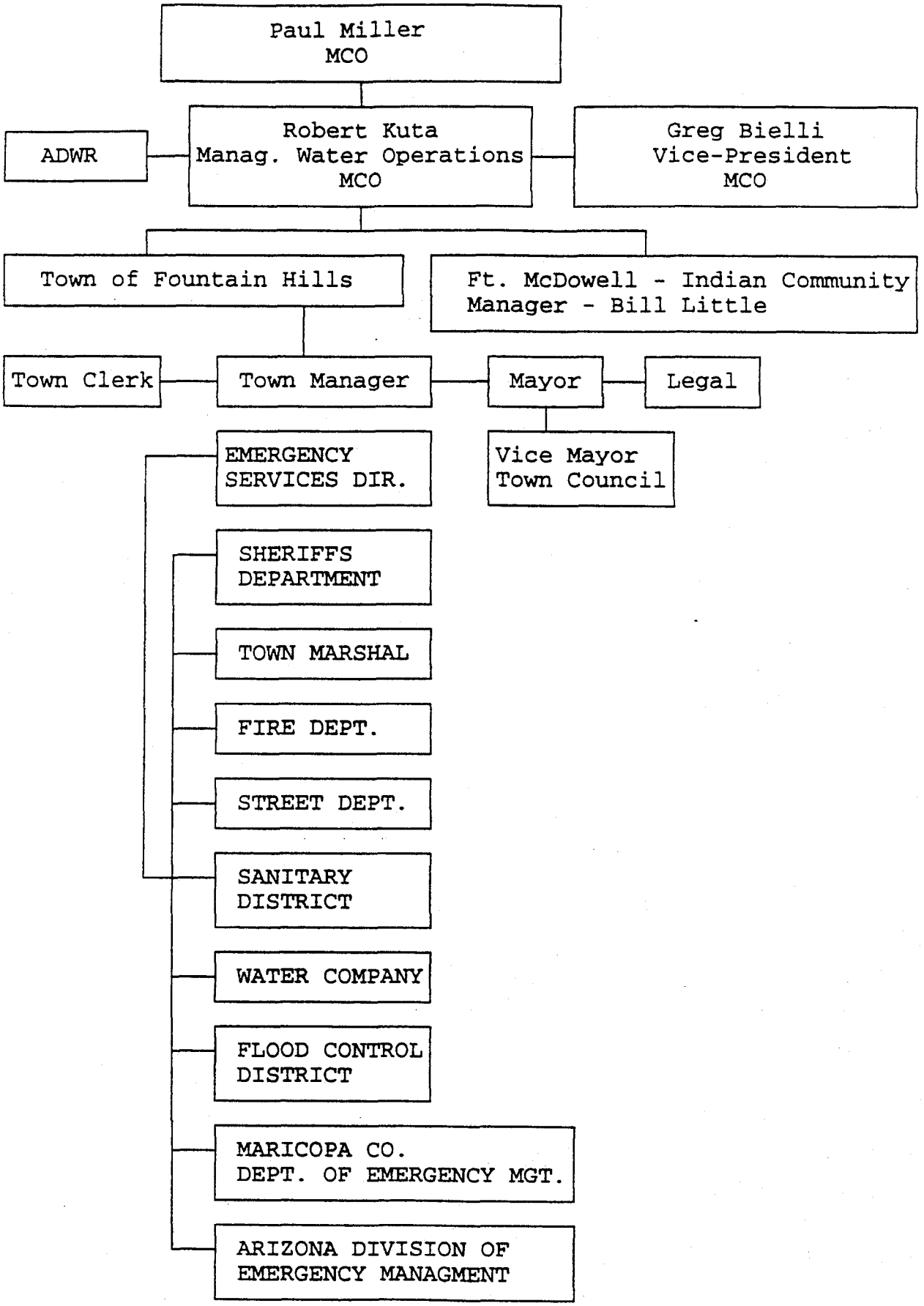
Yes	No	
		Inlet & Outlet Structure
[ ]	[ ]	Existence of obstruction or damage at the inlet.
		See Comments:_____
[ ]	[ ]	Downstream slope of the dam. Existence of erosion, vehicle trespass, sloughing, suspicious areas, dislocated boulders, and rodent activity.
		See Comments: _____
[ ]	[ ]	Principal Outlet Structure - Stilling Basin - Outlet Channel Existence of debris, silt, or obstructions in the box.
		See Comments: _____
[ ]	[ ]	Existence of cracking, spalled areas, or stress of concrete.
		See Comments:_____
[ ]	[ ]	Existence of damaged security fencing - vandalism.
		See Comments:_____
[ ]	[ ]	Existence of obstructive vegetative growth or silt accumulation interfering with designed grade of outlet channel.
		See Comments:_____
[ ]	[ ]	Existence of illegal vehicular trespassing or dumping in the area.
		See Comments:_____
[ ]	[ ]	Existence of down or damaged "No Trespassing" and "No Dumping" signs.
		See Comments:_____
[ ]	[ ]	Existing access roads unsuitable for maintenance vehicles.
		See Comments:_____

Yes	No	
		Principal outlet structure - intake
[ ]	[ ]	Existence of accumulation of trash, debris, or dead wood.
		See Comments:_____
[ ]	[ ]	Existence of settlement, spalled areas, or cracking of structure.
		See Comments:_____
[ ]	[ ]	Existence of deterioration of paint on the wood grates, physical damage.
		See Comments: _____
		Principal outlet conduit
[ ]	[ ]	Existence of debris, cracking, settlement, loss of joint material.
		See Comments:_____
[ ]	[ ]	Existence of silt accumulation at the intake structure above the invert of the intake.
		See Comments:_____
		Impound Area and Inflow Channel
[ ]	[ ]	Existence of unwanted vegetative growth, dead wood, and obstructions.
		See Comments:_____
		Impound Area - Signing
[ ]	[ ]	"No Trespassing" and "No Dumping", existing signs down or damaged.
		See Comments:_____
		Upstream Slope of Dam
[ ]	[ ]	Existence of erosion, vehicle trespass, sloughing, dislocated boulders, or rodent activity.
		See Comments:_____
[ ]	[ ]	**Seepage along toe of Dam and/or downstream slope.**
		See Comments:_____

Yes	No	**Emergency Spillway Area**
[ ]	[ ]	Concrete sill, existence of cracking and stress damage.
		See Comments:_____
[ ]	[ ]	Upstream and downstream slopes - existence of obstructive vegetative growth or obstructions.
		See Comments:_____
[ ]	[ ]	Access roads - unsuitable for maintenance vehicles.
		See Comments:_____

EMERGENCY RESPONSE ORGANIZATION

IV. NOTIFICATION FLOW CHART



MCO PROPERTIES INC.

EMERGENCY ORGANIZATION CHART

Robert Kuta
Manager Water Operations
Work - 837-9660 ext. 317
Cellular - 316-6588
Pager - 590-3400
Home - 940-0608

Primary Point of Contact
Paul Miller, Field Supervisor
Work - 837-9522 ext. 17
Cellular - 810-1034
Pager - 590-3423
Home - 483-1058

Greg Bielli
Vice President
Work - 837-9660 ext. 319
Home - 860-0848

Jeff Games
Pager - 590-3379
Home - 924-5502

Larry Halvorsen
Pager - 590-3025
Home - 837-4371

FORT McDOWELL INDIAN COMMUNITY

POSITION	NAME	TELEPHONE NUMBER
Manager	Bill Little	Pager (520) 421-5608
President	Clinton Pattea	837-5121
Tribal Police	Duty Officer	837-1091

TOWN OF FOUNTAIN HILLS

Position	Name	Address	Telephone Number
Key Staff Personnel:			
Town Manager	Paul Nordin	14614 Dickens Dr.	837-3035
Admin. Asst. To Manager	Diana Nottingham	Not available	314-5347
Town Clerk	Cassie Hansen	15716 E. Sunburst Dr.	837-0437
Emergency Services Dir.	Randy Harrel	Not available	979-2321
MCSO Dist 4	Jerry Sheridan	Not available	256-1742
Town Marshal	Steve Gendler	Not available	837-0118
Fire Chief	Scott Wheelwright	16810 E. Glenbrook Blvd.	837-3651 817-0817 pager
Asst. Fire Chief	Tony Lombardi	Not Available	837-2003
Street Superintendent	Gordon "Pat" Harvey	Not available	837-9685 450-3346 pager
Sanitary District	Ron Huber	Not available	867-4874
Chaparral City Water Co.	Rob Kuta	Not available	837-9522
Maricopa County Flood Control Dist.	Steve Waters	2801 W. Durango	273-1411

Position	Name	Address	Telephone Number
Council Members:			
Mayor	Jerry Miles	16317 E. Inca Ave.	837-3214
Council*	William J. O'Brian	16680 E. Hawk Dr.	837-8941
Council*	Sidney Apps	14481 LaCosta	816-0021 203-0285
Vice Mayor*	Don Lawrence	15528 E. Cholla Dr.	837-2256
Council*	Marianne Wiggshoff	Que-Jav-He-Ma, Rocky Mt. Place	837-8460
Council*	Albert Poma	11219 N. Woodpecker Bay	837-1739
Council*	Penfield Mower	15957 E. Ponderosa Dr.	837-8055
Legal:			
Attorney	Bill Farrell	Not Available	661-6044
Other Emergency Telephone Numbers			
State Fire Marshal		1540 W. Van Buren Street	255-4964
State Land Department		1616 W. Adams Street	255-4052
Arizona Dept. of Water Resources Statewide Flood Warning Section	Wayne Cooley	500 North 3rd Street	417-2400 ext. 7197

* Vice Mayor position is periodically shared by each Council member.

V. EMERGENCY ACTION TABLE

PROBLEM	HOW TO EVALUATE	EMERGENCY ACTION	REQUIRED EQUIPMENT, MATERIALS, AND LABOR	NOTIFICATION	DATA TO RECORD
Flooding	Flood Protection				
	a. Large spillway releases.	During and after any unusual spillway use a special inspection shall be made. If any problems are found, see appropriate items for evaluation, emergency action, and notification procedures. Lower the reservoir by pumping at the maximum rate with no effluent inflow.		Dam operator notifies Effluent Systems Engineer & ADWR.	Discharge, head- water and tailwater elevations, and duration of spill. Complete special inspection checklist.
	b. Headwater is within one foot of the top of dam.	Make a special inspection of the dam; see above.		Dam operator is to notify Effluent Systems Engineer & ADWR.	Discharge, head- water and tail-water elevations, & duration of spill. Complete special inspection checklist.
	c. Flood to approach or exceed top of dam.	Make a special inspection of the dam; see above.		Dam operator initiates notification process and notifies ADWR.	Discharge, rate of rise, time when dam is overtopped, and time of failure.
Seepage					
a. Water - Uncontrolled leakage.	Not Serious - Uncontrolled leak without the removal of fines. Rate of flow not increasing.	None required.		Notify the Effluent Sys. Engr. & ADWR.	Size and location of area, approximate flow.

	o[redacted]ow [redacted]n- creasing. Tail-water flows and elevation are increasing without the removal of fines and no increase in spillway discharge.	[redacted]oir[redacted]o-ordinate with Effluent Sys. Engr. for discharge instructions. Place a ring of sandbags top towards natural drainage to monitor flow. If boil becomes too large to build a dike around it; place a blanket filter over the area. Blanket of material to be coarse sand at bottom to large gravel 2-4" at top. Blanket to be 3-5' thick. Safety precaution: in no case shall the personnel making the repairs be placed in danger.	Materials: Sand and bags; see materials list.	[redacted] Sys. Engr. and immediately notify ADWR if seepage rate is increasing. Begin notification process.	[redacted] of area, approximate flow and how rapidly flow is increasing.
	Failure Imminent - Emerging water is muddy; rate of flow is increasing and an upstream whirlpool develops in reservoir. Tailwater flows and elevation increasing with no increase in spillway discharge.	Lower reservoir by pumping at maximum rate. Notify the Effluent Sys. Engr. Control loss of material by using sandbags to sufficient height to provide back pressure to prevent loss of materials. Safety precaution: In no case shall the personnel making the repairs be placed in danger.	Equipment: Shovels, trucks, dozer, and crane. Materials: Sand, bags, gravel, bales of straw or hay and rip rap. Labor: Equipment operators, 2 or 3 laborers.	For failure in less than 1 day, initiate notification process immedialtely and notify ADWR.	Size, location rate of flow is increasing for boil. Also, size and location of the whirlpool.

MCO RETARDATION STRUCTURES
EMERGENCY ACTION PLAN

MATERIALS LIST

Heavy Equipment
Case 580 Backhoe*
Cat Backhoe*
Dump Truck*

Vehicles
2 - Ford Ranger Pickups
1 - GMC S-15 Pickup
1 - Chevrolet Cheyenne
1 - Chevrolet Suburban

Power Equipment
4" Trash Pump w/125 ft. Discharge Hose
12' Boat and 4 hp motor
3 hp Power Sprayer for Lake Management
Trailer Mounted 8" Diesel Driven Pump
2 - Rotohammers
1 1/2" Diaphragm Pump
5 hp Air Compressor

Communications
6 - Hand Held Radios
2 - Truck Mounted Radios
2 - Mobile Telephones
5 - Digital Pagers

Materials
Surplus Fill
Surplus Rip Rap
500+ft. 8" Aluminum Mainline
Road Barricades
Warning Cones
Emergency Flares
Misc. Hand Tools (i.e., shovels, picks, etc.)

Labor
1 - Manager
1 - Field Supervisor
2 - System Operators
10- Additional Field Laborers*

* Available through Chaparral City Water Company a wholly owned subsidiary of MCO Properties Inc.

VI. INSPECTION AND MAINTENANCE PROCEDURES

The inspection and maintenance of the dams should be performed in accordance with this EAP. All unusual or abnormal conditions that may adversely affect operations, maintenances or safety should be reported promptly.

During the initial or any subsequent rapid filling of the reservoir, the downstream slope of the dam and the foundation contacts should be inspected for indications of any abnormal conditions. Special inspections should be performed after all unusual occurrences, such as heavy rainfall, excessive runoff, high winds or infrequent low reservoir conditions that expose features normally submerged. Low reservoir levels afford the opportunity to carefully inspect the reservoir floor for tears in the liner, seepage holes or sink holes that may endanger the integrity of the liner and/or structure.

The down stream slopes should be carefully inspected for indications of cracks, slides, sloughs, subsidence, impairment of slope protection, springs, seeps or boggy areas caused by seepage from the reservoir. The upstream slope should be carefully inspected for adequate protection of the liner material. Extensive wave action and/or cracking and displacement of the gunite edge can expose the PVC liner.

The maintenance of the embankment consists of removing debris from the upstream face of the dams, replacing disintegrated rip rap, repairing eroded material, proper grading of access roads and controlling undesirable vegetation and rodents

Following completion and licensing, each dam will be on a yearly inspection schedule with the Arizona Department of Water Resources.

VII. DEFINITIONS

Boil: A flow of soil, usually fine sand or silt, into the bottom of a depression or excavation; forced in by water or water and air under pressure. A spring is a boil with very little sand in the flow.

Boggy Areas: Wet spongy ground; poorly drained area.

Emergency: A situation arising with or without warning, causing or threatening death, injury or disruption to normal life for numbers of people in excess of those which can be dealt with by the public services operating under normal conditions, and which requires special mobilization and organization of those forces.

Emergency Action Plan (EAP): An Emergency Action Plan is a formal plan that identifies potential emergency conditions at a dam and prescribes the procedures to be followed to minimize property damage and loss of life. An Emergency in terms of dam operation is defined as a condition which develops unexpectedly, endangers he structural integrity of the dam and/or downstream property and human life, and requires immediate action.

Emergency Operations Plan (EOP): Multi-hazard, functional plan that treats emergency management activities generally, with the unique aspects of individual disasters contained in hazard-specific annexes. It describes the emergency organization and the means of coordination with other entities. It assigns functional responsibilities and details tasks to be carried out as accurately as permitted by the situation.

Emergency Response Organization: Key personnel responding to emergencies and/or disasters, composed of the Mayor and his executive group which acts as advisors and the operations group which will man and operate the EOC.

Eminent Danger: Potential danger standing out as to be readily perceived or noted

Evacuation: Government recommended or ordered movement of persons and property from a hazard area to an area of safety.

Response: The efforts to minimize the risks created in an emergency by protecting the people, the environment, and property, and the efforts to return the scene to normal pre-emergency conditions.

Seepage: The process of seeping; oozing; a quantity of fluid that has seeped through porous material.

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*
   - ☐ Physical change
     - ☐ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☐ Improved data
   - ☐ Floodway revision
   - ☒ Other New Study

   Explain This is the first delineation of this watercourse

2. Flooding Source: Arrow Wash
3. Project Name/Identifier: Fountain Hills North Floodplain Delineation Study FCD 92-04
4. FEMA zone designations affected: *
   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy,City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
04013	Maricopa County	Maricopa	AZ	04013C	1750E	9-4-91
	Fountain Hills, Town					

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding
- ☐ Riverine
- ☐ Coastal
- ☐ Alluvial Fan
- ☐ Shallow Flooding *(e.g. Zones AO and AH)*
- ☐ Lakes

Affected by wind/wave action
- ☐ Yes
- ☐ No

Structures
- ☐ Channelization
- ☐ Levee/Floodwall
- ☐ Bridge/Culvert
- ☐ Dam
- ☐ Coastal
- ☐ Fill
- ☐ Pump Station
- ☐ None
- ☐ Channel Relocation
- ☐ Excavation
- ☐ Other *(describe)*

Disciplines*
- ☐ Water Resources
  - ☒ Hydrology
  - ☒ Hydraulics
  - ☐ Sediment Transport
  - ☐ Interior Drainage
- ☐ Structural
- ☐ Geotechnical
- ☐ Land Surveying
- ☐ Other *(describe)*

☐ Other(describe)

*** Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☐ Yes ☒ No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM ☒ Yes ☐ No

   If yes, give reason: New Study, this is the first delineation of this watercourse

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions. See attached articles and announcements

9. 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.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? ☐ Yes ☐ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☐ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (*or other surcharge limit if community or state has adopted more stringent criteria*)? ☐ Yes ☐ No

If the answer to either Items 1B or 2B is yes, please provide 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.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒ Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒ Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐ Yes ☐ No N/A New Study

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ (entity)

_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☐ has ☐ has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____
(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.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

_____a. CLOMR — A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*.

_____b. LOMR — A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. I Parts 60 and 65.)*

X c. PMR — A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. I, Parts 60 and 65.)*

_____d. Other: Describe _____

8. FORMS INCLUDED

17. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

• Hydrologic analysis for flooding source differs from that used to develop FIRM	☒ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine /Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☒ Bridge/Culvert Form (Form 7)
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☐ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. ☐ Yes ☐ No

Initial fee amount: $ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program**. If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. ☐ Yes ☐ No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. ☒ Yes ☐ No

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

Ron Neuitt
Signature of Revision Requester

Ron Neuitt / Program Mgr. NFIP
Printed Name and Title of Revision Requester

Flood Control District of Maricopa Co.
Company Name

(602) 506-1501 1-29-97
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.

Randy L Harrel
Signature of Community Official

Randy L Harrel, Town Engr.
Printed Name and Title of Community Official

Fountain Hills
Community Name

1-22-97
Date

Does this request impact any other communities? ☐ Yes ☐ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

11-22-95

C 07 '95 04:46PM FOUNTAIN HILLS, AZ

No big problems in County floodplain study

If you've ever wondered what would happen in Fountain Hills in the event of a 100-year flood, Maricopa County has just completed a study that will tell you.

Representatives of Maricopa County Flood Control District were on hand for an open house at Town Hall on Thursday, Oct. 16. They were there to explain and answer questions concerning the Fountain Hills Flood Delineation Study.

The study defines the areas that would be inundated in the event of a 100-year storm and flood.

There was not a big turnout for the two-hour session, but a few residents dropped by to ask about their own particular concerns.

Town Engineer Randy Harrel said the study indicates no significant problems for individual homeowners. Some residents have property which lies within the flood area, but few if any structures are threatened.

One area of concern that town officials will look at is the Baptist Church on Saguaro Boulevard. In the event of a significant 100-year flooding event all of the church buildings and the parking lot would be under water. It is a low flat area which Nicklaus and Cypress washes flow into.

A Sanitary District pumping station adjacent to the church is apparently not within the flood plain.

Sanitary District Manager Ron Huber said no flood study was done when the pumping facility was constructed. But he said the pump building is significantly higher than the church buildings.

Huber also said that pump station is scheduled to be abandoned in the near future.

Harrel said the town will use the study to consider its options for protecting citizens and property during such a flood.

There are 26 street crossings the town wants to study further besides the area around the church, Harrel said. The options that may be considered would include culvert work and possibly diversion or containment structures.

Those further studies are to begin in the near future.

Nearly all of the area included in the 100-year flood plain will belong to the Town of Fountain Hills once the wash property transfer between the town and MCO Properties is completed in the near future.

Fountain Hills Vice Mayor Peg Tibbetts, center, discusses the county's floodplain study with Flood Control District representatives Ron Nevitt and Sandy Walchuk.

However, Harrel said the flood plain delineation will not significantly impact what the town may choose to do with the washes in the way of public use.

Harrel said no structures would be built in the washes, and measures can be taken to protect whatever facilities might be placed in the washes.

The Maricopa County Flood Control District has spent about two years on the study.

NOTICE OF REGULAR SESSION

OF THE

FOUNTAIN HILLS TOWN COUNCIL

WHEN: **NOVEMBER 16, 1995**

TIME: ****6:30 P.M.**

WHERE: **TOWN HALL COUNCIL CHAMBERS**

Pursuant to A.R.S. 38-431.02, notice is hereby given to the members of the Town Council of Fountain Hills and to the general public that the Town Council of Fountain Hills will hold a regular session open to the public on Thursday, November 16, 1995 at 6:30 p.m. in the Council Chambers of the Fountain Hills Town Hall, located at 16836 E. Palisades Blvd., Building C, Fountain Hills, Arizona.

***** Prior to the regularly scheduled Council meeting, the Flood Control District of Maricopa County and the Town of Fountain Hills Engineering Department will host an open public meeting presenting the results of the Fountain Hills Floodplain Delineation Studies. The public meeting will be held in the conference room from 4:00 to 6:30 p.m.***

RULES FOR ADDRESSING THE COUNCIL - ADOPTED 1/18/90

It is the Council's desire to hear public comment on agenda items. As it is important to maintain order during the meeting, please adhere to the following rules of order if you wish to speak:

1.) All citizens wishing to speak must first be recognized by the Mayor.
2.) The Mayor will not call for public comment on an item until after a motion has been made and seconded and the Council has had adequate opportunity to discuss the item.
3.) Please stand and state your name and address after being called on to speak.
4.) All comments must be directed to the Mayor.
5.) TIME LIMIT - 3 MINUTES PER PERSON PER ITEM.
6.) Statements should not be repetitive.
7.) Persons or groups wishing to make longer presentations, should see the Town Clerk prior to the meeting.

The agenda for the meeting is as follows:

1.) Meeting called to order, pledge to the flag, invocation and roll call.

Consent Agenda:

All items listed with an asterisk (*) are considered to be routine, non-controversial matters and will be enacted by one motion and one roll call vote of the Council. There will be no separate discussion of these items unless a Councilmember or member of the public so requests. If a Councilmember or member of the public wishes to discuss an item on the consent agenda, they may request so prior to the motion to accept the consent agenda. The item will be removed from the Consent Agenda and considered in its normal sequence on the agenda.

Open house Thursday on floodplain

A public open house will be held Thursday, Nov. 16, to review results of floodplain delineation studies performed in Fountain Hills.

The open house will be held from 4 to 6:30 p.m. at Town Hall's conference room.

Floodplain delineation involves developing detailed topographic maps to determine where water goes while incorporating the results of rainfall patterns to determine typical and peak amounts of runoff.

Along with extensive surveying and aerial mapping, drainage factors such as slope, vegetation, soil composition and land use are analyzed and included.

The studies will be used to better manage the floodplain to reduce or prevent flood damage and maintain the integrity of the floodplains.

Areas designated for further analysis in an upcoming area drainage master study also will be presented.

Results obtained in the north and south delineation studies will be displayed at the open house.

Representatives from the Flood Control District of Maricopa County, the Town of Fountain Hills' Engineering Department and the engineering consulting firms will be available to discuss the results and answer questions.

PUBLIC NOTICE
YOUR RIGHT TO KNOW

ANNOUNCEMENT OF FLOOD HAZARD STUDY

he Flood Control District of Maricopa County, under authority f the National Flood Insurance Act of 1968 (P.L. 90 448), as nded, and the Flood Disaster Protection Act of 1973 (p.L. 93- , is funding a detailed study of flood hazard areas in The Town f Fountain Hills, Arizona.

he study is being performed for the Flood Control District by K Engineers and George V. Sabel Consulting Engineers. purpose of this study is to examine and evaluate flood hazard s which are developed or which are likely to be developed or hich are likely to be developed and to determine flood elevations those areas. Flood elevations will be used by Maricopa County rry our floodplain management objectives of the National d Insurance Program. They will also be used as the basis for etermining appropriate flood insurance premium rates applible for buildings and their contents.

announcement is intended to notify all interested persons of commencement of this study so that they may have an rtunity to bring any relevant facts and technical data concern- g local flood hazards to the attention of the Flood Control istrict for consideration in the course of this study. Such mation should be addressed to Mr. Tim Murphy or Ms. Sandy , Flood Control District of Maricopa County, 2801 W. urango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

shed FH Times 1/13,1/20/93.

AFFIDAVIT OF PUBLICATION

The Times
OF FOUNTAIN HILLS AND RIO VERDE, ARIZONA

A publication of Western States Publishers, Inc.

STATE OF ARIZONA
COUNTY OF MARICOPA } ss.

L. ALAN CRUIKSHANK, being first duly sworn, upon oath deposes and says: That he is the publisher of

THE TIMES OF FOUNTAIN HILLS AND RIO VERDE

a newspaper of general circulation in the County of Maricopa and the State of Arizona, published at Fountain Hills, Arizona, and that the copy hereto attached is a true copy of the advertisement as published weekly in The Times of Fountain Hills and Rio Verde on the following dates:

Jan. 13, 1993
Jan 20, 1993

Sworn to before me this

23 day of

February A.D. 19 93

Karen Kirkendoll
Notary Public

OFFICIAL SEAL
KAREN KIRKENDOLL
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My comm. expires May 14, 1993

AFFIDAVIT OF PUBLICATION

INVOICE NO. 93008

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by AGK Engineers and George V. Sabol Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed and to determine flood elevations for those areas. Flood elevations will be used by Maricopa County to carry out floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Story, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published: Arizona Republic, January 13, 20, 1993.

The Arizona Republic/The Phoenix Gazette

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

JOAN LOHR, being first duly sworn, upon oath deposes and says: That she is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic and The Phoenix Gazette, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

~~The Arizona Republic~~
The Phoenix Gazette

JANUARY 13, 20, 1993

Joan Lohr

Sworn to before me this

25TH day of

JANUARY 93 A.D. 19

OFFICIAL SEAL
MARY LEE BOOHER
NOTARY PUBLIC STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1995

Mary Lee Booher
Notary Public

Meeting on flood plain plan

Find out where flood waters go on Dec. 17

An open house to inform Fountain Hills residents of floodplain delineation studies being performed in over 30 washes flowing through the community will be held on Thursday, Dec. 17.

The meeting will be held from 5 to 8 p.m. at the Town Hall Conference Room, 16836 E. Palisades Blvd.

The public is invited to come by the Town Hall anytime during the three-hour open house to share their experience and observations of local flooding and hear details about the studies.

Details will include how the study is conducted, what kind of information is being gathered and how the information will be used.

Mapping floodplains involves developing detailed topographic maps to determine where water goes and studying rainfall patterns to determine typical amounts of runoff. The studies and resulting maps will be used to better manage the floodplain so as to reduce or prevent flood damage and maintain the integrity of the floodplains.

Extensive surveying and aerial mapping is involved in the studies, but other factors influencing drainage also must be considered, including soil composition, slope and vegetation and land use.

The Fountain Hills studies are expected to take 12 months to complete, after which time a second open house will be held to inform residents of the results of the studies.

Questions or additional information regarding the studies can be obtained by writing or calling Jim Phipps or Tim Murphy of the Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone 506-1501, or Randy Harrel, town engineer, Town of Fountain Hills, 16836 E. Palisades Blvd, Fountain Hills, AZ 85268, telephone 837-2003.

Audit tops Sanitary agenda

The annual audit report will be the major topic on the agenda for the Sanitary District board of directors when it meets Thursday, Dec. 10.

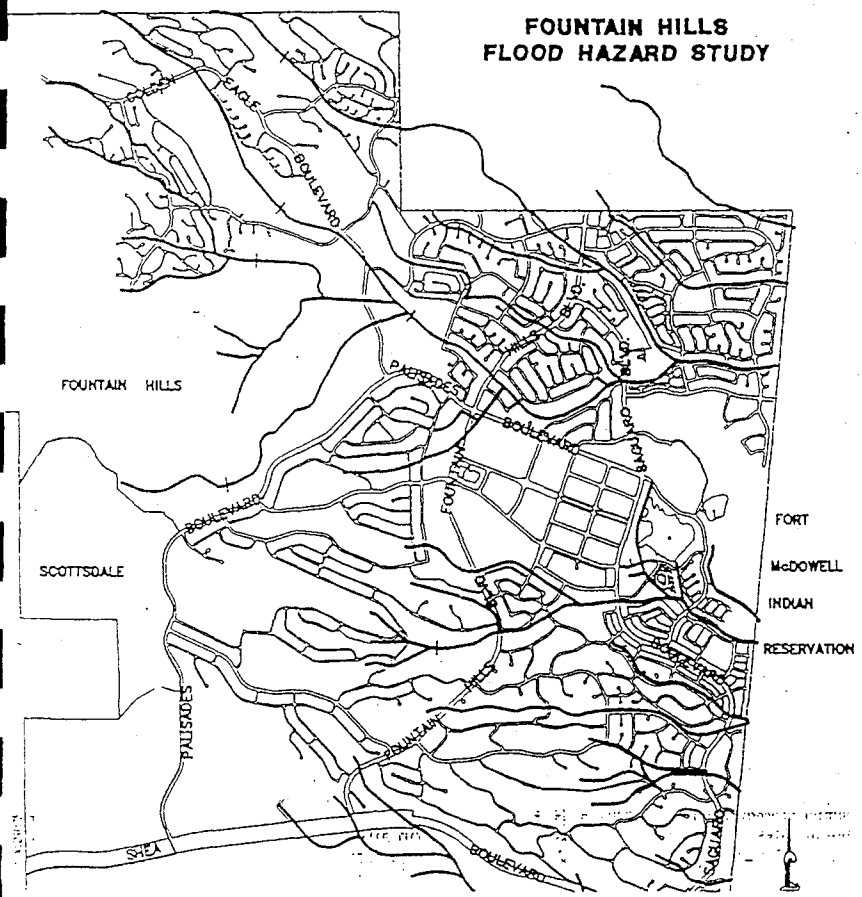
The report is a routine document prepared each year, according to District Manager Ron Huber.

The board will also select a new chairman for the coming calendar year.

The job of chairman has simply rotated under the current board, and that being the case Director Dennis Regeski will be leading the board for the next year. Director Bruce Hansen is the outgoing chairman.

Huber said monthly staff reports will also be presented at the meeting, and he has a few carryover items to update the board on.

Doesn't Your Single Large
INVESTMEN
Deserve a second opinion?
LaCosta Construction Inc.
designers & builders
of
LUXURY LA COSTA HOMES
"The Art of Construction"
837-1640



When you need to sell your
call
erica
Fountain Hills #1 Top Pro
Over 100 Opened & Closed Transactions Sid
(So Far)
Watch... erica west
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"Real Estate Expert"
...her team of "SPECIALIS
are WORKING FOR YOU
Transaction Specialist
Larraine LaGiglia.....
daily monitors the progress of each of my ESCROWS and LISTINGS. She is in constant contact with my LISTERS & concentrates on finding BUYERS for my listings.

Systems Specialists
Dana West.....
implements the unique MARKETING SYSTEMS designed to get my L
SOLD quickly! She keeps my LISTERS advised of the progress on their
Administration Specialist
Carol Talty.....
handles all mailings/brochures and assists with special projects.

The Times of Fountain Hills

12-9-92

FEDERAL EMERGENCY MANAGEMENT AGENCY **CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average . 23 hour 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.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Hydrology, Hydraulics
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 25 years experience in the expertise listed above.
4. I have ☒ prepared ☒ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
   Hydrologic analysis and floodplain delineation
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.

   b. ☐ Compared plans and specifications with as-built survey information.

   c. ☐ Examined plans and specifications and compared with completed projects.

   d. ☐ Other _____
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: George V. Sabol
(please print or type)

Title: Sr. Associate, SFC Engineering Company
(please print or type)

Registration No. 17928 Expiration Date: 30 June 1998

State Arizona

Type of License Professional Engineer

Signature

23 January 1997
Date

Registered Professional Engineer (Civil) CERTIFICATE NO. 17928 GEORGE V. SABOL Date Signed 23 Jan ARIZONA, U.S.A.

Seal
(Optional)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply.

FEDERAL EMERGENCY MANAGEMENT AGENCY **HYDROLOGIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.67 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.

Community Name: MARICOPA, COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ARROW WASH
(One form for each flooding source)

Project Name /Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. HYDROLOGIC ANALYSIS IN FIS

☐ Approximate study stream (Zone A)
☒ Detailed study stream (briefly explain methodology) The analysis was performed using HEC-1.

2. REASON FOR NEW HYDROLOGIC ANALYSIS

☒ No existing analysis
☐ Improved data *(see data revision on page 3)*
☐ Changed physical conditions of watershed *(explain)* _____

☐ Alternative methodology *(justify why the revised model is better than model used in the effective FIS)*

☐ Evaluation of proposed conditions (CLOMRs only) (explain) _____

☐ Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100 - and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

☒ Approval of hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., Flood Control District of Maricopa County)
Attach evidence of approval.

☐ Approval of the hydrologic analysis is not required by any local, State, or Federal Agency.

4. REVIEW OF RESULTS

Stream: ARROW WASH

Comparison of 100-year Discharges

Location:	Drainage area (Sq mi.)	FIS (cfs):	Revised (cfs):
AT CAVERN DRIVE (C617)	0.13	N/A	270
AT MIMOSA DRIVE (C618)	0.19	N/A	398
AT FOUNTAIN HILLS BLVD. (C619)	0.25	N/A	520
AT PALISADES BLVD. (C620)	0.42	N/A	490

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review.

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made *(attach separate sheet if necessary)*

N/A

ATTACH A COMPLETED REVIEW OF RESULTS PAGE FOR EACH FLOODING SOURCE.

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS *(i.e. no changed hydraulic conditions)*? ☐ Yes ☒ No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No N/A New study

FEMA does not normally revise NFIP maps solely due to insignificant flow changes where changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? ☐ Yes ☒ No

If yes, provide the following:

Location along flooding source: _____

Maximum peak discharge: _____ cfs

Second highest peak discharge: _____ cfs

Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site *(along flooding source or similar watershed; specify)*

UNAVAILABLE

Gaging Station: _____

Drainage area at gage: _____ mi^2

Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as new data (*New*) or as revising existing data (*Revised*). *(If necessary, attach a separate sheet.)*

Data Parameter	New	Revised	Data Source
SUBBASIN AREAS	☒	☐	FOUNTIAN HILLS/USGS MAPPING
LAG TIME, L, LCA, SLOPE, KN	☒	☐	FOUNTIAN HILLS/USGS MAPPING
GREEN + Ampt PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
ROUTING REACH PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
	☐	☐	

- Data source can be from a Federal, State, or local government agency, or from a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source *(i.e., certified statement, report, bibliographical reference to a published document)*. In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

☐ Statistical Analysis of Gage Records (*use Attachment A*)

☐ Regional Regression Equations *(use Attachment B)*

☒ Precipitation/Runoff Model *(use Attachment C)*

☐ Other *(specify; attach backup computations and supporting data)* _____

ATTACHMENT A: STATISTICAL ANALYSIS OF GAGE RECORDS

Gaging Station: N/A

Gage Location (latitude and longitude): _____

	FIS:	Revised:
1. Number of years of data	_____	_____
Systematic	_____	_____
Historical	_____	_____
2. Homogeneous data	☐ Yes ☐ No	☐ Yes ☐ No
3. Data adjustments	☐ Yes ☐ No	☐ Yes ☐ No
4. Number of high outliers	_____	_____
Low outliers	_____	_____
Zero events	_____	_____
5. Generalized skew	_____	_____
6. Station skew	_____	_____
7. Adopted skew	_____	_____
8. Probability distribution used (justify if log-Pearson III was not used)	_____	_____
9. Transfer equations to ungaged sites		☐ Yes ☐ No

If yes, specify method

_____

_____

_____

10. Expected probability*	☐ Yes ☐ No
11. Comparison of results with other analyses	☐ Yes ☐ No

If yes, describe comparison

_____

_____

_____

*FEMA does not accept expected probability analyses for the purpose of reflecting flood hazard information in a FIS.

If any data is not available, indicate by N/A.

Attach analysis including plot of flood frequency curve.

1. Bibliographical Reference: N/A

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. Gaged or ungaged stream: _____

3. Hydrologic region(s): _____
Attach backup map.

4. Provide parameters, values, and source of data used to define parameters.

		FIS:		Revised:	
5.	Urbanized conditions calculations	☐ Yes	☐ No	☐ Yes	☐ No
6	Percent of watershed urbanization	_____		_____	
7.	Is the watershed controlled?	☐ Yes	☐ No	☐ Yes	☐ No
8.	Comparison with other analyses	☐ Yes	☐ No	☐ Yes	☐ No

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

		FIS:	Revised
1.	Method or model used:	N/A	HEC-1
	Version:	N/A	4.0.1E
	Date:	N/A	MAY 1991
2.	Source of rainfall depth:	N/A	NOAA ATLAS 2
3.	Source of rainfall distribution:	N/A	FCDMC HYDROLOGIC MANUAL
4.	Rainfall duration:	N/A	6+24 HR.
5.	Areal adjustment to precipitation (%):	N/A	DEPENDS UPON SUBBASIN AREA
6.	Maximum overland flow length	N/A	.572mi. TABLE 5-7 (211R)
7.	Hydrograph development method:	N/A	CLARK UNIT GRAPH
8.	Loss rate method:	N/A	GREEN - Ampt.
	Source of soils information:	N/A	SCS SOIL SURVEY
	Source of land use information	N/A	AERIAL PHOTOS
9.	Channel routing method:	N/A	NORMAL DEPTH
10.	Reservoir routing:	☐ Yes ☐ No	☒ Yes ☐ No
11.	Baseflow considerations:	☐ Yes ☐ No	☐ Yes ☒ No

If yes, explain how baseflow was determined:

12. Snowmelt considerations: ☐ Yes ☐ No ☐ Yes ☒ No

13. Model calibration: ☐ Yes ☐ No ☒ Yes ☐ No

If yes, explain how calibration was performed The model was calibrated by comparing USGS gage data, runoff volume checks upstream from dams, results with estimates using a USGS regional regression eqn., and modeled results with results of other M.C. studies (Section 3.2.3 pg 3-61)

14. Future land use condition: ☐ Yes ☒ No

If yes, explain why

NOTE: FEMA policy is to base flooding on existing conditions.
If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

See Hydrology Report

ATTACHMENT D: CONFIDENCE LIMITS EVALUATION

Stream: N/A

Select one location for Confidence Limits Evaluation (*describe location*): _____

_____

Discharges for selected location:

Exceedance Probability		FIS	Revised
10%	(10-year)	_____ cfs	_____ cfs
2%	(50-year)	_____ cfs	_____ cfs
1%	(100-year)	_____ cfs	_____ cfs
0.2%	(500-year)	_____ cfs	_____ cfs

1% (100-year) Flood Confidence Intervals

90% Confidence Interval: 5% limit _____ cfs

95% limit _____ cfs

50% Confidence Interval: 25% limit _____ cfs

75% limit _____ cfs

If the value of the 100-year frequency flood in the FIS is beyond the 50% confidence interval but within the 90% confidence interval, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No

An example of confidence limits analysis can be found in Appendix 9 of Bulletin 17B.

Attach Confidence Limits Analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ARROW WASH
(One form for each flooding source)

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCO 92-04

1. REACH TO BE REVISED

Downstream limit: CONFLUENCE WITH ASHBROOK WASH

Upstream limit: 200 ft ABOVE CAVERN DRIVE (SECNO 1.06)

2. EFFECTIVE FIS

☒ Not studied

☐ Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

☐ Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

☐ Floodway delineated

Downstream limit of Floodway _____

Upstream limit of Floodway _____

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

☒ Not studied in FIS

☐ Improved hydrologic data/analysis. Explain: _____

☐ Improved hydraulic analysis. Explain: _____

☐ Flood control structure. Explain: _____

☐ Other. Explain: _____

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete 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 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 for existing or pre-project conditions and revised or post-project conditions must be submitted All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model — Natural ☐ Floodway ☐

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 requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor'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 ☐ Floodway ☐

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 ☐ Floodway ☐

The duplicate effective or corrected 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 or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☐

The existing or pre-project conditions model *(or duplicate effective 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 proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. — Natural ☒ Floodway ☒

6. Hydraulic Analyses (Only if Hydraulic Models are not developed) — see the Hydraulics Report

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS *(from model used to revise 100-year water surface elevation)*

1. Discharges:

	Upstream Limit	Downstream Limit
10-year		
50-year		
100-year	270cfs	490cfs
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined

CRITICAL DEPTH

3. Give range of friction loss coefficients (*Manning's "N"*) Channel ..... .033 – .069

Overbanks ..... .060 – .070

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

Location	FIS	Revised

Explain: N/A NEW STUDY

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

The cross-sections were determined photogrammetrically by the aerial mapping company. All cross-sections are stationed from left to right looking downstream with the thalweg set at station 10,000.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☒ Yes ☐ No If no, explain why not:

6. Explain how reach lengths for channel and overbanks were determined:

Channel reach lengths were measured along the thalweg and the overbank reach lengths were measured along the anticipated path of the center of mass of the overbank flow.

5. RESULTS *(from model used to revise 100-year water surface elevations)*

1. Do the results indicate:

a. Water surface elevations higher than end points of cross sections? ☐ Yes ☒ No

b. Supercritical depth? ☐ Yes ☒ No

c. Critical depth? ☒ Yes ☐ No

d. Other unique situations ☐ Yes ☒ No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.

For those cross-sections where the HEC-2 model defaulted to critical depth the critical depth water surface elevations are plotted on the profiles and maps.

2. What is the maximum change in energy gradient between cross-sections? 27.89

Specify location SECNO .17

3. What is the distance between the cross-sections in 2 above? 913.9

4. What is the maximum distance between cross-sections? 913.9

Specify location SECNO .17

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? 1 foot

b. What is the maximum surcharge for the revised conditions? N/A NEW STUDY foot

Specify location

c. What is the maximum velocity? 16.18 fps

Specify location SECNO .561

d. Are there any negeative surcharge values at any cross-section? ☐ Yes ☒ No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain:

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? ..... ☐ Yes ☒ No

If Yes, explain:

7. Do 100-year water surface elevations increase at any location? ..... ☐ Yes ☐ No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

N/A NEW STUDY

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

N/A NEW STUDY

A. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section_____ within_____feet *(vertical)* and upstream of the project at cross section_____within_____feet *(vertical)*.

N/A NEW STUDY

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section_____within_____feet *(vertical)* and upstream of the project at cross section_____ within_____feet *(vertical)*.

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

The profiles are located in the hydraulic analysis notebook.

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

Proceed to Riverine /Coastal Mapping Form

FEDERAL EMERGENCY MANAGMENT AGENCY
WATER SURFACE ELEVATION CHECK N/A NEW STUDY

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
MARICOPA COUNTY, ARIZONA	ARROW WASH	FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCP 92-04

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]

COMMENTS:

1-100-year (natural) Water Surface Elevation 2-Encroachment (floodway) Water Surface Elevation 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ARROW WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable)*:

		Included		
A.	Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☒ N/A
B.	Revised detailed 100- and 500-year floodplain boundaries	☐ Yes	☐ No	☒ N/A
C.	Revised 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
D.	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated	☒ Yes	☐ No	☐ N/A
E.	Stream alignments, road and dam alignments	☒ Yes	☐ No	☐ N/A
F.	Current community boundaries	☒ Yes	☐ No	☐ N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map	☐ Yes	☐ No	☒ N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
I.	The requestor's property boundaries and community easements	☐ Yes	☐ No	☒ N/A
J.	The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
K.	Location and description of reference marks	☒ Yes	☐ No	☐ N/A
L.	Vertical datum (example: NGVD, ~~NAVD etc.~~) NGVD 1929	☒ Yes	☐ No	☐ N/A
M.	Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
N.	Location and alignment of all coastal transects used to revise the coastal analyses	☐ Yes	☐ No	☒ N/A

If any of the items above are marked no or N/A, please explain: THIS IS THE FIRST STUDY DONE IN FOUNTAIN HILLS, THEREFORE THERE ARE NO EXISTING FLOODPLAIN AND FLOODWAY DELINEATIONS.

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? AERIAL MAPPING AUGUST 1991

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS N/A scale N/A Contour interval
   b. Revision Request 1" = 200' scale 2 FOOT Contour interval

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

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.

   Attach additional pages if needed.

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's? ☐ Yes ☐ No

If yes, please give the location of shift or increase and an explanation for the increase.

N/A This is the first study of the area, therefore, there isn't an existing 100-year floodplain delineation.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? ..... ☐ Yes ☐ No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase? _____

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? ..... ☐ Yes ☐ No

If yes, explain:

N/A This is the first study of the area, therefore, there isn't an existing floodway delineation.

7. If a V-zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? N/A ☐ Yes ☐ No

If no, explain:

8. Manual or digital map submission:

☒ Manual

☐ Digital

Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

IF REQUESTED A DIGITIZED MAP CAN BE SUPPLIED.

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.

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_____

      _____

   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, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? N/A ☐ 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.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ARROW WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: FOUNTAIN HILLS BLVD. / PALISADES BLVD.
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 0.338
3. This revision reflects *(check one of the following)*:

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed) _____

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
1-60" CMP (UPSTREAM); 2-36" CMPs (DOWNSTREAM)

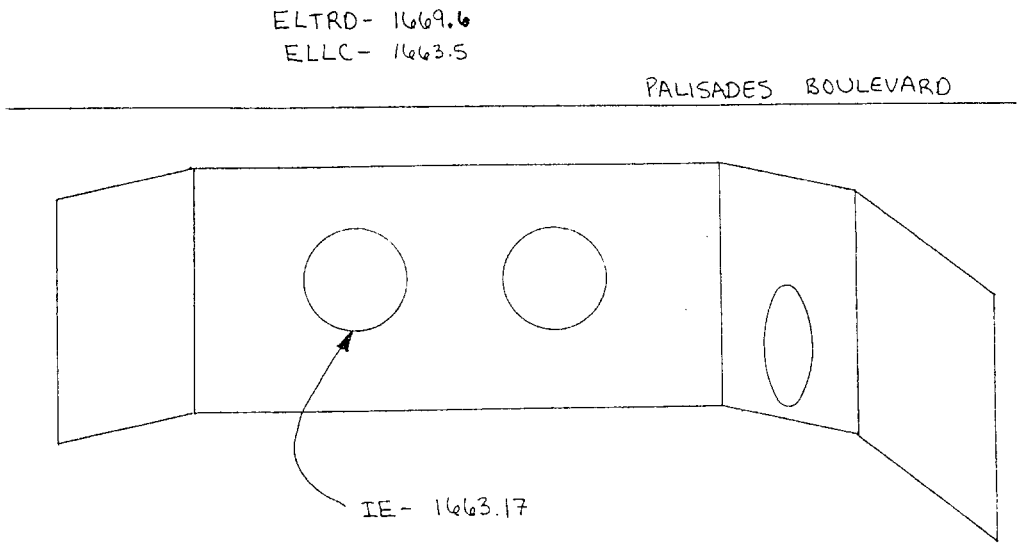
2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments)
PIPE PROJECTING FROM FILL (UPSTREAM); 30°-75° WING WALLS/SQUARE TOP EDGE. (DOWNSREAM)

3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
TEXAS HYDRAULIC SYSTEM (THYSYS)

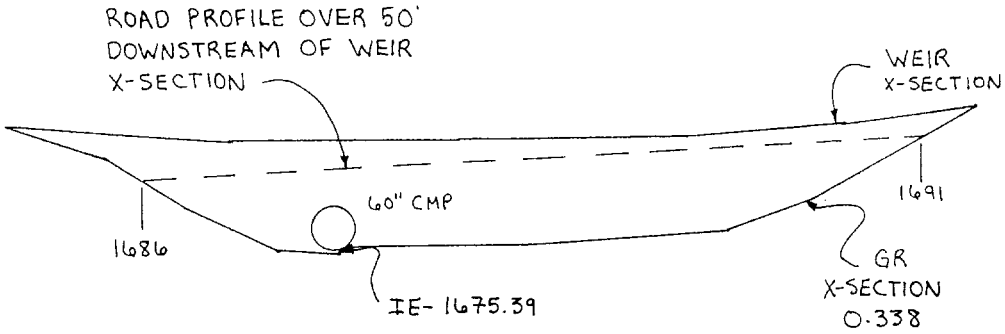
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

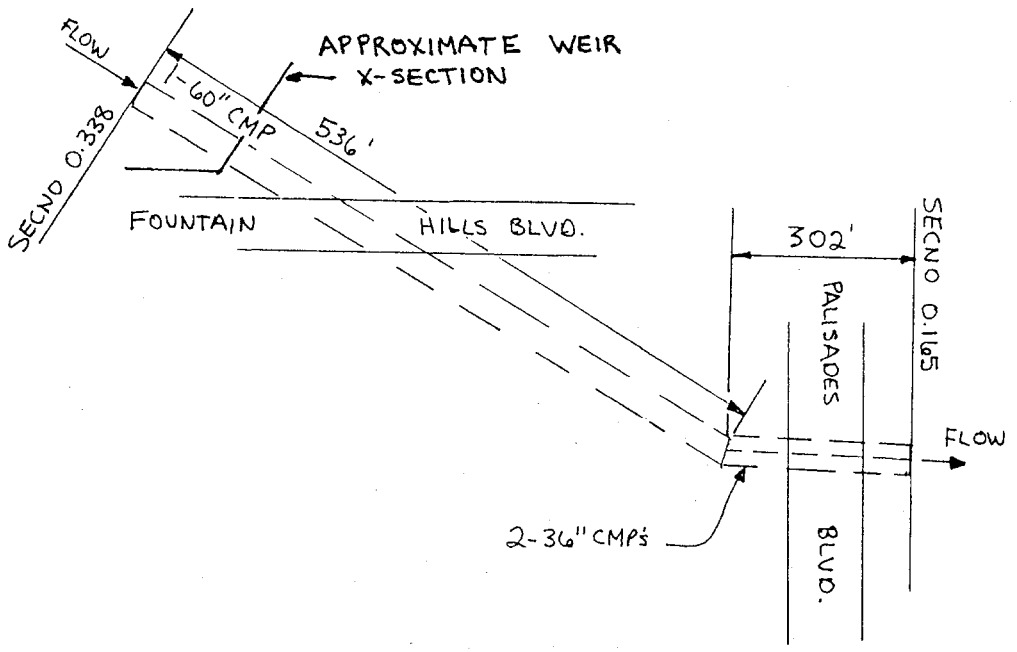
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	838 ft.
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	UPSTREAM-19.6 ft.² ; DOWNSTREAM-14 ft.²
Total culvert/bridge area (ft²)	59.6 ft.²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1696	1696
Downstream face	1674	1674

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1690	1692
Downstream face	1670	1670

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1693.20	1693.20
Downstream face	1664.90	1665.31

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	171	192	520

The maximum depth of flow over the roadway/railroad (ft.) ..... 1.2 ft.

Weir length (ft.) ..... 80 ft.

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	55	55	55
Downstream face	15	15	15

Loss Coefficients

Entrance loss coefficient	0.9
Manning's "n" value assigned to the structure(s)	.024
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	.40 (JUNC. LOSS)
Total loss coefficient	N/A
Weir coefficient	2.90
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport *(including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ARROW WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCO 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: MOUNTAINSIDE DRIVE
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 0.583
3. This revision reflects *(check one of the following)*:

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
1-36" CMP

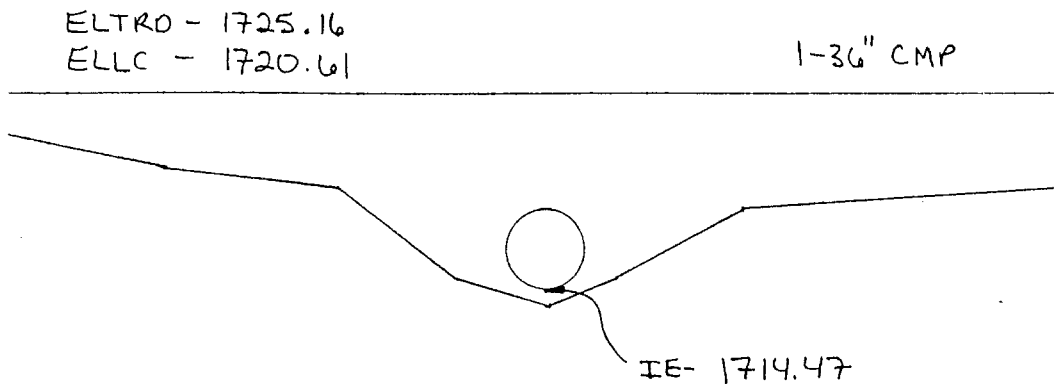
2. Entrance geometry of culvert/type of bridge opening (e.g. 30 ° - 75 ° wing walls with square top edge, sloping embankments and vertical abutments)
PIPE PROJECTING FROM FILL

3. Hydraulic model used to analyze the structure *(e.g., HEC-2 with special bridge routine, WSPRO, HY8)*
HEC-2 Special Culvert Method

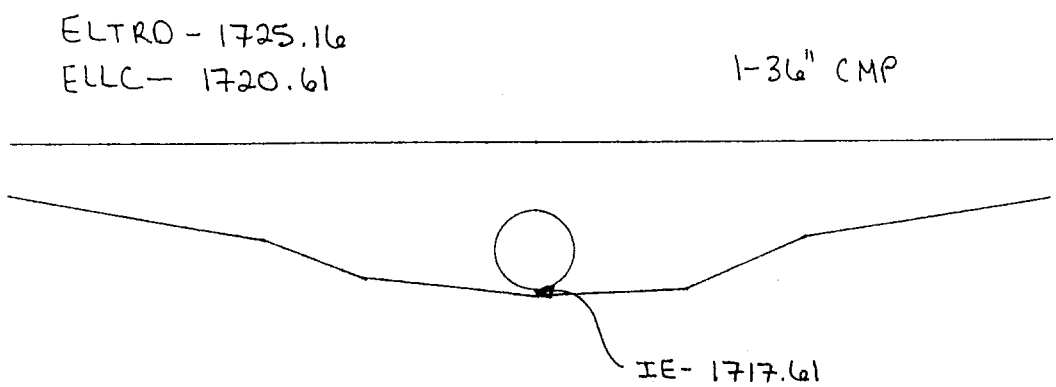
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

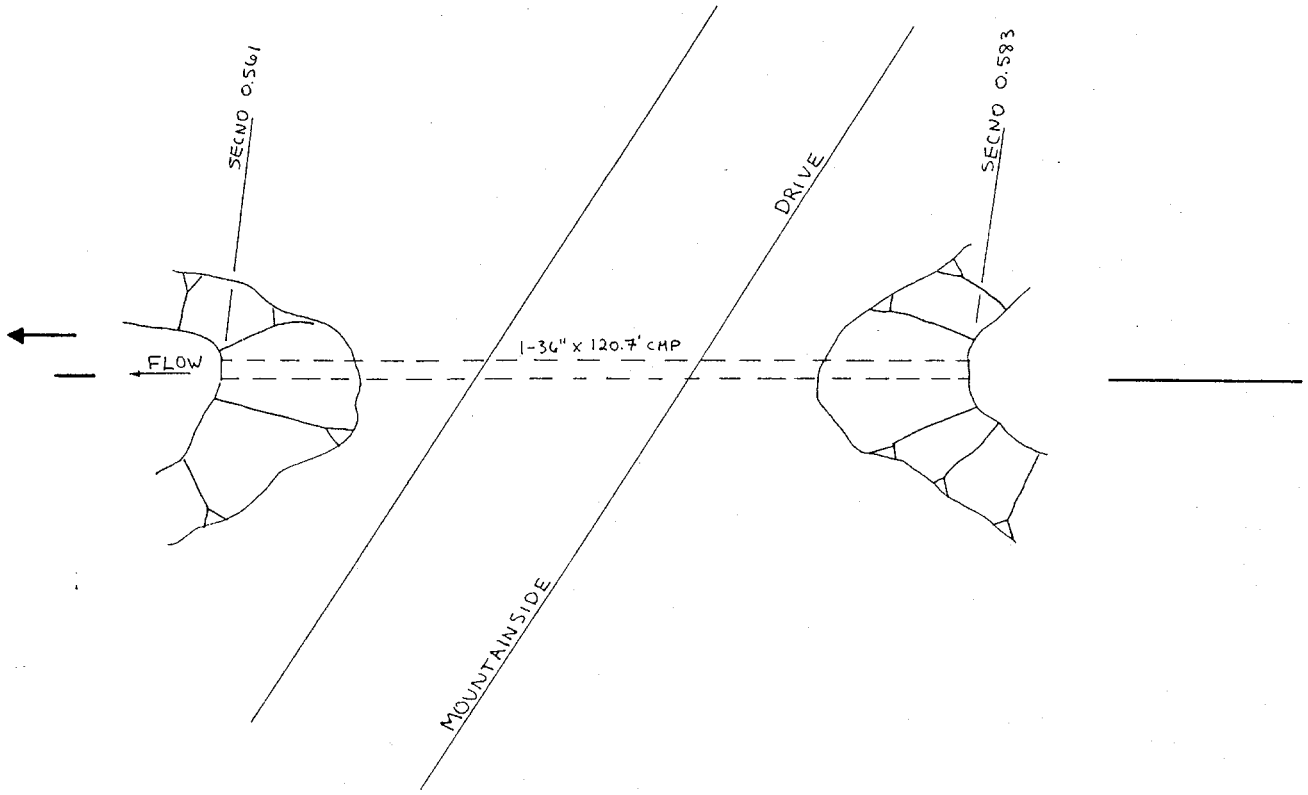
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	120.7'
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	7.1 ft²
Total culvert/bridge area (ft²)	7.1 ft²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1725.15	1725.15
Downstream face	1724.74	1724.74

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1725.16	1725.16
Downstream face	1725.16	1725.16

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1727.00	1727.01
Downstream face	1722.47	1726.53

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	55	465	520

The maximum depth of flow over the roadway/railroad (ft.) ..... 1.85 ft.

Weir length (ft.) ..... 127 ft.

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	130	130	130
Downstream face	100	100	100

Loss Coefficients

Entrance loss coefficient	0.9
Manning's "n" value assigned to the structure(s)	.024
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment (*bed material*) load?
   _____cfs (*attach gradation curve*)

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ARROW WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: MIMOSA DRIVE
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 0.672
3. This revision reflects *(check one of the following)*:

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
1-36" CMP

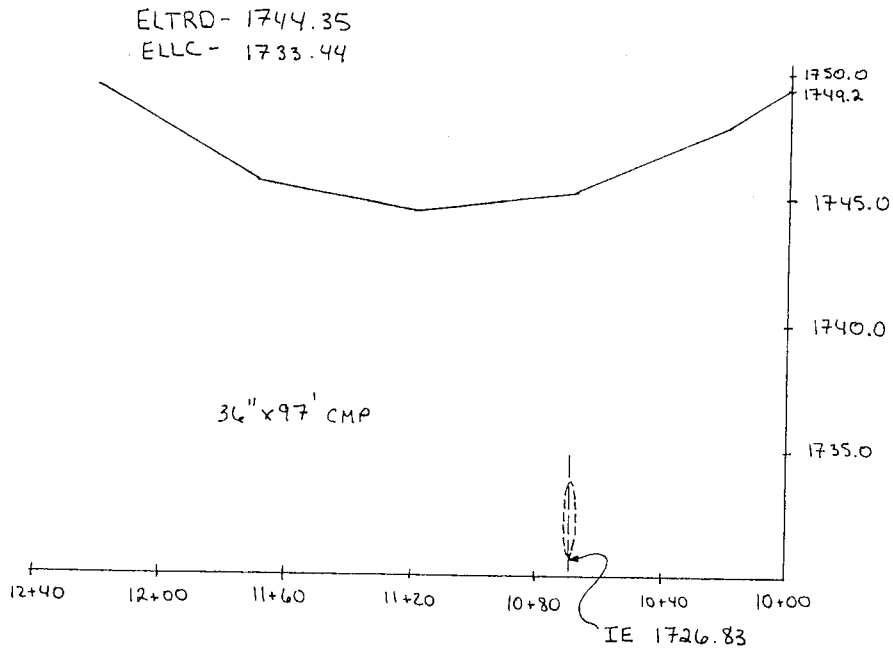
2. Entrance geometry of culvert/type of bridge opening (e.g. 30 ° - 75 ° wing walls with square top edge, sloping embankments and vertical abutments)
PIPE PROJECTING FROM FILL

3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
HEC-2 SPECIAL CULVERT METHOD.

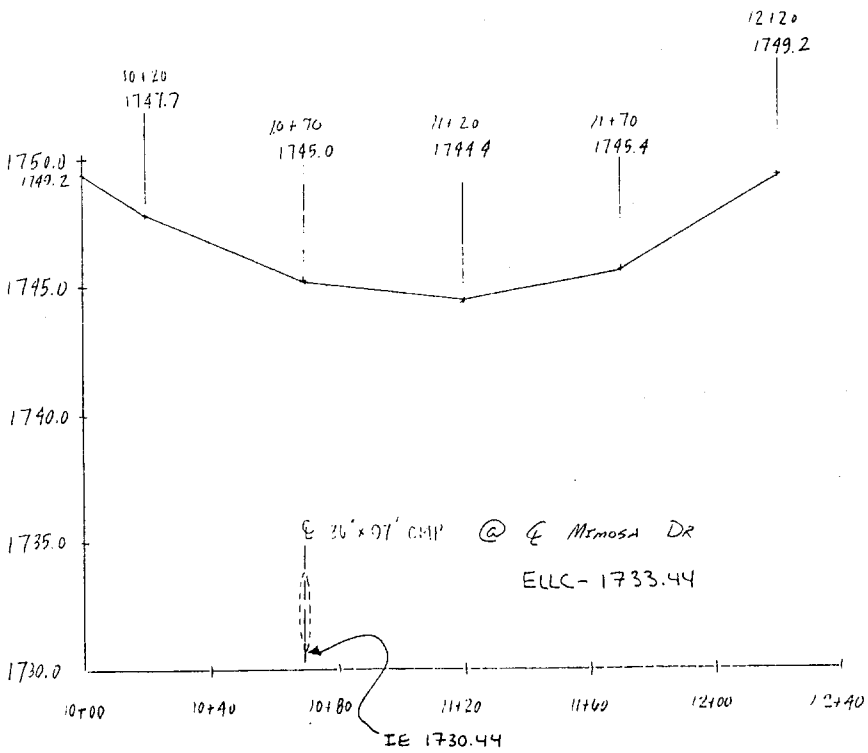
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

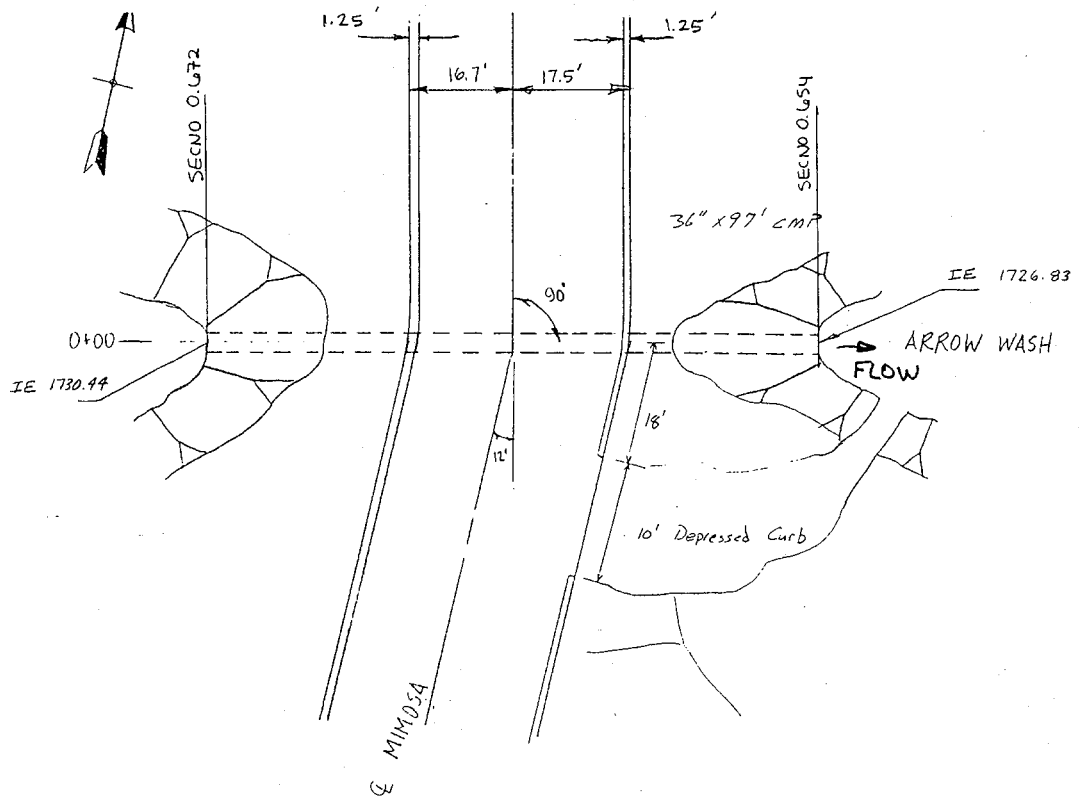
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	97 ft.
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	.4 ft²
Total culvert/bridge area (ft²)	.4 ft²

INLET IS FREE, BUT OUTLET IS 7/8 PLUGGED. MODEL USING 0.75' DIAMETER.

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1744.35	1744.35
Downstream face	1735.71	1735.71

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1744.35	1744.35
Downstream face	1744.35	1744.35

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1745.97	1745.97
Downstream face	1735.82	1737.34

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	3	366	370

The maximum depth of flow over the roadway/railroad (ft.) ..... 1.6 ft.

Weir length (ft.) ..... 126 ft.

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	170	130	170
Downstream face	30	30	30

Loss Coefficients

Entrance loss coefficient	0.9
Manning's "n" value assigned to the structure(s)	0.024
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment (*bed material*) load?
   _____cfs (*attach gradation curve*)

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ARROW WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: ARROW DRIVE
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 0.071
3. This revision reflects *(check one of the following)*:
   - ☒ New bridge/culvert not modeled in the FIS
   - ☐ Modified bridge/culvert previously modeled in the FIS
   - ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
3-54" CMP's

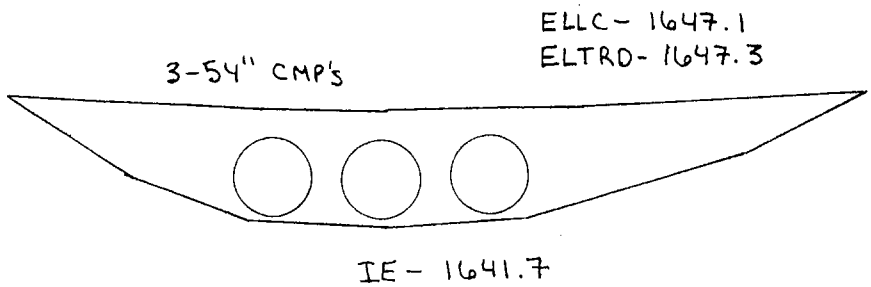
2. Entrance geometry of culvert/type of bridge opening (e.g. 30 ° - 75 ° wing walls with square top edge, sloping embankments and vertical abutments)
CULVERT INLET MITERED TO CONFORM TO SLOPE

3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
HEC-2 Special Culvert Method

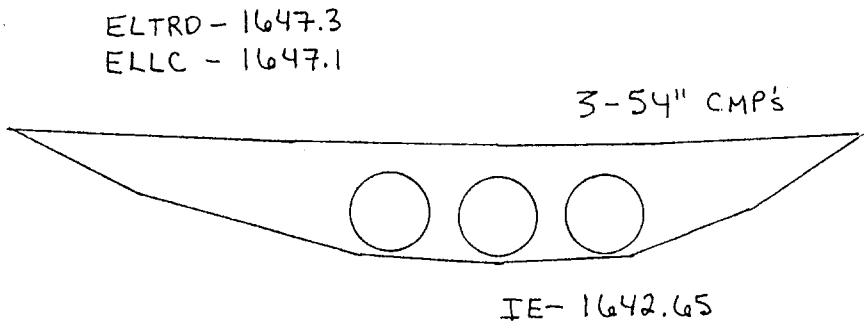
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1647.11	1647.11
Downstream face	1644	1644

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1647.3	1647.3
Downstream face	1647.3	1647.3

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1648.3	1648.5
Downstream face	1644.4	1645.5

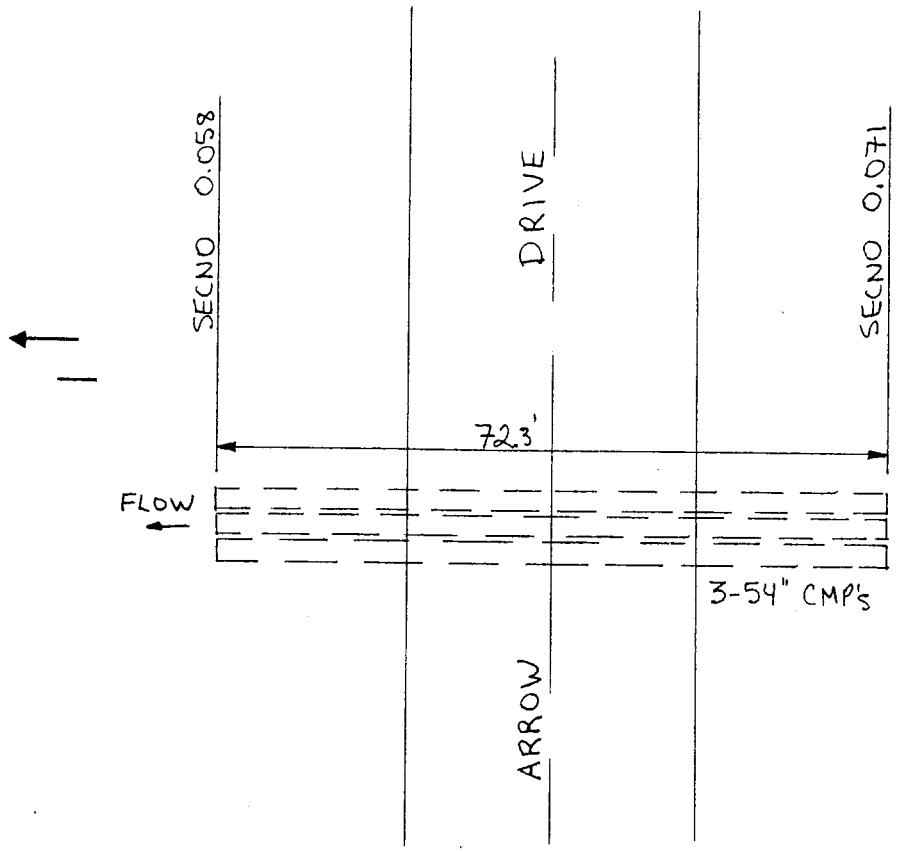
Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	371	116	490

The maximum depth of flow over the roadway/railroad (ft.) ..... 1.2 ft.

Weir length (ft.) ..... 89 ft.

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	40	40	40
Downstream face	30	30	30

Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	72.3 ft.
Calculated culvert/bridge area (ft 2) by the hydraulic model, if applicable	47.7 ft.^{2}
Total culvert/bridge area (ft 2)	47.7 ft.^{2}

Loss Coefficients

Entrance loss coefficient	0.7
Manning's "n" value assigned to the structure(s)	0.022
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport *(including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM**	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

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1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*
   - ☐ Physical change
     - ☐ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☐ Improved data
   - ☐ Floodway revision
   - ☒ Other New Study

   Explain This is the first delineation of this water course

2. Flooding Source: Balboa Wash
3. Project Name/Identifier: Fountain Hills North Floodplain Delineation Study FCD 92-04
4. FEMA zone designations affected: X
   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy,City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
04013	Maricopa County	Maricopa	AZ	04013C	1750 E	9-4-91
	Fountain Hills, Town				1300 E	9-4-91

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding

- ☐ Riverine
- ☐ Coastal
- ☐ Alluvial Fan
- ☐ Shallow Flooding *(e.g. Zones AO and AH)*
- ☐ Lakes

Affected by wind/wave action
- ☐ Yes
- ☐ No

Structures

- ☐ Channelization
- ☐ Levee/Floodwall
- ☐ Bridge/Culvert
- ☐ Dam
- ☐ Coastal
- ☐ Fill
- ☐ Pump Station
- ☐ None
- ☐ Channel Relocation
- ☐ Excavation
- ☐ Other *(describe)*

Disciplines*

- ☐ Water Resources
  - ☒ Hydrology
  - ☒ Hydraulics
  - ☐ Sediment Transport
  - ☐ Interior Drainage
- ☐ Structural
- ☐ Geotechnical
- ☐ Land Surveying
- ☐ Other *(describe)*

☐ Other(describe)_____

*** Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☐ Yes ☒ No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM ☒ Yes ☐ No

   If yes, give reason: New Study, this is the first delineation of this water course

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions. See attached articles and announcements

9. 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.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? ☐ Yes ☐ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☐ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (*or other surcharge limit if community or state has adopted more stringent criteria*)? ☐ Yes ☐ No

If the answer to either Items 1B or 2B is yes, please provide 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.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒ Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒ Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐ Yes ☐ No N/A New Study

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ (entity)

_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☐ has ☐ has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____
(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.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

_____a. CLOMR — A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*.

_____b. LOMR — A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. I Parts 60 and 65.)*

X c. PMR — A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. I, Parts 60 and 65.)*

_____d. Other: Describe_____

8. FORMS INCLUDED

17. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

• Hydrologic analysis for flooding source differs from that used to develop FIRM	☒ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine /Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☐ Bridge/Culvert Form (Form 7)
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☐ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

NOTICE OF REGULAR SESSION

OF THE

FOUNTAIN HILLS TOWN COUNCIL

WHEN: NOVEMBER 16, 1995

TIME: **6:30 P.M.

WHERE: TOWN HALL COUNCIL CHAMBERS

Pursuant to A.R.S. 38-431.02, notice is hereby given to the members of the Town Council of Fountain Hills and to the general public that the Town Council of Fountain Hills will hold a regular session open to the public on Thursday, November 16, 1995 at 6:30 p.m. in the Council Chambers of the Fountain Hills Town Hall, located at 16836 E. Palisades Blvd., Building C, Fountain Hills, Arizona.

***** Prior to the regularly scheduled Council meeting, the Flood Control District of Maricopa County and the Town of Fountain Hills Engineering Department will host an open public meeting presenting the results of the Fountain Hills Floodplain Delineation Studies. The public meeting will be held in the conference room from 4:00 to 6:30 p.m.***

RULES FOR ADDRESSING THE COUNCIL - ADOPTED 1/18/90

It is the Council's desire to hear public comment on agenda items. As it is important to maintain order during the meeting, please adhere to the following rules of order if you wish to speak:

1.) All citizens wishing to speak must first be recognized by the Mayor.
2.) The Mayor will not call for public comment on an item until after a motion has been made and seconded and the Council has had adequate opportunity to discuss the item.
3.) Please stand and state your name and address after being called on to speak.
4.) All comments must be directed to the Mayor.
5.) TIME LIMIT - 3 MINUTES PER PERSON PER ITEM.
6.) Statements should not be repetitive.
7.) Persons or groups wishing to make longer presentations, should see the Town Clerk prior to the meeting.

The agenda for the meeting is as follows:

1.) Meeting called to order, pledge to the flag, invocation and roll call.

Consent Agenda:

All items listed with an asterisk (*) are considered to be routine, non-controversial matters and will be enacted by one motion and one roll call vote of the Council. There will be no separate discussion of these items unless a Councilmember or member of the public so requests. If a Councilmember or member of the public wishes to discuss an item on the consent agenda, they may request so prior to the motion to accept the consent agenda. The item will be removed from the Consent Agenda and considered in its normal sequence on the agenda.

Open house Thursday on floodplain

A public open house will be held Thursday, Nov. 16, to review results of floodplain delineation studies performed in Fountain Hills.

The open house will be held from 4 to 6:30 p.m. at Town Hall's conference room.

Floodplain delineation involves developing detailed topographic maps to determine where water goes while incorporating the results of rainfall patterns to determine typical and peak amounts of runoff.

Along with extensive surveying and aerial mapping, drainage factors such as slope, vegetation, soil composition and land use are analyzed and included.

The studies will be used to better manage the floodplain to reduce or prevent flood damage and maintain the integrity of the floodplains.

Areas designated for further analysis in an upcoming area drainage master study also will be presented.

Results obtained in the north and south delineation studies will be displayed at the open house.

Representatives from the Flood Control District of Maricopa County, the Town of Fountain Hills' Engineering Department and the engineering consulting firms will be available to discuss the results and answer questions.

PUBLIC NOTICE
YOUR RIGHT TO KNOW

ANNOUNCEMENT OF FLOOD HAZARD STUDY

he Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90 448), as ended, and the Flood Disaster Protection Act of 1973 (p.L. 93-4), is funding a detailed study of flood hazard areas in The Town Fountain Hills, Arizona.

he study is being performed for the Flood Control District by K Engineers and George V. Sabel Consulting Engineers.

e purpose of this study is to examine and evaluate flood hazard as which are developed or which are likely to be developed or which are likely to be developed and to determine flood elevations or those areas. Flood elevations will be used by Maricopa County carry our floodplain management objectives of the National od Insurance Program. They will also be used as the basis for termining appropriate flood insurance premium rates applicable for buildings and their contents.

is announcement is intended to notify all interested persons of commencement of this study so that they may have an portunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control istrict for consideration in the course of this study. Such rmation should be addressed to Mr. Tim Murphy or Ms. Sandy y, Flood Control District of Maricopa County, 2801 W. urango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

lished FH Times 1/13,1/20/93.

AFFIDAVIT OF PUBLICATION

The Times
OF FOUNTAIN HILLS AND RIO VERDE, ARIZONA

A publication of Western States Publishers, Inc.

STATE OF ARIZONA
COUNTY OF MARICOPA } ss.

L. ALAN CRUIKSHANK, being first duly sworn, upon oath deposes and says: That he is the publisher of

THE TIMES OF FOUNTAIN HILLS AND RIO VERDE

a newspaper of general circulation in the County of Maricopa and the State of Arizona, published at Fountain Hills, Arizona, and that the copy hereto attached is a true copy of the advertisement as published weekly in The Times of Fountain Hills and Rio Verde on the following dates:

Jan. 13, 1993
Jan 20, 1993

Sworn to before me this

23 day of

February A.D. 19 93

Karen Kirkendoll
Notary Public

OFFICIAL SEAL
KAREN KIRKENDOLL
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My comm. expires May 14, 1993

INVOICE NO. 93008

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by AGK Engineers and George V. Sabol Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed and to determine flood elevations for those areas. Flood elevations will be used by Maricopa County to carry out floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Story, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published: Arizona Republic, January 13, 20, 1993.

AFFIDAVIT OF PUBLICATION

The Arizona Republic/The Phoenix Gazette

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

JOAN LOHR, being first duly sworn, upon oath deposes and says: That she is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic and The Phoenix Gazette, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

~~The Arizona Republic~~
The Phoenix Gazette

JANUARY 13, 20, 1993

Joan Lohr

Sworn to before me this

25TH day of

JANUARY 93 A.D. 19

OFFICIAL SEAL
MARY LEE BOOHER
NOTARY PUBLIC STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1995

Mary Lee Booher
Notary Public

Meeting on flood plain plan

Find out where flood waters go on Dec. 17

An open house to inform Fountain Hills residents of floodplain delineation studies being performed on over 30 washes flowing through the community will be held on Thursday, Dec. 17.

The meeting will be held from 5 to 8 p.m. at the Town Hall Conference Room, 16836 E. Palisades Blvd.

The public is invited to come by the Town Hall anytime during the three-hour open house to share their experience and observations of local flooding and hear details about the studies.

Details will include how the study is conducted, what kind of information is being gathered and how the information will be used.

Mapping floodplains involves developing detailed topographic maps to determine where water goes and studying rainfall patterns to determine typical amounts of runoff. The studies and resulting maps will be used to better manage the floodplain so as to reduce or prevent flood damage and maintain the integrity of the floodplains.

Extensive surveying and aerial mapping is involved in the studies, but other factors influencing drainage also must be considered, including soil composition, slope and vegetation and land use.

The Fountain Hills studies are expected to take 12 months to complete, after which time a second open house will be held to inform residents of the results of the studies.

Questions or additional information regarding the studies can be obtained by writing or calling Jim Phipps or Tim Murphy of the Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone 506-1501, or Randy Harrel, town engineer, Town of Fountain Hills, 16836 E. Palisades Blvd, Fountain Hills, AZ 85268, telephone 837-2003.

Audit tops Sanitary agenda

The annual audit report will be the major topic on the agenda for the Sanitary District board of directors when it meets Thursday, Dec. 10.

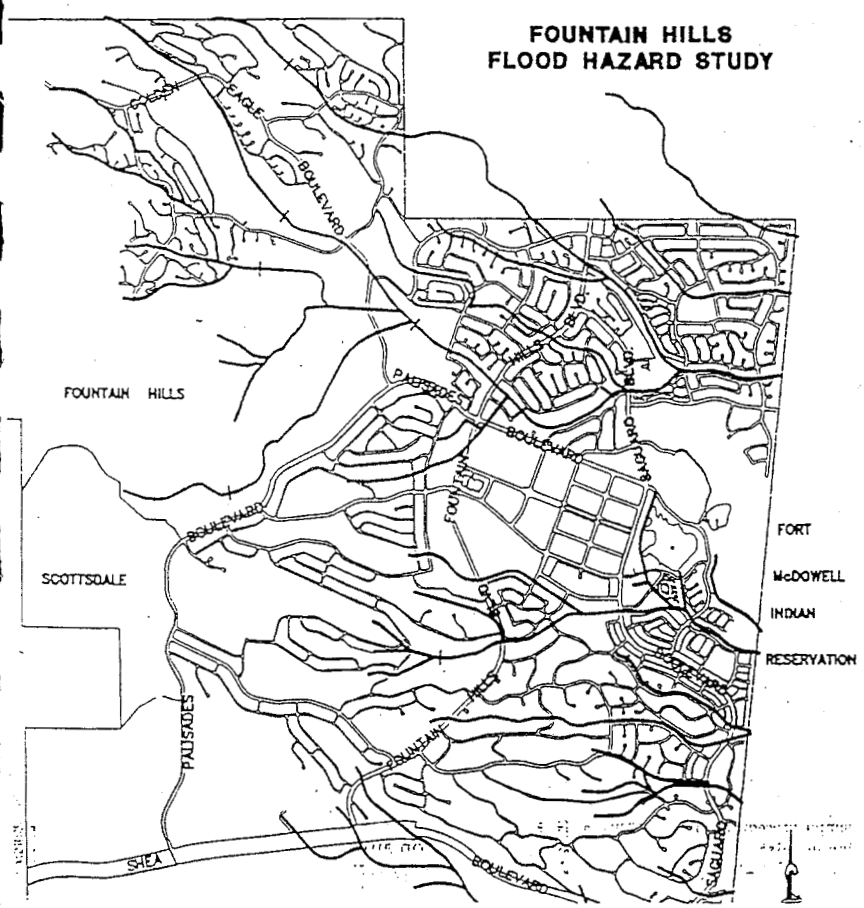
The report is a routine document prepared each year, according to District Manager Ron Huber.

The board will also select a new chairman for the coming calendar year.

The job of chairman has simply rotated under the current board, and that being the case Director Dennis Regeski will be leading the board for the next year. Director Bruce Hansen is the outgoing chairman.

Huber said monthly staff reports will also be presented at the meeting, and he has a few carryover items to update the board on.

Doesn't Your Single Larg
INVESTMEN
Deserve a second opinion?
LaCosta Construction Inc.
designers & builders
of
LUXURY LA COSTA HOMES
"The Art of Construction"
837-1640



When you need to sell your
call
erica
Fountain Hills #1 Top Pr
Over 100 Opened & Closed Transactions Sid
(So Far)
Watch... erica west
Channel 10 NEWS
"Real Estate Expert"
...her team of "SPECIALIS
are WORKING FOR YOU
Transaction Specialist
Larraine LaGiglia.....
daily monitors the progress of each of my ESCROWS and LISTINGS. She is in constant contact with my LISTERS & concentrates on finding BUYERS for my listings.

Systems Specialists
Dana West.....
implements the unique MARKETING SYSTEMS designed to get my l
SOLD quickly! She keeps my LISTERS advised of the progress on their
Administration Specialist
Carol Talty.....
handles all mailings/brochures and assists with special projects.

The Times of Fountain Hills

12-9-92

FEDERAL EMERGENCY MANAGEMENT AGENCY

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM

O.M.B. Burden No. 3067-0148
Expires July 31, 1997

FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average . 23 hour 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.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Hydrology, Hydraulics
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 25 years experience in the expertise listed above.
4. I have ☒ prepared ☒ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
   Hydrologic analysis and floodplain delineation
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.
   b. ☐ Compared plans and specifications with as-built survey information.
   c. ☐ Examined plans and specifications and compared with completed projects.
   d. ☐ Other _____
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: George V. Sabol
(please print or type)

Title: Sr. Associate, SFC Engineering Company
(please print or type)

Registration No. 17928 Expiration Date: 30 June 1998

State Arizona

Type of License Professional Engineer

Signature

23 January 1997
Date

Registered Professional Engineer (Civil) CERTIFICATE NO. 17928 GEORGE V. SABOL Date Signed 23 Jan ARIZONA, U.S.A.

Seal
(Optional)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply.

FEDERAL EMERGENCY MANAGEMENT AGENCY **HYDROLOGIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.67 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: BALBOA WASH
(One form for each flooding source)

Project Name /Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. HYDROLOGIC ANALYSIS IN FIS

☐ Approximate study stream (Zone A)
☒ Detailed study stream (briefly explain methodology) The analysis was performed using HEC-1.

2. REASON FOR NEW HYDROLOGIC ANALYSIS

☒ No existing analysis
☐ Improved data *(see data revision on page 3)*
☐ Changed physical conditions of watershed *(explain)* _____

☐ Alternative methodology *(justify why the revised model is better than model used in the effective FIS)*

☐ Evaluation of proposed conditions (CLOMRs only) (explain) _____

☐ Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100 - and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

☒ Approval of hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., Flood Control District of Maricopa County)
Attach evidence of approval.

☐ Approval of the hydrologic analysis is not required by any local, State, or Federal Agency.

Stream: BALBOA WASH

Comparison of 100-year Discharges

Location:	Drainage area (Sq mi.)	FIS (cfs):	Revised (cfs):
Above confluence with Ashbrook Wash	4.19	N/A	1130
Below confluence with Oxford Wash	4.04	N/A	1040
Above confluence with Oxford Wash	3.72	N/A	720
Below Glenbrook Boulevard	3.40	N/A	720
Below confluence with Hesperus Wash	3.16	N/A	660

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review.

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made *(attach separate sheet if necessary)*

N/A

ATTACH A COMPLETED REVIEW OF RESULTS PAGE FOR EACH FLOODING SOURCE.

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS *(i.e. no changed hydraulic conditions)*? ☐ Yes ☒ No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No N/A New study

FEMA does not normally revise NFIP maps solely due to insignificant flow changes where changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? ☐ Yes ☒ No

If yes, provide the following:

Location along flooding source: _____

Maximum peak discharge: _____ cfs

Second highest peak discharge: _____ cfs

Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site *(along flooding source or similar watershed; specify)*

UNAVAILABLE

Gaging Station: _____

Drainage area at gage: _____ mi^2

Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as new data (*New*) or as revising existing data (*Revised*). *(If necessary, attach a separate sheet.)*

Data Parameter	New	Revised	Data Source
SUBBASIN AREAS	☒	☐	FOUNTAIN HILLS/USGS MAPPING
LAG TIME, L, L_{CA}, SLOPE, K_n	☒	☐	FOUNTAIN HILLS/USGS MAPPING
GREEN + Ampt PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
ROUTING REACH PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
	☐	☐	

- Data source can be from a Federal, State, or local government agency, or from a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source *(i.e., certified statement, report, bibliographical reference to a published document)*. In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

☐ Statistical Analysis of Gage Records (*use Attachment A*)

☐ Regional Regression Equations *(use Attachment B)*

☒ Precipitation/Runoff Model *(use Attachment C)*

☐ Other *(specify; attach backup computations and supporting data)* _____

ATTACHMENT A: STATISTICAL ANALYSIS OF GAGE RECORDS

Gaging Station: N/A

Gage Location (latitude and longitude): _____

	FIS:	Revised:
1. Number of years of data	_____	_____
Systematic	_____	_____
Historical	_____	_____
2. Homogeneous data	☐ Yes ☐ No	☐ Yes ☐ No
3. Data adjustments	☐ Yes ☐ No	☐ Yes ☐ No
4. Number of high outliers	_____	_____
Low outliers	_____	_____
Zero events	_____	_____
5. Generalized skew	_____	_____
6. Station skew	_____	_____
7. Adopted skew	_____	_____
8. Probability distribution used (justify if log-Pearson III was not used)	_____	_____
9. Transfer equations to ungaged sites		☐ Yes ☐ No

If yes, specify method

_____

_____

_____

10. Expected probability* ☐ Yes ☐ No

11. Comparison of results with other analyses ☐ Yes ☐ No

If yes, describe comparison

_____

_____

_____

*FEMA does not accept expected probability analyses for the purpose of reflecting flood hazard information in a FIS.

If any data is not available, indicate by N/A.

Attach analysis including plot of flood frequency curve.

1. Bibliographical Reference: N/A

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. Gaged or ungaged stream: _____

3. Hydrologic region(s): _____
Attach backup map.

4. Provide parameters, values, and source of data used to define parameters.

		FIS:		Revised:	
5.	Urbanized conditions calculations	☐ Yes	☐ No	☐ Yes	☐ No
6	Percent of watershed urbanization	_____		_____	
7.	Is the watershed controlled?	☐ Yes	☐ No	☐ Yes	☐ No
8.	Comparison with other analyses	☐ Yes	☐ No	☐ Yes	☐ No

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

		FIS:	Revised
1.	Method or model used:	N/A	HEC-1
	Version:	N/A	4.0.1E
	Date:	N/A	MAY 1991
2.	Source of rainfall depth:	N/A	NOAA ATLAS 2
3.	Source of rainfall distribution:	N/A	FCDMC HYDROLOGIC MANUAL
4.	Rainfall duration:	N/A	6+24 HR.
5.	Areal adjustment to precipitation (%):	N/A	DEPEND UPON SUBBASIN AREA
6.	Maximum overland flow length	N/A	.975 mi TABLE 5-7 (206F)
7.	Hydrograph development method:	N/A	CLARK UNIT GRAPH
8.	Loss rate method:	N/A	GREEN-AMPT
	Source of soils information:	N/A	SCS SOIL SURVEY
	Source of land use information	N/A	AERIAL PHOTOS
9.	Channel routing method:	N/A	NORMAL DEPTH
10.	Reservoir routing:	☐ Yes ☐ No	☒ Yes ☐ No
11.	Baseflow considerations:	☐ Yes ☐ No	☐ Yes ☒ No

If yes, explain how baseflow was determined:

12.	Snowmelt considerations:	☐ Yes ☐ No	☐ Yes ☒ No
13.	Model calibration:	☐ Yes ☐ No	☒ Yes ☐ No

If yes, explain how calibration was performed The model was calibrated by comparing USGS gage data, runoff volume checks upstream from dams, results with estimates using a USGS regional regression eqn., and modeled results with results of other M.C. studies. (Section 3.2.3 pg. 3-61)

14. Future land use condition: ☐ Yes ☒ No

If yes, explain why

NOTE: FEMA policy is to base flooding on existing conditions.
If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

See the Hydrology Report

ATTACHMENT D: CONFIDENCE LIMITS EVALUATION

Stream: N/A

Select one location for Confidence Limits Evaluation (*describe location*): _____

_____

Discharges for selected location:

Exceedance Probability		FIS	Revised
10%	(10-year)	_____ cfs	_____ cfs
2%	(50-year)	_____ cfs	_____ cfs
1%	(100-year)	_____ cfs	_____ cfs
0.2%	(500-year)	_____ cfs	_____ cfs

1% (100-year) Flood Confidence Intervals

90% Confidence Interval: 5% limit _____ cfs

95% limit _____ cfs

50% Confidence Interval: 25% limit _____ cfs

75% limit _____ cfs

If the value of the 100-year frequency flood in the FIS is beyond the 50% confidence interval but within the 90% confidence interval, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No

An example of confidence limits analysis can be found in Appendix 9 of Bulletin 17B.

Attach Confidence Limits Analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: BALBOA WASH
(One form for each flooding source)

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. REACH TO BE REVISED

Downstream limit: CONFLUENCE WITH ASHBROOK WASH

Upstream limit: END OF HESPERUS WASH

2. EFFECTIVE FIS

☒ Not studied

☐ Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

☐ Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

☐ Floodway delineated

Downstream limit of Floodway _____

Upstream limit of Floodway _____

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

☒ Not studied in FIS

☐ Improved hydrologic data/analysis. Explain: _____

☐ Improved hydraulic analysis. Explain: _____

☐ Flood control structure. Explain: _____

☐ Other. Explain: _____

3. RIVERINE HYDRAULIC ANALYSIS FORM
Models Submitted

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete 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 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 for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model — Natural ☐ Floodway ☐

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 requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor'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 ☐ Floodway ☐

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 ☐ Floodway ☐

The duplicate effective or corrected 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 or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☐

The existing or pre-project conditions model *(or duplicate effective 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 proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. — Natural ☒ Floodway ☒

6. Hydraulic Analyses (Only if Hydraulic Models are not developed) — See the Hydraulics Report

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS *(from model used to revise 100-year water surface elevation)*

1. Discharges:

	Upstream Limit	Downstream Limit
10-year		
50-year		
100-year	660 cfs.	1130 cfs.
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined

CRITICAL DEPTH

3. Give range of friction loss coefficients (*Manning's "N"*) Channel ..... .035 - .08

Overbanks ..... .051 - .07

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

Location	FIS	Revised
N/A		

Explain: NEW STUDY

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

The cross-sections were determined photogrammetrically by the aerial mapping company. All cross-sections are stationed from left to right looking downstream with the thalweg set at station 10,000.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☒ Yes ☐ No If no, explain why not:

6. Explain how reach lengths for channel and overbanks were determined:

Channel reach lengths were measured along the thalweg and the overbank reach lengths were measured along the anticipated path of the center of mass of the overbank flow.

5. RESULTS *(from model used to revise 100-year water surface elevations)*

1. Do the results indicate:

a. Water surface elevations higher than end points of cross sections? ☐ Yes ☒ No

b. Supercritical depth? ☐ Yes ☒ No

c. Critical depth? ☒ Yes ☐ No

d. Other unique situations ☐ Yes ☒ No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.
FOR THOSE CROSS-SECTIONS WHERE THE HEC-2 MODEL DEFAULTED TO CRITICAL DEPTH THE CRITICAL DEPTH WATER SURFACE ELEVATIONS ARE PLOTTED ON THE PROFILES AND MAPS.

2. What is the maximum change in energy gradient between cross-sections? 15.01

Specify location SECNO 1.517

3. What is the distance between the cross-sections in 2 above? 674.7 ft.

4. What is the maximum distance between cross-sections? 674.7 ft.

Specify location SECNO 1.517

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? 1 foot

b. What is the maximum surcharge for the revised conditions? N/A (NEW STUDY) foot

Specify location

c. What is the maximum velocity? 8.62 fps

Specify location SECNO 1.715

d. Are there any negeative surcharge values at any cross-section? ☐ Yes ☒ No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain:

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? ..... ☐ Yes ☐ No

If Yes, explain:

_____

_____

_____

7. Do 100-year water surface elevations increase at any location? ..... ☐ Yes ☐ No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

N/A NEW STUDY

_____

_____

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

N/A NEW STUDY

A. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section_____ within_____feet *(vertical)* and upstream of the project at cross section_____within_____feet *(vertical)*.

N/A NEW STUDY

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section_____within_____feet *(vertical)* and upstream of the project at cross section_____ within_____feet *(vertical)*.

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

THE PROFILES ARE LOCATED IN THE HYDRAULIC ANALYSIS NOTEBOOK

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

Proceed to Riverine /Coastal Mapping Form

FEDERAL EMERGENCY MANAGMENT AGENCY

WATER SURFACE ELEVATION CHECK N/A NEW STUDY

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
MARICOPA COUNTY, ARIZONA	BALBOA WASH	FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]

COMMENTS:

1-100-year (natural) Water Surface Elevation 2-Encroachment (floodway) Water Surface Elevation 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

MT-2 Form 4 Page 6 of 6

Sheet_____ of _____

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: BALBOA WASH,

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable)*:

		Included		
A.	Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☒ N/A
B.	Revised detailed 100- and 500-year floodplain boundaries	☐ Yes	☐ No	☒ N/A
C.	Revised 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
D.	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated	☒ Yes	☐ No	☐ N/A
E.	Stream alignments, road and dam alignments	☒ Yes	☐ No	☐ N/A
F.	Current community boundaries	☒ Yes	☐ No	☐ N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map	☐ Yes	☐ No	☒ N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
I.	The requestor's property boundaries and community easements	☐ Yes	☐ No	☒ N/A
J.	The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
K.	Location and description of reference marks	☒ Yes	☐ No	☐ N/A
L.	Vertical datum (example: NGVD, ~~NAVD etc.~~) NGVD 1929	☒ Yes	☐ No	☐ N/A
M.	Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
N.	Location and alignment of all coastal transects used to revise the coastal analyses	☐ Yes	☐ No	☒ N/A

If any of the items above are marked no or N/A, please explain: THIS IS THE FIRST STUDY DONE IN FOUNTAIN HILLS, THEREFORE THERE ARE NO EXISTING FLOODPLAIN AND FLOODWAY DELINEATIONS.

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? AERIAL MAPPING AUGUST 1991

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS N/A scale N/A Contour interval
   b. Revision Request 1" = 200' scale 2 FOOT Contour interval

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

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.

   Attach additional pages if needed.

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's? ☐ Yes ☐ No

If yes, please give the location of shift or increase and an explanation for the increase.

N/A This is the first study of the area, therefore, there isn't an existing 100-year floodplain delineation.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? ..... ☐ Yes ☐ No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase? _____

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? ..... ☐ Yes ☐ No

If yes, explain:

N/A This is the first study of the area, therefore, there isn't an existing floodway delineation.

7. If a V-zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? N/A ☐ Yes ☐ No

If no, explain:

8. Manual or digital map submission:

☒ Manual

☐ Digital

Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

IF REQUESTED A DIGITIZED MAP CAN BE SUPPLIED.

2. EARTH FILL PLACEMENT

1. The fill is: ☐ Existing ☐ Proposed N/A

2. Has fill been/will be placed in the regulatory floodway? ..... ☐ Yes ☒ No
   If yes, please attach completed Riverine Hydraulic Analysis Form.

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_____

   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, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? N/A ☐ 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.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: BALBOA WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: FOUNTAIN HILLS BOULEVARD
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 0.782
3. This revision reflects *(check one of the following)*:
   - ☒ New bridge/culvert not modeled in the FIS
   - ☐ Modified bridge/culvert previously modeled in the FIS
   - ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
2-54" CMP's

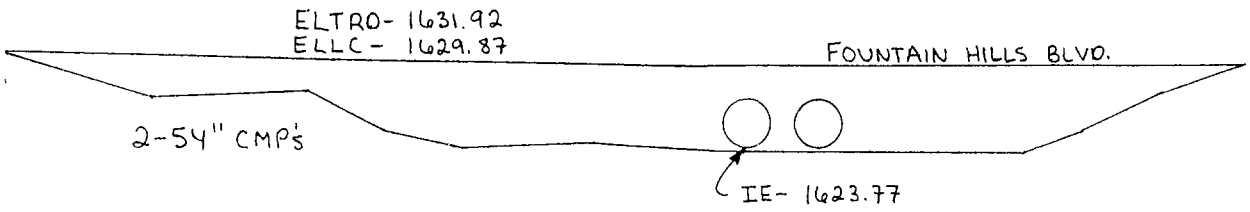
2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments)
PIPE PROJECTING FROM FILL

3. Hydraulic model used to analyze the structure *(e.g., HEC-2 with special bridge routine, WSPRO, HY8)*
HEC-2 SPECIAL CULVERT METHOD

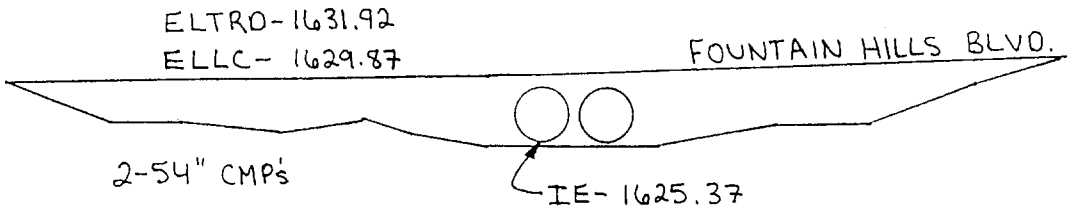
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

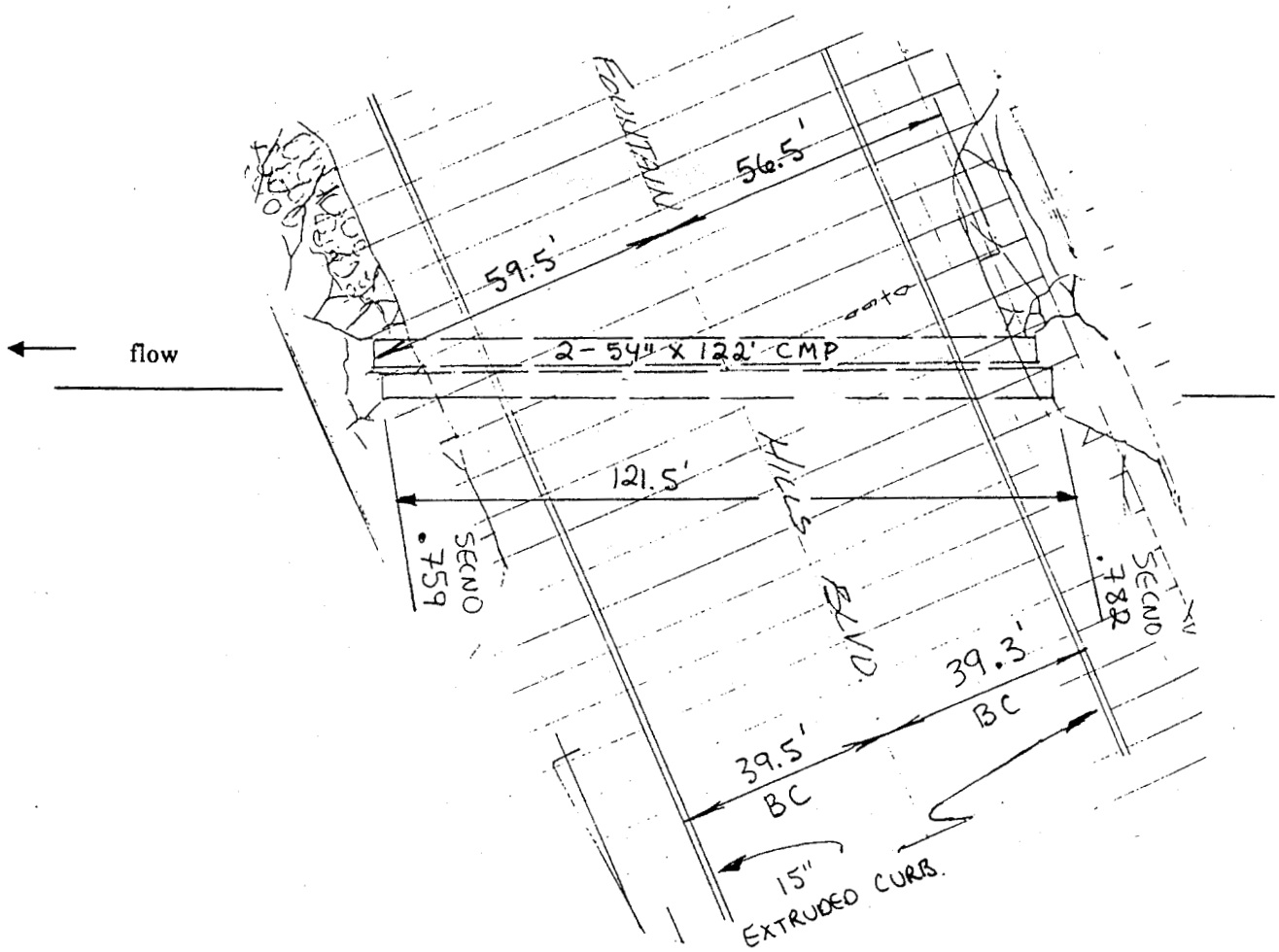
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	122'
Calculated culvert/bridge area (ft 2) by the hydraulic model, if applicable	31.8 ft²
Total culvert/bridge area (ft 2)	31.8 ft²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1631.9	1631.9
Downstream face	1623.57	1623.57

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1631.92	1631.92
Downstream face	1631.92	1631.92

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1633.64	1633.67
Downstream face	1624.81	1625.26

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	328	397	720

WEIR FLOW IS DIVERTED DOWN FOUNTAIN HILLS BLVD. INTO OXFORD WASH ONLY TO RETURN DOWNSTREAM AT CONFLUENCE.

The maximum depth of flow over the roadway/railroad (ft.) 1.74

Weir length (ft.) 108

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	107.79	108	107.79
Downstream face	69.64	70	69.64

3. ANALYSIS (Cont'd)

Loss Coefficients

Entrance loss coefficient	.90
Manning's "n" value assigned to the structure(s)	.024
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport *(including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM**	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

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1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*
   - ☐ Physical change
     - ☐ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☐ Improved data
   - ☐ Floodway revision
   - ☒ Other New Study

   Explain This is the first delineation of this watercourse

2. Flooding Source: Hesperus Wash
3. Project Name/Identifier: Fountain Hills North Floodplain Delineation Study FCD 92-04
4. FEMA zone designations affected: X
   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy,City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
04013	Maricopa County	Maricopa	AZ	04013C	1300 E	9-4-91
	Fountain Hills, Town				1270 D	

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding

- ☒ Riverine
- ☐ Coastal
- ☐ Alluvial Fan
- ☐ Shallow Flooding *(e.g. Zones AO and AH)*
- ☐ Lakes

Affected by wind/wave action
- ☐ Yes
- ☒ No

Structures

- ☐ Channelization
- ☐ Levee/Floodwall
- ☐ Bridge/Culvert
- ☐ Dam
- ☐ Coastal
- ☐ Fill
- ☐ Pump Station
- ☐ None
- ☐ Channel Relocation
- ☐ Excavation
- ☐ Other *(describe)*

Disciplines*

- ☐ Water Resources
  - ☒ Hydrology
  - ☒ Hydraulics
  - ☐ Sediment Transport
  - ☐ Interior Drainage
- ☐ Structural
- ☐ Geotechnical
- ☐ Land Surveying
- ☐ Other *(describe)*

☐ Other(describe)_____

*** Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☐ Yes ☒ No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM ☒ Yes ☐ No
   If yes, give reason: New Study, this is the first delineation of this water course

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions. See attached articles and announcements

9. 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.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? ☐ Yes ☐ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☐ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (*or other surcharge limit if community or state has adopted more stringent criteria*)? ☐ Yes ☐ No

If the answer to either Items 1B or 2B is yes, please provide 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.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒ Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒ Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐ Yes ☐ No N/A New Study

If yes, please provide the following information for each of the new flood control structures:

See Emergency Action Plan attached to Form 11.

A. Inspection of the flood control project will be conducted periodically by the owners and the State (entity) with a maximum interval of 36 months between inspections for the State and four months for the owners.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by the owners. (entity) to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☒ has ☐ has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for ☐ performing ☒ overseeing compliance with the maintenance and operation plans of the Hesperus Wash Dam (No. 36)
(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.

Attach operation and maintenance plans See attached Report with Form 11

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

_____a. CLOMR — A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*.

_____b. LOMR — A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. I Parts 60 and 65.)*

X c. PMR — A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. I, Parts 60 and 65.)*

_____d. Other: Describe_____

8. FORMS INCLUDED

17. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

• Hydrologic analysis for flooding source differs from that used to develop FIRM	☒ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine /Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☒ Bridge/Culvert Form (Form 7)
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☒ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. ☐ Yes ☐ No

Initial fee amount: $ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. ☐ Yes ☐ No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. ☒ Yes ☐ No

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

Ron Newitt
Signature of Revision Requester

RON Newitt/Program Mgr. NFIP
Printed Name and Title of Revision Requester

Flood Control District of Maricopa Co.
Company Name

(602) 506-1501 1-29-97
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.

Randy L Hanel
Signature of Community Official

Randy L Hanel, Town Engr.
Printed Name and Title of Community Official

Fountain Hills
Community Name

1-22-97
Date

Does this request impact any other communities? ☐ Yes ☐ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

11-22-95

No big problems in County floodplain study

If you've ever wondered what would happen in Fountain Hills in the event of a 100-year flood, Maricopa County has just completed a study that will tell you.

Representatives of Maricopa County Flood Control District were on hand for an open house at Town Hall on Thursday, Oct. 16. They were there to explain and answer questions concerning the Fountain Hills Flood Delineation Study.

The study defines the areas that would be inundated in the event of a 100-year storm and flood.

There was not a big turnout for the two-hour session, but a few residents dropped by to ask about their own particular concerns.

Town Engineer Randy Harrel said the study indicates no significant problems for individual homeowners. Some residents have property which lies within the flood area, but few if any structures are threatened.

One area of concern that town officials will look at is the Baptist Church on Saguaro Boulevard. In the event of a significant 100-year flooding event all of the church buildings and the parking lot would be under water. It is a low flat area which Nicklaus and Cypress washes flow into.

A Sanitary District pumping station adjacent to the church is apparently not within the flood plain.

Sanitary District Manager Ron Huber said no flood study was done when the pumping facility was constructed. But he said the pump building is significantly higher than the church buildings.

Huber also said that pump station is scheduled to be abandoned in the near future.

Harrel said the town will use the study to consider its options for protecting citizens and property during such a flood.

There are 26 street crossings the town wants to study further besides the area around the church, Harrel said. The options that may be considered would include culvert work and possibly diversion or containment structures.

Those further studies are to begin in the near future.

Nearly all of the area included in the 100-year flood plain will belong to the Town of Fountain Hills once the wash property transfer between the town and MCO Properties is completed in the near future.

Fountain Hills Vice Mayor Peg Tibbetts, center, discusses the county's floodplain study with Flood Control District representatives Ron Nevitt and Sandy Walchuk.

However, Harrel said the flood plain delineation will not significantly impact what the town may choose to do with the washes in the way of public use.

Harrel said no structures would be built in the washes, and measures can be taken to protect whatever facilities might be placed in the washes.

The Maricopa County Flood Control District has spent about two years on the study.

NOTICE OF REGULAR SESSION

OF THE

FOUNTAIN HILLS TOWN COUNCIL

WHEN: **NOVEMBER 16, 1995**

TIME: ****6:30 P.M.**

WHERE: **TOWN HALL COUNCIL CHAMBERS**

Pursuant to A.R.S. 38-431.02, notice is hereby given to the members of the Town Council of Fountain Hills and to the general public that the Town Council of Fountain Hills will hold a regular session open to the public on Thursday, November 16, 1995 at 6:30 p.m. in the Council Chambers of the Fountain Hills Town Hall, located at 16836 E. Palisades Blvd., Building C, Fountain Hills, Arizona.

***** Prior to the regularly scheduled Council meeting, the Flood Control District of Maricopa County and the Town of Fountain Hills Engineering Department will host an open public meeting presenting the results of the Fountain Hills Floodplain Delineation Studies. The public meeting will be held in the conference room from 4:00 to 6:30 p.m.***

RULES FOR ADDRESSING THE COUNCIL - ADOPTED 1/18/90

It is the Council's desire to hear public comment on agenda items. As it is important to maintain order during the meeting, please adhere to the following rules of order if you wish to speak:

1.) All citizens wishing to speak must first be recognized by the Mayor.
2.) The Mayor will not call for public comment on an item until after a motion has been made and seconded and the Council has had adequate opportunity to discuss the item.
3.) Please stand and state your name and address after being called on to speak.
4.) All comments must be directed to the Mayor.
5.) TIME LIMIT - 3 MINUTES PER PERSON PER ITEM.
6.) Statements should not be repetitive.
7.) Persons or groups wishing to make longer presentations, should see the Town Clerk prior to the meeting.

The agenda for the meeting is as follows:

1.) Meeting called to order, pledge to the flag, invocation and roll call.

Consent Agenda:

All items listed with an asterisk (*) are considered to be routine, non-controversial matters and will be enacted by one motion and one roll call vote of the Council. There will be no separate discussion of these items unless a Councilmember or member of the public so requests. If a Councilmember or member of the public wishes to discuss an item on the consent agenda, they may request so prior to the motion to accept the consent agenda. The item will be removed from the Consent Agenda and considered in its normal sequence on the agenda.

Open house Thursday on floodplain

A public open house will be held Thursday, Nov. 16, to review results of floodplain delineation studies performed in Fountain Hills.

The open house will be held from 4 to 6:30 p.m. at Town Hall's conference room.

Floodplain delineation involves developing detailed topographic maps to determine where water goes while incorporating the results of rainfall patterns to determine typical and peak amounts of runoff.

Along with extensive surveying and aerial mapping, drainage factors such as slope, vegetation, soil composition and land use are analyzed and included.

The studies will be used to better manage the floodplain to reduce or prevent flood damage and maintain the integrity of the floodplains.

Areas designated for further analysis in an upcoming area drainage master study also will be presented.

Results obtained in the north and south delineation studies will be displayed at the open house.

Representatives from the Flood Control District of Maricopa County, the Town of Fountain Hills' Engineering Department and the engineering consulting firms will be available to discuss the results and answer questions.

PUBLIC NOTICE
YOUR RIGHT TO KNOW

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90 448), as amended, and the Flood Disaster Protection Act of 1973 (p.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by K Engineers and George V. Sabel Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed or which are likely to be developed and to determine flood elevations in those areas. Flood elevations will be used by Maricopa County to carry our floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Gray, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published FH Times 1/13,1/20/93.

AFFIDAVIT OF PUBLICATION

The Times
OF FOUNTAIN HILLS AND RIO VERDE, ARIZONA

A publication of Western States Publishers, Inc.

STATE OF ARIZONA
COUNTY OF MARICOPA } ss.

L. ALAN CRUIKSHANK, being first duly sworn, upon oath deposes and says: That he is the publisher of

THE TIMES OF FOUNTAIN HILLS AND RIO VERDE

a newspaper of general circulation in the County of Maricopa and the State of Arizona, published at Fountain Hills, Arizona, and that the copy hereto attached is a true copy of the advertisement as published weekly in The Times of Fountain Hills and Rio Verde on the following dates:

Jan. 13, 1993
Jan 20, 1993

Sworn to before me this

23 day of

February A.D. 19 93

Karen Kirkendoll
Notary Public

OFFICIAL SEAL
KAREN KIRKENDOLL
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My comm. expires May 14, 1993

INVOICE NO. 93008

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by AGK Engineers and George V. Sabol Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed and to determine flood elevations for those areas. Flood elevations will be used by Maricopa County to carry out floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Story, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published: Arizona Republic, January 13, 20, 1993.

AFFIDAVIT OF PUBLICATION

The Arizona Republic/The Phoenix Gazette

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

JOAN LOHR, being first duly sworn, upon oath deposes and says: That she is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic and The Phoenix Gazette, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

~~The Arizona Republic~~
The Phoenix Gazette

JANUARY 13, 20, 1993

Joan Lohr

Sworn to before me this

25TH day of

JANUARY 93 A.D. 19____

OFFICIAL SEAL
MARY LEE BOOHER
NOTARY PUBLIC STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1995

Mary Lee Booher
Notary Public

Meeting on flood plain plan

Find out where flood waters go on Dec. 17

An open house to inform Fountain Hills residents of floodplain delineation studies being performed over 30 washes flowing through the community will be held on Thursday, Dec. 17.

The meeting will be held from 5 to 8 p.m. at the Town Hall Conference Room, 16836 E. Palisades Blvd.

The public is invited to come by the Town Hall anytime during the three-hour open house to share their experience and observations of local flooding and hear details about the studies.

Details will include how the study is conducted, what kind of information is being gathered and how the information will be used.

Mapping floodplains involves developing detailed topographic maps to determine where water goes and studying rainfall patterns to determine typical amounts of runoff. The studies and resulting maps will be used to better manage the floodplain so as to reduce or prevent flood damage and maintain the integrity of the floodplains.

Extensive surveying and aerial mapping is involved in the studies, but other factors influencing drainage also must be considered, including soil composition, slope and vegetation and land use.

The Fountain Hills studies are expected to take 12 months to complete, after which time a second open house will be held to inform residents of the results of the studies.

Questions or additional information regarding the studies can be obtained by writing or calling Jim Phipps or Tim Murphy of the Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone 506-1501, or Randy Harrel, town engineer, Town of Fountain Hills, 16836 E. Palisades Blvd, Fountain Hills, AZ 85268, telephone 837-2003.

Audit tops Sanitary agenda

The annual audit report will be the major topic on the agenda for the Sanitary District board of directors when it meets Thursday, Dec. 10.

The report is a routine document prepared each year, according to District Manager Ron Huber.

The board will also select a new chairman for the coming calendar year.

The job of chairman has simply rotated under the current board, and that being the case Director Dennis Regeski will be leading the board for the next year. Director Bruce Hansen is the outgoing chairman.

Huber said monthly staff reports will also be presented at the meeting, and he has a few carryover items to update the board on.

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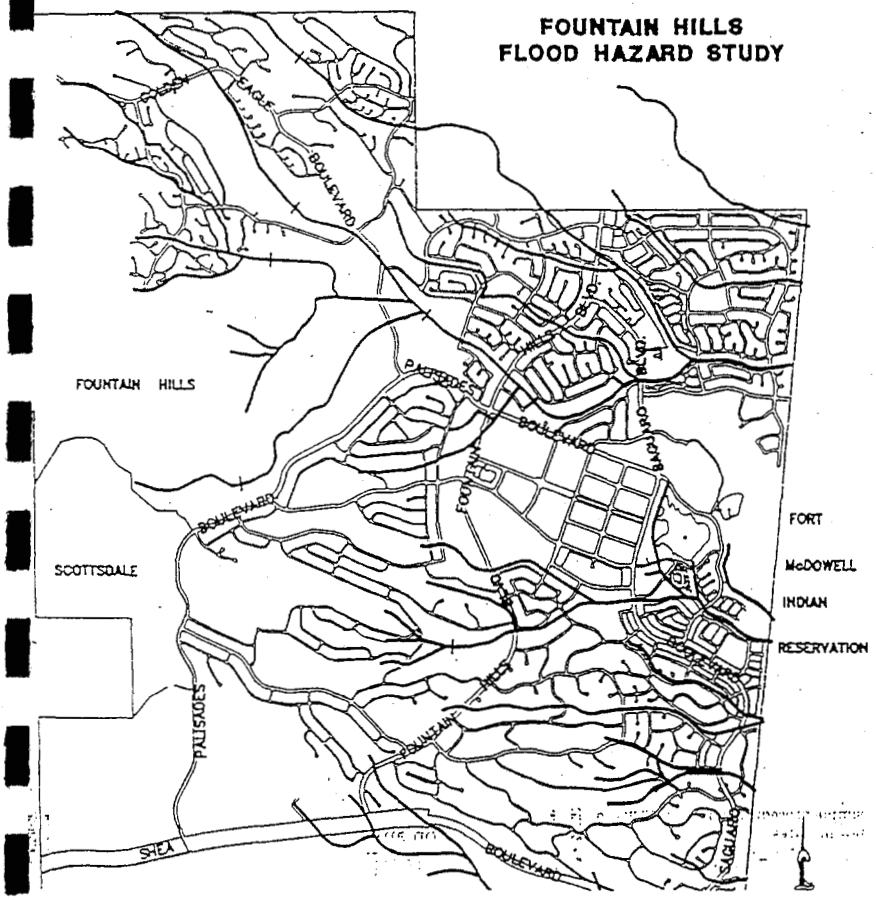

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Systems Specialists
Dana West.....
implements the unique MARKETING SYSTEMS designed to get my L
SOLD quickly! She keeps my LISTERS advised of the progress on their

Administration Specialist
Carol Talty.....
handles all mailings/brochures and assists with special projects.

The Times of Fountain Hills

12-9-92

FEDERAL EMERGENCY MANAGEMENT AGENCY **CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average . 23 hour 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.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Hydrology, Hydraulics
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 25 years experience in the expertise listed above.
4. I have ☒ prepared ☒ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
   Hydrologic analysis and floodplain delineation
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.
   b. ☐ Compared plans and specifications with as-built survey information.
   c. ☐ Examined plans and specifications and compared with completed projects.
   d. ☐ Other _____
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: George V. Sabol
(please print or type)

Title: Sr. Associate, SFC Engineering Company
(please print or type)

Registration No. 17928 Expiration Date: 30 June 1998

State Arizona

Type of License Professional Engineer

George Sabol
Signature

23 January 1997
Date

Registered Professional Engineer (Civil) CERTIFICATE NO. 17928 GEORGE V. SABOL Date Signed 23 Jan ARIZONA, U.S.A.

Seal
(Optional)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply.

FEDERAL EMERGENCY MANAGEMENT AGENCY **HYDROLOGIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.67 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: HESPERUS WASH
(One form for each flooding source)

Project Name /Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. HYDROLOGIC ANALYSIS IN FIS

☐ Approximate study stream (Zone A)
☒ Detailed study stream (briefly explain methodology) THE ANALYSIS WAS PERFORMED USING HEC-1.

2. REASON FOR NEW HYDROLOGIC ANALYSIS

☒ No existing analysis
☐ Improved data *(see data revision on page 3)*
☐ Changed physical conditions of watershed *(explain)* _____

☐ Alternative methodology *(justify why the revised model is better than model used in the effective FIS)*

☐ Evaluation of proposed conditions (CLOMRs only) (explain) _____

☐ Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100 - and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

☒ Approval of hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., FLOOD CONTROL DISTRICT OF MARICOPA COUNTY)
Attach evidence of approval.

☐ Approval of the hydrologic analysis is not required by any local, State, or Federal Agency.

Stream: HESPERUS WASH

Comparison of 100-year Discharges

Location:	Drainage area (Sq mi.)	FIS (cfs) :	Revised (cfs) :
TOWN LIMIT (NORTH)	2.91	N/A	2590
ABOVE DAM 36	2.91	N/A	2590
BELOW DAM 36	2.91	N/A	350
AT BOULDER DRIVE	3.14	N/A	450
AT CONFLUENCE WITH BALBOA WASH	3.16	N/A	660

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review.

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made *(attach separate sheet if necessary)*

N/A

ATTACH A COMPLETED REVIEW OF RESULTS PAGE FOR EACH FLOODING SOURCE.

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS *(i.e. no changed hydraulic conditions)*? ☐ Yes ☒ No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No N/A New study

FEMA does not normally revise NFIP maps solely due to insignificant flow changes where changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? ☐ Yes ☒ No

If yes, provide the following:

Location along flooding source: _____

Maximum peak discharge: _____ cfs

Second highest peak discharge: _____ cfs

Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site *(along flooding source or similar watershed; specify)*

UNAVAILABLE

Gaging Station: _____

Drainage area at gage: _____ mi^2

Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as new data (*New*) or as revising existing data (*Revised*). *(If necessary, attach a separate sheet.)*

Data Parameter	New	Revised	Data Source
SUBBASIN AREAS	☒	☐	FOUNTAIN HILLS/USGS MAPPING
LAG TIME, L, LCA, SLOPE, KN	☒	☐	FOUNTAIN HILLS/USGS MAPPING
GREEN + AMPT. PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
ROUTING REACH PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
	☐	☐	

- Data source can be from a Federal, State, or local government agency, or from a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source *(i.e., certified statement, report, bibliographical reference to a published document)*. In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

☐ Statistical Analysis of Gage Records (*use Attachment A*)

☐ Regional Regression Equations *(use Attachment B)*

☒ Precipitation/Runoff Model *(use Attachment C)*

☐ Other *(specify; attach backup computations and supporting data)* _____

ATTACHMENT A: STATISTICAL ANALYSIS OF GAGE RECORDS

Gaging Station: N/A

Gage Location (latitude and longitude): _____

	FIS:	Revised:
1. Number of years of data	_____	_____
Systematic	_____	_____
Historical	_____	_____
2. Homogeneous data	☐ Yes ☐ No	☐ Yes ☐ No
3. Data adjustments	☐ Yes ☐ No	☐ Yes ☐ No
4. Number of high outliers	_____	_____
Low outliers	_____	_____
Zero events	_____	_____
5. Generalized skew	_____	_____
6. Station skew	_____	_____
7. Adopted skew	_____	_____
8. Probability distribution used (justify if log-Pearson III was not used)	_____	_____
9. Transfer equations to ungaged sites		☐ Yes ☐ No

If yes, specify method

_____

_____

_____

10. Expected probability* ☐ Yes ☐ No

11. Comparison of results with other analyses ☐ Yes ☐ No

If yes, describe comparison

_____

_____

_____

*FEMA does not accept expected probability analyses for the purpose of reflecting flood hazard information in a FIS.

If any data is not available, indicate by N/A.

Attach analysis including plot of flood frequency curve.

1. Bibliographical Reference: N/A

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. Gaged or ungaged stream: _____

3. Hydrologic region(s): _____
Attach backup map.

4. Provide parameters, values, and source of data used to define parameters.

	FIS:		Revised:	
5. Urbanized conditions calculations	☐ Yes	☐ No	☐ Yes	☐ No
6 Percent of watershed urbanization	_____		_____	
7. Is the watershed controlled?	☐ Yes	☐ No	☐ Yes	☐ No
8. Comparison with other analyses	☐ Yes	☐ No	☐ Yes	☐ No

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

ATTACHMENT C: PRECIPITATION/RUNOFF MODEL

		FIS:	Revised
1.	Method or model used:	N/A	HEC-1
	Version:	N/A	4.0.1E
	Date:	N/A	MAY 1991
2.	Source of rainfall depth:	N/A	NOAA ATLAS 2
3.	Source of rainfall distribution:	N/A	FCDMC HYDROLOGIC MANUAL
4.	Rainfall duration:	N/A	6 + 24 HR.
5.	Areal adjustment to precipitation (%):	N/A	DEPENDS UPON SUBBASIN AREA
6.	Maximum overland flow length	N/A	.631 TABLE 5-7 (206-A)
7.	Hydrograph development method:	N/A	CLARK UNIT GRAPH
8.	Loss rate method:	N/A	GREEN-Ampt
	Source of soils information:	N/A	SCS SOIL SURVEY
	Source of land use information	N/A	AERIAL PHOTOS
9.	Channel routing method:	N/A	NORMAL DEPTH
10.	Reservoir routing:	☐ Yes ☐ No	☒ Yes ☐ No
11.	Baseflow considerations:	☐ Yes ☐ No	☐ Yes ☒ No

If yes, explain how baseflow was determined:

12. Snowmelt considerations: ☐ Yes ☐ No ☐ Yes ☒ No

13. Model calibration: ☐ Yes ☐ No ☒ Yes ☐ No

If yes, explain how calibration was performed The model was calibrated by comparing USGS gage data, runoff volume checks upstream from dams, results with estimates using a USGS regional regression eqn., and modeled results with results of other M.C. studies (Section 3.2.3 pg 3-61)

14. Future land use condition: ☐ Yes ☒ No

If yes, explain why

NOTE: FEMA policy is to base flooding on existing conditions.
If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

See Hydrology Report

ATTACHMENT D: CONFIDENCE LIMITS EVALUATION

Stream: N/A

Select one location for Confidence Limits Evaluation (*describe location*): _____

_____

Discharges for selected location:

Exceedance Probability		FIS	Revised
10%	(10-year)	_____ cfs	_____ cfs
2%	(50-year)	_____ cfs	_____ cfs
1%	(100-year)	_____ cfs	_____ cfs
0.2%	(500-year)	_____ cfs	_____ cfs

1% (100-year) Flood Confidence Intervals

90% Confidence Interval: 5% limit _____ cfs

95% limit _____ cfs

50% Confidence Interval: 25% limit _____ cfs

75% limit _____ cfs

If the value of the 100-year frequency flood in the FIS is beyond the 50% confidence interval but within the 90% confidence interval, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No

An example of confidence limits analysis can be found in Appendix 9 of Bulletin 17B.

Attach Confidence Limits Analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: HESPERUS WASH
(One form for each flooding source)

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCO 92-04

1. REACH TO BE REVISED

Downstream limit: BEGINNING OF BALBOA WASH

Upstream limit: NORTH-WEST CORNER OF SECTION 4; T3N

2. EFFECTIVE FIS

☒ Not studied

☐ Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

☐ Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

☐ Floodway delineated

Downstream limit of Floodway _____

Upstream limit of Floodway _____

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

☒ Not studied in FIS

☐ Improved hydrologic data/analysis. Explain: _____

☐ Improved hydraulic analysis. Explain: _____

☐ Flood control structure. Explain: _____

☐ Other. Explain: _____

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete 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 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 for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model — Natural ☐ Floodway ☐

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 requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor'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 ☐ Floodway ☐

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 ☐ Floodway ☐

The duplicate effective or corrected 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 or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☐

The existing or pre-project conditions model *(or duplicate effective 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 proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. — Natural ☒ Floodway ☒

6. Hydraulic Analyses (Only if Hydraulic Models are not developed)

See the Hydraulics Report

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS *(from model used to revise 100-year water surface elevation)*

1. Discharges:

	Upstream Limit	Downstream Limit
10-year		
50-year		
100-year	2590	660
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined

CRITICAL DEPTH

3. Give range of friction loss coefficients (*Manning's "N"*) Channel ..... .047 – .068

Overbanks ..... .064 – .075

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

Location	FIS	Revised
N/A		

Explain: NEW STUDY

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

The cross-sections were determined photogrammetrically by the aerial photos company. All cross-sections are stationed from left to right looking downstream with the thalweg set at station 10,000.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☒ Yes ☐ No If no, explain why not:

6. Explain how reach lengths for channel and overbanks were determined:

Channel reach lengths were measured along the thalweg and the overbank reach lengths were measured along the anticipated path of the center of mass of the overbank flow.

5. RESULTS *(from model used to revise 100-year water surface elevations)*

1. Do the results indicate:

a. Water surface elevations higher than end points of cross sections? ☐ Yes ☒ No

b. Supercritical depth? ☐ Yes ☒ No

c. Critical depth? ☒ Yes ☐ No

d. Other unique situations ☐ Yes ☒ No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.

FOR THOSE CROSS-SECTIONS WHERE THE HEC-2 MODEL DEFAULTED TO CRITICAL DEPTH THE CRITICAL DEPTH WATER SURFACE ELEVATIONS ARE PLOTTED ON THE PROFILES AND MAPS.

2. What is the maximum change in energy gradient between cross-sections? 32.03

Specify location SECNO 2.85; DAM 36

3. What is the distance between the cross-sections in 2 above? 956.10

4. What is the maximum distance between cross-sections? 956.10

Specify location SECNO 2.85; DAM 36

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? 1 foot

b. What is the maximum surcharge for the revised conditions? N/A (NEW STUDY) foot

Specify location

c. What is the maximum velocity? 14.40 fps

Specify location SECNO 2.20

d. Are there any negeative surcharge values at any cross-section? ☐ Yes ☒ No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain:

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? ..... ☐ Yes ☒ No

If Yes, explain:

_____

_____

_____

7. Do 100-year water surface elevations increase at any location? ..... ☐ Yes ☐ No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

N/A NEW STUDY

_____

_____

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

N/A NEW STUDY

A. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section_____ within_____feet *(vertical)* and upstream of the project at cross section_____within_____feet *(vertical)*.

N/A NEW STUDY

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section_____within_____feet *(vertical)* and upstream of the project at cross section_____ within_____feet *(vertical)*.

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

THE PROFILES ARE LOCATED IN THE HYDRAULIC ANALYSIS NOTEBOOK

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

Proceed to Riverine /Coastal Mapping Form

FEDERAL EMERGENCY MANAGMENT AGENCY

WATER SURFACE ELEVATION CHECK

N/A
NEW STUDY

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
MARICOPA COUNTY, ARIZONA	HESPERUS WASH	FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]

COMMENTS:

1-100-year (natural) Water Surface Elevation 2-Encroachment (floodway) Water Surface Elevation 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

MT-2 Form 4 Page 6 of 6

Sheet_____ of _____

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: HESPERUS WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable):*

		Included		
A.	Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☒ N/A
B.	Revised detailed 100- and 500-year floodplain boundaries	☐ Yes	☐ No	☒ N/A
C.	Revised 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
D.	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated	☒ Yes	☐ No	☐ N/A
E.	Stream alignments, road and dam alignments	☒ Yes	☐ No	☐ N/A
F.	Current community boundaries	☒ Yes	☐ No	☐ N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map	☐ Yes	☐ No	☒ N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
I.	The requestor's property boundaries and community easements	☐ Yes	☐ No	☒ N/A
J.	The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
K.	Location and description of reference marks	☒ Yes	☐ No	☐ N/A
L.	Vertical datum (example: NGVD, ~~NAVD etc.~~) NGVD 1929	☒ Yes	☐ No	☐ N/A
M.	Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
N.	Location and alignment of all coastal transects used to revise the coastal analyses	☐ Yes	☐ No	☒ N/A

If any of the items above are marked no or N/A, please explain: THIS IS THE FIRST STUDY DONE IN FOUNTAIN HILLS, THEREFORE THERE ARE NO EXISTING FLOODPLAIN AND FLOODWAY DELINEATIONS.

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? AERIAL MAPPING AUGUST 1991

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS N/A scale N/A Contour interval
   b. Revision Request 1" = 200' scale 2 FOOT Contour interval

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

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.

Attach additional pages if needed.

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's? ☐ Yes ☐ No

If yes, please give the location of shift or increase and an explanation for the increase.

N/A This is the first study of the area, therefore, there isn't an existing 100-year floodplain delineation.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? ..... ☐ Yes ☐ No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase?_____

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? ..... ☐ Yes ☐ No

If yes, explain:

N/A This is the first study of the area, therefore, there isn't an existing floodway delineation.

7. If a V- zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? N/A ☐ Yes ☐ No

If no, explain:

8. Manual or digital map submission:

☒ Manual

☐ Digital

Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

IF REQUESTED A DIGITIZED MAP CAN BE SUPPLIED.

2. EARTH FILL PLACEMENT

1. The fill is: ☐ Existing ☐ Proposed N/A

2. Has fill been/will be placed in the regulatory floodway? ..... ☐ Yes ☒ No
   If yes, please attach completed Riverine Hydraulic Analysis Form.

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_____

      _____

   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, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? N/A ☐ 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.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: HESPERUS WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: BOULDER DRIVE
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 2.229
3. This revision reflects *(check one of the following)*:

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
1-60" CMP

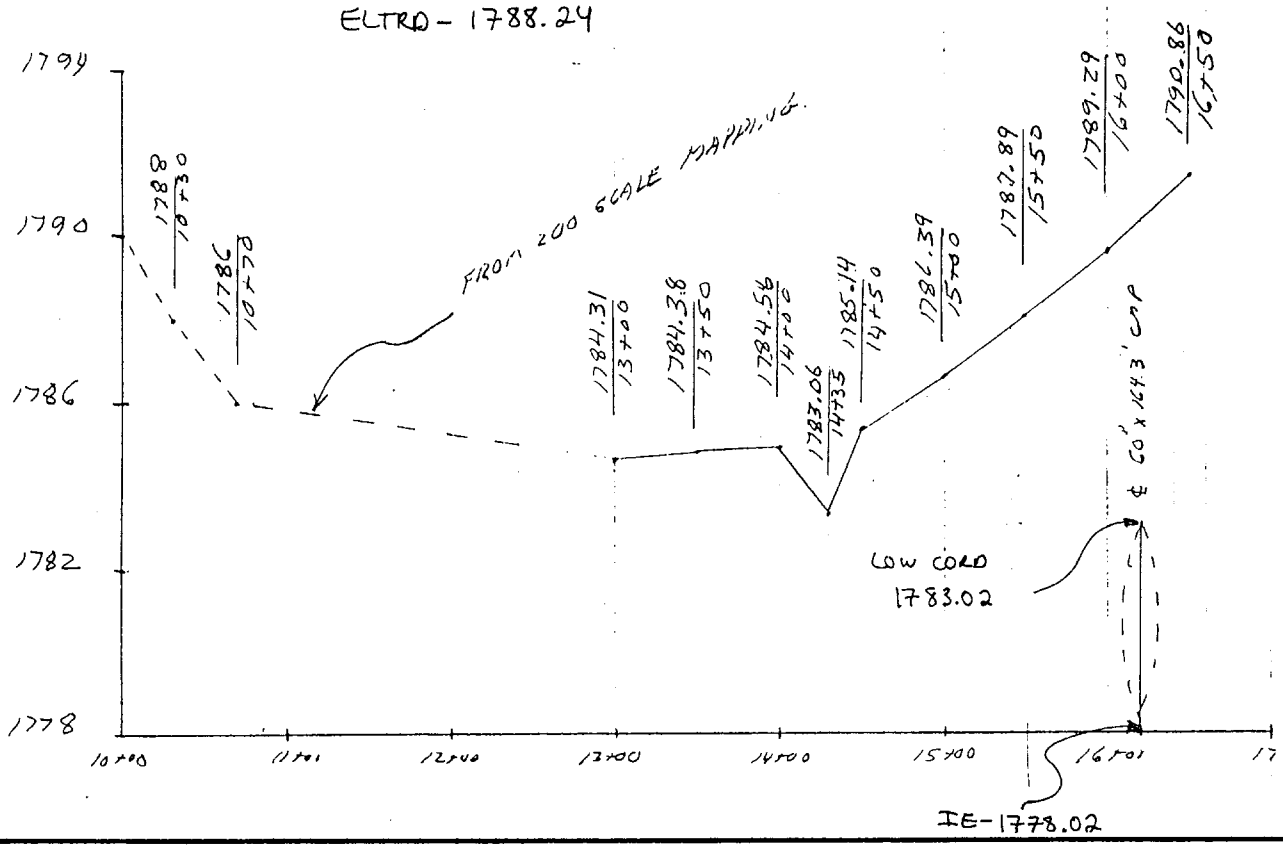
2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments)
PIPE PROJECTING FROM FILL

3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
HEC-2 SPECIAL CULVERT METHOD

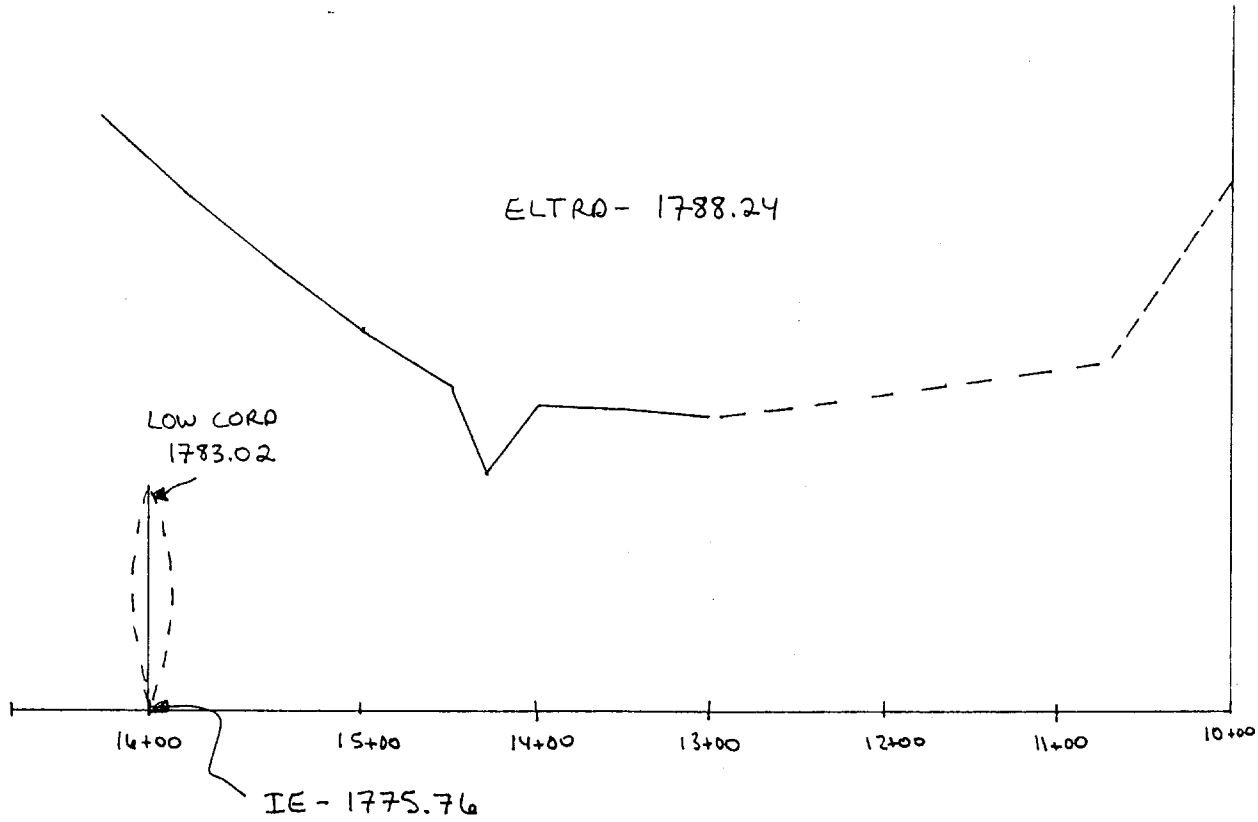
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

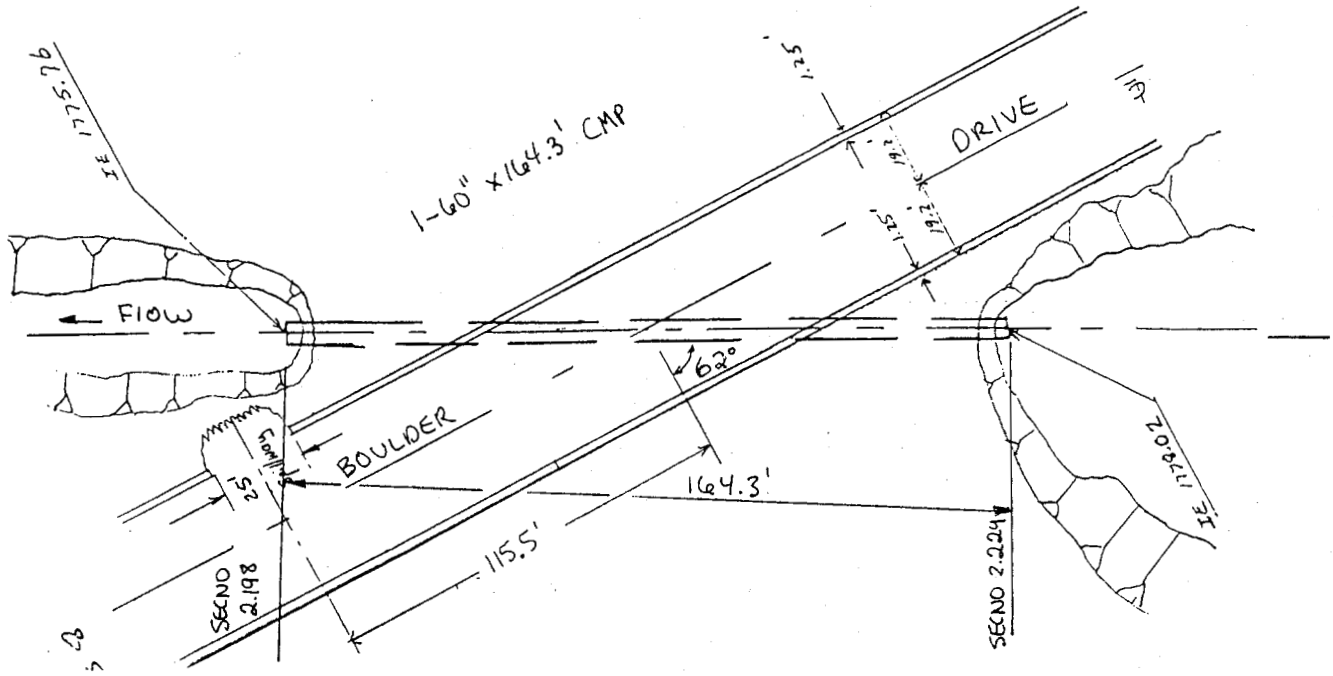
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	164.3'
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	19.6 ft²
Total culvert/bridge area (ft²)	19.6 ft²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1788.2	1788.2
Downstream face	1781.22	1781.22

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1788.24	1788.24
Downstream face	1788.24	1788.24

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1790.45	1790.45
Downstream face	1780.33	1780.33

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	261	190	450

The maximum depth of flow over the roadway/railroad (ft.) ..... 2.25 ft.

Weir length (ft.) ..... 132 ft.

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	130	130	130
Downstream face	50	5	50

Loss Coefficients

Entrance loss coefficient	0.9
Manning's "n" value assigned to the structure(s)	.024
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **DAM FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: Maricopa County, Arizona (Town of Fountain Hills)

Flooding Source: Hesperus Wash

Project Name/Identifier: Fountain Hills North Floodplain Delineation Study FCD 92-04

IDENTIFIER

Name of Dam: Hesperus Wash Dam (Dam #36)

Location of dam along flood source (in terms of stream distance or cross section identifier):

SECNO. 2.849

Check one of the following:

- [x] Existing dam
- [ ] New dam
- [ ] Modifications of existing dam (describe modifications) _____

Was the dam designed by ____ Federal agency ____ State agency

____ Local government agency ___X___ Private organization?

BACKGROUND

Does the dam have dedicated flood control storage? [x] Yes [ ] No

Does the project involve revised hydrology? this is the first study of the area [x] Yes [ ] No

If yes, complete Hydrologic Analysis Form and include calculations of the 100-year inflow flood hydrograph routed through the dam with the beginning pool at the normal pool elevation (spillway crest elevation for ungated spillway). Include any inflow hydrograph bulking by watershed sediment yield and provide necessary debris and sediment yield analysis.

See the Hydrology Report

Does the revised hydrology affect the 100-year water-surface elevation behind the dam or downstream of the dam? New Study [x] Yes [ ] No

If yes, complete the Riverine Hydraulic Analysis Form and complete the table shown on the following page. Also See the Hydraulics Report

	Stillwater Elevation Behind the Dam	
	FIS	Revised
10-year		
50-year		
100-year	N/A	1883.3
500-year		
Normal Pool Elevation		None

Was long term sediment accumulation taken into consideration in determining the normal pool elevation? ☒ Yes ☐ No

Was the dam designed to withstand the hydrostatic and hydrodynamic forces associated with floods greater than the 100-year flood? ☒ Yes ☐ No

If no, and the dam has a reasonable probability of failure during the 100-year flood, please attach dam break analysis.

Provide the following data on the dam:

Dimensional Height: 43 ft
Crest Elevation of top of dam: 1895
100-year flood storage capacity: 158 ac-ft
Freeboard (measured from 100-year water surface elevation): 6

Spillway(s):

Type: ☐ gated ☒ ungated

Dimensional Width: 250 ft
Dimensional Height: 6 ft
Crest Elevation of top of spillway: 1889

Outlet(s):

Type: ☐ gated ☒ ungated

Width: —
Height —
Diameter: 48"
Invert Elevation: 1851.88

Explain flow regulation plan: This is a flood retarding structure which uses an ungated pipe to reduce the peak discharge. During a flow event, no human intervention is needed for the operation of this structure.

Are the project features, including the emergency spillway, designed to accommodate the 100-year flood discharge without overtopping the dam? ☒ Yes ☐ No

Was the dam designed in accordance with all currently applicable local, State, and Federal regulations? ☒ Yes ☐ No

If no, please provide explanation.

FEMA may request a list of regulations that have been complied with and supporting documentation demonstrating compliance with these regulations. See attached licenses from the State and the Emergency Action Plan Report.

Attach copy of formal operation and maintenance plan

Answer N/A to any questions which are not applicable

State of Arizona
DEPARTMENT OF WATER RESOURCES
Division of Safety of Dams

LICENSE OF APPROVAL

Pursuant to Chapter 3, Title 45-Waters, of the Arizona Revised Statutes, the DIRECTOR, Department of Water Resources authorizes the use of: FOUNTAIN HILLS FRS #36 *Dam and Reservoir, Application Number* 07.38 *Located in Sec.* 4 *, Tp.* 3N *, R.* 6E *, G. & S.R.B. & M.* Maricopa *County, State of Arizona to impound water in accordance with and subject to the following terms and conditions:*

(1) Use shall be only as a flood retarding structure, limited to temporary storage during periods of flood and for such additional time as may be required to completely evacuate the flood waters through the outlet conduit. (2) The owner shall take reasonable actions toward removal of the deficiencies present at the dam in a timely manner.

This license of approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and seal of the Arizona Department of Water Resources

6th *day of* December *, 19* 84 *.*

Wesley E. Steiner

WESLEY E. STEINER
DIRECTOR

State of Arizona
OFFICE OF THE STATE WATER ENGINEER
Supervision of Safety of Dams

License of Approval

Pursuant to Chapter 3, Title 45 (Waters), of the Arizona Revised Statutes, the STATE WATER ENGINEER has found that the FOUNTAIN HILLS DAM #36 *Dam and Reservoir, State Application Number* 7-38, *located in Sec.* 4, *Tp.* 3N, *R.* 6E, *G. & S. R. B & M,* Maricopa *County, State of Arizona, are safe to impound water; and the use of said dam and reservoir to impound water in accordance with and subject to the following terms and conditions is hereby authorized:* Use shall be only as a flood retarding structure, limited to temporary storage during periods of flood and for such additional time as may be required to completely evacuate the flood waters through the outlet conduit.

This license of approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and the seal of the Arizona Water Commission of the State of Arizona this 13th *day of* December, *19*73

STATE WATER ENGINEER

Benson G. Scott

By Chief, Supervision of Safety of Dams

OCT 23

Town of Fountain Hills
Maricopa County, Arizona

Fountain Hills Retardation Structures
Aspen Dam (No. 6)
Fountain Lake Dam
Hesperus Wash Dam (No. 36)
Stoneridge Dam (No. 19)

EMERGENCY ACTION PLAN

June 1996

Prepared for:

MCO Properties Inc.
16838 E. Palisades Blvd.
Fountain Hills, Arizona 85268

Prepared by:

Anderson-Nelson, Inc.
4441 East McDowell Road
Phoenix, Arizona 85008
(602) 273-1850

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I. PURPOSE

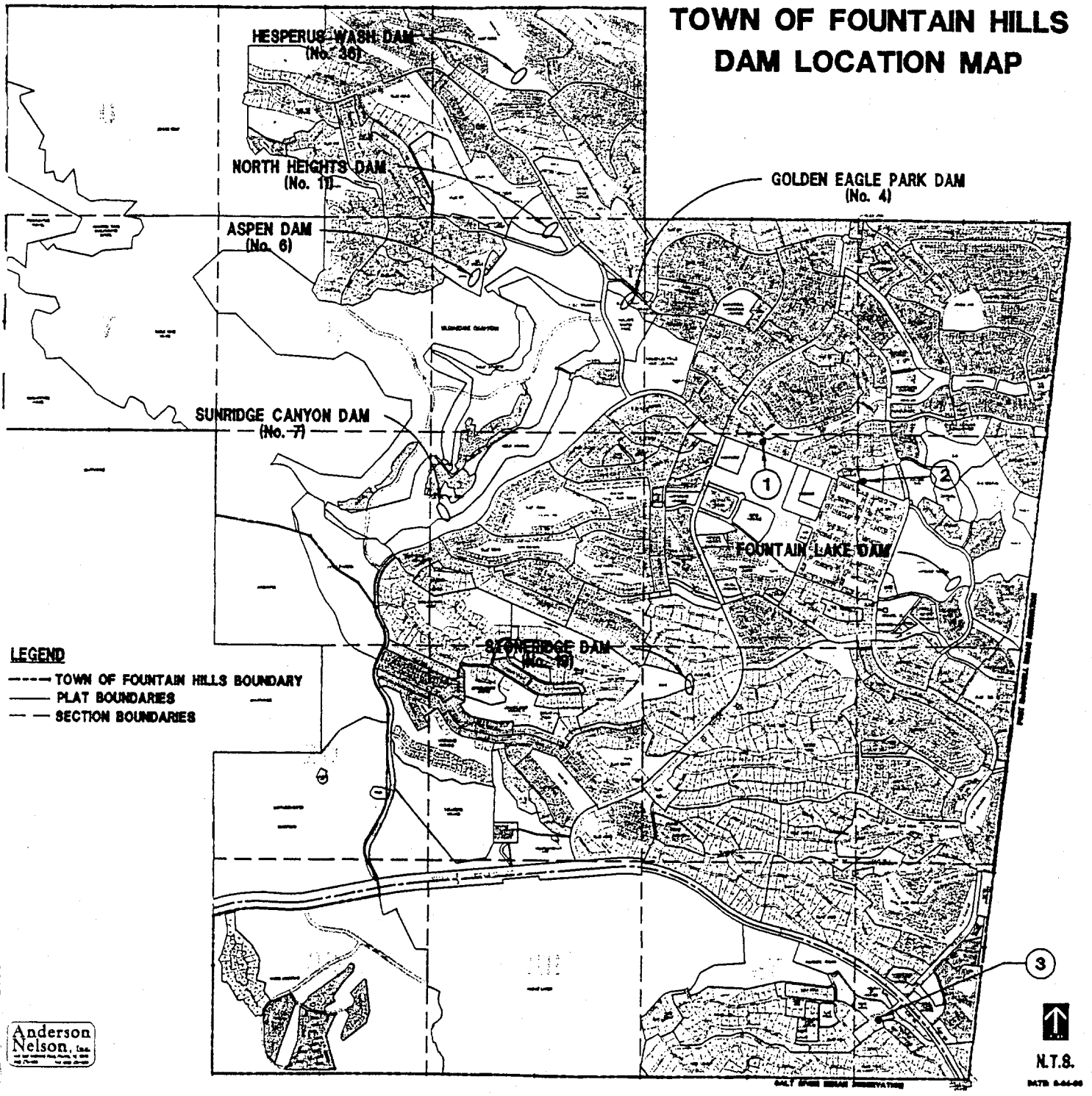
The purpose of this Emergency Action Plan is to define responsibilities and provide procedures to identify unusual and unlikely conditions which may endanger the integrity of the seven Flood Retardation Structures north of Shea Blvd. This identification process should be done in time to take remedial action and to notify the appropriate public officials of possible impending, or actual failure of one or more of the structures.

The EAP for the four Retardation Structures also includes sections from the Town of Fountain Hills Emergency Operations Plan. The Town will be the main vehicle for carrying out of the emergency response and evacuation of public entities threatened by the breaching or failure of the structures. The initial detection of potential problems and the evaluation of the risks associated with those problems will fall upon both MCO Properties Inc. and the Town of Fountain Hills under the inspection, maintenance and emergency action plan procedures outlined in this plan.

The Retardation Structures evaluated are Hesperus Wash Dam (Structure No. 36), Aspen Dam (Structure No. 6), Stoneridge Dam (Structure No. 19) and Fountain Lake Dam.

LOCATION OF EMERGENCY SERVICES

1. TOWN OFFICES, TOWN MARSHALL, & MCO
2. FIRE DEPARTMENT
3. MARICOPA COUNTY SHERRIF'S OFFICE



III. RESPONSIBILITIES

Mr. Paul Miller of MCO Properties Inc., will have the responsibility for the day to day monitoring of the dam structures. He will monitor the initial filling and operations of these structures. In addition he will also be responsible for monitoring these structures during any severe storm event. Mr. Miller will report directly to Mr. Robert Kuta, Water Operations Manager for MCO Properties Inc. Mr. Kuta will analyze the situation and take the appropriate remedial action and/or the notification of local authorities of any imminent potential danger. However, under certain circumstances, such as when failure is imminent or has already occurred, Mr. Miller will have the authority for notification. Warning and evacuation will be handled and coordinated through the Town of Fountain Hills under their Emergency Operation Plan. Facilities located directly below the dam structures (see listing on following page) would be notified immediately by MCO Properties Inc. so as to insure adequate time for evacuation. This procedure will be coordinated with the appropriate public officials. To accomplish this task Mr. Miller will contact the lead coordinator for the Town of Fountain Hills (see Emergency Response Organization Notification Flow Chart) to ensure the proper line of succession is established for dissemination of emergency information.

Mr. Kuta, as Water Operations Manager, will be designated as the EAP coordinator. He will be responsible for all EAP related activities, including preparing revisions to the EAP, establishing training for new field personnel, coordinating EAP drills, etc. Mr. Kuta will be the person to contact should there be any questions concerning the EAP.

PRIMARY CONTACT

Field Supervisor:	Mr. Paul Miller	
	Work	837-9522 ext. 17
	Pager	590-3423
	Mobile	(602) 810-1034
	Home	483-1058

SECONDARY CONTACT

EAP Coordinator:	Mr. Robert Kuta, Water Operations Manager	
	Office	837-9666 ext. 317
	Pager	590-3400
	Mobile	316-6588
	Home	940-0608

TERTIARY CONTACT

MCO Properties Inc.:	Mr. Greg Bielli, Vice President	
	Office	837-9660 ext. 319
	Mobile	309-3717
	Home	860-0848

FACILITIES LOCATED WITHIN THE PROJECTED FLOOD INUNDATION AREA

	Facility and Location	Telephone Number and Contact
1.	Fire Station	911 Dispatch
2.	Sheriff Station 16833 E. Saguaro Blvd.	911 Dispatch
3.	Fountain Hills High School 16000 E. Palisades Blvd.	837-0690 Don Combrink
4.	F.H. Sanitary District 16941 E. Pepperwood Crl.	837-9444 Ron Huber
5.	Fort McDowell Sand & Gravel El Pueblo & Grande	837-2358 Shift Boss
6.	Ft. McDowell Casino Ft. McDowell Road and Shea Blvd.	837-1424 Mr. Kinsley

MCO PROPERTIES INC.
DAM STRUCTURE
QUATERLY INSPECTION REPORT

Structure Name: _____

Inspection Date: _____

Date of Last Inspection: _____

Inspectors: _____

Indication of Recent Rainfall or Impoundment: Yes [ ] No [ ]

Existing weather conditions: _____

DAM

Yes	No	**Access Road and Entrance**
[ ]	[ ]	Existence of holes or deterioration of pavement.
		See Comments: _____
[ ]	[ ]	Existence of rock or debris on roadway.
		See Comments: _____
[ ]	[ ]	Existence of obstructive vegetative growth interfering with the view of vehicles entering and exiting the entrance area.
		See Comments: _____
[ ]	[ ]	Existence of dislocated boulders and landscape rock
		See Comments: _____
[ ]	[ ]	Existence of vandalized or dead cacti or plants.
		See Comments: _____

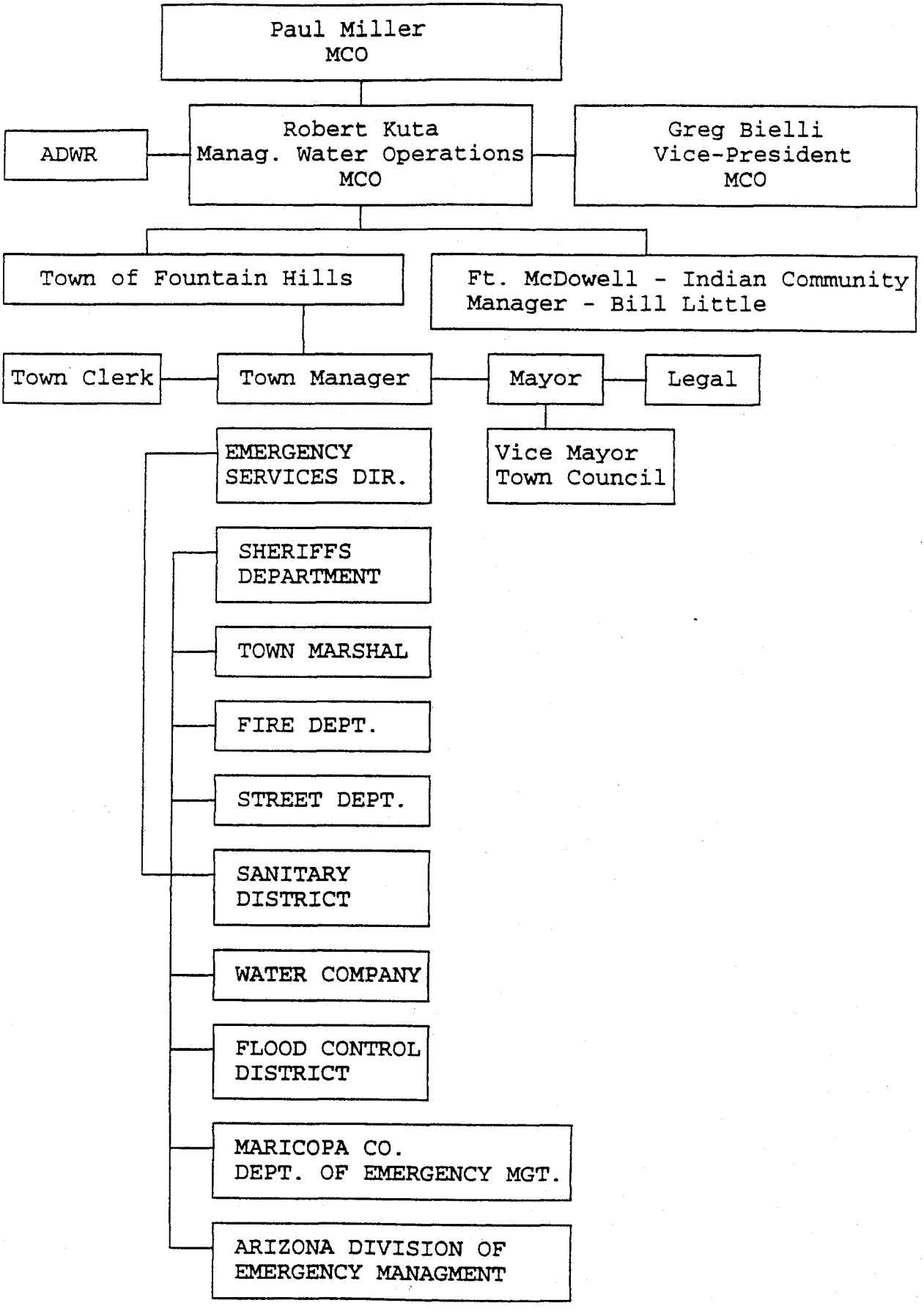
Yes	No	Inlet & Outlet Structure
[ ]	[ ]	Existence of obstruction or damage at the inlet. See Comments:_____
[ ]	[ ]	Downstream slope of the dam. Existence of erosion, vehicle trespass, sloughing, suspicious areas, dislocated boulders, and rodent activity. See Comments: _____
[ ]	[ ]	Principal Outlet Structure - Stilling Basin - Outlet Channel Existence of debris, silt, or obstructions in the box. See Comments: _____
[ ]	[ ]	Existence of cracking, spalled areas, or stress of concrete. See Comments:_____
[ ]	[ ]	Existence of damaged security fencing - vandalism. See Comments:_____
[ ]	[ ]	Existence of obstructive vegetative growth or silt accumulation interfering with designed grade of outlet channel. See Comments:_____
[ ]	[ ]	Existence of illegal vehicular trespassing or dumping in the area. See Comments:_____
[ ]	[ ]	Existence of down or damaged "No Trespassing" and "No Dumping" signs. See Comments:_____
[ ]	[ ]	Existing access roads unsuitable for maintenance vehicles. See Comments:_____

Yes	No	
		Principal outlet structure - intake
[ ]	[ ]	Existence of accumulation of trash, debris, or dead wood.
		See Comments:_____
[ ]	[ ]	Existence of settlement, spalled areas, or cracking of structure.
		See Comments:_____
[ ]	[ ]	Existence of deterioration of paint on the wood grates, physical damage.
		See Comments: _____
		Principal outlet conduit
[ ]	[ ]	Existence of debris, cracking, settlement, loss of joint material.
		See Comments:_____
[ ]	[ ]	Existence of silt accumulation at the intake structure above the invert of the intake.
		See Comments:_____
		Impound Area and Inflow Channel
[ ]	[ ]	Existence of unwanted vegetative growth, dead wood, and obstructions.
		See Comments:_____
		Impound Area - Signing
[ ]	[ ]	"No Trespassing" and "No Dumping", existing signs down or damaged.
		See Comments:_____
		Upstream Slope of Dam
[ ]	[ ]	Existence of erosion, vehicle trespass, sloughing, dislocated boulders, or rodent activity.
		See Comments:_____
[ ]	[ ]	**Seepage along toe of Dam and/or downstream slope.**
		See Comments:_____

Yes	No	**Emergency Spillway Area**
[ ]	[ ]	Concrete sill, existence of cracking and stress damage.
		See Comments:_____
[ ]	[ ]	Upstream and downstream slopes - existence of obstructive vegetative growth or obstructions.
		See Comments:_____
[ ]	[ ]	Access roads - unsuitable for maintenance vehicles.
		See Comments:_____

EMERGENCY RESPONSE ORGANIZATION

IV. NOTIFICATION FLOW CHART



MCO PROPERTIES INC.

EMERGENCY ORGANIZATION CHART

Robert Kuta
Manager Water Operations
Work - 837-9660 ext. 317
Cellular - 316-6588
Pager - 590-3400
Home - 940-0608

Primary Point of Contact
Paul Miller, Field Supervisor
Work - 837-9522 ext. 17
Cellular - 810-1034
Pager - 590-3423
Home - 483-1058

Greg Bielli
Vice President
Work - 837-9660 ext. 319
Home - 860-0848

Jeff Games
Pager - 590-3379
Home - 924-5502

Larry Halvorsen
Pager - 590-3025
Home - 837-4371

EMERGENCY TELEPHONE CONTACT LIST - EMERGENCY ACTION PLAN

FORT McDOWELL INDIAN COMMUNITY

POSITION	NAME	TELEPHONE NUMBER
Manager	Bill Little	Pager (520) 421-5608
President	Clinton Pattea	837-5121
Tribal Police	Duty Officer	837-1091

TOWN OF FOUNTAIN HILLS

Position	Name	Address	Telephone Number
Key Staff Personnel:			
Town Manager	Paul Nordin	14614 Dickens Dr.	837-3035
Admin. Asst. To Manager	Diana Nottingham	Not available	314-5347
Town Clerk	Cassie Hansen	15716 E. Sunburst Dr.	837-0437
Emergency Services Dir.	Randy Harrel	Not available	979-2321
MCSO Dist 4	Jerry Sheridan	Not available	256-1742
Town Marshal	Steve Gendler	Not available	837-0118
Fire Chief	Scott Wheelwright	16810 E. Glenbrook Blvd.	837-3651 817-0817 pager
Asst. Fire Chief	Tony Lombardi	Not Available	837-2003
Street Superintendent	Gordon "Pat" Harvey	Not available	837-9685 450-3346 pager
Sanitary District	Ron Huber	Not available	867-4874
Chaparral City Water Co.	Rob Kuta	Not available	837-9522
Maricopa County Flood Control Dist.	Steve Waters	2801 W. Durango	273-1411

Position	Name	Address	Telephone Number
Council Members:			
Mayor	Jerry Miles	16317 E. Inca Ave.	837-3214
Council*	William J. O'Brian	16680 E. Hawk Dr.	837-8941
Council*	Sidney Apps	14481 LaCosta	816-0021 203-0285
Vice Mayor*	Don Lawrence	15528 E. Cholla Dr.	837-2256
Council*	Marianne Wiggshoff	Que-Jav-He-Ma, Rocky Mt. Place	837-8460
Council*	Albert Poma	11219 N. Woodpecker Bay	837-1739
Council*	Penfield Mower	15957 E. Ponderosa Dr.	837-8055
Legal:			
Attorney	Bill Farrell	Not Available	661-6044
Other Emergency Telephone Numbers			
State Fire Marshal		1540 W. Van Buren Street	255-4964
State Land Department		1616 W. Adams Street	255-4052
Arizona Dept. of Water Resources Statewide Flood Warning Section	Wayne Cooley	500 North 3rd Street	417-2400 ext. 7197

* Vice Mayor position is periodically shared by each Council member.

V. EMERGENCY ACTION TABLE

PROBLEM	HOW TO EVALUATE	EMERGENCY ACTION	REQUIRED EQUIPMENT, MATERIALS, AND LABOR	NOTIFICATION	DATA TO RECORD
Flooding	Flood Protection				
	a. Large spillway releases.	During and after any unusual spillway use a special inspection shall be made. If any problems are found, see appropriate items for evaluation, emergency action, and notification procedures. Lower the reservoir by pumping at the maximum rate with no effluent inflow.		Dam operator notifies Effluent Systems Engineer & ADWR.	Discharge, head- water and tailwater elevations, and duration of spill. Complete special inspection checklist.
	b. Headwater is within one foot of the top of dam.	Make a special inspection of the dam; see above.		Dam operator is to notify Effluent Systems Engineer & ADWR.	Discharge, head- water and tail-water elevations, & duration of spill. Complete special inspection checklist.
	c. Flood to approach or exceed top of dam.	Make a special inspection of the dam; see above.		Dam operator initiates notification process and notifies ADWR.	Discharge, rate of rise, time when dam is overtopped, and time of failure.
Seepage					
a. Water - Uncontrolled leakage.	Not Serious - Uncontrolled leak without the removal of fines. Rate of flow not increasing.	None required.		Notify the Effluent Sys. Engr. & ADWR.	Size and location of area, approximate flow.

	Serious - Rate of flow is increasing. Tailwater flows and elevation are increasing without the removal of fines and no increase in spillway discharge.	Lower the reservoir. Coordinate with Effluent Sys. Engr. for discharge instructions. Place a ring of sandbags top towards natural drainage to monitor flow. If boil becomes too large to build a dike around it; place a blanket filter over the area. Blanket of material to be coarse sand at bottom to large gravel 2-4" at top. Blanket to be 3-5' thick. Safety precaution: in no case shall the personnel making the repairs be placed in danger.	Materials: Sand and bags; see materials list.	Notify the Effluent Sys. Engr. and immediately notify ADWR if seepage rate is increasing. Begin notification process.	Size and location of area, approximate flow and how rapidly flow is increasing.
	Failure Imminent - Emerging water is muddy; rate of flow is increasing and an upstream whirlpool develops in reservoir. Tailwater flows and elevation increasing with no increase in spillway discharge.	Lower reservoir by pumping at maximum rate. Notify the Effluent Sys. Engr. Control loss of material by using sandbags to sufficient height to provide back pressure to prevent loss of materials. Safety precaution: In no case shall the personnel making the repairs be placed in danger.	Equipment: Shovels, trucks, dozer, and crane. Materials: Sand, bags, gravel, bales of straw or hay and rip rap. Labor: Equipment operators, 2 or 3 laborers.	For failure in less than 1 day, initiate notification process immedialtely and notify ADWR.	Size, location rate of flow is increasing for boil. Also, size and location of the whirlpool.

MCO RETARDATION STRUCTURES
EMERGENCY ACTION PLAN

MATERIALS LIST

Heavy Equipment
Case 580 Backhoe*
Cat Backhoe*
Dump Truck*

Vehicles
2 - Ford Ranger Pickups
1 - GMC S-15 Pickup
1 - Chevrolet Cheyenne
1 - Chevrolet Suburban

Power Equipment
4" Trash Pump w/125 ft. Discharge Hose
12' Boat and 4 hp motor
3 hp Power Sprayer for Lake Management
Trailer Mounted 8" Diesel Driven Pump
2 - Rotohammers
1 1/2" Diaphragm Pump
5 hp Air Compressor

Communications
6 - Hand Held Radios
2 - Truck Mounted Radios
2 - Mobile Telephones
5 - Digital Pagers

Materials
Surplus Fill
Surplus Rip Rap
500+ft. 8" Aluminum Mainline
Road Barricades
Warning Cones
Emergency Flares
Misc. Hand Tools (i.e., shovels, picks, etc.)

Labor
1 - Manager
1 - Field Supervisor
2 - System Operators
10- Additional Field Laborers*

* Available through Chaparral City Water Company a wholly owned subsidiary of MCO Properties Inc.

VI. INSPECTION AND MAINTENANCE PROCEDURES

The inspection and maintenance of the dams should be performed in accordance with this EAP. All unusual or abnormal conditions that may adversely affect operations, maintenances or safety should be reported promptly.

During the initial or any subsequent rapid filling of the reservoir, the downstream slope of the dam and the foundation contacts should be inspected for indications of any abnormal conditions. Special inspections should be performed after all unusual occurrences, such as heavy rainfall, excessive runoff, high winds or infrequent low reservoir conditions that expose features normally submerged. Low reservoir levels afford the opportunity to carefully inspect the reservoir floor for tears in the liner, seepage holes or sink holes that may endanger the integrity of the liner and/or structure.

The down stream slopes should be carefully inspected for indications of cracks, slides, sloughs, subsidence, impairment of slope protection, springs, seeps or boggy areas caused by seepage from the reservoir. The upstream slope should be carefully inspected for adequate protection of the liner material. Extensive wave action and/or cracking and displacement of the gunite edge can expose the PVC liner.

The maintenance of the embankment consists of removing debris from the upstream face of the dams, replacing disintegrated rip rap, repairing eroded material, proper grading of access roads and controlling undesirable vegetation and rodents

Following completion and licensing, each dam will be on a yearly inspection schedule with the Arizona Department of Water Resources.

VII. DEFINITIONS

Boil: A flow of soil, usually fine sand or silt, into the bottom of a depression or excavation; forced in by water or water and air under pressure. A spring is a boil with very little sand in the flow.

Boggy Areas: Wet spongy ground; poorly drained area.

Emergency: A situation arising with or without warning, causing or threatening death, injury or disruption to normal life for numbers of people in excess of those which can be dealt with by the public services operating under normal conditions, and which requires special mobilization and organization of those forces.

Emergency Action Plan (EAP): An Emergency Action Plan is a formal plan that identifies potential emergency conditions at a dam and prescribes the procedures to be followed to minimize property damage and loss of life. An Emergency in terms of dam operation is defined as a condition which develops unexpectedly, endangers he structural integrity of the dam and/or downstream property and human life, and requires immediate action.

Emergency Operations Plan (EOP): Multi-hazard, functional plan that treats emergency management activities generally, with the unique aspects of individual disasters contained in hazard-specific annexes. It describes the emergency organization and the means of coordination with other entities. It assigns functional responsibilities and details tasks to be carried out as accurately as permitted by the situation.

Emergency Response Organization: Key personnel responding to emergencies and/or disasters, composed of the Mayor and his executive group which acts as advisors and the operations group which will man and operate the EOC.

Eminent Danger: Potential danger standing out as to be readily perceived or noted

Evacuation: Government recommended or ordered movement of persons and property from a hazard area to an area of safety.

Response: The efforts to minimize the risks created in an emergency by protecting the people, the environment, and property, and the efforts to return the scene to normal pre-emergency conditions.

Seepage: The process of seeping; oozing; a quantity of fluid that has seeped through porous material.

Seepage Hole: An area containing porous soil whereby water seeps through the soil collecting at the surface. Also see definition of boil.

Sink Hole: An opening in the ground surface leading to a subsurface cavity or a hole produced by the caving in of the roof of a subsurface cavity.

Slides: A sliding down of the soil on a slope due to an increase of load (due to rain or a new structure), or the removal of support at the foot due to excavation or erosion. Clays are particularly liable to sliding.

Slope Failure: The breakdown of soil cohesion between soil particles of an earthen slope. Slope failure produces a slide.

Sloughs: Pertaining to an earthen slope; a portion of the ground sliding or breaking off.

Subsidence: Downward movement of the ground surface for any reason. Subsidence is usually caused by the compression or movement of the soil below it. (syn; settlement).

Weather-Related Definitions:

WATCH: Severe weather or flash flood WATCH means that conditions are such that a storm or flood of significant magnitude is likely to occur. Persons within the area alerted should take precautionary steps.

WARNING: Announcement that threatening conditions (thunderstorm, high winds, tornado, flooding, dam or levee failure) are occurring or are imminent, and are expected to have a harmful effect upon the area alerted. Persons within the area must take immediate steps to protect themselves.

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM**	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

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.

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*
   - ☐ Physical change
     - ☐ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☐ Improved data
   - ☐ Floodway revision
   - ☒ Other New Study

     Explain This is the first delineation of this watercourse
2. Flooding Source: Caliente Wash
3. Project Name/Identifier: Fountain Hills North Floodplain Delineation Study FCD 92-04
4. FEMA zone designations affected: X
   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy,City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
04013	Maricopa County	Maricopa	AZ	04013C	1300 E	9-4-91
	Fountain Hills, Town	Maricopa	AZ	04013C	1750 E	9-4-91

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding
- ☒ Riverine
- ☐ Coastal
- ☐ Alluvial Fan
- ☐ Shallow Flooding *(e.g. Zones AO and AH)*
- ☐ Lakes

Affected by wind/wave action
- ☐ Yes
- ☒ No

Structures
- ☐ Channelization
- ☐ Levee/Floodwall
- ☒ Bridge/Culvert
- ☐ Dam
- ☐ Coastal
- ☐ Fill
- ☐ Pump Station
- ☒ None
- ☐ Channel Relocation
- ☐ Excavation
- ☐ Other *(describe)*

Disciplines*
- ☐ Water Resources
  - ☒ Hydrology
  - ☒ Hydraulics
  - ☐ Sediment Transport
  - ☐ Interior Drainage
- ☐ Structural
- ☐ Geotechnical
- ☐ Land Surveying
- ☐ Other *(describe)*

☐ Other(describe)_____

*** Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☐ Yes ☒ No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM ☒ Yes ☐ No

   If yes, give reason: New Study, this is the first delineation of this watercourse

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions. See attached articles and announcements

9. 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.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? ☐ Yes ☐ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☐ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (*or other surcharge limit if community or state has adopted more stringent criteria*)? ☐ Yes ☐ No

If the answer to either Items 1B or 2B is yes, please provide 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.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒ Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒ Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐ Yes ☐ No N/A New study

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ (entity)

_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☐ has ☐ has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____
(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.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

_____a. CLOMR — A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*.

_____b. LOMR — A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. I Parts 60 and 65.)*

_X_c. PMR — A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. I, Parts 60 and 65.)*

_____d. Other: Describe_____

8. FORMS INCLUDED

17. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

• Hydrologic analysis for flooding source differs from that used to develop FIRM	☒ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine /Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☒ Bridge/Culvert Form (Form 7)
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☐ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. ☐ Yes ☐ No

Initial fee amount: $ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. ☐ Yes ☐ No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. ☒ Yes ☐ No

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

Ron Newitt
Signature of Revision Requester

Ron Newitt/Program Mgr. NFIP
Printed Name and Title of Revision Requester

Flood Control District of Maricopa Co.
Company Name

(602) 506-1501 1-29-97
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.

Randy Harrel
Signature of Community Official

Randy Harrel, Town Engr.
Printed Name and Title of Community Official

Fountain Hills
Community Name

1-22-97
Date

Does this request impact any other communities? ☐ Yes ☐ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

11-22-95

.C 07 '95 04:46PM FOUNTAIN HILLS, AZ. P.2

No big problems in County floodplain study

If you've ever wondered what would happen in Fountain Hills in the event of a 100-year flood, Maricopa County has just completed a study that will tell you.

Representatives of Maricopa County Flood Control District were on hand for an open house at Town Hall on Thursday, Oct. 16. They were there to explain and answer questions concerning the Fountain Hills Flood Delineation Study.

The study defines the areas that would be inundated in the event of a 100-year storm and flood.

There was not a big turnout for the two-hour session, but a few residents dropped by to ask about their own particular concerns.

Town Engineer Randy Harrel said the study indicates no significant problems for individual homeowners. Some residents have property which lies within the flood area, but few if any structures are threatened.

One area of concern that town officials will look at is the Baptist Church on Saguaro Boulevard. In the event of a significant 100-year flooding event all of the church buildings and the parking lot would be under water. It is a low flat area which Nicklaus and Cypress washes flow into.

A Sanitary District pumping station adjacent to the church is apparently not within the flood plain.

Sanitary District Manager Ron Huber said no flood study was done when the pumping facility was constructed. But he said the pump building is significantly higher than the church buildings.

Huber also said that pump station is scheduled to be abandoned in the near future.

Harrel said the town will use the study to consider its options for protecting citizens and property during such a flood.

There are 26 street crossings the town wants to study further besides the area around the church, Harrel said. The options that may be considered would include culvert work and possibly diversion or containment structures.

Those further studies are to begin in the near future.

Nearly all of the area included in the 100-year flood plain will belong to the Town of Fountain Hills once the wash property transfer between the town and MCO Properties is completed in the near future.

Fountain Hills Vice Mayor Peg Tibbetts, center, discusses the county's floodplain study with Flood Control District representatives Ron Nevitt and Sandy Walchuk.

However, Harrel said the flood plain delineation will not significantly impact what the town may choose to do with the washes in the way of public use.

Harrel said no structures would be built in the washes, and measures can be taken to protect whatever facilities might be placed in the washes.

The Maricopa County Flood Control District has spent about two years on the study.

NOTICE OF REGULAR SESSION

OF THE

FOUNTAIN HILLS TOWN COUNCIL

WHEN: **NOVEMBER 16, 1995**

TIME: ****6:30 P.M.**

WHERE: **TOWN HALL COUNCIL CHAMBERS**

Pursuant to A.R.S. 38-431.02, notice is hereby given to the members of the Town Council of Fountain Hills and to the general public that the Town Council of Fountain Hills will hold a regular session open to the public on Thursday, November 16, 1995 at 6:30 p.m. in the Council Chambers of the Fountain Hills Town Hall, located at 16836 E. Palisades Blvd., Building C, Fountain Hills, Arizona.

***** Prior to the regularly scheduled Council meeting, the Flood Control District of Maricopa County and the Town of Fountain Hills Engineering Department will host an open public meeting presenting the results of the Fountain Hills Floodplain Delineation Studies. The public meeting will be held in the conference room from 4:00 to 6:30 p.m.***

RULES FOR ADDRESSING THE COUNCIL - ADOPTED 1/18/90

It is the Council's desire to hear public comment on agenda items. As it is important to maintain order during the meeting, please adhere to the following rules of order if you wish to speak:

1.) All citizens wishing to speak must first be recognized by the Mayor.
2.) The Mayor will not call for public comment on an item until after a motion has been made and seconded and the Council has had adequate opportunity to discuss the item.
3.) Please stand and state your name and address after being called on to speak.
4.) All comments must be directed to the Mayor.
5.) TIME LIMIT - 3 MINUTES PER PERSON PER ITEM.
6.) Statements should not be repetitive.
7.) Persons or groups wishing to make longer presentations, should see the Town Clerk prior to the meeting.

The agenda for the meeting is as follows:

1.) Meeting called to order, pledge to the flag, invocation and roll call.

Consent Agenda:

All items listed with an asterisk (*) are considered to be routine, non-controversial matters and will be enacted by one motion and one roll call vote of the Council. There will be no separate discussion of these items unless a Councilmember or member of the public so requests. If a Councilmember or member of the public wishes to discuss an item on the consent agenda, they may request so prior to the motion to accept the consent agenda. The item will be removed from the Consent Agenda and considered in its normal sequence on the agenda.

Open house Thursday on floodplain

A public open house will be held Thursday, Nov. 16, to review results of floodplain delineation studies performed in Fountain Hills.

The open house will be held from 4 to 6:30 p.m. at Town Hall's conference room.

Floodplain delineation involves developing detailed topographic maps to determine where water goes while incorporating the results of rainfall patterns to determine typical and peak amounts of runoff.

Along with extensive surveying and aerial mapping, drainage factors such as slope, vegetation, soil composition and land use are analyzed and included.

The studies will be used to better manage the floodplain to reduce or prevent flood damage and maintain the integrity of the floodplains.

Areas designated for further analysis in an upcoming area drainage master study also will be presented.

Results obtained in the north and south delineation studies will be displayed at the open house.

Representatives from the Flood Control District of Maricopa County, the Town of Fountain Hills' Engineering Department and the engineering consulting firms will be available to discuss the results and answer questions.

PUBLIC NOTICE
YOUR RIGHT TO KNOW

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90 448), as amended, and the Flood Disaster Protection Act of 1973 (p.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by K Engineers and George V. Sabel Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed or which are likely to be developed and to determine flood elevations of those areas. Flood elevations will be used by Maricopa County to carry our floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Mory, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published FH Times 1/13,1/20/93.

AFFIDAVIT OF PUBLICATION

The Times
OF FOUNTAIN HILLS AND RIO VERDE, ARIZONA

A publication of Western States Publishers, Inc.

STATE OF ARIZONA
COUNTY OF MARICOPA } ss.

L. ALAN CRUIKSHANK, being first duly sworn, upon oath deposes and says: That he is the publisher of

THE TIMES OF FOUNTAIN HILLS AND RIO VERDE

a newspaper of general circulation in the County of Maricopa and the State of Arizona, published at Fountain Hills, Arizona, and that the copy hereto attached is a true copy of the advertisement as published weekly in The Times of Fountain Hills and Rio Verde on the following dates:

Jan. 13, 1993
Jan 20, 1993

Sworn to before me this

23 day of

February A.D. 19 93

Karen Kirkendoll
Notary Public

OFFICIAL SEAL
KAREN KIRKENDOLL
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My comm. expires May 14, 1993

INVOICE NO. 93008

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by AGK Engineers and George V. Sabol Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed and to determine flood elevations for those areas. Flood elevations will be used by Maricopa County to carry out floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Story, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published: Arizona Republic, January 13, 20, 1993.

AFFIDAVIT OF PUBLICATION

The Arizona Republic/The Phoenix Gazette

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

JOAN LOHR, being first duly sworn, upon oath deposes and says: That she is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic and The Phoenix Gazette, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

~~The Arizona Republic~~
The Phoenix Gazette

JANUARY 13, 20, 1993

Joan Lohr

Sworn to before me this

25TH day of

JANUARY 93 A.D. 19

OFFICIAL SEAL
MARY LEE BOOHER
NOTARY PUBLIC STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1995

Mary Lee Booher
Notary Public

Meeting on flood plain plan

Find out where flood waters go on Dec. 17

An open house to inform Fountain Hills residents of floodplain delineation studies being performed in over 30 washes flowing through the community will be held on Thursday, Dec. 17.

The meeting will be held from 5 to 8 p.m. at the Town Hall Conference Room, 16836 E. Palisades Blvd.

The public is invited to come by the Town Hall anytime during the three-hour open house to share their experience and observations of local flooding and hear details about the studies.

Details will include how the study is conducted, what kind of information is being gathered and how the information will be used.

Mapping floodplains involves developing detailed topographic maps to determine where water goes and studying rainfall patterns to determine typical amounts of runoff. The studies and resulting maps will be used to better manage the floodplain so as to reduce or prevent flood damage and maintain the integrity of the floodplains.

Extensive surveying and aerial mapping is involved in the studies, but other factors influencing drainage also must be considered, including soil composition, slope and vegetation and land use.

The Fountain Hills studies are expected to take 12 months to complete, after which time a second open house will be held to inform residents of the results of the studies.

Questions or additional information regarding the studies can be obtained by writing or calling Jim Phipps or Tim Murphy of the Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone 506-1501, or Randy Harrel, town engineer, Town of Fountain Hills, 16836 E. Palisades Blvd, Fountain Hills, AZ 85268, telephone 837-2003.

Audit tops Sanitary agenda

The annual audit report will be the major topic on the agenda for the Sanitary District board of directors when it meets Thursday, Dec. 10.

The report is a routine document prepared each year, according to District Manager Ron Huber.

The board will also select a new chairman for the coming calendar year.

The job of chairman has simply rotated under the current board, and that being the case Director Dennis Regeski will be leading the board for the next year. Director Bruce Hansen is the outgoing chairman.

Huber said monthly staff reports will also be presented at the meeting, and he has a few carryover items to update the board on.

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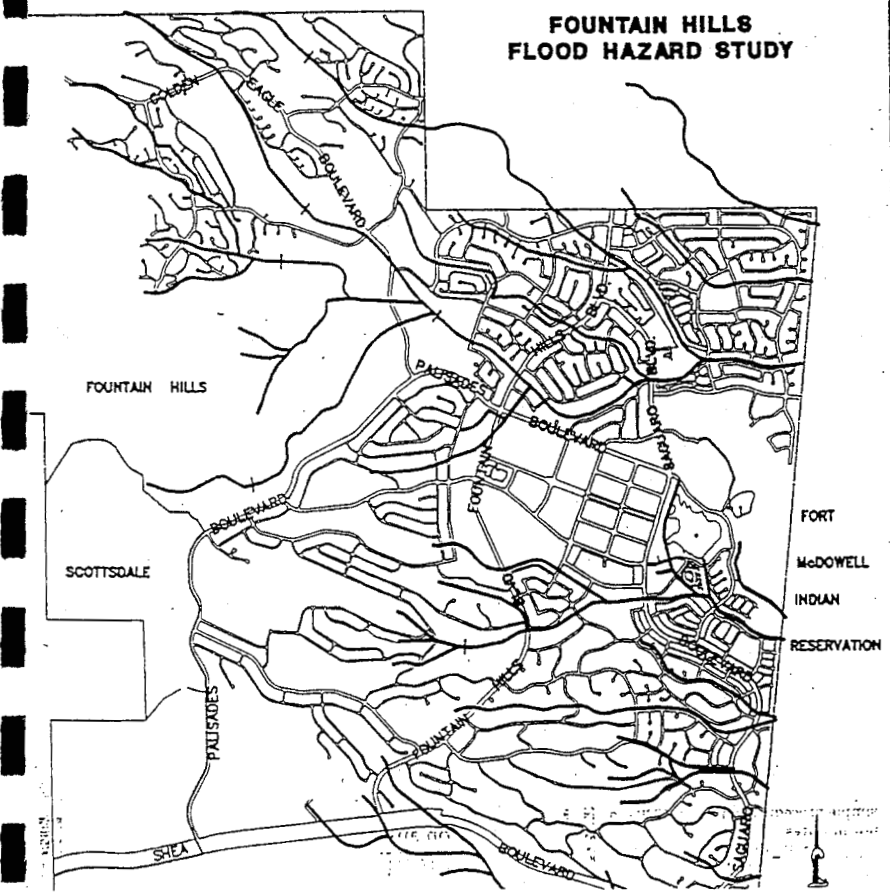

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Larraine LaGiglia.....
daily monitors the progress of each of my ESCROWS and LISTINGS. She is in constant contact with my LISTERS & concentrates on finding BUYERS for my listings.

Systems Specialists
Dana West.....
implements the unique MARKETING SYSTEMS designed to get my SOLD quickly! She keeps my LISTERS advised of the progress on thei

Administration Specialist
Carol Talty.....
handles all mailings/brochures and assists with special projects.

The Times of Fountain Hills

12-9-92

FEDERAL EMERGENCY MANAGEMENT AGENCY **CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average . 23 hour 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.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Hydrology, Hydraulics
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 25 years experience in the expertise listed above.
4. I have ☒ prepared ☒ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
   Hydrologic analysis and floodplain delineation
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.
   b. ☐ Compared plans and specifications with as-built survey information.
   c. ☐ Examined plans and specifications and compared with completed projects.
   d. ☐ Other _____
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: George V. Sabol
(please print or type)

Title: Sr. Associate, SFC Engineering Company
(please print or type)

Registration No. 17928 Expiration Date: 30 June 1998

State Arizona

Type of License Professional Engineer

Signature

23 January 1997
Date

Registered Professional Engineer (Civil) CERTIFICATE NO. 17928 GEORGE V. SABOL Date Signed 23 Jan ARIZONA, U.S.A.

Seal
(*Optional*)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply.

FEDERAL EMERGENCY MANAGEMENT AGENCY **HYDROLOGIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.67 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: CALIENTE WASH
(One form for each flooding source)

Project Name /Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. HYDROLOGIC ANALYSIS IN FIS

☐ Approximate study stream (Zone A)
☒ Detailed study stream (briefly explain methodology) The analysis was performed using HEC-1.

2. REASON FOR NEW HYDROLOGIC ANALYSIS

☒ No existing analysis
☐ Improved data *(see data revision on page 3)*
☐ Changed physical conditions of watershed *(explain)* _____

☐ Alternative methodology *(justify why the revised model is better than model used in the effective FIS)*

☐ Evaluation of proposed conditions (CLOMRs only) (explain) _____

☐ Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100 - and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

☒ Approval of hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., Flood Control District of Maricopa County)
Attach evidence of approval.

☐ Approval of the hydrologic analysis is not required by any local, State, or Federal Agency.

Stream: CALIENTE WASH

Comparison of 100-year Discharges

Location:	Drainage area (Sq mi.)	FIS (cfs):	Revised (cfs):
At McDowell Mtn. Road (C523I)	.23	N/A	390
At El Pueblo Blvd. (C524)	.31	N/A	280
At Deerskin Drive (C525)	.35	N/A	360
At Sabrante Avenue (C526)	.43	N/A	523
Town Limit (East); (C527)	.50	N/A	665

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review.

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made *(attach separate sheet if necessary)*

N/A

ATTACH A COMPLETED REVIEW OF RESULTS PAGE FOR EACH FLOODING SOURCE.

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS *(i.e. no changed hydraulic conditions)*? ☐ Yes ☒ No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No N/A NEW STUDY

FEMA does not normally revise NFIP maps solely due to insignificant flow changes where changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? ☐ Yes ☒ No

If yes, provide the following:

Location along flooding source: _____

Maximum peak discharge: _____ cfs

Second highest peak discharge: _____ cfs

Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site *(along flooding source or similar watershed; specify)*

UNAVAILABLE

Gaging Station: _____

Drainage area at gage: _____ mi^2

Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as new data (*New*) or as revising existing data (*Revised*). *(If necessary, attach a separate sheet.)*

Data Parameter	New	Revised	Data Source
Subbasin Areas	☒	☐	Fountain Hills / USGS Mapping
Lag Time, L, Lca, Slope, Kn	☒	☐	Fountain Hills / USGS Mapping
Green + Ampt Parameters	☒	☐	FCDMC Hydrologic Manual
Routing Reach Parameters	☒	☐	FCDMC Hydrologic Manual
	☐	☐	

- Data source can be from a Federal, State, or local government agency, or from a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source *(i.e., certified statement, report, bibliographical reference to a published document)*. In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

☐ Statistical Analysis of Gage Records (*use Attachment A*)

☐ Regional Regression Equations *(use Attachment B)*

☒ Precipitation/Runoff Model *(use Attachment C)*

☐ Other *(specify; attach backup computations and supporting data)* _____

ATTACHMENT A: STATISTICAL ANALYSIS OF GAGE RECORDS

Gaging Station: N/A

Gage Location (latitude and longitude): _____

	FIS:	Revised:
1. Number of years of data	_____	_____
Systematic	_____	_____
Historical	_____	_____
2. Homogeneous data	☐ Yes ☐ No	☐ Yes ☐ No
3. Data adjustments	☐ Yes ☐ No	☐ Yes ☐ No
4. Number of high outliers	_____	_____
Low outliers	_____	_____
Zero events	_____	_____
5. Generalized skew	_____	_____
6. Station skew	_____	_____
7. Adopted skew	_____	_____
8. Probability distribution used (justify if log-Pearson III was not used)	_____	_____
9. Transfer equations to ungaged sites		☐ Yes ☐ No

If yes, specify method

_____

_____

_____

10. Expected probability* ☐ Yes ☐ No

11. Comparison of results with other analyses ☐ Yes ☐ No

If yes, describe comparison

_____

_____

_____

*FEMA does not accept expected probability analyses for the purpose of reflecting flood hazard information in a FIS.

If any data is not available, indicate by N/A.

Attach analysis including plot of flood frequency curve.

1. Bibliographical Reference: N/A

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. Gaged or ungaged stream: _____

3. Hydrologic region(s): _____
Attach backup map.

4. Provide parameters, values, and source of data used to define parameters.

	FIS:		Revised:	
5. Urbanized conditions calculations	☐ Yes	☐ No	☐ Yes	☐ No
6 Percent of watershed urbanization	_____		_____	
7. Is the watershed controlled?	☐ Yes	☐ No	☐ Yes	☐ No
8. Comparison with other analyses	☐ Yes	☐ No	☐ Yes	☐ No

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

		FIS:	Revised
1.	Method or model used:	N/A	HEC-1
	Version:	N/A	4.0.1E
	Date:	N/A	MAY 1991
2.	Source of rainfall depth:	N/A	NOAA ATLAS 2
3.	Source of rainfall distribution:	N/A	FCDMC Hydrologic Manual
4.	Rainfall duration:	N/A	6 + 24 Hr.
5.	Areal adjustment to precipitation (%):	N/A	DEPENDS UPON SUBBASIN AREA
6.	Maximum overland flow length	N/A	.775 mi. (204B) TABLE 5-7
7.	Hydrograph development method:	N/A	CLARK UNIT GRAPH
8.	Loss rate method:	N/A	GREEN - AMPT
	Source of soils information:	N/A	SCS SOIL SURVEY
	Source of land use information	N/A	AERIAL PHOTOS
9.	Channel routing method:	N/A	NORMAL DEPTH
10.	Reservoir routing:	☐ Yes ☐ No	☒ Yes ☐ No
11.	Baseflow considerations:	☐ Yes ☐ No	☐ Yes ☒ No

If yes, explain how baseflow was determined:

12.	Snowmelt considerations:	☐ Yes ☐ No	☐ Yes ☒ No
13.	Model calibration:	☐ Yes ☐ No	☒ Yes ☐ No

If yes, explain how calibration was performed The model was calibrated by comparing USGS gage data, runoff volume checks upstream from dams, results with estimates using a USGS regional regression eqn, and modeled results with results of other M.C. studies. (Section 3.2.3; pg. 3-(61))

14. Future land use condition: ☐ Yes ☒ No

If yes, explain why

NOTE: FEMA policy is to base flooding on existing conditions.
If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

See Hydrology Reports

ATTACHMENT D: CONFIDENCE LIMITS EVALUATION

Stream: N/A

Select one location for Confidence Limits Evaluation (*describe location*): _____

_____

Discharges for selected location:

Exceedance Probability		FIS	Revised
10%	(10-year)	_____ cfs	_____ cfs
2%	(50-year)	_____ cfs	_____ cfs
1%	(100-year)	_____ cfs	_____ cfs
0.2%	(500-year)	_____ cfs	_____ cfs

1% (100-year) Flood Confidence Intervals

90% Confidence Interval:	5% limit	_____	cfs
	95% limit	_____	cfs
50% Confidence Interval:	25% limit	_____	cfs
	75% limit	_____	cfs

If the value of the 100-year frequency flood in the FIS is beyond the 50% confidence interval but within the 90% confidence interval, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No

An example of confidence limits analysis can be found in Appendix 9 of Bulletin 17B.

Attach Confidence Limits Analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: CALIENTE WASH
(One form for each flooding source)

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. REACH TO BE REVISED

Downstream limit: BORDER AT FT. MCDOWELL INDIAN RESERVATION

Upstream limit: MCDOWELL MOUNTAIN ROAD

2. EFFECTIVE FIS

☒ Not studied

☐ Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

☐ Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

☐ Floodway delineated

Downstream limit of Floodway _____

Upstream limit of Floodway _____

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

☒ Not studied in FIS

☐ Improved hydrologic data/analysis. Explain: _____

☐ Improved hydraulic analysis. Explain: _____

☐ Flood control structure. Explain: _____

☐ Other. Explain: _____

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete 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 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 for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model — Natural ☐ Floodway ☐

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 requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor'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 ☐ Floodway ☐

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 ☐ Floodway ☐

The duplicate effective or corrected 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 or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☐

The existing or pre-project conditions model *(or duplicate effective 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 proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. — Natural ☒ Floodway ☒

6. Hydraulic Analyses (Only if Hydraulic Models are not developed)

See the Hydraulics Report

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS *(from model used to revise 100-year water surface elevation)*

1. Discharges:

	Upstream Limit	Downstream Limit
10-year		
50-year		
100-year	390 cfs	670 cfs
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined

CRITICAL DEPTH

3. Give range of friction loss coefficients (*Manning's "N"*) Channel ..... 0.035 - 0.071

Overbanks ..... 0.038 - 0.080

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

Location	FIS	Revised
N/A		

Explain: NEW STUDY

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

The cross-sections were determined photogrammetrically by the aerial mapping company. All cross-sections are stationed from left to right looking downstream with the thalweg set at station 10,000.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☒ Yes ☐ No If no, explain why not:

6. Explain how reach lengths for channel and overbanks were determined:

Channel reach lengths were measured along the thalweg and overbank reach lengths were measured along the anticipated path of the center of mass of the overbank flow.

5. RESULTS *(from model used to revise 100-year water surface elevations)*

1. Do the results indicate:

a. Water surface elevations higher than end points of cross sections? ☐ Yes ☒ No

b. Supercritical depth? ☐ Yes ☒ No

c. Critical depth? ☒ Yes ☐ No

d. Other unique situations ☐ Yes ☒ No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps. For those cross-sections where the HEC-2 model defaulted to critical depth, the critical depth water surface elevations are plotted on the profiles and maps.

2. What is the maximum change in energy gradient between cross-sections? 14.01

Specify location CROSS-SECTION # 1.663

3. What is the distance between the cross-sections in 2 above? 478 ft.

4. What is the maximum distance between cross-sections? 658 ft.

Specify location CROSS-SECTION # 1.311

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? 1 foot

b. What is the maximum surcharge for the revised conditions? N/A NEW STUDY foot

Specify location

c. What is the maximum velocity? 11.59 fps

Specify location CROSS SECTION # 2.287

d. Are there any negeative surcharge values at any cross-section? ☐ Yes ☒ No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain:

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? ..... ☐ Yes ☒ No

If Yes, explain:

_____

_____

_____

7. Do 100-year water surface elevations increase at any location? ..... ☐ Yes ☐ No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

N/A NEW STUDY

_____

_____

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

N/A NEW STUDY

A. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section_____ within_____feet *(vertical)* and upstream of the project at cross section_____within_____feet *(vertical)*.

N/A NEW STUDY

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section_____within_____feet *(vertical)* and upstream of the project at cross section_____ within_____feet *(vertical)*.

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

THE PROFILES ARE LOCATED IN THE HYDRAULIC ANALYSIS NOTEBOOK.

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

Proceed to Riverine /Coastal Mapping Form

FEDERAL EMERGENCY MANAGMENT AGENCY

WATER SURFACE ELEVATION CHECK

N/A
NEW STUDY

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
MARICOPA COUNTY, ARIZONA	CALIENTE WASH	FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]

COMMENTS:

1-100-year (natural) Water Surface Elevation 2-Encroachment (floodway) Water Surface Elevation 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

MT-2 Form 4 Page 6 of 6

Sheet_____ of _____

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: CALIENTE WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable)*:

		Included		
A.	Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☒ N/A
B.	Revised detailed 100- and 500-year floodplain boundaries	☐ Yes	☐ No	☒ N/A
C.	Revised 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
D.	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated	☒ Yes	☐ No	☐ N/A
E.	Stream alignments, road and dam alignments	☒ Yes	☐ No	☐ N/A
F.	Current community boundaries	☒ Yes	☐ No	☐ N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map	☐ Yes	☐ No	☒ N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
I.	The requestor's property boundaries and community easements	☐ Yes	☐ No	☒ N/A
J.	The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
K.	Location and description of reference marks	☒ Yes	☐ No	☐ N/A
L.	Vertical datum (example: NGVD, ~~NAVD etc.~~) NGVD 1929	☒ Yes	☐ No	☐ N/A
M.	Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
N.	Location and alignment of all coastal transects used to revise the coastal analyses	☐ Yes	☐ No	☒ N/A

If any of the items above are marked no or N/A, please explain: THIS IS THE FIRST STUDY DONE IN FOUNTAIN HILLS, THEREFORE THERE ARE NO EXISTING FLOODPLAIN AND FLOODWAY DELINEATIONS.

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? AERIAL MAPPING AUGUST 1991

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS N/A scale N/A Contour interval
   b. Revision Request 1" = 200' scale 2 FOOT Contour interval

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

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.

   Attach additional pages if needed.

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's ? ☐ Yes ☐ No

If yes, please give the location of shift or increase and an explanation for the increase.

N/A This is the first study of the area, therefore, there isn't an existing 100-year floodplain delineation.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? ..... ☐ Yes ☐ No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase?_____

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? ..... ☐ Yes ☐ No

If yes, explain:

N/A This is the first study of the area, therefore, there isn't an existing floodway delineation.

7. If a V- zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? N/A ☐ Yes ☐ No

If no, explain:

8. Manual or digital map submission:

☒ Manual

☐ Digital

Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

IF REQUESTED A DIGITIZED MAP CAN BE SUPPLIED.

2. EARTH FILL PLACEMENT

1. The fill is: ☐ Existing ☐ Proposed N/A

2. Has fill been/will be placed in the regulatory floodway? ..... ☐ Yes ☒ No
   If yes, please attach completed Riverine Hydraulic Analysis Form.

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_____

      _____

   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, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? N/A ☐ 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.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: CALIENTE WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: DIRT ROAD AT TOWN LIMIT (EAST)
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 1.098
3. This revision reflects *(check one of the following)*:
   - ☒ New bridge/culvert not modeled in the FIS
   - ☐ Modified bridge/culvert previously modeled in the FIS
   - ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
SINGLE PIPE CULVERT; 1-42" CMP

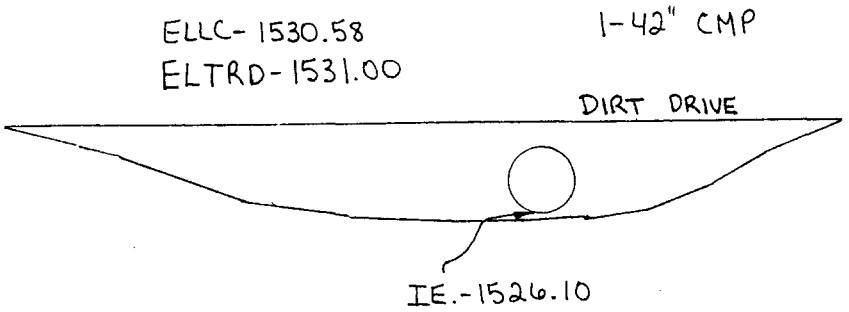
2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments)
PIPE PROJECTING FROM FILL

3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
HEC-2 SPECIAL CULVERT METHOD

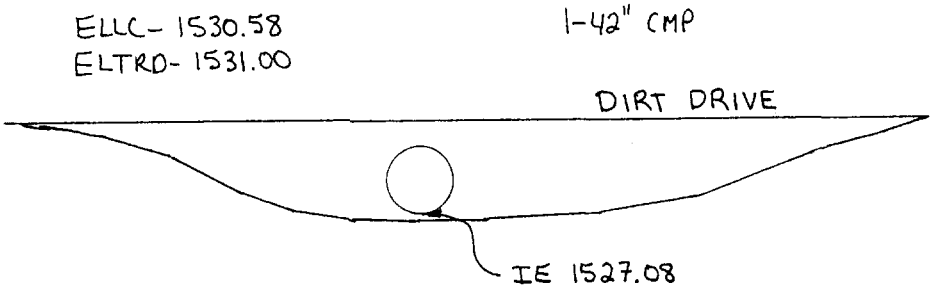
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

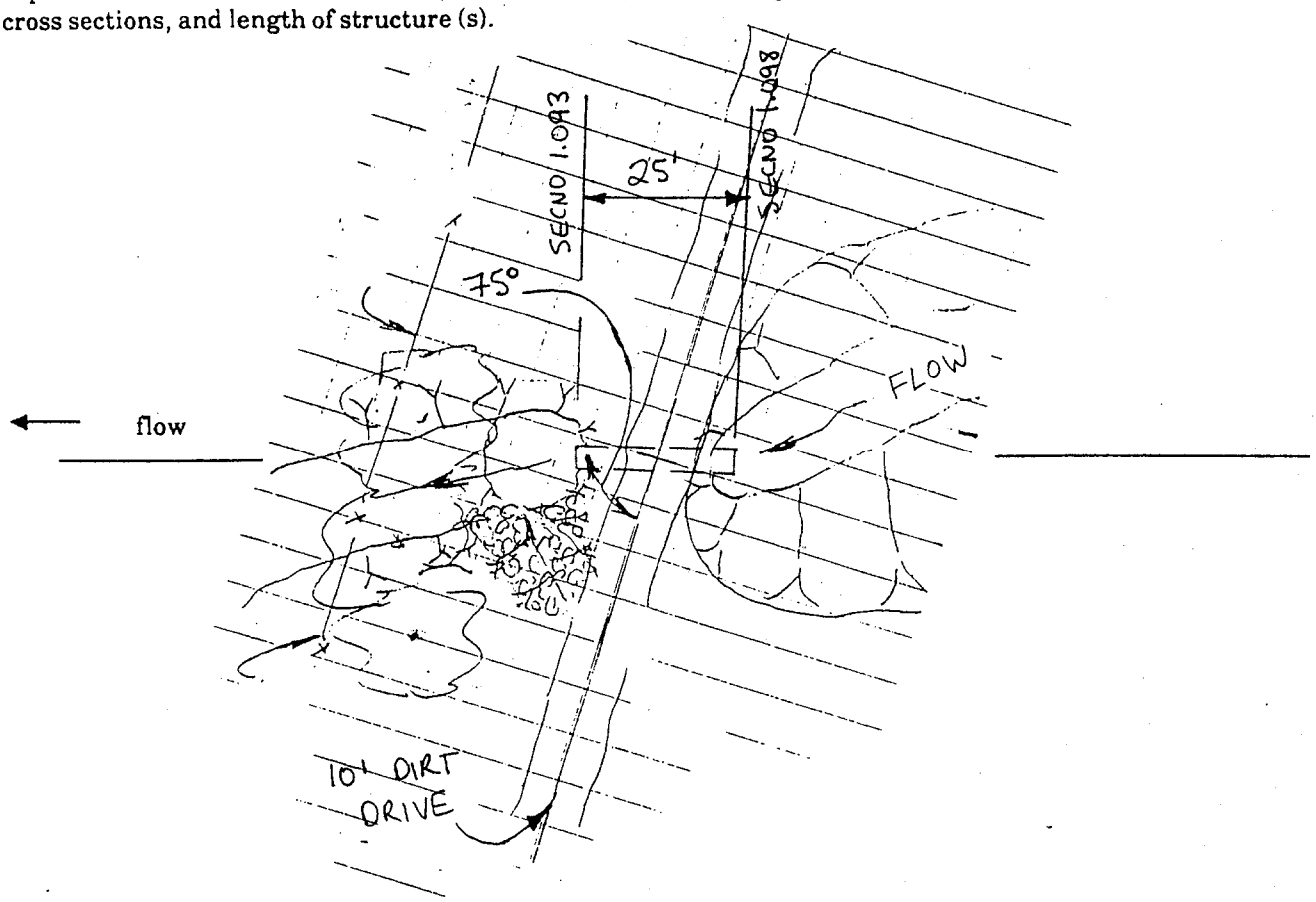
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	25 ft.
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	9.6 ft.²
Total culvert/bridge area (ft²)	9.6 ft.²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1530.34	1530.34
Downstream face	1528.19	1528.19

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1530.64	1530.64
Downstream face	1528.19	1528.19

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1532.40	1532.74
Downstream face	1529.36	1530.34

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	80	593	670

The maximum depth of flow over the roadway/railroad (ft.) ..... 2.1 ft.

Weir length (ft.) ..... 129 ft.

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	129	129	129
Downstream face	48	48	48

3. ANALYSIS (Cont'd)

Loss Coefficients

Entrance loss coefficient	0.9
Manning's "n" value assigned to the structure(s)	.022
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport *(including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: CALIENTE WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: DEERSKIN DRIVE
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier):
   SECNO 1.789
3. This revision reflects *(check one of the following)*:
   - ☒ New bridge/culvert not modeled in the FIS
   - ☐ Modified bridge/culvert previously modeled in the FIS
   - ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
3- 70" x 60" CMP's

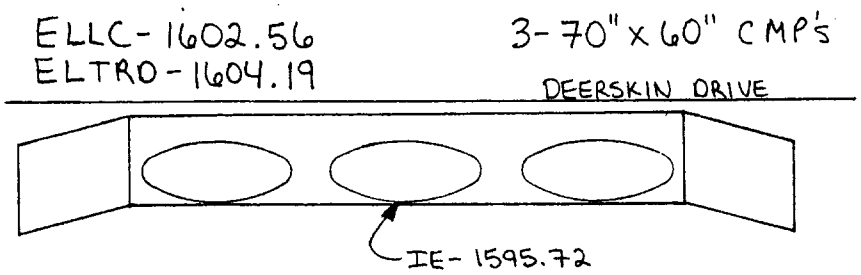
2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments)
CULVERT INLET WITH HEADWALL AND WINGWALLS

3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
HEC-2 SPECIAL CULVERT METHOD

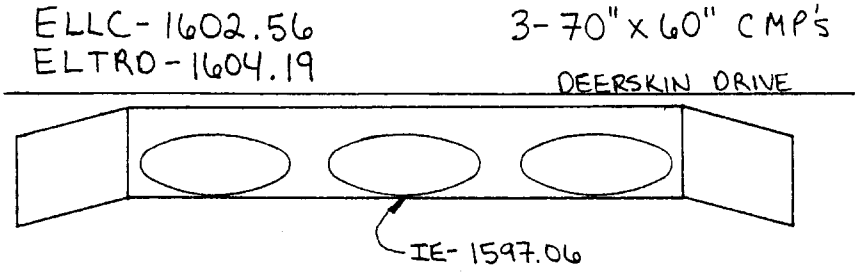
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

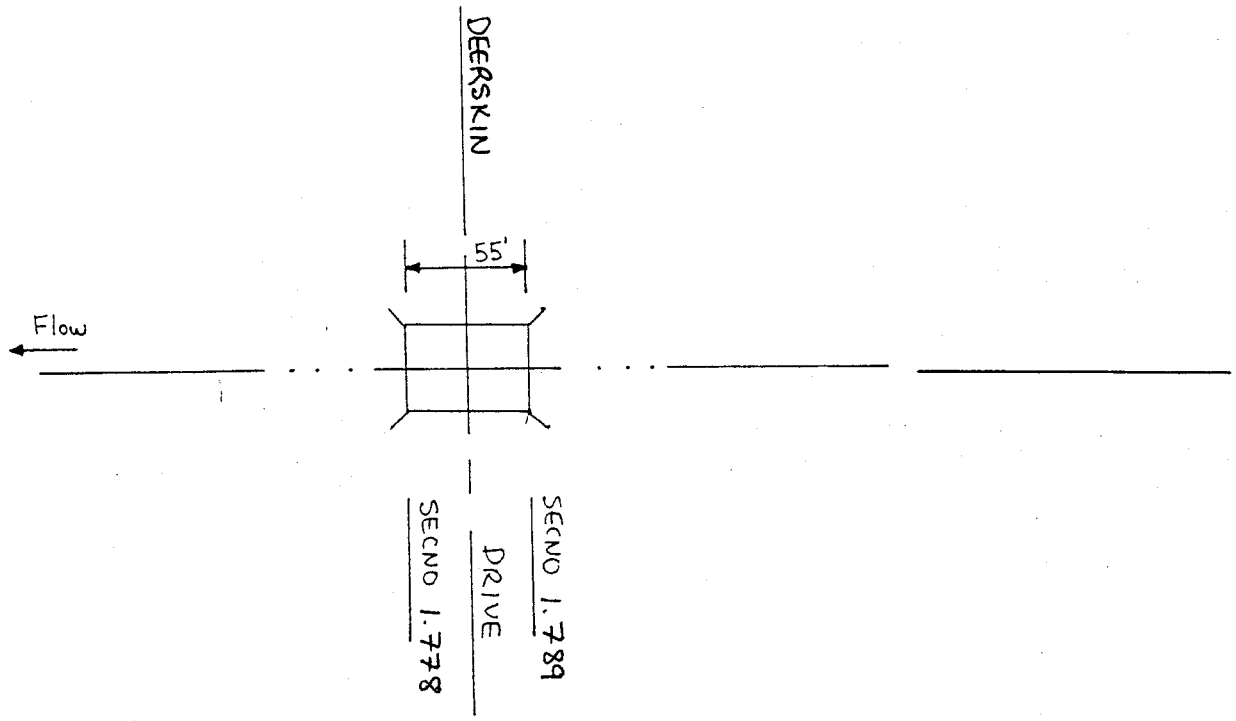
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s)



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	55 ft.
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	71.3 ft²
Total culvert/bridge area (ft²)	71.3 ft²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1603.95	1603.95
Downstream face	1601.71	1601.71

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1604.19	1604.19
Downstream face	1601.71	1601.71

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1601.71	1601.95
Downstream face	1598.36	1599.70

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	360	N/A	N/A	360

The maximum depth of flow over the roadway/railroad (ft.) ..... N/A

Weir length (ft.) ..... N/A

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	55	19.10	55
Downstream face	55	14.60	55

Loss Coefficients

Entrance loss coefficient	0.5
Manning's "n" value assigned to the structure(s)	0.022
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	N/A
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment (*bed material*) load?
   _____cfs (*attach gradation curve*)

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments (*explain any unusual situations*):

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: CALIENTE WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCO 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: IVORY DRIVE
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 2.120
3. This revision reflects *(check one of the following)*:

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed) _____

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
BOX CULVERTS - 3-10' x 3'

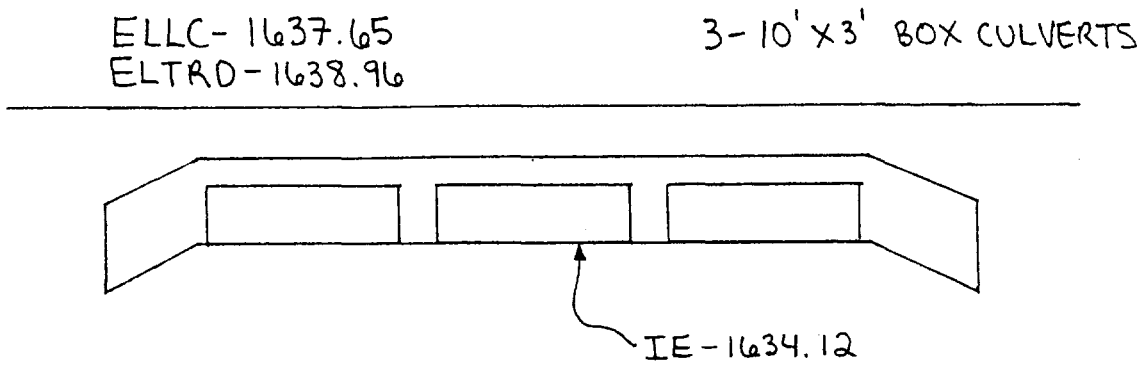
2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments)
18°-33.7° WING WALLS WITH INLET TOP EDGE BEVELED = .083D

3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
HEC-2 SPECIAL CULVERT METHOD

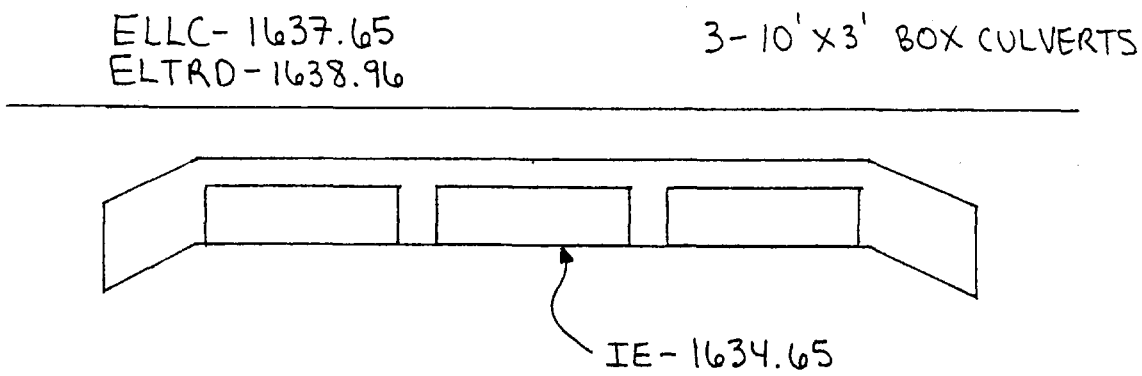
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

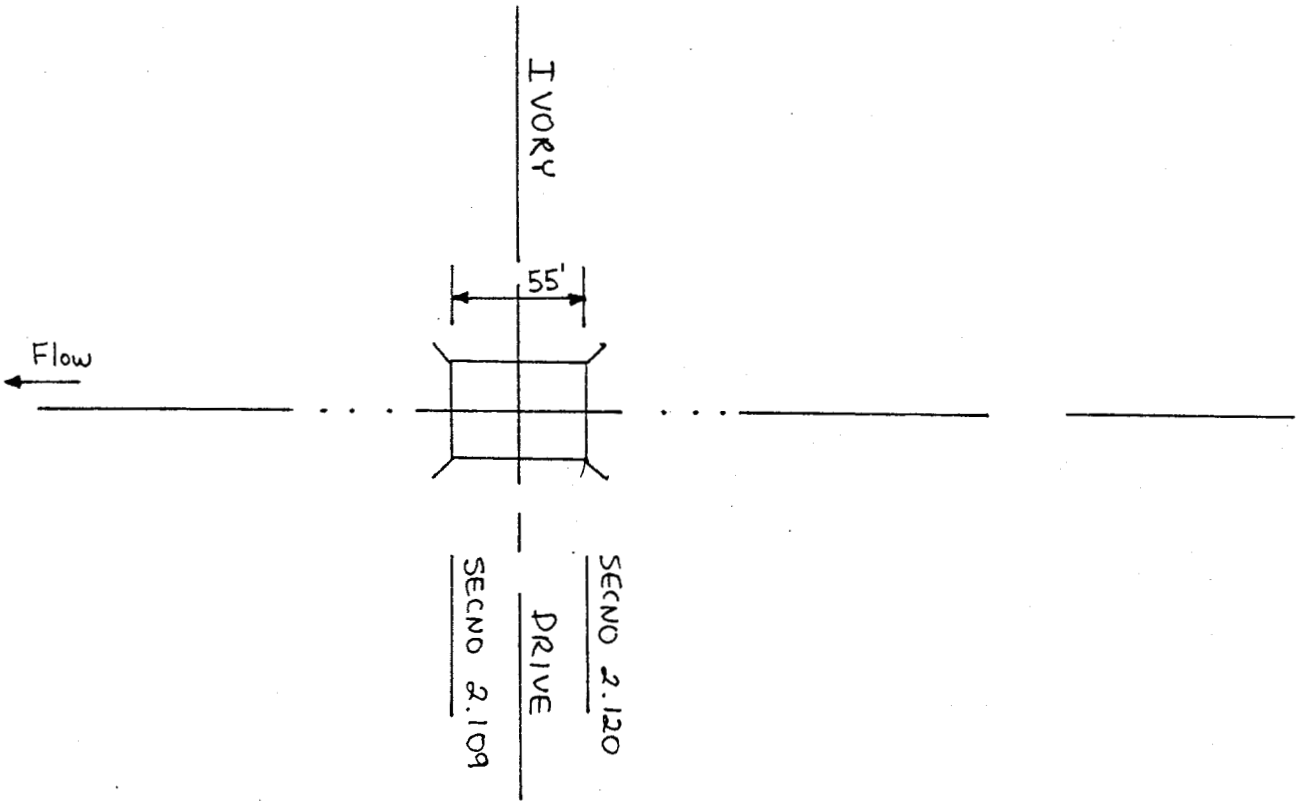
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	55 ft.
Calculated culvert/bridge area (ft ^{2}) by the hydraulic model, if applicable	90 ft.^{2}
Total culvert/bridge area (ft ^{2})	90 ft^2

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1638.7	1638.7
Downstream face	1637.87	1637.87

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1638.96	1638.96
Downstream face	1637.87	1637.87

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1636.77	1637.01
Downstream face	1635.58	1636.13

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	280	N/A	N/A	280

The maximum depth of flow over the roadway/railroad (ft.) ..... N/A

Weir length (ft.) ..... N/A

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	32	30	32
Downstream face	31.8	30	31.8

Loss Coefficients

Entrance loss coefficient	0.4
Manning's "n" value assigned to the structure(s)	0.012
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	N/A
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport *(including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: CALIENTE WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCO 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: McDOWELL MOUNTAIN ROAD
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier):
   SECNO 2.306
3. This revision reflects *(check one of the following)*:
   - [x] New bridge/culvert not modeled in the FIS
   - [ ] Modified bridge/culvert previously modeled in the FIS
   - [ ] New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

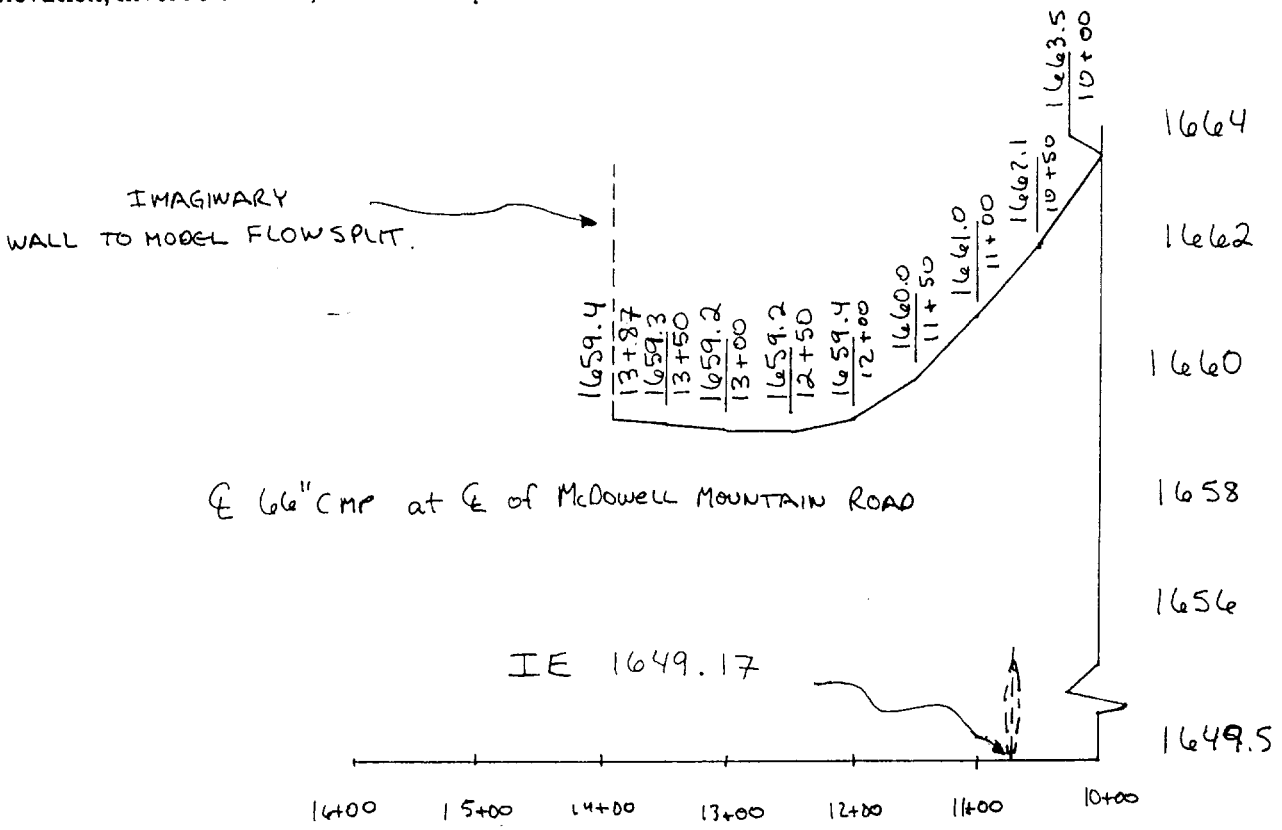
Provide the following information about the structure:

1. Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
   SINGLE PIPE CULVERT — 1-66" CMP
2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments)
   PIPE PROJECTING FROM FILL
3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
   HEC-2 SPECIAL CULVERT METHOD

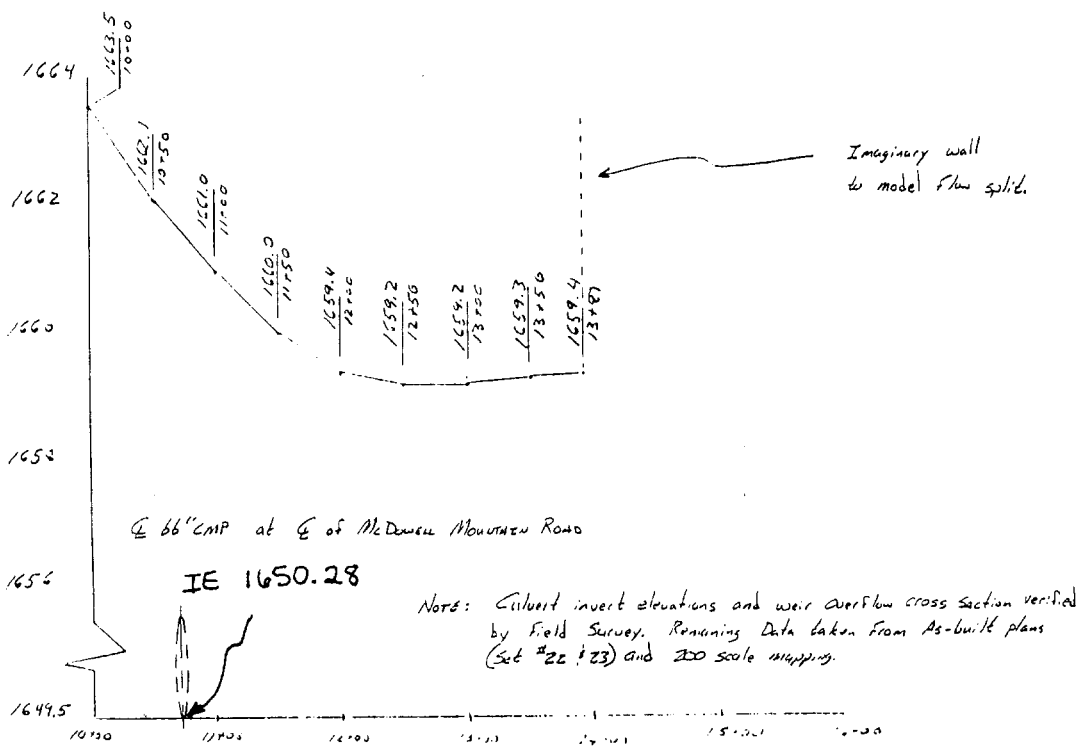
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

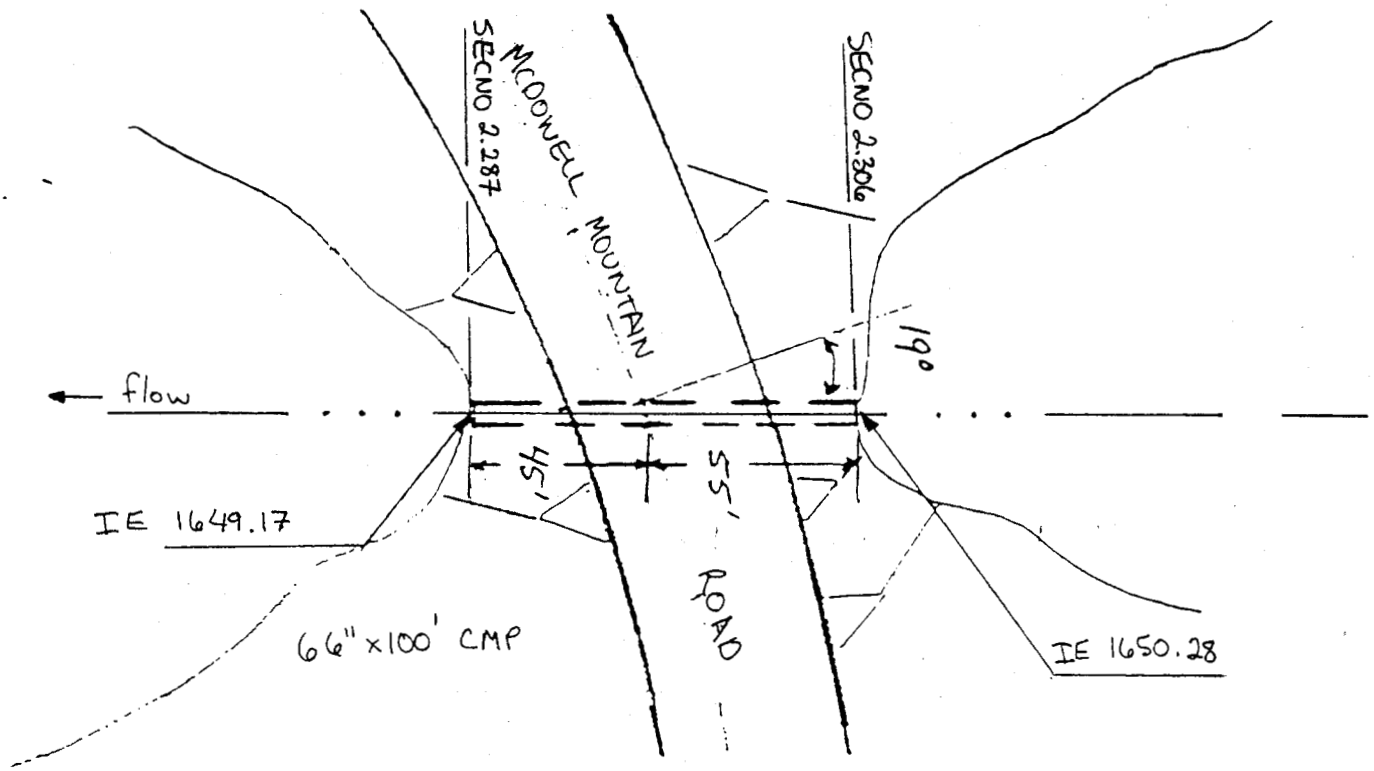
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	100 ft.
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	23.8 ft.²
Total culvert/bridge area (ft²)	23.8 ft.²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1659.2	1659.2
Downstream face	1654.94	1654.94

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1659.2	1659.2
Downstream face	1654.94	1654.94

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1659.68	1659.68
Downstream face	1653.34	1655.43

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	257	132	390

The maximum depth of flow over the roadway/railroad (ft.) ..... .48

Weir length (ft.) 211

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	334.07	211 + 6	334.07
Downstream face	80	6	80

The sum of the weir flow (211) and culvert flow (6) width were used for the upstream effective flow. On the downstream flow width only the culvert flow was used. See cross-sections 2.306 + 2.287.

Loss Coefficients

Entrance loss coefficient	0.90
Manning's "n" value assigned to the structure(s)	0.022
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport *(including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport + scour analysis were not done. THese types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*
   - ☐ Physical change
     - ☐ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☐ Improved data
   - ☐ Floodway revision
   - ☒ Other New Study

     Explain This is the first delineation of this watercourse
2. Flooding Source: Escalante Wash
3. Project Name/Identifier: Fountain Hills North Floodplain Delineation Study FCD 92-04
4. FEMA zone designations affected: X

   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy,City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
04013	Maricopa County	Maricopa	AZ	04013 C	1750	9-4-91
	Fountain Hills, Town				1300	9-4-91

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding	Structures	Disciplines*
☐ Riverine	☐ Channelization	☐ Water Resources
☐ Coastal	☐ Levee/Floodwall	☒ Hydrology
☐ Alluvial Fan	☐ Bridge/Culvert	☒ Hydraulics
☐ Shallow Flooding *(e.g. Zones AO and AH)*	☐ Dam	☐ Sediment Transport
☐ Lakes	☐ Coastal	☐ Interior Drainage
	☐ Fill	☐ Structural
Affected by wind/wave action	☐ Pump Station	☐ Geotechnical
☐ Yes	☐ None	☐ Land Surveying
☐ No	☐ Channel Relocation	☐ Other *(describe)*
	☐ Excavation	
	☐ Other *(describe)*	

☐ Other(describe)_____

*** Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☐ Yes ☒ No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM ☒ Yes ☐ No

   If yes, give reason: New study, this is the first delineation of this watercourse

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions. See attached articles and announcements

9. 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.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? ☐ Yes ☐ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☐ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (*or other surcharge limit if community or state has adopted more stringent criteria*)? ☐ Yes ☐ No

If the answer to either Items 1B or 2B is yes, please provide 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.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒ Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒ Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐ Yes ☐ No N/A New Study

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ (entity)

_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☐ has ☐ has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____
(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.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

_____a. CLOMR — A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*.

_____b. LOMR — A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. I Parts 60 and 65.)*

_X_c. PMR — A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. I, Parts 60 and 65.)*

_____d. Other: Describe_____

8. FORMS INCLUDED

17. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

• Hydrologic analysis for flooding source differs from that used to develop FIRM	☒ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine /Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☐ Bridge/Culvert Form (Form 7)
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☐ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. ☐ Yes ☐ No

Initial fee amount: $ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. ☐ Yes ☐ No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. ☒ Yes ☐ No

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

Ron Nevitt
Signature of Revision Requester

Ron Nevitt/Program Mgr. NFIP
Printed Name and Title of Revision Requester

Flood Control District of Maricopa Co.
Company Name

(602) 506-1501 1-29-97
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.

Randy L Hanel
Signature of Community Official

Randy L Hanel, Town Engr.
Printed Name and Title of Community Official

Fountain Hills
Community Name

1-22-97
Date

Does this request impact any other communities? ☐ Yes ☐ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

11-22-95

No big problems in County floodplain study

If you've ever wondered what would happen in Fountain Hills in the event of a 100-year flood, Maricopa County has just completed a study that will tell you.

Representatives of Maricopa County Flood Control District were on hand for an open house at Town Hall on Thursday, Oct. 16. They were there to explain and answer questions concerning the Fountain Hills Flood Delineation Study.

The study defines the areas that would be inundated in the event of a 100-year storm and flood.

There was not a big turnout for the two-hour session, but a few residents dropped by to ask about their own particular concerns.

Town Engineer Randy Harrel said the study indicates no significant problems for individual homeowners. Some residents have property which lies within the flood area, but few if any structures are threatened.

One area of concern that town officials will look at is the Baptist Church on Saguaro Boulevard. In the event of a significant 100-year flooding event all of the church buildings and the parking lot would be under water. It is a low flat area which Nicklaus and Cypress washes flow into.

A Sanitary District pumping station adjacent to the church is apparently not within the flood plain.

Sanitary District Manager Ron Huber said no flood study was done when the pumping facility was constructed. But he said the pump building is significantly higher than the church buildings.

Huber also said that pump station is scheduled to be abandoned in the near future.

Harrel said the town will use the study to consider its options for protecting citizens and property during such a flood.

There are 26 street crossings the town wants to study further besides the area around the church, Harrel said. The options that may be considered would include culvert work and possibly diversion or containment structures.

Those further studies are to begin in the near future.

Nearly all of the area included in the 100-year flood plain will belong to the Town of Fountain Hills once the wash property transfer between the town and MCO Properties is completed in the near future.

Fountain Hills Vice Mayor Peg Tibbetts, center, discusses the county's floodplain study with Flood Control District representatives Ron Nevitt and Sandy Walchuk.

However, Harrel said the flood plain delineation will not significantly impact what the town may choose to do with the washes in the way of public use.

Harrel said no structures would be built in the washes, and measures can be taken to protect whatever facilities might be placed in the washes.

The Maricopa County Flood Control District has spent about two years on the study.

NOTICE OF REGULAR SESSION

OF THE

FOUNTAIN HILLS TOWN COUNCIL

WHEN: **NOVEMBER 16, 1995**

TIME: ****6:30 P.M.**

WHERE: **TOWN HALL COUNCIL CHAMBERS**

Pursuant to A.R.S. 38-431.02, notice is hereby given to the members of the Town Council of Fountain Hills and to the general public that the Town Council of Fountain Hills will hold a regular session open to the public on Thursday, November 16, 1995 at 6:30 p.m. in the Council Chambers of the Fountain Hills Town Hall, located at 16836 E. Palisades Blvd., Building C, Fountain Hills, Arizona.

***** Prior to the regularly scheduled Council meeting, the Flood Control District of Maricopa County and the Town of Fountain Hills Engineering Department will host an open public meeting presenting the results of the Fountain Hills Floodplain Delineation Studies. The public meeting will be held in the conference room from 4:00 to 6:30 p.m.***

RULES FOR ADDRESSING THE COUNCIL - ADOPTED 1/18/90

It is the Council's desire to hear public comment on agenda items. As it is important to maintain order during the meeting, please adhere to the following rules of order if you wish to speak:

1.) All citizens wishing to speak must first be recognized by the Mayor.
2.) The Mayor will not call for public comment on an item until after a motion has been made and seconded and the Council has had adequate opportunity to discuss the item.
3.) Please stand and state your name and address after being called on to speak.
4.) All comments must be directed to the Mayor.
5.) TIME LIMIT - 3 MINUTES PER PERSON PER ITEM.
6.) Statements should not be repetitive.
7.) Persons or groups wishing to make longer presentations, should see the Town Clerk prior to the meeting.

The agenda for the meeting is as follows:

1.) Meeting called to order, pledge to the flag, invocation and roll call.

Consent Agenda:

All items listed with an asterisk (*) are considered to be routine, non-controversial matters and will be enacted by one motion and one roll call vote of the Council. There will be no separate discussion of these items unless a Councilmember or member of the public so requests. If a Councilmember or member of the public wishes to discuss an item on the consent agenda, they may request so prior to the motion to accept the consent agenda. The item will be removed from the Consent Agenda and considered in its normal sequence on the agenda.

Open house Thursday on floodplain

A public open house will be held Thursday, Nov. 16, to review results of floodplain delineation studies performed in Fountain Hills.

The open house will be held from 4 to 6:30 p.m. at Town Hall's conference room.

Floodplain delineation involves developing detailed topographic maps to determine where water goes while incorporating the results of rainfall patterns to determine typical and peak amounts of runoff.

Along with extensive surveying and aerial mapping, drainage factors such as slope, vegetation, soil composition and land use are analyzed and included.

The studies will be used to better manage the floodplain to reduce or prevent flood damage and maintain the integrity of the floodplains.

Areas designated for further analysis in an upcoming area drainage master study also will be presented.

Results obtained in the north and south delineation studies will be displayed at the open house.

Representatives from the Flood Control District of Maricopa County, the Town of Fountain Hills' Engineering Department and the engineering consulting firms will be available to discuss the results and answer questions.

PUBLIC NOTICE
YOUR RIGHT TO KNOW

ANNOUNCEMENT OF FLOOD HAZARD STUDY

e Flood Control District of Maricopa County, under authority the National Flood Insurance Act of 1968 (P.L. 90 448), as ended, and the Flood Disaster Protection Act of 1973 (p.L. 93-34), is funding a detailed study of flood hazard areas in The Town f Fountain Hills, Arizona.

e study is being performed for the Flood Control District by K Engineers and George V. Sabel Consulting Engineers. he purpose of this study is to examine and evaluate flood hazard reas which are developed or which are likely to be developed or ich are likely to be developed and to determine flood elevations those areas. Flood elevations will be used by Maricopa County carry our floodplain management objectives of the National lood Insurance Program. They will also be used as the basis for etermining appropriate flood insurance premium rates applile for buildings and their contents.

s announcement is intended to notify all interested persons of e commencement of this study so that they may have an pportunity to bring any relevant facts and technical data concern-y local flood hazards to the attention of the Flood Control trict for consideration in the course of this study. Such rmation should be addressed to Mr. Tim Murphy or Ms. Sandy tory, Flood Control District of Maricopa County, 2801 W. urango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

lished FH Times 1/13,1/20/93.

AFFIDAVIT OF PUBLICATION

The Times
OF FOUNTAIN HILLS AND RIO VERDE, ARIZONA

A publication of Western States Publishers, Inc.

STATE OF ARIZONA
COUNTY OF MARICOPA } ss.

L. ALAN CRUIKSHANK, being first duly sworn, upon oath deposes and says: That he is the publisher of

THE TIMES OF FOUNTAIN HILLS AND RIO VERDE

a newspaper of general circulation in the County of Maricopa and the State of Arizona, published at Fountain Hills, Arizona, and that the copy hereto attached is a true copy of the advertisement as published weekly in The Times of Fountain Hills and Rio Verde on the following dates:

Jan. 13, 1993
Jan 20, 1993

Sworn to before me this

23 day of

February A.D. 19 93

Karen Kirkendoll
Notary Public

OFFICIAL SEAL
KAREN KIRKENDOLL
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My comm. expires May 14, 1993

INVOICE NO. 93008

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by AGK Engineers and George V. Sabol Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed and to determine flood elevations for those areas. Flood elevations will be used by Maricopa County to carry out floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Story, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published: Arizona Republic, January 13, 20, 1993.

AFFIDAVIT OF PUBLICATION

The Arizona Republic/The Phoenix Gazette

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

JOAN LOHR, being first duly sworn, upon oath deposes and says: That she is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic and The Phoenix Gazette, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

~~The Arizona Republic~~
The Phoenix Gazette

JANUARY 13, 20, 1993

Joan Lohr

Sworn to before me this

25TH day of

JANUARY 93 A.D. 19

OFFICIAL SEAL
MARY LEE BOOHER
NOTARY PUBLIC STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1995

Mary Lee Booher
Notary Public

Meeting on flood plain plan

Find out where flood waters go on Dec. 17

An open house to inform Fountain Hills residents of floodplain delineation studies being performed on over 30 washes flowing through the community will be held on Thursday, Dec. 17.

The meeting will be held from 5 to 8 p.m. at the Town Hall Conference Room, 16836 E. Palisades Blvd.

The public is invited to come by the Town Hall anytime during the three-hour open house to share their experience and observations of local flooding and hear details about the studies.

Details will include how the study is conducted, what kind of information is being gathered and how the information will be used.

Mapping floodplains involves developing detailed topographic maps to determine where water goes and studying rainfall patterns to determine typical amounts of runoff. The studies and resulting maps will be used to better manage the floodplain so as to reduce or prevent flood damage and maintain the integrity of the floodplains.

Extensive surveying and aerial mapping is involved in the studies, but other factors influencing drainage also must be considered, including soil composition, slope and vegetation and land use.

The Fountain Hills studies are expected to take 12 months to complete, after which time a second open house will be held to inform residents of the results of the studies.

Questions or additional information regarding the studies can be obtained by writing or calling Jim Phipps or Tim Murphy of the Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone 506-1501, or Randy Harrel, town engineer, Town of Fountain Hills, 16836 E. Palisades Blvd, Fountain Hills, AZ 85268, telephone 837-2003.

Audit tops Sanitary agenda

The annual audit report will be the major topic on the agenda for the Sanitary District board of directors when it meets Thursday, Dec. 10.

The report is a routine document prepared each year, according to District Manager Ron Huber.

The board will also select a new chairman for the coming calendar year.

The job of chairman has simply rotated under the current board, and that being the case Director Dennis Regeski will be leading the board for the next year. Director Bruce Hansen is the outgoing chairman.

Huber said monthly staff reports will also be presented at the meeting, and he has a few carryover items to update the board on.

Doesn't Your Single Larg
INVESTMEN
Deserve a second opinion?
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designers & builders
of
LUXURY LA COSTA HOME
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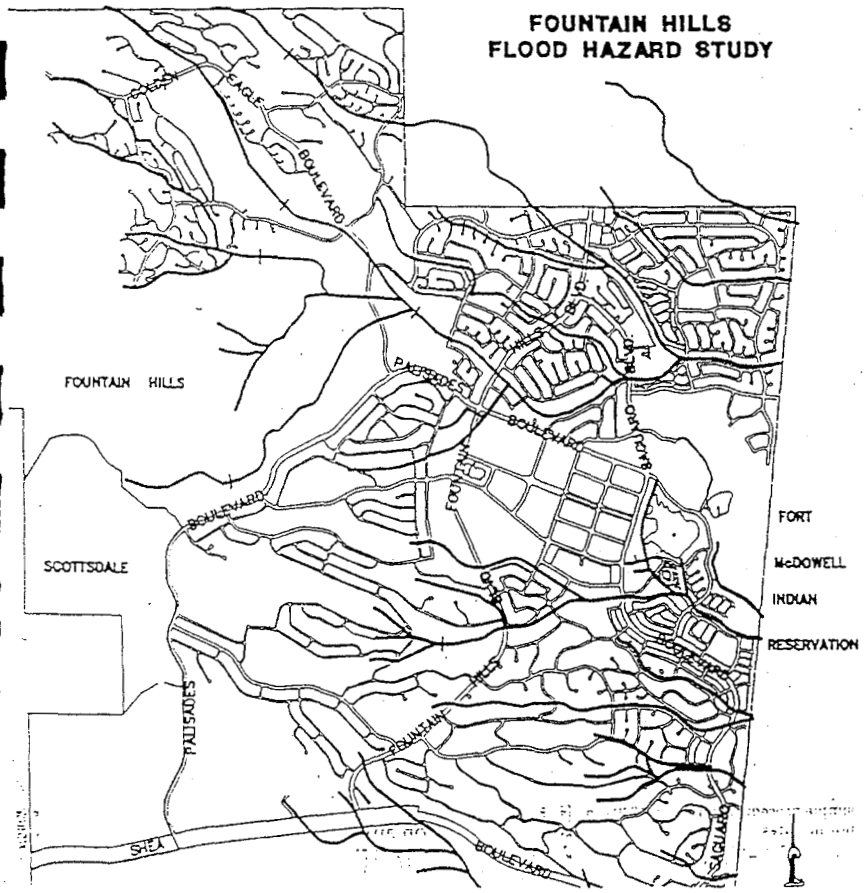

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call
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Fountain Hills #1 Top Pr
Over 100 Opened & Closed Transactions Si
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"Real Estate Expert"
...her team of "SPECIALIS
are WORKING FOR YOU
Transaction Specialist
Larraine LaGiglia.....
daily monitors the progress of each of my ESCROWS and LISTINGS. She is in constant contact with my LISTERS & concentrates on finding BUYERS for my listings.

Systems Specialists
Dana West.....
implements the unique MARKETING SYSTEMS designed to get my SOLD quickly! She keeps my LISTERS advised of the progress on the
Administration Specialist
Carol Talty.....
handles all mailings/brochures and assists with special projects.

The Times of Fountain Hills

12-9-92

FEDERAL EMERGENCY MANAGEMENT AGENCY

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM

O.M.B. Burden No. 3067-0148
Expires July 31, 1997

FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average . 23 hour 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.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Hydrology, Hydraulics
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 25 years experience in the expertise listed above.
4. I have ☒ prepared ☒ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
   Hydrologic analysis and floodplain delineation
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.
   b. ☐ Compared plans and specifications with as-built survey information.
   c. ☐ Examined plans and specifications and compared with completed projects.
   d. ☐ Other _____
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: George V. Sabol
(please print or type)

Title: Sr. Associate, SFC Engineering Company
(please print or type)

Registration No. 17928 Expiration Date: 30 June 1998

State Arizona

Type of License Professional Engineer

Signature

23 January 1997
Date

Registered Professional Engineer (Civil) CERTIFICATE NO. 17928 GEORGE V. SABOL Date Signed 23 Jan ARIZONA, U.S.A.

Seal
(Optional)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply.

FEDERAL EMERGENCY MANAGEMENT AGENCY **HYDROLOGIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.67 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ESCALANTE WASH
(One form for each flooding source)

Project Name /Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. HYDROLOGIC ANALYSIS IN FIS

☐ Approximate study stream (Zone A)
☒ Detailed study stream (briefly explain methodology) THE ANALYSIS WAS PERFORMED USING HEC-1.

2. REASON FOR NEW HYDROLOGIC ANALYSIS

☒ No existing analysis
☐ Improved data *(see data revision on page 3)*
☐ Changed physical conditions of watershed *(explain)* _____

☐ Alternative methodology *(justify why the revised model is better than model used in the effective FIS)*

☐ Evaluation of proposed conditions (CLOMRs only) (explain) _____

☐ Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100 - and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

☒ Approval of hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., FLOOD CONTROL DISTRICT OF MARICOPA COUNTY)
Attach evidence of approval.

☐ Approval of the hydrologic analysis is not required by any local, State, or Federal Agency.

Stream: ESCALANTE WASH

Comparison of 100-year Discharges

Location:	Drainage area (Sq mi.)	FIS (cfs):	Revised (cfs):
TOWN LIMIT (EAST); (C521)	1.99	N/A	1,410
AT BAHIA DRIVE; (C591)	1.83	N/A	1,400
TOWN LIMIT (NORTH); ()	1.59	N/A	1,400
AT MCDOWELL MOUNTIAN RD. (C519)	1.59	N/A	1,410

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review.

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made *(attach separate sheet if necessary)*

N/A

ATTACH A COMPLETED REVIEW OF RESULTS PAGE FOR EACH FLOODING SOURCE.

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS *(i.e. no changed hydraulic conditions)*? ☐ Yes ☒ No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No N/A New study

FEMA does not normally revise NFIP maps solely due to insignificant flow changes where changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? ☐ Yes ☒ No

If yes, provide the following:

Location along flooding source: _____

Maximum peak discharge: _____ cfs

Second highest peak discharge: _____ cfs

Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site *(along flooding source or similar watershed; specify)*

UNAVAILABLE

Gaging Station: _____

Drainage area at gage: _____ mi^2

Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as new data (*New*) or as revising existing data (*Revised*). *(If necessary, attach a separate sheet.)*

Data Parameter	New	Revised	Data Source
SUBBASIN AREAS	☒	☐	FOUNTIAN HILLS/USGS MAPPING
LAG TIME, L, LCA, SLOPE, KN	☒	☐	FOUNTIAN HILLS/USGS MAPPING
GREEN + AMPT PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
ROUTING REACH PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
	☐	☐	

- Data source can be from a Federal, State, or local government agency, or from a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source *(i.e., certified statement, report, bibliographical reference to a published document)*. In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

☐ Statistical Analysis of Gage Records (*use Attachment A*)

☐ Regional Regression Equations *(use Attachment B)*

☒ Precipitation/Runoff Model *(use Attachment C)*

☐ Other *(specify; attach backup computations and supporting data)* _____

ATTACHMENT A: STATISTICAL ANALYSIS OF GAGE RECORDS

Gaging Station: N/A

Gage Location (latitude and longitude): _____

	FIS:	Revised:
1. Number of years of data	_____	_____
Systematic	_____	_____
Historical	_____	_____
2. Homogeneous data	☐ Yes ☐ No	☐ Yes ☐ No
3. Data adjustments	☐ Yes ☐ No	☐ Yes ☐ No
4. Number of high outliers	_____	_____
Low outliers	_____	_____
Zero events	_____	_____
5. Generalized skew	_____	_____
6. Station skew	_____	_____
7. Adopted skew	_____	_____
8. Probability distribution used (justify if log-Pearson III was not used)	_____	_____
9. Transfer equations to ungaged sites		☐ Yes ☐ No

If yes, specify method

_____

_____

_____

10. Expected probability*	☐ Yes ☐ No
11. Comparison of results with other analyses	☐ Yes ☐ No

If yes, describe comparison

_____

_____

_____

*FEMA does not accept expected probability analyses for the purpose of reflecting flood hazard information in a FIS.

If any data is not available, indicate by N/A.

Attach analysis including plot of flood frequency curve.

1. Bibliographical Reference: N/A

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. Gaged or ungaged stream: _____

3. Hydrologic region(s): _____
Attach backup map.

4. Provide parameters, values, and source of data used to define parameters.

		FIS:		Revised:	
5.	Urbanized conditions calculations	☐ Yes	☐ No	☐ Yes	☐ No
6	Percent of watershed urbanization	_____		_____	
7.	Is the watershed controlled?	☐ Yes	☐ No	☐ Yes	☐ No
8.	Comparison with other analyses	☐ Yes	☐ No	☐ Yes	☐ No

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

		FIS:	Revised
1.	Method or model used:	N/A	HEC-1
	Version:	N/A	4.0.1E
	Date:	N/A	MAY 1991
2.	Source of rainfall depth:	N/A	NOAA ATLAS 2
3.	Source of rainfall distribution:	N/A	FCDMC HYDROLOGIC MANUAL
4.	Rainfall duration:	N/A	6+24 HR.
5.	Areal adjustment to precipitation (%):	N/A	DEPENDS UPON SUBBASIN AREA
6.	Maximum overland flow length	N/A	.861 mi. TABLE 5-7 (202H)
7.	Hydrograph development method:	N/A	CLARK UNIT GRAPH
8.	Loss rate method:	N/A	GREEN - Ampt.
	Source of soils information:	N/A	SCS SOIL SURVEY
	Source of land use information	N/A	AERIAL PHOTOS
9.	Channel routing method:	N/A	NORMAL DEPTH
10.	Reservoir routing:	☐ Yes ☐ No	☒ Yes ☐ No
11.	Baseflow considerations:	☐ Yes ☐ No	☐ Yes ☒ No

If yes, explain how baseflow was determined:

12.	Snowmelt considerations:	☐ Yes ☐ No	☐ Yes ☒ No
13.	Model calibration:	☐ Yes ☐ No	☒ Yes ☐ No

If yes, explain how calibration was performed The model was calibrated by comparing USGS gage data, runoff volume checks upstream from dams, results with estimates using a USGS regional regression eqn., and modeled results with results of other M.C. studies. (Section 3.2.3 pg 3-61)

14. Future land use condition: ☐ Yes ☒ No

If yes, explain why

NOTE: FEMA policy is to base flooding on existing conditions.
If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

See the Hydrology Report

ATTACHMENT D: CONFIDENCE LIMITS EVALUATION

Stream: N/A

Select one location for Confidence Limits Evaluation (*describe location*): _____

_____

Discharges for selected location:

Exceedance Probability		FIS	Revised
10%	(10-year)	_____ cfs	_____ cfs
2%	(50-year)	_____ cfs	_____ cfs
1%	(100-year)	_____ cfs	_____ cfs
0.2%	(500-year)	_____ cfs	_____ cfs

1% (100-year) Flood Confidence Intervals

90% Confidence Interval: 5% limit _____ cfs

95% limit _____ cfs

50% Confidence Interval: 25% limit _____ cfs

75% limit _____ cfs

If the value of the 100-year frequency flood in the FIS is beyond the 50% confidence interval but within the 90% confidence interval, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No

An example of confidence limits analysis can be found in Appendix 9 of Bulletin 17B.

Attach Confidence Limits Analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ESCALANTE WASH
(One form for each flooding source)

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCO 92-04

1. REACH TO BE REVISED

Downstream limit: BORDER AT FT. MCDOWELL INDIAN RESERVATION

Upstream limit: MCDOWELL MOUNTAIN ROAD

2. EFFECTIVE FIS

☒ Not studied

☐ Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

☐ Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

☐ Floodway delineated

Downstream limit of Floodway _____

Upstream limit of Floodway _____

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

☒ Not studied in FIS

☐ Improved hydrologic data/analysis. Explain: _____

☐ Improved hydraulic analysis. Explain: _____

☐ Flood control structure. Explain: _____

☐ Other. Explain: _____

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete 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 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 for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model — Natural ☐ Floodway ☐

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 requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor'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 ☐ Floodway ☐

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 ☐ Floodway ☐

The duplicate effective or corrected 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 or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☐

The existing or pre-project conditions model *(or duplicate effective 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 proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. — Natural ☒ Floodway ☒

6. Hydraulic Analyses (Only if Hydraulic Models are not developed) — See the Hydraulics Report

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS *(from model used to revise 100-year water surface elevation)*

1. Discharges:

	Upstream Limit	Downstream Limit
10-year		
50-year		
100-year	1,410 cfs	1,410 cfs
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined

CRITICAL DEPTH

3. Give range of friction loss coefficients (*Manning's "N"*) Channel ..... 0.050 – 0.069

Overbanks ..... 0.060 – 0.090

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

Location	FIS	Revised
N/A		

Explain: NEW STUDY

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

The cross-sections were determined photogrammetrically by the aerial mapping company. All cross-sections are stationed from left to right looking downstream with the thalweg set at station 10,000.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☒ Yes ☐ No If no, explain why not:

6. Explain how reach lengths for channel and overbanks were determined:

Channel reach lengths were measured along the thalweg and the overbank reach lengths were measured along the anticipated path of the center of mass of the overbank flow.

5. RESULTS ***(from model used to revise 100-year water surface elevations)***

1. Do the results indicate:

a. Water surface elevations higher than end points of cross sections? ☐ Yes ☒ No

b. Supercritical depth? ☐ Yes ☒ No

c. Critical depth? ☒ Yes ☐ No

d. Other unique situations ☐ Yes ☒ No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.
For those cross sections where the HEC-2 model defaulted to critical depth the critical depth water surface elevations are plotted on the profiles and maps.

2. What is the maximum change in energy gradient between cross-sections? 9.16

Specify location Section # 2.882

3. What is the distance between the cross-sections in 2 above? 542 ft.

4. What is the maximum distance between cross-sections? 542 ft.

Specify location Section # 2.882

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? 1 foot

b. What is the maximum surcharge for the revised conditions? N/A (NEW STUDY) foot

Specify location

c. What is the maximum velocity? 10.18 fps

Specify location Section # 2.519

d. Are there any negeative surcharge values at any cross-section? ☐ Yes ☒ No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain:

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? ..... ☐ Yes ☒ No

If Yes, explain:

7. Do 100-year water surface elevations increase at any location? ..... ☐ Yes ☐ No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

N/A NEW STUDY

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

N/A NEW STUDY

A. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section_____ within_____feet *(vertical)* and upstream of the project at cross section_____within_____feet *(vertical)*.

N/A NEW STUDY

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section_____within_____feet *(vertical)* and upstream of the project at cross section_____ within_____feet *(vertical)*.

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

THE PROFILES ARE LOCATED IN THE HYDRAULIC ANALYSIS NOTEBOOK.

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

Proceed to Riverine /Coastal Mapping Form

FEDERAL EMERGENCY MANAGMENT AGENCY

WATER SURFACE ELEVATION CHECK

N/A
NEW STUDY

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
MARICOPA COUNTY, ARIZONA	ESCALANTE WASH	Fountain Hills North Floodplain Delineation Study FCD 92-04

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]

COMMENTS:

1-100-year (natural) Water Surface Elevation 2-Encroachment (floodway) Water Surface Elevation 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: ESCALANTE WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable)*:

		Included		
A.	Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☒ N/A
B.	Revised detailed 100- and 500-year floodplain boundaries	☐ Yes	☐ No	☒ N/A
C.	Revised 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
D.	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated	☒ Yes	☐ No	☐ N/A
E.	Stream alignments, road and dam alignments	☒ Yes	☐ No	☐ N/A
F.	Current community boundaries	☒ Yes	☐ No	☐ N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map	☐ Yes	☐ No	☒ N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
I.	The requestor's property boundaries and community easements	☐ Yes	☐ No	☒ N/A
J.	The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
K.	Location and description of reference marks	☒ Yes	☐ No	☐ N/A
L.	Vertical datum (example: NGVD, ~~NAVD etc.~~) NGVD 1929	☒ Yes	☐ No	☐ N/A
M.	Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
N.	Location and alignment of all coastal transects used to revise the coastal analyses	☐ Yes	☐ No	☒ N/A

If any of the items above are marked no or N/A, please explain: THIS IS THE FIRST STUDY DONE IN FOUNTAIN HILLS, THEREFORE THERE ARE NO EXISTING FLOODPLAIN AND FLOODWAY DELINEATIONS.

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? AERIAL MAPPING AUGUST 1991

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS N/A scale N/A Contour interval
   b. Revision Request 1" = 200' scale 2 FOOT Contour interval

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

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.

   Attach additional pages if needed.

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's? ☐ Yes ☐ No

If yes, please give the location of shift or increase and an explanation for the increase.

N/A This is the first study of the area, therefore, there isn't an existing 100-year floodplain delineation.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? ..... ☐ Yes ☐ No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase? _____

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? ..... ☐ Yes ☐ No

If yes, explain:

N/A This is the first study of the area, therefore, there isn't an existing floodway delineation.

7. If a V- zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? N/A ☐ Yes ☐ No

If no, explain:

8. Manual or digital map submission:

☒ Manual

☐ Digital

Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

IF REQUESTED A DIGITIZED MAP CAN BE SUPPLIED.

2. EARTH FILL PLACEMENT

1. The fill is: ☐ Existing ☐ Proposed N/A

2. Has fill been/will be placed in the regulatory floodway? ..... ☐ Yes ☒ No
   If yes, please attach completed Riverine Hydraulic Analysis Form.

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_____

   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, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? N/A ☐ 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.

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM**	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

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.

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*
   - ☐ Physical change
     - ☐ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☐ Improved data
   - ☐ Floodway revision
   - ☒ Other New Study

   Explain This is the first delineation of this watercourse

2. Flooding Source: Legend Wash
3. Project Name/Identifier: Fountain Hills North Floodplain Delineation Study FCD 92-04
4. FEMA zone designations affected: X
   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy,City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
04013	Maricopa County Fountain Hills, Town	Maricopa	AZ	04013C	1750	9-4-91

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding
- ☒ Riverine
- ☐ Coastal
- ☐ Alluvial Fan
- ☐ Shallow Flooding *(e.g. Zones AO and AH)*
- ☐ Lakes

Affected by wind/wave action
- ☐ Yes
- ☐ No

Structures
- ☐ Channelization
- ☐ Levee/Floodwall
- ☐ Bridge/Culvert
- ☐ Dam
- ☐ Coastal
- ☐ Fill
- ☐ Pump Station
- ☐ None
- ☐ Channel Relocation
- ☐ Excavation
- ☐ Other *(describe)*

Disciplines*
- ☐ Water Resources
  - ☒ Hydrology
  - ☒ Hydraulics
  - ☐ Sediment Transport
  - ☐ Interior Drainage
- ☐ Structural
- ☐ Geotechnical
- ☐ Land Surveying
- ☐ Other *(describe)*

☐ Other(describe)_____

*** Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☐ Yes ☒ No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM ☒ Yes ☐ No

   If yes, give reason: New study, this is the first delineation of this watercourse

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions. See attached articles and announcements

9. 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.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? ☐ Yes ☐ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☐ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (*or other surcharge limit if community or state has adopted more stringent criteria*)? ☐ Yes ☐ No

If the answer to either Items 1B or 2B is yes, please provide 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.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒ Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒ Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐ Yes ☐ No N/A New Study

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ (entity)

_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☐ has ☐ has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____
(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.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

_____a. CLOMR — A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*.

_____b. LOMR — A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. I Parts 60 and 65.)*

_X_c. PMR — A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. I, Parts 60 and 65.)*

_____d. Other: Describe_____

8. FORMS INCLUDED

17. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

• Hydrologic analysis for flooding source differs from that used to develop FIRM	☒ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine /Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☐ Bridge/Culvert Form (Form 7)
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☐ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. ☐ Yes ☐ No

Initial fee amount: $ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. ☐ Yes ☐ No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. ☒ Yes ☐ No

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

Ron Nesitt
Signature of Revision Requester

Ron Nesitt/Program Mgr. NFIP
Printed Name and Title of Revision Requester

Flood Control District of Maricopa Co.
Company Name

(602) 506-1501 1-29-97
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

Randy L Hanel, Town Engr.
Printed Name and Title of Community Official

Fountain Hills
Community Name

1-22-97
Date

Does this request impact any other communities? ☐ Yes ☐ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

11-22-95

No big problems in County floodplain study

If you've ever wondered what would happen in Fountain Hills in the event of a 100-year flood, Maricopa County has just completed a study that will tell you.

Representatives of Maricopa County Flood Control District were on hand for an open house at Town Hall on Thursday, Oct. 16. They were there to explain and answer questions concerning the Fountain Hills Flood Delineation Study.

The study defines the areas that would be inundated in the event of a 100-year storm and flood.

There was not a big turnout for the two-hour session, but a few residents dropped by to ask about their own particular concerns.

Town Engineer Randy Harrel said the study indicates no significant problems for individual homeowners. Some residents have property which lies within the flood area, but few if any structures are threatened.

One area of concern that town officials will look at is the Baptist Church on Saguaro Boulevard. In the event of a significant 100-year flooding event all of the church buildings and the parking lot would be under water. It is a low flat area which Nicklaus and Cypress washes flow into.

A Sanitary District pumping station adjacent to the church is apparently not within the flood plain.

Sanitary District Manager Ron Huber said no flood study was done when the pumping facility was constructed. But he said the pump building is significantly higher than the church buildings.

Huber also said that pump station is scheduled to be abandoned in the near future.

Harrel said the town will use the study to consider its options for protecting citizens and property during such a flood.

There are 26 street crossings the town wants to study further besides the area around the church, Harrel said. The options that may be considered would include culvert work and possibly diversion or containment structures.

Those further studies are to begin in the near future.

Nearly all of the area included in the 100-year flood plain will belong to the Town of Fountain Hills once the wash property transfer between the town and MCO Properties is completed in the near future.

Fountain Hills Vice Mayor Peg Tibbetts, center, discusses the county's floodplain study with Flood Control District representatives Ron Nevitt and Sandy Walchuk.

However, Harrel said the flood plain delineation will not significantly impact what the town may choose to do with the washes in the way of public use.

Harrel said no structures would be built in the washes, and measures can be taken to protect whatever facilities might be placed in the washes.

The Maricopa County Flood Control District has spent about two years on the study.

NOTICE OF REGULAR SESSION

OF THE

FOUNTAIN HILLS TOWN COUNCIL

WHEN: NOVEMBER 16, 1995

TIME: **6:30 P.M.

WHERE: TOWN HALL COUNCIL CHAMBERS

Pursuant to A.R.S. 38-431.02, notice is hereby given to the members of the Town Council of Fountain Hills and to the general public that the Town Council of Fountain Hills will hold a regular session open to the public on Thursday, November 16, 1995 at 6:30 p.m. in the Council Chambers of the Fountain Hills Town Hall, located at 16836 E. Palisades Blvd., Building C, Fountain Hills, Arizona.

*** Prior to the regularly scheduled Council meeting, the Flood Control District of Maricopa County and the Town of Fountain Hills Engineering Department will host an open public meeting presenting the results of the Fountain Hills Floodplain Delineation Studies. The public meeting will be held in the conference room from 4:00 to 6:30 p.m.*

RULES FOR ADDRESSING THE COUNCIL - ADOPTED 1/18/90

It is the Council's desire to hear public comment on agenda items. As it is important to maintain order during the meeting, please adhere to the following rules of order if you wish to speak:

1.) All citizens wishing to speak must first be recognized by the Mayor.
2.) The Mayor will not call for public comment on an item until after a motion has been made and seconded and the Council has had adequate opportunity to discuss the item.
3.) Please stand and state your name and address after being called on to speak.
4.) All comments must be directed to the Mayor.
5.) TIME LIMIT - 3 MINUTES PER PERSON PER ITEM.
6.) Statements should not be repetitive.
7.) Persons or groups wishing to make longer presentations, should see the Town Clerk prior to the meeting.

The agenda for the meeting is as follows:

1.) Meeting called to order, pledge to the flag, invocation and roll call.

Consent Agenda:

All items listed with an asterisk (*) are considered to be routine, non-controversial matters and will be enacted by one motion and one roll call vote of the Council. There will be no separate discussion of these items unless a Councilmember or member of the public so requests. If a Councilmember or member of the public wishes to discuss an item on the consent agenda, they may request so prior to the motion to accept the consent agenda. The item will be removed from the Consent Agenda and considered in its normal sequence on the agenda.

Open house Thursday on floodplain

A public open house will be held Thursday, Nov. 16, to review results of floodplain delineation studies performed in Fountain Hills.

The open house will be held from 4 to 6:30 p.m. at Town Hall's conference room.

Floodplain delineation involves developing detailed topographic maps to determine where water goes while incorporating the results of rainfall patterns to determine typical and peak amounts of runoff.

Along with extensive surveying and aerial mapping, drainage factors such as slope, vegetation, soil composition and land use are analyzed and included.

The studies will be used to better manage the floodplain to reduce or prevent flood damage and maintain the integrity of the floodplains.

Areas designated for further analysis in an upcoming area drainage master study also will be presented.

Results obtained in the north and south delineation studies will be displayed at the open house.

Representatives from the Flood Control District of Maricopa County, the Town of Fountain Hills' Engineering Department and the engineering consulting firms will be available to discuss the results and answer questions.

PUBLIC NOTICE
YOUR RIGHT TO KNOW

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90 448), as amended, and the Flood Disaster Protection Act of 1973 (p.L. 93-, is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by CK Engineers and George V. Sabel Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed or which are likely to be developed and to determine flood elevations for those areas. Flood elevations will be used by Maricopa County to carry out floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published FH Times 1/13,1/20/93.

AFFIDAVIT OF PUBLICATION

The Times
OF FOUNTAIN HILLS AND RIO VERDE, ARIZONA

A publication of Western States Publishers, Inc.

STATE OF ARIZONA
COUNTY OF MARICOPA } ss.

L. ALAN CRUIKSHANK, being first duly sworn, upon oath deposes and says: That he is the publisher of

THE TIMES OF FOUNTAIN HILLS AND RIO VERDE

a newspaper of general circulation in the County of Maricopa and the State of Arizona, published at Fountain Hills, Arizona, and that the copy hereto attached is a true copy of the advertisement as published weekly in The Times of Fountain Hills and Rio Verde on the following dates:

Jan. 13, 1993
Jan 20, 1993

Sworn to before me this

23 day of

February A.D. 19 93

Karen Kirkendoll
Notary Public

OFFICIAL SEAL
KAREN KIRKENDOLL
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My comm. expires May 14, 1993

AFFIDAVIT OF PUBLICATION

INVOICE NO. 93008

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by AGK Engineers and George V. Sabol Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed and to determine flood elevations for those areas. Flood elevations will be used by Maricopa County to carry out floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study, so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Story, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published: Arizona Republic, January 13, 20, 1993.

The Arizona Republic/The Phoenix Gazette

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

JOAN LOHR, being first duly sworn, upon oath deposes and says: That she is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic and The Phoenix Gazette, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

~~The Arizona Republic~~
The Phoenix Gazette

JANUARY 13, 20, 1993

Joan Lohr

Sworn to before me this

25TH day of

JANUARY 93 A.D. 19

OFFICIAL SEAL
MARY LEE BOOHER
NOTARY PUBLIC STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1995

Mary Lee Booher
Notary Public

Meeting on flood plain plan

Find out where flood waters go on Dec. 17

An open house to inform Fountain Hills residents of floodplain delineation studies being performed on over 30 washes flowing through the community will be held on Thursday, Dec. 17.

The meeting will be held from 5 to 8 p.m. at the Town Hall Conference Room, 16836 E. Palisades Blvd.

The public is invited to come by the Town Hall anytime during the three-hour open house to share their experience and observations of local flooding and hear details about the studies.

Details will include how the study is conducted, what kind of information is being gathered and how the information will be used.

Mapping floodplains involves developing detailed topographic maps to determine where water goes and studying rainfall patterns to determine typical amounts of runoff. The studies and resulting maps will be used to better manage the floodplain so as to reduce or prevent flood damage and maintain the integrity of the floodplains.

Extensive surveying and aerial mapping is involved in the studies, but other factors influencing drainage also must be considered, including soil composition, slope and vegetation and land use.

The Fountain Hills studies are expected to take 12 months to complete, after which time a second open house will be held to inform residents of the results of the studies.

Questions or additional information regarding the studies can be obtained by writing or calling Jim Phipps or Tim Murphy of the Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone 506-1501, or Randy Harrel, town engineer, Town of Fountain Hills, 16836 E. Palisades Blvd, Fountain Hills, AZ 85268, telephone 837-2003.

Audit tops Sanitary agenda

The annual audit report will be the major topic on the agenda for the Sanitary District board of directors when it meets Thursday, Dec. 10.

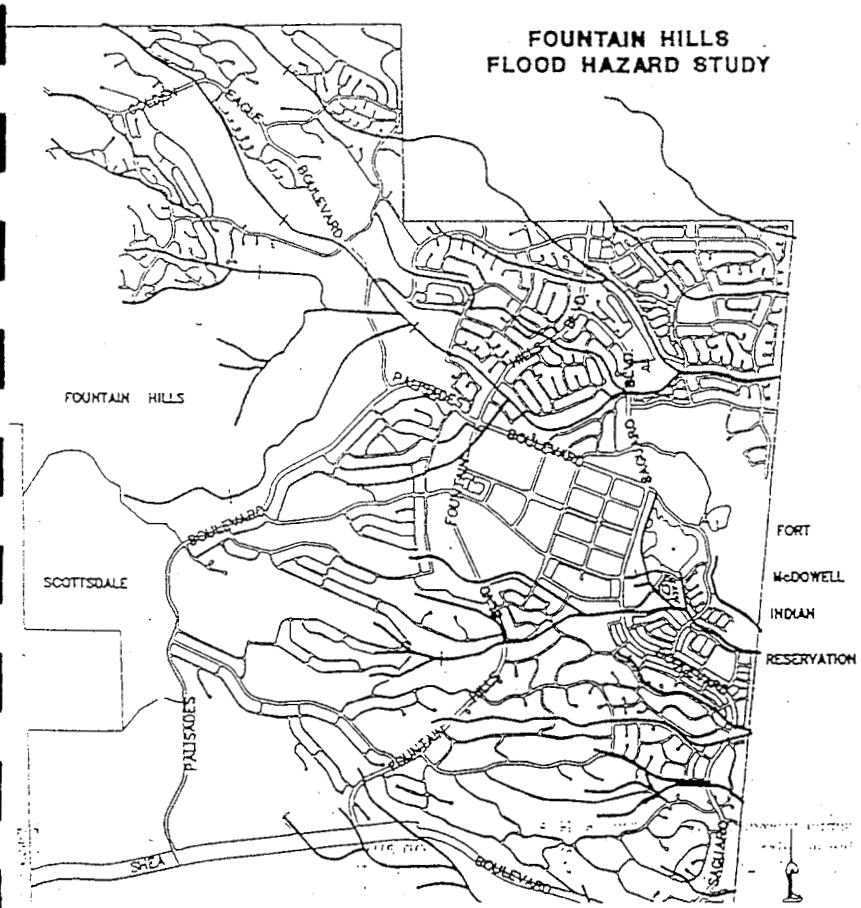
The report is a routine document prepared each year, according to District Manager Ron Huber.

The board will also select a new chairman for the coming calendar year.

The job of chairman has simply rotated under the current board, and that being the case Director Dennis Regeski will be leading the board for the next year. Director Bruce Hansen is the outgoing chairman.

Huber said monthly staff reports will also be presented at the meeting, and he has a few carryover items to update the board on.

Doesn't Your Single Larg
INVESTMEN
Deserve a second opinion?
LaCosta Construction Inc.
designers & builders
of
LUXURY LA COSTA HOMES
"The Art of Construction"
837-1640



When you need to sell your
call
erica
Fountain Hills #1 Top Pr
Over 100 Opened & Closed Transactions Sid
(So Far)
Watch... erica west
Channel 10 NEWS
"Real Estate Expert"
...her team of "SPECIALIST
are WORKING FOR YOU
Transaction Specialist
Larraine LaGiglia.....
daily monitors the progress of each of my ESCROWS and LISTINGS. She is in constant contact with my LISTERS & concentrates on finding BUYERS for my listings.

Systems Specialists
Dana West.....
implements the unique MARKETING SYSTEMS designed to get my L SOLD quickly! She keeps my LISTERS advised of the progress on their
Administration Specialist
Carol Talty.....
handles all mailings/brochures and assists with special projects.

The Times of Fountain Hills

12-9-92

FEDERAL EMERGENCY MANAGEMENT AGENCY **CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average . 23 hour 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.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Hydrology, Hydraulics
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 25 years experience in the expertise listed above.
4. I have ☒ prepared ☒ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
   Hydrologic analysis and floodplain delineation
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.
   b. ☐ Compared plans and specifications with as-built survey information.
   c. ☐ Examined plans and specifications and compared with completed projects.
   d. ☐ Other _____
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: George V. Sabol
(please print or type)

Title: Sr. Associate, SFC Engineering Company
(please print or type)

Registration No. 17928 Expiration Date: 30 June 1998

State Arizona

Type of License Professional Engineer

Signature

23 January 1997
Date

Registered Professional Engineer (Civil) CERTIFICATE NO. 17928 GEORGE V. SABOL Date Signed 23 Jan ARIZONA, U.S.A.

Seal
(Optional)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply.

FEDERAL EMERGENCY MANAGEMENT AGENCY **HYDROLOGIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.67 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: LEGEND WASH
(One form for each flooding source)

Project Name /Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. HYDROLOGIC ANALYSIS IN FIS

☐ Approximate study stream (Zone A)
☒ Detailed study stream (briefly explain methodology) The analysis was performed using HEC-1.

2. REASON FOR NEW HYDROLOGIC ANALYSIS

☒ No existing analysis
☐ Improved data *(see data revision on page 3)*
☐ Changed physical conditions of watershed *(explain)* _____

☐ Alternative methodology *(justify why the revised model is better than model used in the effective FIS)*

☐ Evaluation of proposed conditions (CLOMRs only) (explain) _____

☐ Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100 - and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

☒ Approval of hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., Flood Control District of Maricopa County)
Attach evidence of approval.

☐ Approval of the hydrologic analysis is not required by any local, State, or Federal Agency.

4. REVIEW OF RESULTS

Stream: LEGEND WASH

Comparison of 100-year Discharges

Location:	Drainage area (Sq mi.)	FIS (cfs):	Revised (cfs):
AT END OF TULIP WASH	.37	N/A	940
BELOW FOUNTAIN HILLS BLVD.	.52	N/A	1120
ABOVE CONFLUENCE WITH ASHBROOK WASH	.63	N/A	1120

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review.

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made *(attach separate sheet if necessary)*

N/A

ATTACH A COMPLETED REVIEW OF RESULTS PAGE FOR EACH FLOODING SOURCE.

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS *(i.e. no changed hydraulic conditions)*? ☐ Yes ☒ No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No N/A New study

FEMA does not normally revise NFIP maps solely due to insignificant flow changes where changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? ☐ Yes ☒ No

If yes, provide the following:

Location along flooding source: _____

Maximum peak discharge: _____ cfs

Second highest peak discharge: _____ cfs

Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site *(along flooding source or similar watershed; specify)*

UNAVAILABLE

Gaging Station: _____

Drainage area at gage: _____ mi^2

Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as new data (*New*) or as revising existing data (*Revised*). *(If necessary, attach a separate sheet.)*

Data Parameter	New	Revised	Data Source
SUBBASIN AREAS	☒	☐	FOUNTIAN HILLS/USGS MAPPING
LAG TIME, L, LCA, SLOPE, KN	☒	☐	FOUNTIAN HILLS/USGS MAPPING
GREEN + AMPT PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
ROUTING REACH PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
	☐	☐	

- Data source can be from a Federal, State, or local government agency, or from a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source *(i.e., certified statement, report, bibliographical reference to a published document)*. In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

☐ Statistical Analysis of Gage Records (*use Attachment A*)

☐ Regional Regression Equations *(use Attachment B)*

☒ Precipitation/Runoff Model *(use Attachment C)*

☐ Other *(specify; attach backup computations and supporting data)* _____

ATTACHMENT A: STATISTICAL ANALYSIS OF GAGE RECORDS

Gaging Station: N/A

Gage Location (latitude and longitude): _____

	FIS:	Revised:
1. Number of years of data	_____	_____
Systematic	_____	_____
Historical	_____	_____
2. Homogeneous data	☐ Yes ☐ No	☐ Yes ☐ No
3. Data adjustments	☐ Yes ☐ No	☐ Yes ☐ No
4. Number of high outliers	_____	_____
Low outliers	_____	_____
Zero events	_____	_____
5. Generalized skew	_____	_____
6. Station skew	_____	_____
7. Adopted skew	_____	_____
8. Probability distribution used (justify if log-Pearson III was not used)	_____	_____
9. Transfer equations to ungaged sites		☐ Yes ☐ No

If yes, specify method

_____

_____

_____

10. Expected probability* ☐ Yes ☐ No

11. Comparison of results with other analyses ☐ Yes ☐ No

If yes, describe comparison

_____

_____

_____

*FEMA does not accept expected probability analyses for the purpose of reflecting flood hazard information in a FIS.

If any data is not available, indicate by N/A.

Attach analysis including plot of flood frequency curve.

ATTACHMENT B: REGIONAL REGRESSION EQUATIONS

1. Bibliographical Reference: N/A

_____

_____

_____

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. Gaged or ungaged stream: _____

3. Hydrologic region(s): _____
   Attach backup map.

4. Provide parameters, values, and source of data used to define parameters.

_____

_____

_____

		FIS:		Revised:	
5.	Urbanized conditions calculations	☐ Yes	☐ No	☐ Yes	☐ No
6	Percent of watershed urbanization	_____		_____	
7.	Is the watershed controlled?	☐ Yes	☐ No	☐ Yes	☐ No
8.	Comparison with other analyses	☐ Yes	☐ No	☐ Yes	☐ No

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

_____

_____

_____

_____

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

		FIS:	Revised
1.	Method or model used:	N/A	HEC-1
	Version:	N/A	4.0.1E
	Date:	N/A	MAY 1991
2.	Source of rainfall depth:	N/A	NOAA ATLAS 2
3.	Source of rainfall distribution:	N/A	FCDMC HYDROLOGIC MANUAL
4.	Rainfall duration:	N/A	6+24 HR.
5.	Areal adjustment to precipitation (%):	N/A	DEPENDS UPON SUBBASIN AREA
6.	Maximum overland flow length	N/A	.770mi. TABLE 5-7 (211-F)
7.	Hydrograph development method:	N/A	CLARK UNIT GRAPH
8.	Loss rate method:	N/A	GREEN - Ampt.
	Source of soils information:	N/A	SCS SOIL SURVEY
	Source of land use information	N/A	AERIAL PHOTOS
9.	Channel routing method:	N/A	NORMAL DEPTH
10.	Reservoir routing:	☐ Yes ☐ No	☒ Yes ☐ No
11.	Baseflow considerations:	☐ Yes ☐ No	☐ Yes ☒ No

If yes, explain how baseflow was determined:

12. Snowmelt considerations: ☐ Yes ☐ No ☐ Yes ☒ No

13. Model calibration: ☐ Yes ☐ No ☒ Yes ☐ No

If yes, explain how calibration was performed The model was calibrated by comparing USGS gage data, runoff volume checks upstream from dams, results with estimates using a USGS regional regression eqn., and modeled results with results of other M.C. studies (Section 3.2.3 pg 3-61)

14. Future land use condition: ☐ Yes ☒ No

If yes, explain why

NOTE: FEMA policy is to base flooding on existing conditions.
If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

See the Hydrology Report

ATTACHMENT D: CONFIDENCE LIMITS EVALUATION

Stream: N/A

Select one location for Confidence Limits Evaluation (*describe location*): _____

_____

Discharges for selected location:

Exceedance Probability		FIS	Revised
10%	(10-year)	_____ cfs	_____ cfs
2%	(50-year)	_____ cfs	_____ cfs
1%	(100-year)	_____ cfs	_____ cfs
0.2%	(500-year)	_____ cfs	_____ cfs

1% (100-year) Flood Confidence Intervals

90% Confidence Interval: 5% limit _____ cfs

95% limit _____ cfs

50% Confidence Interval: 25% limit _____ cfs

75% limit _____ cfs

If the value of the 100-year frequency flood in the FIS is beyond the 50% confidence interval but within the 90% confidence interval, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No

An example of confidence limits analysis can be found in Appendix 9 of Bulletin 17B.

Attach Confidence Limits Analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: LEGEND WASH
(One form for each flooding source)

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. REACH TO BE REVISED

Downstream limit: CONFLUENCE WITH ASHBROOK WASH

Upstream limit: 300' BELOW HAMPSTEAD DRIVE

2. EFFECTIVE FIS

☒ Not studied

☐ Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

☐ Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

☐ Floodway delineated

Downstream limit of Floodway _____

Upstream limit of Floodway _____

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

☒ Not studied in FIS

☐ Improved hydrologic data/analysis. Explain: _____

☐ Improved hydraulic analysis. Explain: _____

☐ Flood control structure. Explain: _____

☐ Other. Explain: _____

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete 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 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 for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model — Natural ☐ Floodway ☐

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 requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor'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 ☐ Floodway ☐

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 ☐ Floodway ☐

The duplicate effective or corrected 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 or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☐

The existing or pre-project conditions model *(or duplicate effective 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 proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. — Natural ☐ Floodway ☐

6. Hydraulic Analyses (Only if Hydraulic Models are not developed)

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS *(from model used to revise 100-year water surface elevation)*

1. Discharges:

	Upstream Limit	Downstream Limit
10-year		
50-year		
100-year	940 cfs	1120 cfs
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined

CRITICAL DEPTH

3. Give range of friction loss coefficients (*Manning's "N"*) Channel ..... .045 - .125

Overbanks ..... .060 - .120

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

Location	FIS	Revised
N/A		

Explain: NEW STUDY

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

The cross-sections were determined photogrammetrically by the aerial mapping company. All cross-sections are stationed from left to right looking downstream with the thalweg set at station 10,000.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☒ Yes ☐ No If no, explain why not:

6. Explain how reach lengths for channel and overbanks were determined:

Channel reach lengths were measured along the thalweg and the overbank reach lengths were measured along the anticipated path of the center of mass of the overbank flow.

5. RESULTS *(from model used to revise 100-year water surface elevations)*

1. Do the results indicate:

a. Water surface elevations higher than end points of cross sections? ☐ Yes ☒ No

b. Supercritical depth? ☐ Yes ☒ No

c. Critical depth? ☒ Yes ☐ No

d. Other unique situations ☐ Yes ☒ No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.

For those cross-sections where the HEC-2 model defaulted to critical depth the critical depth water surface elevations are plotted on the profiles and maps.

2. What is the maximum change in energy gradient between cross-sections? 12.5

Specify location SECNO 0.67

3. What is the distance between the cross-sections in 2 above? 504.9

4. What is the maximum distance between cross-sections? 504.9

Specify location SECNO 0.67

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? 1 foot

b. What is the maximum surcharge for the revised conditions? N/A NEW STUDY foot

Specify location

c. What is the maximum velocity? 10.16 fps

Specify location SECNO 0.94

d. Are there any negeative surcharge values at any cross-section? ☐ Yes ☒ No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain:

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? ..... ☐ Yes ☒ No

If Yes, explain:

7. Do 100-year water surface elevations increase at any location? ..... ☐ Yes ☐ No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

N/A NEW STUDY

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

N/A NEW STUDY

A. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section_____ within_____feet *(vertical)* and upstream of the project at cross section_____within_____feet *(vertical)*.

N/A NEW STUDY

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section_____within_____feet *(vertical)* and upstream of the project at cross section_____ within_____feet *(vertical)*.

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

The profiles are located in the hydraulic analysis notebook.

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

Proceed to Riverine /Coastal Mapping Form

FEDERAL EMERGENCY MANAGMENT AGENCY
WATER SURFACE ELEVATION CHECK

N/A NEW STUDY

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
MARICOPA COUNTY, ARIZONA	LEGEND WASH	FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]

COMMENTS:

1-100-year (natural) Water Surface Elevation 2-Encroachment (floodway) Water Surface Elevation 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: LEGEND WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable)*:

		Included		
A.	Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☒ N/A
B.	Revised detailed 100- and 500-year floodplain boundaries	☐ Yes	☐ No	☒ N/A
C.	Revised 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
D.	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated	☒ Yes	☐ No	☐ N/A
E.	Stream alignments, road and dam alignments	☒ Yes	☐ No	☐ N/A
F.	Current community boundaries	☒ Yes	☐ No	☐ N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map	☐ Yes	☐ No	☒ N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
I.	The requestor's property boundaries and community easements	☐ Yes	☐ No	☒ N/A
J.	The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
K.	Location and description of reference marks	☒ Yes	☐ No	☐ N/A
L.	Vertical datum (example: NGVD, ~~NAVD etc.~~) NGVD 1929	☒ Yes	☐ No	☐ N/A
M.	Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
N.	Location and alignment of all coastal transects used to revise the coastal analyses	☐ Yes	☐ No	☒ N/A

If any of the items above are marked no or N/A, please explain: THIS IS THE FIRST STUDY DONE IN FOUNTAIN HILLS, THEREFORE THERE ARE NO EXISTING FLOODPLAIN AND FLOODWAY DELINEATIONS.

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? AERIAL MAPPING AUGUST 1991

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS N/A scale N/A Contour interval
   b. Revision Request 1" = 200' scale 2 FOOT Contour interval

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

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.

   Attach additional pages if needed.

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's? ☐ Yes ☐ No

If yes, please give the location of shift or increase and an explanation for the increase.

N/A This is the first study of the area, therefore, there isn't an existing 100-year floodplain delineation.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? ..... ☐ Yes ☐ No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase? _____

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? ..... ☐ Yes ☐ No

If yes, explain:

N/A This is the first study of the area, therefore, there isn't an existing floodway delineation.

7. If a V- zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? N/A ☐ Yes ☐ No

If no, explain:

8. Manual or digital map submission:

☒ Manual

☐ Digital

Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

IF REQUESTED A DIGITIZED MAP CAN BE SUPPLIED.

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.

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_____

   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, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? N/A ☐ 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.

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*
   - ☐ Physical change
     - ☐ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☐ Improved data
   - ☐ Floodway revision
   - ☒ Other New Study

     Explain This is the first delineation of this watercourse
2. Flooding Source: Tulip Wash
3. Project Name/Identifier: Fountain Hills North Floodplain Delineation Study FCD 92-04
4. FEMA zone designations affected: X
   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy,City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
04013	Maricopa County	Maricopa	AZ	04013C	1750E	9-4-91
	Fountain Hills, Town					

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding
- ☒ Riverine
- ☐ Coastal
- ☐ Alluvial Fan
- ☐ Shallow Flooding *(e.g. Zones AO and AH)*
- ☐ Lakes

Affected by wind/wave action
- ☐ Yes
- ☒ No

Structures
- ☐ Channelization
- ☐ Levee/Floodwall
- ☐ Bridge/Culvert
- ☐ Dam
- ☐ Coastal
- ☐ Fill
- ☐ Pump Station
- ☐ None
- ☐ Channel Relocation
- ☐ Excavation
- ☐ Other *(describe)*

Disciplines*
- ☐ Water Resources
  - ☒ Hydrology
  - ☒ Hydraulics
  - ☐ Sediment Transport
  - ☐ Interior Drainage
- ☐ Structural
- ☐ Geotechnical
- ☐ Land Surveying
- ☐ Other *(describe)*

☐ Other(describe)

*** Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☐ Yes ☒ No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM ☒ Yes ☐ No

   If yes, give reason: New Study, this is the first delineation of this watercourse.

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions. See attached articles and announcements

9. 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.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? ☐ Yes ☐ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☐ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (*or other surcharge limit if community or state has adopted more stringent criteria*)? ☐Yes ☐No

If the answer to either Items 1B or 2B is yes, please provide 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.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐Yes ☐ No N/A New Study

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ (entity)

_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☐ has ☐ has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____
(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.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

_____a. CLOMR — A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*.

_____b. LOMR — A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. I Parts 60 and 65.)*

X c. PMR — A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. I, Parts 60 and 65.)*

_____d. Other: Describe_____

8. FORMS INCLUDED

17. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

• Hydrologic analysis for flooding source differs from that used to develop FIRM	☒ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine /Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☒ Bridge/Culvert Form (Form 7)
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☐ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. ☐ Yes ☐ No

Initial fee amount: $ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. ☐ Yes ☐ No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. ☒ Yes ☐ No

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

Ron Nesitt
Signature of Revision Requester

Ron Nesitt/Program Mgr. NFIP
Printed Name and Title of Revision Requester

Flood Control District of Maricopa Co.
Company Name

(602) 506-1501 1-29-97
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.

Randy L. Harrel
Signature of Community Official

Randy L. Harrel, Town Engr.
Printed Name and Title of Community Official

Fountain Hills
Community Name

1-22-97
Date

Does this request impact any other communities? ☐ Yes ☐ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

11-22-95

No big problems in County floodplain study

If you've ever wondered what would happen in Fountain Hills in the event of a 100-year flood, Maricopa County has just completed a study that will tell you.

Representatives of Maricopa County Flood Control District were on hand for an open house at Town Hall on Thursday, Oct. 16. They were there to explain and answer questions concerning the Fountain Hills Flood Delineation Study.

The study defines the areas that would be inundated in the event of a 100-year storm and flood.

There was not a big turnout for the two-hour session, but a few residents dropped by to ask about their own particular concerns.

Town Engineer Randy Harrel said the study indicates no significant problems for individual homeowners. Some residents have property which lies within the flood area, but few if any structures are threatened.

One area of concern that town officials will look at is the Baptist Church on Saguaro Boulevard. In the event of a significant 100-year flooding event all of the church buildings and the parking lot would be under water. It is a low flat area which Nicklaus and Cypress washes flow into.

A Sanitary District pumping station adjacent to the church is apparently not within the flood plain.

Sanitary District Manager Ron Huber said no flood study was done when the pumping facility was constructed. But he said the pump building is significantly higher than the church buildings.

Huber also said that pump station is scheduled to be abandoned in the near future.

Harrel said the town will use the study to consider its options for protecting citizens and property during such a flood.

There are 26 street crossings the town wants to study further besides the area around the church, Harrel said. The options that may be considered would include culvert work and possibly diversion or containment structures.

Those further studies are to begin in the near future.

Nearly all of the area included in the 100-year flood plain will belong to the Town of Fountain Hills once the wash property transfer between the town and MCO Properties is completed in the near future.

Fountain Hills Vice Mayor Peg Tibbetts, center, discusses the county's floodplain study with Flood Control District representatives Ron Nevitt and Sandy Walchuk.

However, Harrel said the flood plain delineation will not significantly impact what the town may choose to do with the washes in the way of public use.

Harrel said no structures would be built in the washes, and measures can be taken to protect whatever facilities might be placed in the washes.

The Maricopa County Flood Control District has spent about two years on the study.

P.2
11 07 '95 04:46PM FOUNTAIN HILLS, AZ

NOTICE OF REGULAR SESSION

OF THE

FOUNTAIN HILLS TOWN COUNCIL

WHEN: NOVEMBER 16, 1995

TIME: **6:30 P.M.

WHERE: TOWN HALL COUNCIL CHAMBERS

Pursuant to A.R.S. 38-431.02, notice is hereby given to the members of the Town Council of Fountain Hills and to the general public that the Town Council of Fountain Hills will hold a regular session open to the public on Thursday, November 16, 1995 at 6:30 p.m. in the Council Chambers of the Fountain Hills Town Hall, located at 16836 E. Palisades Blvd., Building C, Fountain Hills, Arizona.

*** Prior to the regularly scheduled Council meeting, the Flood Control District of Maricopa County and the Town of Fountain Hills Engineering Department will host an open public meeting presenting the results of the Fountain Hills Floodplain Delineation Studies. The public meeting will be held in the conference room from 4:00 to 6:30 p.m.*

RULES FOR ADDRESSING THE COUNCIL - ADOPTED 1/18/90

It is the Council's desire to hear public comment on agenda items. As it is important to maintain order during the meeting, please adhere to the following rules of order if you wish to speak:

1.) All citizens wishing to speak must first be recognized by the Mayor.
2.) The Mayor will not call for public comment on an item until after a motion has been made and seconded and the Council has had adequate opportunity to discuss the item.
3.) Please stand and state your name and address after being called on to speak.
4.) All comments must be directed to the Mayor.
5.) TIME LIMIT - 3 MINUTES PER PERSON PER ITEM.
6.) Statements should not be repetitive.
7.) Persons or groups wishing to make longer presentations, should see the Town Clerk prior to the meeting.

The agenda for the meeting is as follows:

1.) Meeting called to order, pledge to the flag, invocation and roll call.

Consent Agenda:

All items listed with an asterisk (*) are considered to be routine, non-controversial matters and will be enacted by one motion and one roll call vote of the Council. There will be no separate discussion of these items unless a Councilmember or member of the public so requests. If a Councilmember or member of the public wishes to discuss an item on the consent agenda, they may request so prior to the motion to accept the consent agenda. The item will be removed from the Consent Agenda and considered in its normal sequence on the agenda.

Open house Thursday on floodplain

A public open house will be held Thursday, Nov. 16, to review results of floodplain delineation studies performed in Fountain Hills.

The open house will be held from 4 to 6:30 p.m. at Town Hall's conference room.

Floodplain delineation involves developing detailed topographic maps to determine where water goes while incorporating the results of rainfall patterns to determine typical and peak amounts of runoff.

Along with extensive surveying and aerial mapping, drainage factors such as slope, vegetation, soil composition and land use are analyzed and included.

The studies will be used to better manage the floodplain to reduce or prevent flood damage and maintain the integrity of the floodplains.

Areas designated for further analysis in an upcoming area drainage master study also will be presented.

Results obtained in the north and south delineation studies will be displayed at the open house.

Representatives from the Flood Control District of Maricopa County, the Town of Fountain Hills' Engineering Department and the engineering consulting firms will be available to discuss the results and answer questions.

PUBLIC NOTICE
YOUR RIGHT TO KNOW

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90 448), as amended, and the Flood Disaster Protection Act of 1973 (p.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by K Engineers and George V. Sabel Consulting Engineers. The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed or which are likely to be developed and to determine flood elevations in those areas. Flood elevations will be used by Maricopa County to carry our floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Gray, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published FH Times 1/13,1/20/93.

AFFIDAVIT OF PUBLICATION

The Times
OF FOUNTAIN HILLS AND RIO VERDE, ARIZONA

A publication of Western States Publishers, Inc.

STATE OF ARIZONA
COUNTY OF MARICOPA } ss.

L. ALAN CRUIKSHANK, being first duly sworn, upon oath deposes and says: That he is the publisher of

THE TIMES OF FOUNTAIN HILLS AND RIO VERDE

a newspaper of general circulation in the County of Maricopa and the State of Arizona, published at Fountain Hills, Arizona, and that the copy hereto attached is a true copy of the advertisement as published weekly in The Times of Fountain Hills and Rio Verde on the following dates:

Jan 13, 1993
Jan 20, 1993

Sworn to before me this

23 day of

February A.D. 19 93

Karen Kirkendoll
Notary Public

OFFICIAL SEAL
KAREN KIRKENDOLL
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My comm. expires May 14, 1993

INVOICE NO. 93008

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by AGK Engineers and George V. Sabol Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed and to determine flood elevations for those areas. Flood elevations will be used by Maricopa County to carry out floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Story, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published: Arizona Republic, January 13, 20, 1993.

AFFIDAVIT OF PUBLICATION

The Arizona Republic/The Phoenix Gazette

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

JOAN LOHR, being first duly sworn, upon oath deposes and says: That she is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic and The Phoenix Gazette, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

~~The Arizona Republic~~
The Phoenix Gazette

JANUARY 13, 20, 1993

Joan Lohr

Sworn to before me this

25TH day of

JANUARY 93 A.D. 19

OFFICIAL SEAL
MARY LEE BOOHER
NOTARY PUBLIC STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1995

Mary Lee Booher
Notary Public

Meeting on flood plain plan

Find out where flood waters go on Dec. 17

An open house to inform Fountain Hills residents of floodplain delineation studies being performed over 30 washes flowing through the community will be held on Thursday, Dec. 17.

The meeting will be held from 5 to 8 p.m. at the Town Hall Conference Room, 16836 E. Palisades Blvd.

The public is invited to come by the Town Hall anytime during the three-hour open house to share their experience and observations of local flooding and hear details about the studies.

Details will include how the study is conducted, what kind of information is being gathered and how the information will be used.

Mapping floodplains involves developing detailed topographic maps to determine where water goes and studying rainfall patterns to determine typical amounts of runoff. The studies and resulting maps will be used to better manage the floodplain so as to reduce or prevent flood damage and maintain the integrity of the floodplains.

Extensive surveying and aerial mapping is involved in the studies, but other factors influencing drainage also must be considered, including soil composition, slope and vegetation and land use.

The Fountain Hills studies are expected to take 12 months to complete, after which time a second open house will be held to inform residents of the results of the studies.

Questions or additional information regarding the studies can be obtained by writing or calling Jim Phipps or Tim Murphy of the Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone 506-1501, or Randy Harrel, town engineer, Town of Fountain Hills, 16836 E. Palisades Blvd, Fountain Hills, AZ 85268, telephone 837-2003.

Audit tops Sanitary agenda

The annual audit report will be the major topic on the agenda for the Sanitary District board of directors when it meets Thursday, Dec. 10.

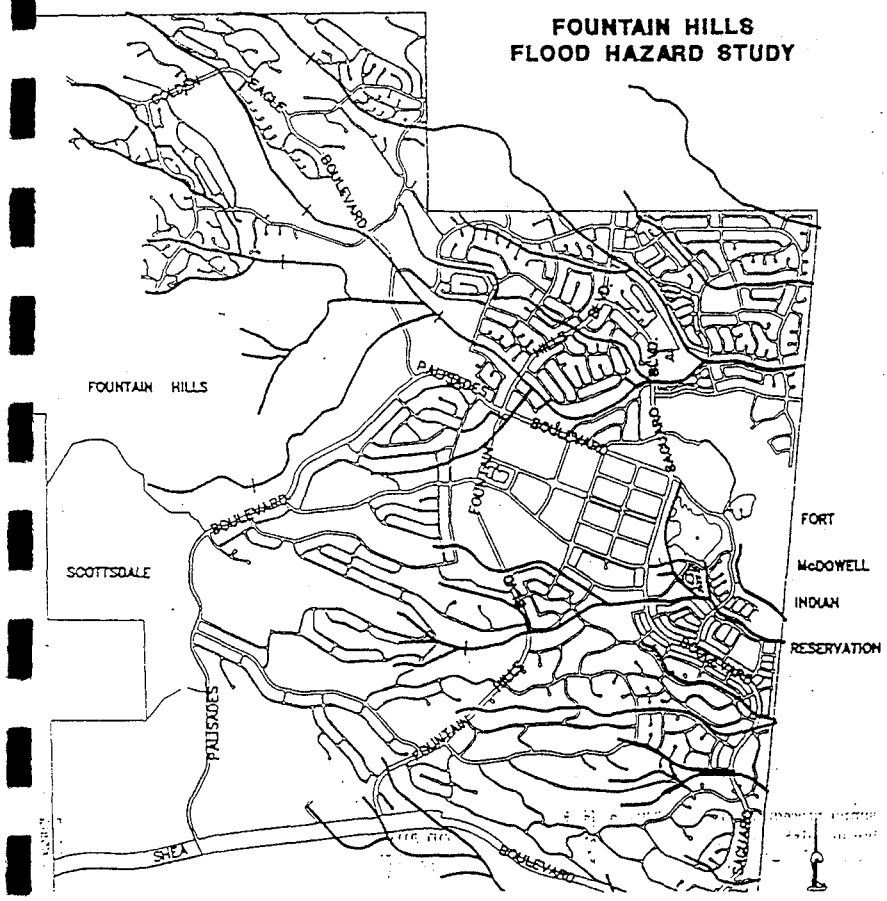
The report is a routine document prepared each year, according to District Manager Ron Huber.

The board will also select a new chairman for the coming calendar year.

The job of chairman has simply rotated under the current board, and that being the case Director Dennis Regeski will be leading the board for the next year. Director Bruce Hansen is the outgoing chairman.

Huber said monthly staff reports will also be presented at the meeting, and he has a few carryover items to update the board on.

Doesn't Your Single Large
INVESTMEN
Deserve a second opinion?
LaCosta Construction Inc.
designers & builders
of
LUXURY LA COSTA HOMES
"The Art of Construction"
837-1640



When you need to sell your
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Fountain Hills #1 Top Pro
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Watch... erica west
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are WORKING FOR YOU
Transaction Specialist
Larraine LaGiglia.....
daily monitors the progress of each of my ESCROWS and LISTINGS. She is in constant contact with my LISTERS & concentrates on finding BUYERS for my listings.

Systems Specialists
Dana West.....
implements the unique MARKETING SYSTEMS designed to get my L
SOLD quickly! She keeps my LISTERS advised of the progress on their
Administration Specialist
Carol Talty.....
handles all mailings/brochures and assists with special projects.

The Times of Fountain Hills

12-9-92

FEDERAL EMERGENCY MANAGEMENT AGENCY **CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average . 23 hour 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.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Hydrology, Hydraulics
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 25 years experience in the expertise listed above.
4. I have ☒ prepared ☒ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
   Hydrologic analysis and floodplain delineation
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.
   b. ☐ Compared plans and specifications with as-built survey information.
   c. ☐ Examined plans and specifications and compared with completed projects.
   d. ☐ Other _____
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: George V. Sabol
(please print or type)

Title: Sr. Associate, SFC Engineering Company
(please print or type)

Registration No. 17928 Expiration Date: 30 June 1998

State Arizona

Type of License Professional Engineer

Geo V Sabol
Signature

23 January 1997
Date

Registered Professional Engineer (Civil) CERTIFICATE NO. 17928 GEORGE V. SABOL Date Signed 23 Jan ARIZONA, U.S.A.

Seal
(Optional)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply.

FEDERAL EMERGENCY MANAGEMENT AGENCY **HYDROLOGIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.67 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.

Community Name: MARICOPA COUNTY, ARIZONA (The Town of Fountain Hills)

Flooding Source: TULIP WASH
(One form for each flooding source)

Project Name /Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. HYDROLOGIC ANALYSIS IN FIS

☐ Approximate study stream (Zone A)
☒ Detailed study stream (briefly explain methodology) The analysis was performed using HEC-1.

2. REASON FOR NEW HYDROLOGIC ANALYSIS

☒ No existing analysis
☐ Improved data *(see data revision on page 3)*
☐ Changed physical conditions of watershed *(explain)* _____

☐ Alternative methodology *(justify why the revised model is better than model used in the effective FIS)*

☐ Evaluation of proposed conditions (CLOMRs only) (explain) _____

☐ Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100 - and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

☒ Approval of hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., Flood Control District of Maricopa County)
Attach evidence of approval.

☐ Approval of the hydrologic analysis is not required by any local, State, or Federal Agency.

4. REVIEW OF RESULTS

Stream: TULIP WASH

Comparison of 100-year Discharges

Location:	Drainage area (Sq mi.)	FIS (cfs):	Revised (cfs):
AT HAMPSTEAD DRIVE	.37	N/A	640
AT GLENBROOK BLVD.	.25	N/A	460
500' ABOVE GLENBROOK BLVD.	.25	N/A	460

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review.

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made *(attach separate sheet if necessary)*

N/A

ATTACH A COMPLETED REVIEW OF RESULTS PAGE FOR EACH FLOODING SOURCE.

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS *(i.e. no changed hydraulic conditions)*? ☐ Yes ☒ No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No N/A New study

FEMA does not normally revise NFIP maps solely due to insignificant flow changes where changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? ☐ Yes ☒ No

If yes, provide the following:

Location along flooding source: _____

Maximum peak discharge: _____ cfs

Second highest peak discharge: _____ cfs

Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site *(along flooding source or similar watershed; specify)*

UNAVAILABLE

Gaging Station: _____

Drainage area at gage: _____ mi^2

Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as new data (*New*) or as revising existing data (*Revised*). *(If necessary, attach a separate sheet.)*

Data Parameter	New	Revised	Data Source
SUBBASIN AREAS	☒	☐	FOUNTIAN HILLS/USGS MAPPING
LAG TIME, L, LCA, SLOPE, K_N	☒	☐	FOUNTIAN HILLS/USGS MAPPING
GREEN + Ampt PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
ROUTING REACH PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
	☐	☐	

- Data source can be from a Federal, State, or local government agency, or from a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source *(i.e., certified statement, report, bibliographical reference to a published document)*. In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

☐ Statistical Analysis of Gage Records (*use Attachment A*)

☐ Regional Regression Equations *(use Attachment B)*

☒ Precipitation/Runoff Model *(use Attachment C)*

☐ Other *(specify; attach backup computations and supporting data)* _____

ATTACHMENT A: STATISTICAL ANALYSIS OF GAGE RECORDS

Gaging Station: N/A

Gage Location (latitude and longitude): _____

	FIS:	Revised:
1. Number of years of data	_____	_____
Systematic	_____	_____
Historical	_____	_____
2. Homogeneous data	☐ Yes ☐ No	☐ Yes ☐ No
3. Data adjustments	☐ Yes ☐ No	☐ Yes ☐ No
4. Number of high outliers	_____	_____
Low outliers	_____	_____
Zero events	_____	_____
5. Generalized skew	_____	_____
6. Station skew	_____	_____
7. Adopted skew	_____	_____
8. Probability distribution used (justify if log-Pearson III was not used)	_____	_____
9. Transfer equations to ungaged sites		☐ Yes ☐ No

If yes, specify method

_____

_____

_____

10. Expected probability* ☐ Yes ☐ No

11. Comparison of results with other analyses ☐ Yes ☐ No

If yes, describe comparison

_____

_____

_____

*FEMA does not accept expected probability analyses for the purpose of reflecting flood hazard information in a FIS.

If any data is not available, indicate by N/A.

Attach analysis including plot of flood frequency curve.

ATTACHMENT B: REGIONAL REGRESSION EQUATIONS

1. Bibliographical Reference: N/A

_____

_____

_____

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. Gaged or ungaged stream: _____

3. Hydrologic region(s): _____
   Attach backup map.

4. Provide parameters, values, and source of data used to define parameters.

_____

_____

_____

		FIS:		Revised:	
5.	Urbanized conditions calculations	☐ Yes	☐ No	☐ Yes	☐ No
6	Percent of watershed urbanization	_____		_____	
7.	Is the watershed controlled?	☐ Yes	☐ No	☐ Yes	☐ No
8.	Comparison with other analyses	☐ Yes	☐ No	☐ Yes	☐ No

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

_____

_____

_____

_____

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

		FIS:	Revised
1.	Method or model used:	N/A	HEC-1
	Version:	N/A	4.0.1E
	Date:	N/A	MAY 1991
2.	Source of rainfall depth:	N/A	NOAA ATLAS 2
3.	Source of rainfall distribution:	N/A	FCOMC HYDROLOGIC MANUAL
4.	Rainfall duration:	N/A	6+24 HR.
5.	Areal adjustment to precipitation (%):	N/A	DEPENDS UPON SUBBASIN AREA
6.	Maximum overland flow length	N/A	.820mi. TABLE 3-7 (211-A)
7.	Hydrograph development method:	N/A	CLARK UNIT GRAPH
8.	Loss rate method:	N/A	GREEN - Ampt.
	Source of soils information:	N/A	SCS SOIL SURVEY
	Source of land use information	N/A	AERIAL PHOTOS
9.	Channel routing method:	N/A	NORMAL DEPTH
10.	Reservoir routing:	☐ Yes ☐ No	☒ Yes ☐ No
11.	Baseflow considerations:	☐ Yes ☐ No	☐ Yes ☒ No

If yes, explain how baseflow was determined:

12. Snowmelt considerations: ☐ Yes ☐ No ☐ Yes ☒ No

13. Model calibration: ☐ Yes ☐ No ☒ Yes ☐ No

If yes, explain how calibration was performed The model was calibrated by comparing USGS gage data, runoff volume checks upstream from dams, results with estimates using a USGS regional regression eqn., and modeled results with results of other M.C. studies (Section 3.2.3 pg 3-61)

14. Future land use condition: ☐ Yes ☒ No

If yes, explain why

NOTE: FEMA policy is to base flooding on existing conditions.
If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

See Hydrology Report

ATTACHMENT D: CONFIDENCE LIMITS EVALUATION

Stream: N/A

Select one location for Confidence Limits Evaluation (*describe location*): _____

_____

Discharges for selected location:

Exceedance Probability		FIS	Revised
10%	(10-year)	_____ cfs	_____ cfs
2%	(50-year)	_____ cfs	_____ cfs
1%	(100-year)	_____ cfs	_____ cfs
0.2%	(500-year)	_____ cfs	_____ cfs

1% (100-year) Flood Confidence Intervals

90% Confidence Interval: 5% limit _____ cfs

95% limit _____ cfs

50% Confidence Interval: 25% limit _____ cfs

75% limit _____ cfs

If the value of the 100-year frequency flood in the FIS is beyond the 50% confidence interval but within the 90% confidence interval, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No

An example of confidence limits analysis can be found in Appendix 9 of Bulletin 17B.

Attach Confidence Limits Analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: TULIP WASH
(One form for each flooding source)

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. REACH TO BE REVISED

Downstream limit: 300' BELOW HAMPSTEAD DRIVE

Upstream limit: 500' ABOVE GLENBROOK BOULEVARD (SECNO 1.455)

2. EFFECTIVE FIS

☒ Not studied

☐ Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

☐ Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

☐ Floodway delineated

Downstream limit of Floodway _____

Upstream limit of Floodway _____

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

☒ Not studied in FIS

☐ Improved hydrologic data/analysis. Explain: _____

☐ Improved hydraulic analysis. Explain: _____

☐ Flood control structure. Explain: _____

☐ Other. Explain: _____

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete 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 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 for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model — Natural ☐ Floodway ☐

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 requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor'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 ☐ Floodway ☐

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 ☐ Floodway ☐

The duplicate effective or corrected 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 or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☐

The existing or pre-project conditions model *(or duplicate effective 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 proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. — Natural ☐ Floodway ☐

6. Hydraulic Analyses (Only if Hydraulic Models are not developed)

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

4. MODEL PARAMETERS *(from model used to revise 100-year water surface elevation)*

1. Discharges:

	Upstream Limit	Downstream Limit
10-year		
50-year		
100-year	460 cfs	640 cfs
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined

CRITICAL DEPTH

3. Give range of friction loss coefficients (*Manning's "N"*) Channel ..... .030 - .118

Overbanks ..... .040 - .102

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

Location	FIS	Revised
N/A		

Explain: NEW STUDY

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

The cross-sections were determined photogrammetrically by the aerial mapping company. All cross-sections are stationed from left to right looking downstream with the thalweg set at station 10,000.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☒ Yes ☐ No If no, explain why not:

6. Explain how reach lengths for channel and overbanks were determined:

Channel reach lengths were measured along the thalweg and overbank reach lengths were measured along the anticipated path of the center of mass of the overbank flow.

5. RESULTS *(from model used to revise 100-year water surface elevations)*

1. Do the results indicate:

a. Water surface elevations higher than end points of cross sections? ☐ Yes ☒ No

b. Supercritical depth? ☐ Yes ☒ No

c. Critical depth? ☒ Yes ☐ No

d. Other unique situations ☐ Yes ☒ No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.

FOR THOSE CROSS-SECTIONS WHERE THE HEC-2 MODEL DEFAULTED TO CRITICAL DEPTH, THE CRITICAL DEPTH WATER SURFACE ELEVATIONS ARE PLOTTED ON THE PROFILES AND MAPS.

2. What is the maximum change in energy gradient between cross-sections? 11.25

Specify location SECNO 1.10

3. What is the distance between the cross-sections in 2 above? 585

4. What is the maximum distance between cross-sections? 613

Specify location SECNO 1.33

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? 1 foot

b. What is the maximum surcharge for the revised conditions? N/A NEW STUDY foot

Specify location

c. What is the maximum velocity? 8.99 fps

Specify location SECNO 1.04

d. Are there any negeative surcharge values at any cross-section? ☐ Yes ☒ No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain:

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? ..... ☐ Yes ☒ No

If Yes, explain:

7. Do 100-year water surface elevations increase at any location? ..... ☐ Yes ☐ No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

N/A NEW STUDY

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

N/A NEW STUDY

A. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section_____ within_____feet *(vertical)* and upstream of the project at cross section_____within_____feet *(vertical)*.

N/A NEW STUDY

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section_____within_____feet *(vertical)* and upstream of the project at cross section_____ within_____feet *(vertical)*.

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

THE PROFILES ARE LOCATED IN THE HYDRAULIC ANALYSIS NOTEBOOK.

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

Proceed to Riverine /Coastal Mapping Form

FEDERAL EMERGENCY MANAGMENT AGENCY
WATER SURFACE ELEVATION CHECK

N/A NEW STUDY

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
MARICOPA COUNTY, ARIZONA	TULIP WASH	FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]

COMMENTS:

1-100-year (natural) Water Surface Elevation 2-Encroachment (floodway) Water Surface Elevation 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: TULIP WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable)*:

		Included		
A.	Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☒ N/A
B.	Revised detailed 100- and 500-year floodplain boundaries	☐ Yes	☐ No	☒ N/A
C.	Revised 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
D.	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated	☒ Yes	☐ No	☐ N/A
E.	Stream alignments, road and dam alignments	☒ Yes	☐ No	☐ N/A
F.	Current community boundaries	☒ Yes	☐ No	☐ N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map	☐ Yes	☐ No	☒ N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
I.	The requestor's property boundaries and community easements	☐ Yes	☐ No	☒ N/A
J.	The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
K.	Location and description of reference marks	☒ Yes	☐ No	☐ N/A
L.	Vertical datum (example: NGVD, ~~NAVD etc.~~) NGVD 1929	☒ Yes	☐ No	☐ N/A
M.	Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
N.	Location and alignment of all coastal transects used to revise the coastal analyses	☐ Yes	☐ No	☒ N/A

If any of the items above are marked no or N/A, please explain: THIS IS THE FIRST STUDY DONE IN FOUNTAIN HILLS, THEREFORE THERE ARE NO EXISTING FLOODPLAIN AND FLOODWAY DELINEATIONS.

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? AERIAL MAPPING AUGUST 1991

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS N/A scale N/A Contour interval
   b. Revision Request 1" = 200' scale 2 FOOT Contour interval

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

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.

   Attach additional pages if needed.

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's ? ☐ Yes ☐ No

If yes, please give the location of shift or increase and an explanation for the increase.

N/A This is the first study of the area, therefore, there isn't an existing 100-year floodplain delineation.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? ..... ☐ Yes ☐ No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase?_____

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? ..... ☐ Yes ☐ No

If yes, explain:

N/A This is the first study of the area, therefore, there isn't an existing floodway delineation.

7. If a V- zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? N/A ☐ Yes ☐ No

If no, explain:

8. Manual or digital map submission:

☒ Manual

☐ Digital

Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

IF REQUESTED A DIGITIZED MAP CAN BE SUPPLIED.

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.

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_____

      _____

   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, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? N/A ☐ 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.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: TULIP WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: GLENBROOK BOULEVARD
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 1.365
3. This revision reflects *(check one of the following)*:

   ☒ New bridge/culvert not modeled in the FIS

   ☐ Modified bridge/culvert previously modeled in the FIS

   ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed)

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
2-60" CMP's

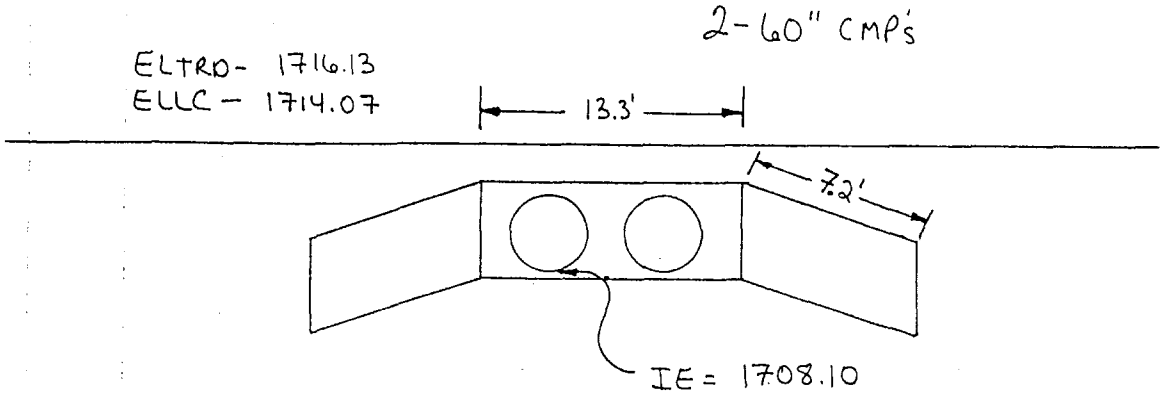
2. Entrance geometry of culvert/type of bridge opening (e.g. 30 ° - 75 ° wing walls with square top edge, sloping embankments and vertical abutments)
CULVERT INLET WITH HEADWALL AND WINGWALLS (30°-75°)

3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
HEC-2 SPECIAL CULVERT METHOD

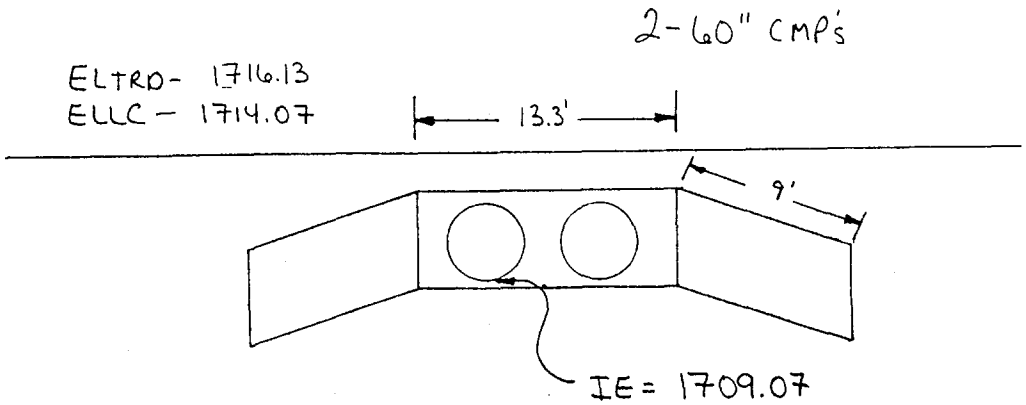
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

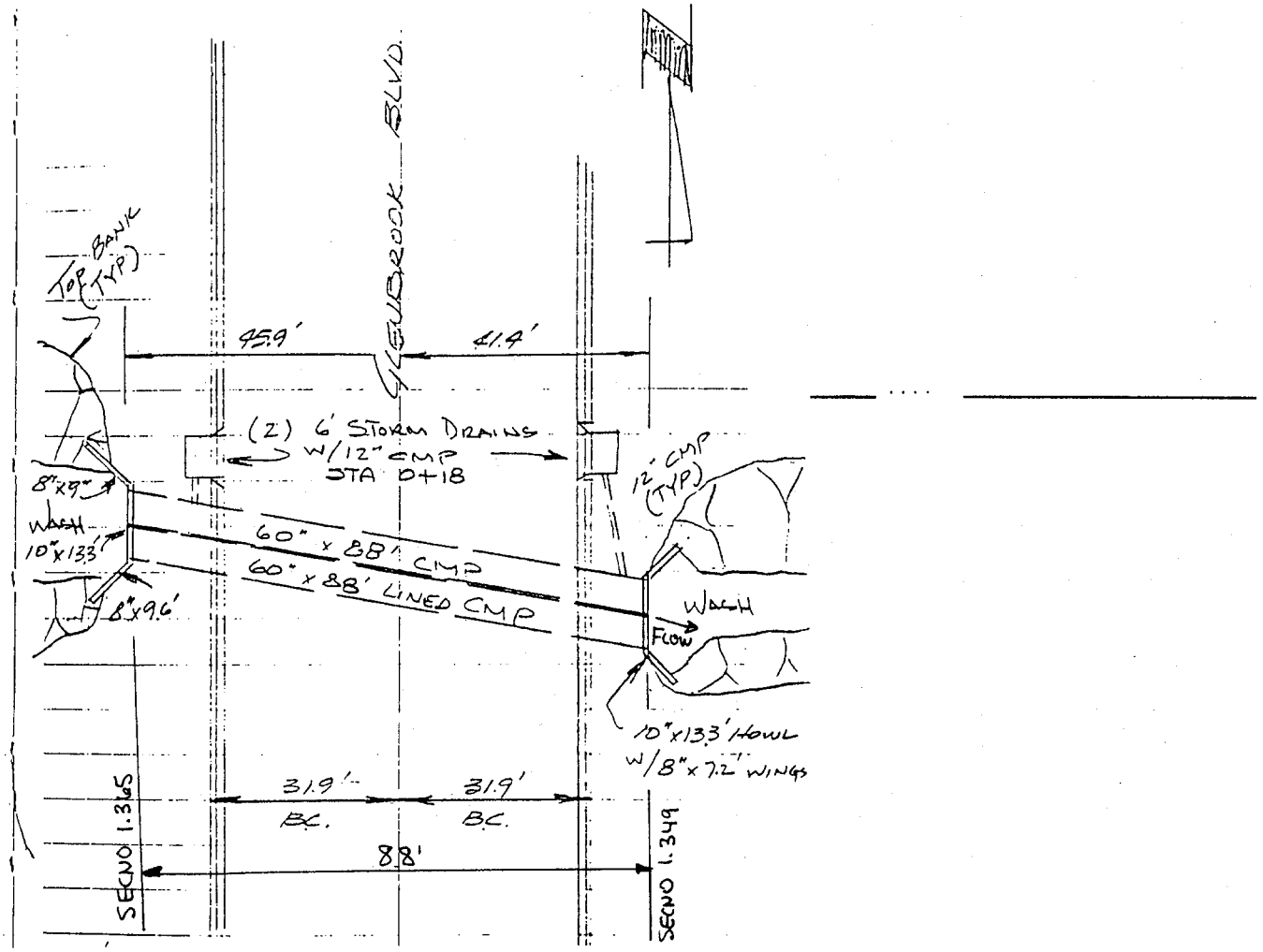
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	88ft.
Calculated culvert/bridge area (ft²) by the hydraulic model, if applicable	39.3 ft.²
Total culvert/bridge area (ft²)	39.3ft.²

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1716.04	1716.04
Downstream face	1713.54	1713.54

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1716.13	1716.13
Downstream face	1716.13	1716.13

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1716.86	1716.96
Downstream face	1713.54	1713.73

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	382	77	460

The maximum depth of flow over the roadway/railroad (ft.) ..... 1 ft.

Weir length (ft.) ..... 43 ft.

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	43	43	43
Downstream face	49	49	49

Loss Coefficients

Entrance loss coefficient	0.4
Manning's "n" value assigned to the structure(s)	.022
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.3
Expansion loss coefficient	0.5

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition*) can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions (*such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions*), is there a potential for debris and sediment transport (*including scour and deposition*) to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment (*bed material*) load?
   _____cfs (*attach gradation curve*)

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*
   - ☐ Physical change
     - ☐ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☐ Improved data
   - ☐ Floodway revision
   - ☒ Other New Study

     Explain This is the first delineation of this watershed
2. Flooding Source: Oxford Wash
3. Project Name/Identifier: Fountain Hills North Floodplain Delineation Study FCD 92-04
4. FEMA zone designations affected: X

   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX: 480301	Katy,City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
04013	Maricopa County	Maricopa	AZ	04013C	1750E	9-4-91
	Fountain Hills, Town					

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding	Structures	Disciplines*
☐ Riverine	☐ Channelization	☐ Water Resources
☐ Coastal	☐ Levee/Floodwall	☒ Hydrology
☐ Alluvial Fan	☐ Bridge/Culvert	☒ Hydraulics
☐ Shallow Flooding *(e.g. Zones AO and AH)*	☐ Dam	☐ Sediment Transport
☐ Lakes	☐ Coastal	☐ Interior Drainage
	☐ Fill	☐ Structural
Affected by wind/wave action	☐ Pump Station	☐ Geotechnical
☐ Yes	☐ None	☐ Land Surveying
☐ No	☐ Channel Relocation	☐ Other *(describe)*
	☐ Excavation	
	☐ Other *(describe)*	

☐ Other(describe)_____

*** Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☐ Yes ☒ No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM ☒ Yes ☐ No

   If yes, give reason: New Study, this is the first delineation of this watercourse

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions. See attached articles and announcements

9. 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.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? ☐ Yes ☐ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☐ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (*or other surcharge limit if community or state has adopted more stringent criteria*)? ☐ Yes ☐ No

If the answer to either Items 1B or 2B is yes, please provide 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.

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒ Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒ Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐ Yes ☐ No N/A New Study

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ (entity)

_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☐ has ☐ has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____
(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.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

_____a. CLOMR — A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*.

_____b. LOMR — A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. I Parts 60 and 65.)*

_X_c. PMR — A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. I, Parts 60 and 65.)*

_____d. Other: Describe_____

8. FORMS INCLUDED

17. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

• Hydrologic analysis for flooding source differs from that used to develop FIRM	☒ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine /Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☐ Bridge/Culvert Form (Form 7)
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☐ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. ☐ Yes ☐ No

Initial fee amount: $ _____

Check or money order only. Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project. ☐ Yes ☐ No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data. ☒ Yes ☐ No

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

Ron Newitt
Signature of Revision Requester

Ron Newitt/Program Mgr. NFIP
Printed Name and Title of Revision Requester

Flood Control District of Maricopa Co.
Company Name

(602) 506-1501 1-29-97
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.

Randy L. Havel
Signature of Community Official

Randy L. Havel, Town Engr.
Printed Name and Title of Community Official

Fountain Hills
Community Name

1-22-97
Date

Does this request impact any other communities? ☐ Yes ☐ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

11-22-95

No big problems in County floodplain study

If you've ever wondered what would happen in Fountain Hills in the event of a 100-year flood, Maricopa County has just completed a study that will tell you.

Representatives of Maricopa County Flood Control District were on hand for an open house at Town Hall on Thursday, Oct. 16. They were there to explain and answer questions concerning the Fountain Hills Flood Delineation Study.

The study defines the areas that would be inundated in the event of a 100-year storm and flood.

There was not a big turnout for the two-hour session, but a few residents dropped by to ask about their own particular concerns.

Town Engineer Randy Harrel said the study indicates no significant problems for individual homeowners. Some residents have property which lies within the flood area, but few if any structures are threatened.

One area of concern that town officials will look at is the Baptist Church on Saguaro Boulevard. In the event of a significant 100-year flooding event all of the church buildings and the parking lot would be under water. It is a low flat area which Nicklaus and Cypress washes flow into.

A Sanitary District pumping station adjacent to the church is apparently not within the flood plain.

Sanitary District Manager Ron Huber said no flood study was done when the pumping facility was constructed. But he said the pump building is significantly higher than the church buildings.

Huber also said that pump station is scheduled to be abandoned in the near future.

Harrel said the town will use the study to consider its options for protecting citizens and property during such a flood.

There are 26 street crossings the town wants to study further besides the area around the church, Harrel said. The options that may be considered would include culvert work and possibly diversion or containment structures.

Those further studies are to begin in the near future.

Nearly all of the area included in the 100-year flood plain will belong to the Town of Fountain Hills once the wash property transfer between the town and MCO Properties is completed in the near future.

Fountain Hills Vice Mayor Peg Tibbetts, center, discusses the county's floodplain study with Flood Control District representatives Ron Nevitt and Sandy Walchuk.

However, Harrel said the flood plain delineation will not significantly impact what the town may choose to do with the washes in the way of public use.

Harrel said no structures would be built in the washes, and measures can be taken to protect whatever facilities might be placed in the washes.

The Maricopa County Flood Control District has spent about two years on the study.

NOTICE OF REGULAR SESSION

OF THE

FOUNTAIN HILLS TOWN COUNCIL

WHEN: **NOVEMBER 16, 1995**

TIME: ****6:30 P.M.**

WHERE: **TOWN HALL COUNCIL CHAMBERS**

Pursuant to A.R.S. 38-431.02, notice is hereby given to the members of the Town Council of Fountain Hills and to the general public that the Town Council of Fountain Hills will hold a regular session open to the public on Thursday, November 16, 1995 at 6:30 p.m. in the Council Chambers of the Fountain Hills Town Hall, located at 16836 E. Palisades Blvd., Building C, Fountain Hills, Arizona.

***** Prior to the regularly scheduled Council meeting, the Flood Control District of Maricopa County and the Town of Fountain Hills Engineering Department will host an open public meeting presenting the results of the Fountain Hills Floodplain Delineation Studies. The public meeting will be held in the conference room from 4:00 to 6:30 p.m.***

RULES FOR ADDRESSING THE COUNCIL - ADOPTED 1/18/90

It is the Council's desire to hear public comment on agenda items. As it is important to maintain order during the meeting, please adhere to the following rules of order if you wish to speak:

1.) All citizens wishing to speak must first be recognized by the Mayor.
2.) The Mayor will not call for public comment on an item until after a motion has been made and seconded and the Council has had adequate opportunity to discuss the item.
3.) Please stand and state your name and address after being called on to speak.
4.) All comments must be directed to the Mayor.
5.) TIME LIMIT - 3 MINUTES PER PERSON PER ITEM.
6.) Statements should not be repetitive.
7.) Persons or groups wishing to make longer presentations, should see the Town Clerk prior to the meeting.

The agenda for the meeting is as follows:

1.) Meeting called to order, pledge to the flag, invocation and roll call.

Consent Agenda:

All items listed with an asterisk (*) are considered to be routine, non-controversial matters and will be enacted by one motion and one roll call vote of the Council. There will be no separate discussion of these items unless a Councilmember or member of the public so requests. If a Councilmember or member of the public wishes to discuss an item on the consent agenda, they may request so prior to the motion to accept the consent agenda. The item will be removed from the Consent Agenda and considered in its normal sequence on the agenda.

Open house Thursday on floodplain

A public open house will be held Thursday, Nov. 16, to review results of floodplain delineation studies performed in Fountain Hills.

The open house will be held from 4 to 6:30 p.m. at Town Hall's conference room.

Floodplain delineation involves developing detailed topographic maps to determine where water goes while incorporating the results of rainfall patterns to determine typical and peak amounts of runoff.

Along with extensive surveying and aerial mapping, drainage factors such as slope, vegetation, soil composition and land use are analyzed and included.

The studies will be used to better manage the floodplain to reduce or prevent flood damage and maintain the integrity of the floodplains.

Areas designated for further analysis in an upcoming area drainage master study also will be presented.

Results obtained in the north and south delineation studies will be displayed at the open house.

Representatives from the Flood Control District of Maricopa County, the Town of Fountain Hills' Engineering Department and the engineering consulting firms will be available to discuss the results and answer questions.

PUBLIC NOTICE
YOUR RIGHT TO KNOW

ANNOUNCEMENT OF FLOOD HAZARD STUDY

he Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90 448), as nded, and the Flood Disaster Protection Act of 1973 (p.L. 93-, is funding a detailed study of flood hazard areas in The Town f Fountain Hills, Arizona.

he study is being performed for the Flood Control District by K Engineers and George V. Sabel Consulting Engineers.

purpose of this study is to examine and evaluate flood hazard s which are developed or which are likely to be developed or hich are likely to be developed and to determine flood elevations r those areas. Flood elevations will be used by Maricopa County rry our floodplain management objectives of the National d Insurance Program. They will also be used as the basis for ermining appropriate flood insurance premium rates applible for buildings and their contents.

announcement is intended to notify all interested persons of commencement of this study so that they may have an rtunity to bring any relevant facts and technical data concern- g local flood hazards to the attention of the Flood Control istrict for consideration in the course of this study. Such rmation should be addressed to Mr. Tim Murphy or Ms. Sandy y, Flood Control District of Maricopa County, 2801 W. urango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

ished FH Times 1/13,1/20/93.

AFFIDAVIT OF PUBLICATION

The Times
OF FOUNTAIN HILLS AND RIO VERDE, ARIZONA

A publication of Western States Publishers, Inc.

STATE OF ARIZONA
COUNTY OF MARICOPA } ss.

L. ALAN CRUIKSHANK, being first duly sworn, upon oath deposes and says: That he is the publisher of

THE TIMES OF FOUNTAIN HILLS AND RIO VERDE

a newspaper of general circulation in the County of Maricopa and the State of Arizona, published at Fountain Hills, Arizona, and that the copy hereto attached is a true copy of the advertisement as published weekly in The Times of Fountain Hills and Rio Verde on the following dates:

Jan. 13, 1993
Jan 20, 1993

Sworn to before me this

23 day of

February A.D. 19 93

Karen Kirkendoll
Notary Public

OFFICIAL SEAL
KAREN KIRKENDOLL
NOTARY PUBLIC-ARIZONA
MARICOPA COUNTY
My comm. expires May 14, 1993

INVOICE NO. 93008

ANNOUNCEMENT OF FLOOD HAZARD STUDY

The Flood Control District of Maricopa County, under authority of the National Flood Insurance Act of 1968 (P.L. 90-448), as amended, and the Flood Disaster Protection Act of 1973 (P.L. 93-234), is funding a detailed study of flood hazard areas in The Town of Fountain Hills, Arizona.

The study is being performed for the Flood Control District by AGK Engineers and George V. Sabol Consulting Engineers.

The purpose of this study is to examine and evaluate flood hazard areas which are developed or which are likely to be developed and to determine flood elevations for those areas. Flood elevations will be used by Maricopa County to carry out floodplain management objectives of the National Flood Insurance Program. They will also be used as the basis for determining appropriate flood insurance premium rates applicable for buildings and their contents.

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be addressed to Mr. Tim Murphy or Ms. Sandy Story, Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone (602) 506-1501.

Published: Arizona Republic, January 13, 20, 1993.

AFFIDAVIT OF PUBLICATION

The Arizona Republic/The Phoenix Gazette

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

JOAN LOHR, being first duly sworn, upon oath deposes and says: That she is the legal advertising manager of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic and The Phoenix Gazette, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

~~The Arizona Republic~~
The Phoenix Gazette

JANUARY 13, 20, 1993

Sworn to before me this

25TH day of

JANUARY 93 A.D. 19

OFFICIAL SEAL
MARY LEE BOOHER
NOTARY PUBLIC STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1995

Notary Public

Meeting on flood plain plan

Find out where flood waters go on Dec. 17

An open house to inform Fountain Hills residents of floodplain delineation studies being performed h over 30 washes flowing through he community will be held on Thursday, Dec. 17.

The meeting will be held from 5 to 8 p.m. at the Town Hall Conference Room, 16836 E. Palisades Blvd.

The public is invited to come by he Town Hall anytime during the hree-hour open house to share their experience and observations of local flooding and hear details about the studies.

Details will include how the study is conducted, what kind of information is being gathered and how the information will be used.

Mapping floodplains involves developing detailed topographic maps to determine where water goes and studying rainfall patterns to determine typical amounts of runoff. The studies and resulting maps will be used to better manage the floodplain so as to reduce or prevent flood damage and maintain the integrity of the floodplains.

Extensive surveying and aerial mapping is involved in the studies, but other factors influencing drainage also must be considered, including soil composition, slope and vegetation and land use.

The Fountain Hills studies are expected to take 12 months to complete, after which time a second open house will be held to inform residents of the results of the studies.

Questions or additional information regarding the studies can be obtained by writing or calling Jim Phipps or Tim Murphy of the Flood Control District of Maricopa County, 2801 W. Durango Street, Phoenix, AZ 85009, telephone 506-1501, or Randy Harrel, town engineer, Town of Fountain Hills, 16836 E. Palisades Blvd, Fountain Hills, AZ 85268, telephone 837-2003.

Audit tops Sanitary agenda

The annual audit report will be the major topic on the agenda for the Sanitary District board of directors when it meets Thursday, Dec. 10.

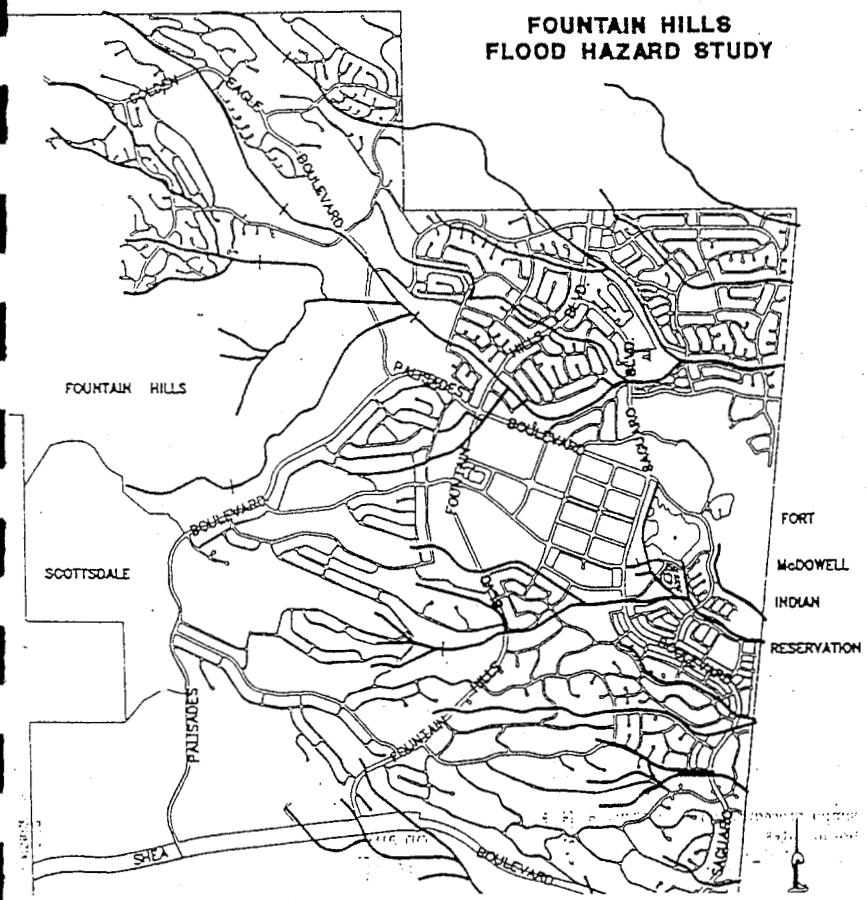
The report is a routine document prepared each year, according to District Manager Ron Huber.

The board will also select a new chairman for the coming calendar year.

The job of chairman has simply rotated under the current board, and that being the case Director Dennis Regeski will be leading the board for the next year. Director Bruce Hansen is the outgoing chairman.

Huber said monthly staff reports will also be presented at the meeting, and he has a few carryover items to update the board on.

Doesn't Your Single Larg
INVESTMEN
Deserve a second opinion?
LaCosta Construction Inc.
designers & builders
of
LUXURY LA COSTA HOME
"The Art of Construction"
837-1640



When you need to sell your
call
erica

Watch... erica west
Channel 10 NEWS
"Real Estate Expert"
Fountain Hills #1 Top Pr
Over 100 Opened & Closed Transactions Sic
(So Far)
...her team of "SPECIALIS
are WORKING FOR YOU
Transaction Specialist
Larraine LaGiglia.....
daily monitors the progress of each of my ESCROWS and LISTINGS. She is in constant contact with my LISTERS & concentrates on finding BUYERS for my listings.

Systems Specialists
Dana West.....
implements the unique MARKETING SYSTEMS designed to get my SOLD quickly! She keeps my LISTERS advised of the progress on thei
Administration Specialist
Carol Talty.....
handles all mailings/brochures and assists with special projects.

The Times of Fountain Hills

12-9-92

FEDERAL EMERGENCY MANAGEMENT AGENCY

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM

O.M.B. Burden No. 3067-0148 Expires July 31, 1997

FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average . 23 hour 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.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2
2. I am licensed with an expertise in Hydrology, Hydraulics
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 25 years experience in the expertise listed above.
4. I have ☒ prepared ☒ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified:
   Hydrologic analysis and floodplain delineation
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.

   b. ☐ Compared plans and specifications with as-built survey information.

   c. ☐ Examined plans and specifications and compared with completed projects.

   d. ☐ Other _____
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: George V. Sabol
(please print or type)

Title: Sr. Associate, SFC Engineering Company
(please print or type)

Registration No. 17928 Expiration Date: 30 June 1998

State Arizona

Type of License Professional Engineer

George Sabol
Signature

23 January 1997
Date

Registered Professional Engineer (Civil) CERTIFICATE NO. 17928 GEORGE V. SABOL Date Signed 23 Jan 97 ARIZONA, U.S.A.

Seal
(Optional)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply.

FEDERAL EMERGENCY MANAGEMENT AGENCY **HYDROLOGIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	***FEMA USE ONLY***

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.67 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: OXFORD WASH
(One form for each flooding source)

Project Name /Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. HYDROLOGIC ANALYSIS IN FIS

☐ Approximate study stream (Zone A)
☒ Detailed study stream (briefly explain methodology) The analysis was performed using HEC-1.

2. REASON FOR NEW HYDROLOGIC ANALYSIS

☒ No existing analysis
☐ Improved data *(see data revision on page 3)*
☐ Changed physical conditions of watershed *(explain)* _____

☐ Alternative methodology *(justify why the revised model is better than model used in the effective FIS)*

☐ Evaluation of proposed conditions (CLOMRs only) (explain) _____

☐ Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100 - and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

☒ Approval of hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., Flood Control District of Maricopa County)
Attach evidence of approval.

☐ Approval of the hydrologic analysis is not required by any local, State, or Federal Agency.

Stream: OXFORD WASH

Comparison of 100-year Discharges

Location:	Drainage area (Sq mi.)	FIS (cfs) :	Revised (cfs) :
BELOW FOUNTAIN HILLS BLVD.	4.04	N/A	1020
ABOVE FOUNTAIN HILLS BLVD.	.32	N/A	640
AT GREENHURST AVE. (C547)	.26	N/A	640
AT GLENBROOK BLVD.	.08	N/A	210

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review.

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made *(attach separate sheet if necessary)*

N/A

ATTACH A COMPLETED REVIEW OF RESULTS PAGE FOR EACH FLOODING SOURCE.

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS *(i.e. no changed hydraulic conditions)*? ☐ Yes ☒ No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No N/A New study

FEMA does not normally revise NFIP maps solely due to insignificant flow changes where changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? ☐ Yes ☒ No

If yes, provide the following:

Location along flooding source: _____

Maximum peak discharge: _____ cfs

Second highest peak discharge: _____ cfs

Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site *(along flooding source or similar watershed; specify)*

UNAVAILABLE

Gaging Station: _____

Drainage area at gage: _____ mi^2

Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as new data (*New*) or as revising existing data (*Revised*). *(If necessary, attach a separate sheet.)*

Data Parameter	New	Revised	Data Source
SUBBASIN AREAS	☒	☐	FOUNTAIN HILLS/USGS MAPPING
LAG TIME, L, LCA, SLOPE, Kn	☒	☐	FOUNTAIN HILLS/USGS MAPPING
GREEN + Ampt Parameters	☒	☐	FCDMC HYDROLOGIC MANUAL
ROUTING REACH PARAMETERS	☒	☐	FCDMC HYDROLOGIC MANUAL
	☐	☐	

- Data source can be from a Federal, State, or local government agency, or from a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source *(i.e., certified statement, report, bibliographical reference to a published document)*. In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

☐ Statistical Analysis of Gage Records (*use Attachment A*)

☐ Regional Regression Equations *(use Attachment B)*

☒ Precipitation/Runoff Model *(use Attachment C)*

☐ Other *(specify; attach backup computations and supporting data)* _____

ATTACHMENT A: STATISTICAL ANALYSIS OF GAGE RECORDS

Gaging Station: N/A

Gage Location (latitude and longitude): _____

	FIS:	Revised:
1. Number of years of data		
Systematic		
Historical		
2. Homogeneous data	☐ Yes ☐ No	☐ Yes ☐ No
3. Data adjustments	☐ Yes ☐ No	☐ Yes ☐ No
4. Number of high outliers		
Low outliers		
Zero events		
5. Generalized skew		
6. Station skew		
7. Adopted skew		
8. Probability distribution used (justify if log-Pearson III was not used)		
9. Transfer equations to ungaged sites		☐ Yes ☐ No

If yes, specify method

_____

_____

_____

10. Expected probability* ☐ Yes ☐ No

11. Comparison of results with other analyses ☐ Yes ☐ No

If yes, describe comparison

_____

_____

_____

*FEMA does not accept expected probability analyses for the purpose of reflecting flood hazard information in a FIS.

If any data is not available, indicate by N/A.

Attach analysis including plot of flood frequency curve.

ATTACHMENT B: REGIONAL REGRESSION EQUATIONS

1. Bibliographical Reference: N/A

_____

_____

_____

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. Gaged or ungaged stream: _____

3. Hydrologic region(s): _____
   Attach backup map.

4. Provide parameters, values, and source of data used to define parameters.

_____

_____

_____

		FIS:		Revised:	
5.	Urbanized conditions calculations	☐ Yes	☐ No	☐ Yes	☐ No
6	Percent of watershed urbanization	_____		_____	
7.	Is the watershed controlled?	☐ Yes	☐ No	☐ Yes	☐ No
8.	Comparison with other analyses	☐ Yes	☐ No	☐ Yes	☐ No

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

_____

_____

_____

_____

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

ATTACHMENT C: PRECIPITATION/RUNOFF MODEL

		FIS:	Revised
1.	Method or model used:	N/A	HEC-1
	Version:	N/A	4.0.1E
	Date:	N/A	MAY 1991
2.	Source of rainfall depth:	N/A	NOAA ATLAS 2
3.	Source of rainfall distribution:	N/A	FCDMC HYDROLOGIC MANUAL
4.	Rainfall duration:	N/A	6 + 24 hr.
5.	Areal adjustment to precipitation (%):	N/A	DEPENDS UPON SUBBASIN AREA
6.	Maximum overland flow length	N/A	.515 mi. TABLE 3-7 (206-H)
7.	Hydrograph development method:	N/A	CLARK UNIT GRAPH
8.	Loss rate method:	N/A	Green-Ampt
	Source of soils information:	N/A	SCS SOIL SURVEY
	Source of land use information	N/A	AERIAL PHOTOS
9.	Channel routing method:	N/A	NORMAL DEPTH
10.	Reservoir routing:	☐ Yes ☐ No	☒ Yes ☐ No
11.	Baseflow considerations:	☐ Yes ☐ No	☐ Yes ☒ No

If yes, explain how baseflow was determined:

12. Snowmelt considerations: ☐ Yes ☐ No ☐ Yes ☒ No

13. Model calibration: ☐ Yes ☐ No ☒ Yes ☐ No

If yes, explain how calibration was performed The model was calibrated by comparing USGS gage data, runoff volume checks upstream from dams, results with estimates using a USGS regional regression eqn., and modeled results with results of other M.C. studies. (Section 3.2.3 pg 3-61)

14. Future land use condition: ☐ Yes ☒ No

If yes, explain why

NOTE: FEMA policy is to base flooding on existing conditions.
If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

See the Hydrology Report

ATTACHMENT D: CONFIDENCE LIMITS EVALUATION

Stream: N/A

Select one location for Confidence Limits Evaluation (*describe location*): _____

_____

Discharges for selected location:

Exceedance Probability		FIS	Revised
10%	(10-year)	_____ cfs	_____ cfs
2%	(50-year)	_____ cfs	_____ cfs
1%	(100-year)	_____ cfs	_____ cfs
0.2%	(500-year)	_____ cfs	_____ cfs

1% (100-year) Flood Confidence Intervals

90% Confidence Interval: 5% limit _____ cfs

95% limit _____ cfs

50% Confidence Interval: 25% limit _____ cfs

75% limit _____ cfs

If the value of the 100-year frequency flood in the FIS is beyond the 50% confidence interval but within the 90% confidence interval, does the 100-year water surface elevation change by 1.0 foot or more? ☐ Yes ☐ No

An example of confidence limits analysis can be found in Appendix 9 of Bulletin 17B.

Attach Confidence Limits Analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: OXFORD WASH
(One form for each flooding source)

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. REACH TO BE REVISED

Downstream limit: CONFLUENCE WITH BALBOA WASH

Upstream limit: 400 ft. Above Glenbrook Blvd. (SECNO 0.986)

2. EFFECTIVE FIS

☒ Not studied

☐ Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

☐ Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

☐ Floodway delineated

Downstream limit of Floodway _____

Upstream limit of Floodway _____

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM. *(Check all that apply)*

☒ Not studied in FIS

☐ Improved hydrologic data/analysis. Explain: _____

☐ Improved hydraulic analysis. Explain: _____

☐ Flood control structure. Explain: _____

☐ Other. Explain: _____

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete 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 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 for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1. Duplicate Effective Model — Natural ☐ Floodway ☐

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 requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor'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 ☐ Floodway ☐

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 ☐ Floodway ☐

The duplicate effective or corrected 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 or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☐

The existing or pre-project conditions model *(or duplicate effective 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 proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. — Natural ☒ Floodway ☒

6. Hydraulic Analyses (Only if Hydraulic Models are not developed)

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

See the Hydraulics Report

4. MODEL PARAMETERS *(from model used to revise 100-year water surface elevation)*

1. Discharges:

	Upstream Limit	Downstream Limit
10-year		
50-year		
100-year	150 cfs	1020 cfs.
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined

CRITICAL DEPTH

3. Give range of friction loss coefficients (*Manning's "N"*) Channel ..... .020-.054

Overbanks ..... .020-.075

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

Location	FIS	Revised
N/A		

Explain: NEW STUDY

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

The cross-sections were determined photogrammetrically by the aerial mapping company. All cross-sections are stationed from left to right looking downstream with the thalweg set at station 10,000.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☒ Yes ☐ No If no, explain why not:

6. Explain how reach lengths for channel and overbanks were determined:

Channel reach lengths were measured along the thalweg and overbank reach lengths were measured along the anticipated path of the center of mass of the overbank flow.

5. RESULTS *(from model used to revise 100-year water surface elevations)*

1. Do the results indicate:

a. Water surface elevations higher than end points of cross sections? ☐ Yes ☒ No

b. Supercritical depth? ☐ Yes ☒ No

c. Critical depth? ☒ Yes ☐ No

d. Other unique situations ☐ Yes ☒ No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.

FOR THOSE CROSS-SECTIONS WHERE THE HEC-2 MODEL DEFAULTED TO CRITICAL DEPTH THE CRITICAL DEPTH WATER SURFACE ELEVATIONS ARE PLOTTED ON THE PROFILES AND MAPS.

2. What is the maximum change in energy gradient between cross-sections? 14.16

Specify location SECNO 0.542

3. What is the distance between the cross-sections in 2 above? 505.6

4. What is the maximum distance between cross-sections? 505.6

Specify location SECNO 0.542

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? 1.0 foot

b. What is the maximum surcharge for the revised conditions? N/A NEW STUDY foot

Specify location

c. What is the maximum velocity? 8.44 fps

Specify location SECNO 0.129

d. Are there any negeative surcharge values at any cross-section? ☐ Yes ☒ No

If yes, the floodway may need to be widened. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain:

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? ..... ☐ Yes ☒ No

If Yes, explain:

_____

_____

_____

7. Do 100-year water surface elevations increase at any location? ..... ☐ Yes ☐ No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

N/A NEW STUDY

_____

_____

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

N/A NEW STUDY

A. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section_____ within_____feet *(vertical)* and upstream of the project at cross section_____within_____feet *(vertical)*.

N/A NEW STUDY

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section_____within_____feet *(vertical)* and upstream of the project at cross section_____ within_____feet *(vertical)*.

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.
THE PROFILES ARE LOCATED IN THE HYDRAULIC ANALYSIS NOTEBOOK.

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

Proceed to Riverine /Coastal Mapping Form

FEDERAL EMERGENCY MANAGMENT AGENCY
WATER SURFACE ELEVATION CHECK

N/A NEW STUDY

COMMUNITY NAME	FLOODIND SOURCE	PROJECT NAME /IDENTIFIER
MARICOPA COUNTY, ARIZONA	OXFORD WASH	FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL[1]	FCWSEL[2]	SURC.[3]

COMMENTS:

1-100-year (natural) Water Surface Elevation 2-Encroachment (floodway) Water Surface Elevation 3-Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

Sheet_____ of _____

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: OXFORD WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable)*:

		Included		
A.	Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☒ N/A
B.	Revised detailed 100- and 500-year floodplain boundaries	☐ Yes	☐ No	☒ N/A
C.	Revised 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
D.	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated	☒ Yes	☐ No	☐ N/A
E.	Stream alignments, road and dam alignments	☒ Yes	☐ No	☐ N/A
F.	Current community boundaries	☒ Yes	☐ No	☐ N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map	☐ Yes	☐ No	☒ N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries	☐ Yes	☐ No	☒ N/A
I.	The requestor's property boundaries and community easements	☐ Yes	☐ No	☒ N/A
J.	The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
K.	Location and description of reference marks	☒ Yes	☐ No	☐ N/A
L.	Vertical datum (example: NGVD, ~~NAVD etc.~~) NGVD 1929	☒ Yes	☐ No	☐ N/A
M.	Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
N.	Location and alignment of all coastal transects used to revise the coastal analyses	☐ Yes	☐ No	☒ N/A

If any of the items above are marked no or N/A, please explain: THIS IS THE FIRST STUDY DONE IN FOUNTAIN HILLS, THEREFORE THERE ARE NO EXISTING FLOODPLAIN AND FLOODWAY DELINEATIONS.

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? AERIAL MAPPING AUGUST 1991

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS N/A scale N/A Contour interval
   b. Revision Request 1" = 200' scale 2 FOOT Contour interval

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

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.

Attach additional pages if needed.

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's? ☐ Yes ☐ No

If yes, please give the location of shift or increase and an explanation for the increase.

N/A This is the first study of the area, therefore, there isn't an existing 100-year floodplain delineation.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? ..... ☐ Yes ☐ No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase?_____

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? ..... ☐ Yes ☐ No

If yes, explain:

N/A This is the first study of the area, therefore, there isn't an existing floodway delineation.

7. If a V- zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? N/A ☐ Yes ☐ No

If no, explain:

8. Manual or digital map submission:

☒ Manual

☐ Digital

Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

IF REQUESTED A DIGITIZED MAP CAN BE SUPPLIED.

2. EARTH FILL PLACEMENT

1. The fill is: ☐ Existing ☐ Proposed N/A

2. Has fill been/will be placed in the regulatory floodway? ..... ☐ Yes ☒ No
   If yes, please attach completed Riverine Hydraulic Analysis Form.

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_____

   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, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? N/A ☐ 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.

FEDERAL EMERGENCY MANAGEMENT AGENCY **BRIDGE/CULVERT FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2 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.

Community Name: MARICOPA COUNTY, ARIZONA (Town of Fountain Hills)

Flooding Source: OXFORD WASH

Project Name/Identifier: FOUNTAIN HILLS NORTH FLOODPLAIN DELINEATION STUDY FCD 92-04

1. IDENTIFIER

1. Name of roadway, railroad, etc.: TANGLEWOOD COURT
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): SECNO 0.656
3. This revision reflects *(check one of the following)*:
   - ☒ New bridge/culvert not modeled in the FIS
   - ☐ Modified bridge/culvert previously modeled in the FIS
   - ☐ New analysis of bridge/culvert previously modeled in the FIS

   (Explain why new analysis was performed) _____

2. BACKGROUND

Provide the following information about the structure:

1 Dimension, material, and shape (e.g. two 10 x 5 feet reinforced concrete box culvert; three 30-foot span bridge with 2 rows of two 3- foot diameter circular piers; 40-foot wide ogee shape spillway)
3-42" CMP's

2. Entrance geometry of culvert/type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments)
MITERED TO CONFORM TO SLOPE

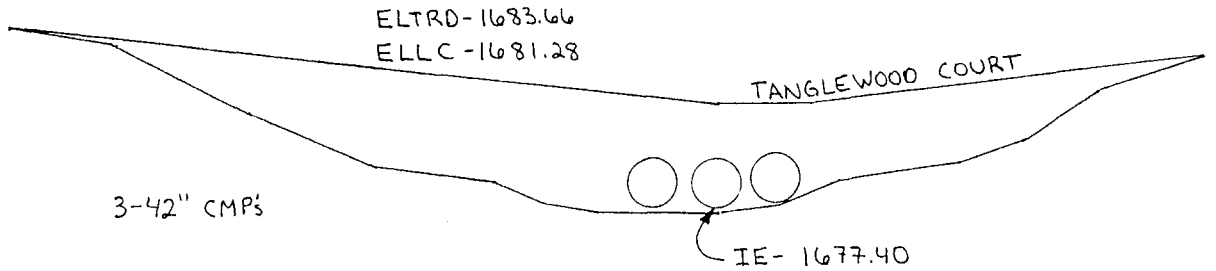
3. Hydraulic model used to analyze the structure (*e.g., HEC-2 with special bridge routine, WSPRO, HY8*)
HEC-2 SPECIAL CULVERT METHOD

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structure(s). *(Attach justification)*

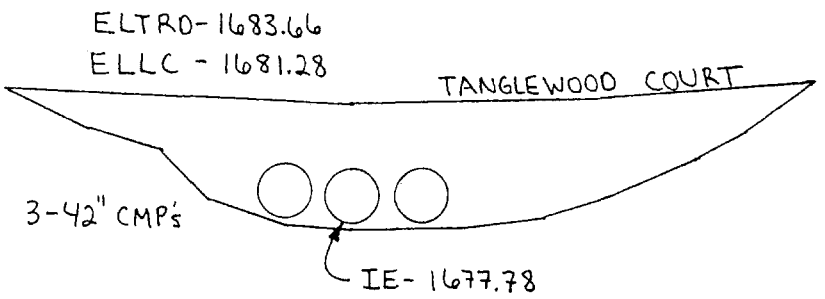
Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A
*** One form per new/revised bridge/culvert**

3. ANALYSIS

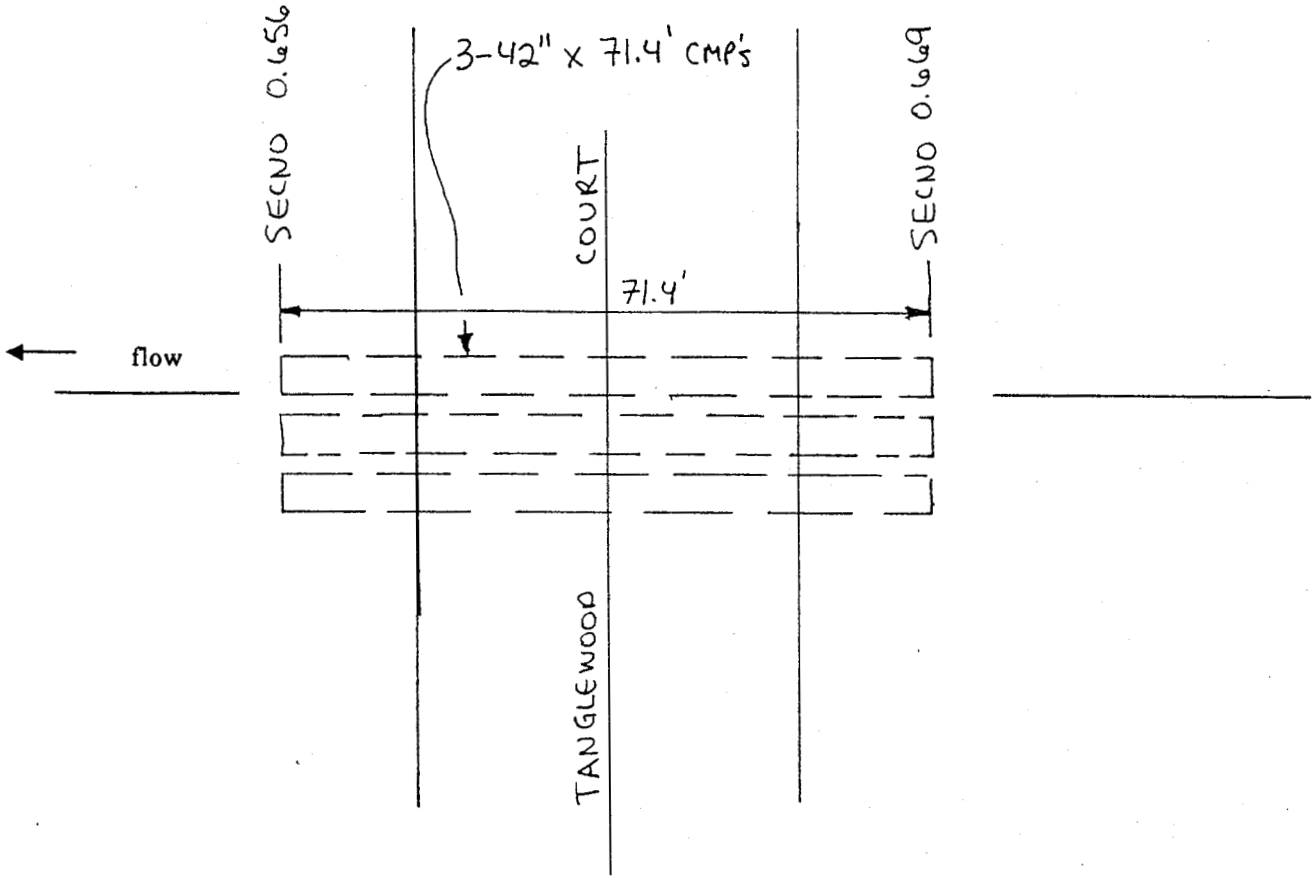
Sketch the downstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, minimum top of road elevation, and ineffective flow widths.



Sketch the upstream face of the structure together with the road profile. Show, at a minimum, the maximum low chord elevation, invert elevation, and minimum top of road elevation.



Sketch the plan view of the structure(s) Show, at a minimum, the skew angle, cross-section locations, distances between cross sections, and length of structure (s).



Attach plans of the structure (s) certified by a registered Professional Engineer.

Culvert length or bridge width (ft)	71.4 ft.
Calculated culvert/bridge area (ft ^{2}) by the hydraulic model, if applicable	28.9 ft.^{2}
Total culvert/bridge area (ft ^{2})	28.9 ft.^{2}

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	1683.5	1683.5
Downstream face	1681.1	1681.1

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	1683.66	1683.66
Downstream face	1683.66	1683.66

100-Year Elevations	Water Surface Elevations	Energy Gradient Elevations
Upstream face	1685.53	1685.63
Downstream face	1681.11	1681.82

Discharge	Low Flow	Pressure Flow	Weir Flow	Total Flow
Amount of flow through/over the structure (s) (cfs)	N/A	289	243	530

The maximum depth of flow over the roadway/railroad (ft.) ..... 2.03 ft.

Weir length (ft.) ..... 47 ft.

Top Widths	Total Floodplain Width	Total Effective Flow Width	Floodway Width
Upstream face	47 ft.	47 ft.	47 ft.
Downstream face	37 ft.	37 ft.	37 ft.

3. ANALYSIS (Cont'd)

Loss Coefficients

Entrance loss coefficient	0.7
Manning's "n" value assigned to the structure(s)	.022
Friction loss coefficient through structure (s)	N/A
Other loss coefficients (e.g., bend manhole, etc.)	N/A
Total loss coefficient	N/A
Weir coefficient	2.63
Pier coefficient	N/A
Contraction loss coefficient	0.1
Expansion loss coefficient	0.3

4. SEDIMENT TRANSPORT CONSIDERATIONS

1. A. Is there any indication from historical records that sediment transport (*including scour and deposition)* can affect the 100-year water surface elevations? ..... ☐ Yes ☐ No

   B Based on the conditions *(such as geomorphology, vegetative cover and development of the watershed and stream bed, and bank conditions)*, is there a potential for debris and sediment transport *(including scour and deposition)* to affect the 100-year water surface elevations and/or conveyance capacity through the bridge/culvert? ..... ☐ Yes ☐ No

2. If the answer to either 1A or 1B is yes:

   A. What is the estimated sediment *(bed material)* load?
   _____cfs *(attach gradation curve)*

   Explain method used to estimate the sediment transport and the depth of scour and/or deposition Because this is only a floodplain delineation study, sediment transport and scour analysis were not done. These types of analysis are above and beyond the scope of work for a floodplain delineation study. However, the topographic data and field surveys reflect the existing condition of the culvert after some 10 to 20 years of service.

   B. Will sediment accumulate anywhere through the bridge/culvert? ☐ Yes ☐ No

   If yes, explain the impact on the conveyance capacity through the bridge/culvert? _____

5. FLOODWAY ANALYSIS

Explain method of bridge encroachment (floodway run) None.

Comments *(explain any unusual situations)*:

Attach analysis.