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FEDERAL EMERGENCY MANAGEMENT AGENCY
FEDERAL INSURANCE ADMINISTRATION

AMENDMENTS AND REVISIONS TO NATIONAL FLOOD INSURANCE PROGRAM MAPS

Application/Certification Forms and Instructions for Letters of Map Amendment, Conditional Letters of Map Amendment, Letters of Map Revision (Based on Fill), and Conditional Letters of Map Revision (Based on Fill)

OCTOBER 1992

TOD-1

CERTIFICATION/APPLICATION FORMS FOR LETTERS OF MAP AMENDMENT/REVISION BASED ON FILL

In 1968, the U.S. Congress passed the National Flood Insurance Act, which created the National Flood Insurance Program (NFIP). The NFIP was designed to reduce future flood losses through local floodplain management and to provide protection for property owners against potential losses through an insurance mechanism that allows a premium to be paid for the protection by those most in need of it. Creation of the NFIP represented a major shift in Federal strategy from previous structural flood-control and disaster relief programs.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt floodplain management ordinances containing certain minimum requirements intended to reduce future flood losses. Therefore, the community official or agency responsible for floodplain management may be able to provide information which would be of use to a requester. This official or agency is usually also responsible for engineering, public works, flood control, or planning.

These certification forms are designed to assist requesters in gathering the information that the Federal Emergency Management Agency (FEMA) needs to determine whether a certain property is likely to be flooded during the flood event that has a 1-percent chance of being equaled or exceeded in any given year (base flood). Lands at risk from the base flood are called Special Flood Hazard Areas (SFHAs).

- The Property Information form may be completed by the property owner.
- The Elevation Information form must be completed by a registered professional engineer or licensed land surveyor.
- The Summary of Elevations—Individual Lot Breakdown form, if applicable, must be completed by a registered professional engineer or licensed land surveyor.
- The Community Acknowledgement form, if applicable, must be completed by the official responsible for floodplain management in the community.
- The Certification of Fill Compaction form, if applicable, must be completed by a registered professional engineer or soils engineer, or the community's NFIP permit official.

These forms shall be used to request Letters of Map Amendment (LOMAs), Conditional Letters of Map Amendment (CLOMAs), Letters of Map Revision Based on Fill (LOMRs-F), and Conditional Letters of Map Revision Based on Fill (CLOMRs-F), as defined on page 7 of these instructions. They shall not be used for requests involving changes in base (100-year) flood elevations (BFEs), floodway designations, coastal high hazard areas (V zones), and alluvial fan areas. In addition, these forms shall not be used for requests involving property and/or structures that have been elevated by fill placed within a regulatory floodway. Such requests must be submitted to FEMA by the community in accordance with the NFIP regulations, published under Title 44 of the Code of Federal Regulations, Chapter I, Part 65.

In accordance with the NFIP regulations, FEMA will use the information provided by these certification forms to make a determination on whether to remove a parcel of property or a structure from a designated SFHA. In certain instances, additional data that are not referenced on these forms may be required. A FEMA representative will notify the requester of any additional requirements.

Please submit all forms and data to support a request involving a single structure or lot to the appropriate FEMA Regional Office (see inside back cover). Requests for multiple lots or structures and requests involving proposed projects should be submitted to FEMA's Headquarters Office:

Federal Emergency Management Agency
Federal Insurance Administration
Office of Risk Assessment
Technical Operations Division
500 C Street, SW.
Washington, DC 20472

(202) 646-2764

INSTRUCTIONS FOR COMPLETING THE PROPERTY INFORMATION FORM

Before completing the Property Information form, request the following documentation from the County Clerk or Recorder for the community:

- A copy of the Plat Map of the area, showing the recordation information (e.g., Book/Volume and Page numbers or Document/Instrument number)

OR

- A copy of the Deed for the property, showing the recordation information (e.g., Book/Volume and Page numbers or Document/Instrument number), accompanied a tax assessor's or other suitable map showing the surveyed location of the property

It will also be necessary to obtain a photocopy of the Flood Insurance Rate Map (FIRM) panel (including the Title Block) that shows the area in which the property is located. To determine which panel shows the property, consult the FIRM Index, which shows the outline of the mapped community and the numbers and layout of the individual FIRM panels. After locating the general area of the property by referring to major streets and streams in the vicinity, read the corresponding FIRM panel number from the Index. The FIRM should be available at the community map repository or from the community official or agency responsible for floodplain management. However, FIRM panels may be ordered from the Flood Map Distribution Center for a minimal fee by calling 1-800-358-9616. Orders may also be faxed to the center at 1-800-358-9620.

Item 1

The Community Name/State, Community Number, Panel or Map Number, and Effective Date appear in the Title Block of the FIRM panel, as shown in Figure 1 (for maps depicting a single community) and Figure 2 (for maps covering an entire county, including all incorporated communities).

Item 2

Enter the street address if there is one. For requests involving multiple lots, a range of street addresses will be sufficient.

Item 3

If a street address cannot be provided, describe the property by referring to the Deed or Plat Map. The description may consist of a lot number and subdivision name, a parcel number, a tract number, or any other information provided in a Deed to identify the property. However, it is not necessary to reproduce a lengthy description of the property as it appears in the Deed.

Item 4

Choose (a) if the entire legally defined property shown on the Plat Map or described in the Deed is to be removed from the SFHA.

Choose (b) if the request is not for the entire piece of property described in the Deed or shown on the Plat Map, but only for a portion of that property. In this case, a registered professional engineer or licensed land surveyor must write and certify a metes and bounds description of the subject portion. The description must be accompanied by a map showing the accurately plotted metes and bounds of that portion.

Choose (c) if only the structure(s) on the property, not the entire property itself, is to be removed from the SFHA.

Item 5

Choose (a) if the request is for a single residential structure or lot.

Choose (b) if the request is for a single commercial structure or lot.

Choose (c) if the request is for more than one structure or lot.

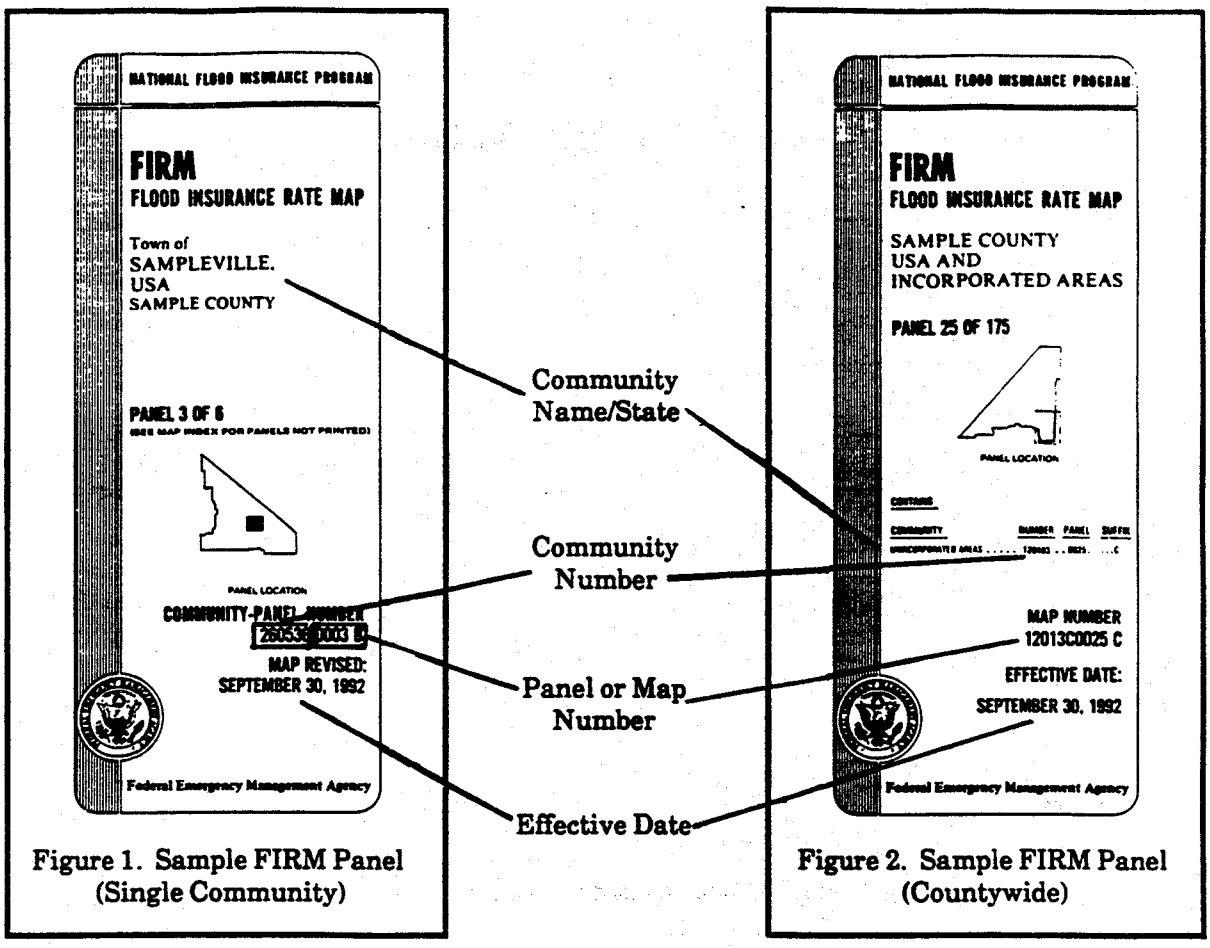

Figure 1. Sample FIRM Panel (Single Community)

Figure 2. Sample FIRM Panel (Countywide)

Item 6

Choose (a) if the request involves structures for which construction is complete ("as-built") or on-grade slabs have been poured, or parcels of land for which the locations have been recorded.

Choose (b) if the request involves planned placement of fill, planned construction of insurable buildings, planned improvements costing 50 percent or more of the market value of the structure before the start of construction of the improvement, and planned subdivisions for which lot locations have not yet been recorded.

Item 7

Fill is defined as material placed to raise the ground to or above the BFE. The common construction practice of removing unsuitable existing material (topsoil) and backfilling with select structural material is not considered the placement of fill if the practice does not alter the existing elevation, which is at or above the BFE. Also, fill placed before the first NFIP map was produced for the area is considered natural ground.

Item 8

If fill has not already been placed on the property to elevate it or a structure above the elevation of the base flood, indicate whether any fill is anticipated.

Item 9

Any available information regarding previous requests will be useful to FEMA. In particular, if the request concerns a proposed project that was submitted to FEMA for comment and is now complete, please indicate that here. It is not necessary, however, to research previous requests.

Item 10

The documents to be enclosed with each request will vary, depending on the nature of the request. Not all forms are required for every request.

a.,b. Property description documentation must be enclosed and will consist of either the Plat Map or the Deed and tax assessor's map. It is important that the recordation data (e.g., Book, Volume, Page, Reel, Date) be evident on the copies of these documents so that FEMA may describe the property in a legal sense. In addition, FEMA must be able to identify the property exactly. If the property is not recorded on a Plat Map, a copy of a tax assessor's map or other suitable map is required to aid FEMA in locating the property.

c. A photocopy of the FIRM panel must be annotated to show where the property is located. For requests involving more than one structure or lot, the locations of the structures or lots must be certified by a registered professional engineer or licensed land surveyor to be accurate representations. The panel number and effective date of the FIRM must appear on the copy submitted. The actual map or a photographic copy must be used. A reproduction from a photocopy is unacceptable due to possible distortion.

d. A map (certified by a registered professional engineer or licensed land surveyor) may be required to relate the ground elevations and locations of structures or lots. The map should be labeled to indicate whether it reflects "as-built" or "proposed" conditions.

e. A metes and bounds description is required only if a request is made that an area less than the entire property be removed from the SFHA. (This does not apply to requests involving only structures.) The metes and bounds description will cover the specific area to be removed, be tied to an identifiable starting point, and be certified by a registered professional engineer or licensed land surveyor. The narrative description must be accompanied by a certified map showing the area described. Note that no portion of the area described by the metes and bounds may be below the 100-year flood elevation.

f. The Elevation Information form must be included UNLESS the request is for a determination that the FIRM already shows the property or structure to be outside the SFHA. This form must be completed by a registered professional engineer or licensed land surveyor.

g. The Community Acknowledgement form must be included for all requests involving the placement of fill in the SFHA to elevate the structure or property. It requires the Chief Executive Officer (CEO) of the community or an official designated by the CEO to acknowledge activities affecting the community's floodplain and floodway management responsibilities.

h. The Certification of Fill Compaction form is required for requests involving the preparation of fill pads designed to support the foundations of residential or commercial structures. It must be completed by a registered professional engineer, an accredited soils scientist, or the community's NFIP permit official. This certification is NOT required for a single residential structure or lot.

i. The initial fee is required for requests involving proposed projects (see instructions for Item 6) and for requests involving more than one lot that has been elevated by the placement of fill. No fee is required to obtain a determination based on existing conditions as long as no fill has been placed or the project involves only one lot.

j. Attach other information as necessary.

Item 11

Complete the last part of the form to certify the accuracy of the information provided.

INSTRUCTIONS FOR COMPLETING THE ELEVATION INFORMATION FORM

For a registered professional engineer or licensed land surveyor to complete this form it will be necessary to obtain the FIRM panel, Flood Boundary and Floodway Map (FBFM) panel, and Flood Insurance Study (FIS) report that cover the area in which the property is located. These can be obtained from the community map repository or can be ordered from the Flood Map Distribution Center by calling 1-800-358-9616.

Item 1

The community name appears in the Title Block of the FIRM panel that shows the area in which the property is located.

Item 2

Include lot /block numbers and subdivision name, street address, or tract/parcel number.

Item 3

Name the source of the flooding (i.e., give the name of the stream, river, lake, bay, or ocean) or note whether there is ponding or shallow flooding.

Item 4

List all flood zones that affect the property (e.g., A, AE, A1-A30, A99, VE, V1-V30, B, C, X, D).

Item 5

The regulatory floodway is the channel of a river or other watercourse that must be reserved to carry the floodwaters efficiently. If a floodway has been adopted by the community it will be shown on the FBFM or FIRM. No fill may be placed in a regulatory floodway.

Item 6

In areas of subsidence or uplift, the elevations shown on this document must be based on the most recent releveling of a National Geodetic Survey or other acceptable benchmark.

Items 7 and 8

After listing the BFE, identify the datum to which the elevation is referenced (e.g., MSL, NGVD, NAVD). If the datum identified differs from the datum used in the FIS report/FIRM, provide a conversion equation to relate the two. Typically, preliminary data produced while an FIS is underway cannot be used to support a request for a LOMA or LOMR-F.

Detailed Analysis

A determination shall be made using the BFE or depth presented in the FIS report (in the Summary of Elevations table or on the Flood Profiles), or the one that is shown on the FIRM. Requests based on flood elevations or depths that are different from those shown on the FIRM or in the FIS report will be processed under other administrative procedures.

Zone AE or A1-A30 (riverine flooding sources): After locating the property on the FBFM or FIRM, use the nearest lettered cross section or physical feature to locate the property and the corresponding BFE on the Flood Profile in the FIS report.

Zone AE or A1-A30 (coastal flooding sources): Read the BFE from the FIRM panel and compare it to the corresponding value presented in the Summary of Stillwater Elevations table in the FIS report. If the table value is within 0.4 foot of the BFE on the FIRM (i.e., no wave runup), use the table value; if the BFE on the FIRM is more than 0.5 foot greater than the table value (i.e., includes wave runup), use the BFE on the FIRM.

Zone AH or A1-A30: Obtain the BFE from the FIRM panel or FIS report.

Zone AO: Read the depth from the FIRM panel.

Zone VE or V1-V30: Revisions in these zones are handled under other procedures.

Approximate Analysis

If FEMA has not specified BFEs for the area, data may be provided to substantiate a 100-year flood elevation. These data may be obtained from an authoritative source, such as the U.S. Army Corps of Engineers, U. S. Geological Survey, U.S. Soil Conservation Service, or a State or local water resource department. Alternatively, data prepared and certified by a registered professional engineer may be submitted. Sufficient technical information should be provided to support the elevation.

Item 9

Complete this item only for requests to remove the SFHA designation from a parcel(s) of land (whether defined by a metes and bounds description, described in a Deed, or shown on a Plat Map). After listing the elevation, identify the datum to which the elevation is referenced, providing a conversion equation as necessary.

Item 10

Complete this item only for requests to remove the SFHA designation from a structure(s). The elevation requested is that of the lowest ground touching the structure. For structures built on piers, provide the lowest ground touching the piers. After listing the elevation, identify the datum to which the elevation is referenced, providing a conversion equation as necessary.

Item 11

Complete this item only for requests involving fill placed within an identified SFHA to elevate a structure(s) since the date of the first NFIP map. If the structure has a basement, the elevation requested is that of the basement floor. After listing the elevation, identify the datum to which the elevation is referenced, providing a conversion equation as necessary.

Item 12

Complete the last part of the form to certify the accuracy of the information provided. If FEMA has specified a BFE for the area in which the property is located or the 100-year flood elevation was obtained from an authoritative source such as the U.S. Army Corps of Engineers, the U.S. Geological Survey, the U.S. Soil Conservation Service, or a State or local water resource department, the form may be certified by either a registered professional engineer or a licensed land surveyor. If FEMA has not specified a BFE for the area, and a registered professional engineer has determined the 100-year flood elevation based on alternative data, Items 7 and 8 must be certified by a registered professional engineer, but the form may be certified by either a registered professional engineer or a licensed land surveyor.

Types of Requests

These forms shall be used to request one of the following responses from FEMA:

LOMA	A letter from FEMA stating that an existing structure or parcel of land that has not been elevated by fill would not be inundated by the 100-year flood
CLOMA	A letter from FEMA stating that a proposed structure that is not to be elevated by fill would not be inundated by the 100-year flood if built as proposed
LOMR-F	A letter from FEMA stating that an existing structure or parcel of land that has been elevated by fill would not be inundated by the 100-year flood
CLOMR-F	A letter from FEMA stating that a parcel of land or proposed structure that is to be elevated by fill would not be inundated by the 100-year flood if fill is placed on the parcel as proposed or the structure is built as proposed

Applicable Regulations

The regulations pertaining to LOMAs and LOMRs-F are presented in the NFIP regulations under Title 44, Chapter I, Parts 65 and 70, Code of Federal Regulations (CFR). The purpose of Part 70 is to provide an administrative procedure whereby FEMA will review information submitted by an owner or lessee of property who believes that his or her property has been inadvertently included in a designated SFHA. The necessity of Part 70 is due in part to the technical difficulty of accurately delineating the SFHA boundary on an NFIP map. Part 70 procedures shall not apply if the topography has been altered since the effective date of the first NFIP map (i.e., a FIRM or Flood Hazard Boundary Map) showing the property to be within the SFHA. Requests involving changes in topography (such as the placement of fill) are handled under the procedures described in Part 65.

Part 72 of the NFIP regulations, published at 44 CFR 72, presents information regarding the reimbursement procedure that FEMA has initiated to allow for the recovery of costs associated with the review of requests for CLOMAs, CLOMRs-F, and LOMRs-F involving more than one lot, thereby reducing the expense to the general taxpayer. The initial, minimum fees for FEMA's review and processing of such requests are as follows:

• Single-lot CLOMA or CLOMR-F	$175
• Multiple-lot CLOMA or CLOMR-F	$245
• Multiple-lot LOMR-F that follows a CLOMR-F, provided that the as-built conditions are the same as the proposed conditions upon which FEMA based the CLOMR-F	$200
• Multiple-lot LOMR-F, not following a CLOMR-F	$445

Before a determination is issued, the requester will be billed for any actual costs incurred during the review that exceed the initial fee. In addition, if a multiple-lot LOMR-F results in a change that can be shown on the NFIP map when the map is next revised, a fee of $560 per panel will be charged for cartographic preparation and processing. If the total cost will exceed $700, FEMA will advise the requester and obtain approval in writing before costs in excess of $700 are incurred.

The following types of requests are exempt from fees under Section 72.5 of the NFIP regulations:

- Requests for LOMAs or LOMRs to correct map errors or to include the effects of natural (not manmade) changes to the SFHA
- Requests for LOMRs-F to remove single residential lots or structures from the SFHA

Basis of Determination

FEMA's determination as to whether a structure(s) may be removed from the SFHA will be based upon a comparison of the BFE with the elevation of the lowest adjacent grade to the structure and, if fill has been placed, with the elevation of the lowest floor (including basement). For a legally defined property that does not have a structure on it to be removed from the SFHA, the elevation of the lowest ground on the property must be at or above the BFE.

Please note the following special considerations that may affect FEMA's determination:

- In areas of sheetflow flooding (AO Zones), the elevation of the lowest adjacent grade and the elevation of the lowest floor (including basement) must be above the elevation of the highest surrounding ground by at least the amount of the depth specified on the FIRM. In addition, adequate drainage paths must be maintained to guide floodwaters around and away from the structure(s).

- If the lowest floor of a building has been elevated on posts, piers, or pilings above the BFE in the SFHA and any portion of the structure (i.e., posts or piers) is still below the BFE, the building will not be removed from the SFHA.

Response

In accordance with Part 70 procedures, the requester will be notified in writing of the determination within 60 days of the date of receipt of all required data. Under Part 65 procedures, the community will be notified in writing of the determination within 90 days of the date of receipt of all requested data.

Effect on Insurance Purchase Requirements

Although FEMA may issue a LOMA or LOMR-F removing a structure(s) from the SFHA, it is the lending institution's prerogative to require flood insurance if it deems such action appropriate. If, however, the lending institution agrees to waive the flood insurance purchase requirement for a structure that has not been elevated by fill, the property owner is eligible for a full refund of the premium paid for the current policy year, provided that no claim is pending or has been paid on the policy in question during the same policy year. If the property owner has been required to renew his or her policy during a period when a revised map was being printed, the premium will be refunded for an additional year. To initiate processing of the refund, the property owner should provide the LOMA and evidence of the waiver of the flood insurance requirement from the lending institution to the insurance agent or broker who sold the policy.

Conditional Determinations

To qualify for a CLOMA or CLOMR-F, the proposed project must meet the same criteria as those required for a LOMA or LOMR-F. After construction is completed or fill is placed, certified as-built information must be submitted to FEMA in order for a LOMA or LOMR-F to be issued.

Property owners and developers should note that a CLOMA or CLOMR-F merely provides comment on the proposed plan and does not amend the map. It also does not relieve Federal agencies of the need to comply in carrying out their responsibilities for providing federally undertaken, financed, or assisted construction and improvements or in their regulating and licensing activities, in accordance with the provisions of Executive Order 11988.

FEMA USE ONLY

PROPERTY INFORMATION

This form may be completed by the property owner.

1. Community Name: _____ State: _____

   Community Number: _____ Panel or Map Number: _____

   Effective Date: _____

2. Street Address of Property: _____

   _____

3. Description of Property (if a street address cannot be provided): _____

   _____

   _____

4. Are you requesting that the SFHA designation be removed from (a) all of the land within the bounds of the property, (b) a portion of land within the bounds of the property (metes and bounds description is required), or (c) the structure(s) on the property? (Answer "a," "b," or "c")

   _____

5. Is this request for (a) a single residential structure or lot, (b) a single commercial structure or lot, or (c) multiple structures or lots? (Answer "a," "b," or "c") _____

6. Is this request for (a) existing conditions or (b) a proposed project? (Answer "a" or "b")

   _____

7. Has fill been placed in an identified SFHA? _____ If yes, when? _____

8. For proposed projects, will fill be placed to elevate this land or structure(s)? _____

9. Do you know of previous requests that have been submitted to FEMA for this property or adjacent properties? _____

   If yes, what was the date of FEMA's response letter? _____

10. I have enclosed the following documents in support of this request:

_____ a. Copy of the Plat Map (with recordation data)

OR

_____ b. Copy of the Deed (with recordation data), accompanied by a tax assessor's or other suitable map showing the surveyed location of the property

_____ c. Copy of the effective FIRM panel on which the property location has been accurately plotted (If the request is for more than one lot/structure, this location must be certified by a registered professional engineer or licensed land surveyor)

_____ d. A map showing the locations of any structures existing on or proposed for the property (certified by a registered professional engineer or licensed land surveyor)

_____ e. Metes and bounds description and accompanying map (only if the request is for a portion of land within the bounds of the property, not structure(s) only)

_____ f. Elevation Information form

_____ g. Community Acknowledgment form (only if fill has been/will be placed)

_____ h. Certification of Fill Compaction form (only if fill has been/will be placed and the request is not for a single residential structure)

Initial fee (if applicable, see page 7 of instructions)

_____ i. _____ $_____
(type of request) (amount enclosed)

_____ j. Additional information: _____
(please specify)

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

Applicant's Name: _____
(please print or type)

Mailing Address: _____

_____
(please print or type)

Daytime Telephone Number: _____

_____ _____
Date Signature of Applicant

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ELEVATION INFORMATION

This form must be completed by a registered professional engineer or licensed land surveyor. (See page 6 of instructions for details.)

1. Community Name: _____

2. Legal Description of Property: _____

   _____

3. Flooding Source: _____

4. Based on the FIRM, this property is located in Zone(s) _____

5. Is any portion of this property located in the adopted regulatory floodway? _____

   Are any structures (existing or proposed) located in the regulatory floodway? _____

6. Is this area subject to land subsidence or uplift? _____ If yes, what is the date of the current releveling? _____

7. What is the BFE for this property? (Provide elevation to nearest tenth of a foot and datum)*

   _____

8. How was the BFE determined (attach a copy of the Flood Profile or table from the FIS report, if appropriate, or other necessary supporting information)? _____

   _____

   _____

   _____

   _____

   _____

   _____

*For multiple lots/structures, complete the Summary of Elevations—Individual Lot Breakdown form, identifying the elevation for each lot/structure .

9. If this request is to remove the SFHA designation from a parcel of land or lot(s), what is the existing or proposed elevation of the lowest grade; that is, the lowest ground on the property? (Provide elevation to nearest tenth of a foot and datum)* _____

10. If this request is to remove the SFHA designation from a structure(s), what is the elevation of the existing or proposed lowest adjacent grade; that is, the lowest ground touching the structure? (Provide elevation to nearest tenth of a foot and datum)* _____

11. If fill has been/will be placed to elevate the structure(s) on this property, what is the existing or proposed elevation of the lowest floor, including basement? (Provide elevation to nearest tenth of a foot and datum)* _____

*For multiple lots/structures, complete the appropriate column(s) of the Summary of Elevations—Individual Lot Breakdown form, identifying the elevation for each lot/structure.

12. 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: _____
(please print or type)

Title: _____
(please print or type)

Registration No. _____ Expiration Date: _____

State _____

_____
Signature

_____ _____
Date Seal (Optional)

FEMA USE ONLY

CERTIFICATION OF FILL COMPACTION

Community Name

Property Name or Address

I hereby certify that fill placed on the property to raise the ground surface to or above the base (100-year) flood elevation in order to gain exclusion from a Special Flood Hazard Area (100-year floodplain) meets the criteria of Title 44 of the Code of Federal Regulations, Paragraph 65.5(a)(6), listed below. For proposed fill, I hereby certify that it is designed in accordance with these criteria.

1. That the fill has been compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test method or an acceptable equivalent method for (check one of the following)

   _____ a. Fill pads prepared for the foundations of residential or commercial structures

   _____ b. Entire legally defined parcel (Note: If the location of fill pads has not been determined, the fill over the entire legally defined parcel must be compacted to the above criteria).

2. That fill slopes for granular materials are not steeper than one vertical on one-and-one-half horizontal (steeper slopes must be justified); and

3. That adequate erosion protection is 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 permanent 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 appropriately designed stone, rock, concrete, or other durable products).

Signature

Date

Community Official's Title or
Engineer's Seal/Registration Number

FEMA USE ONLY

COMMUNITY ACKNOWLEDGMENT OF REQUESTS INVOLVING FILL

Community Name _____ Property Name or Address _____

We hereby acknowledge receipt and review of this Letter of Map Revision request and have found that the completed or proposed project meets or is designed to meet all of the community's applicable floodplain management regulations, including the requirement that no fill be placed in the adopted regulatory floodway. We understand that this request is being forwarded to FEMA for a possible map revision. For proposed projects, we understand that FEMA is being asked to provide comments on the potential effects of this project on the flood hazards of our community.

Community comments on the proposed project: _____

_____

_____

_____

_____

_____

Community Official's Name: _____
(please print or type)

Address: _____

_____
(please print or type)

Daytime Telephone Number: _____

_____ _____
Community Official's Signature Date

_____
Community Official's Title

October 1992

FEMA USE ONLY

SUMMARY OF ELEVATIONS— INDIVIDUAL LOT BREAKDOWN

Community Name

Property Name or Address

LOT NUMBER	BLOCK NUMBER	LOWEST LOT ELEVATION[1]	LOWEST FLOOR ELEVATION[2] (INCLUDING BASEMENT)	LOWEST ADJACENT GRADE TO STRUCTURE[3]	100-YEAR FLOOD ELEVATION	SOURCE OF 100-YEAR FLOOD ELEVATION	FOR FEMA USE ONLY

[1]For requests that an entire parcel of land be removed from the SFHA; if the request involves an area described by metes and bounds, provide the lowest elevation within that area

[2]For requests that a structure that has been elevated by fill be removed from the SFHA

[3]For requests that a structure be removed from the SFHA

REGION I

(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont)

Federal Emergency Management Agency
Natural and Technological Hazards Division
J.W. McCormack Post Office and Courthouse Building, Room 462
Boston, Massachusetts 02109-4595

(617) 223-9559

REGION II

(New York, Puerto Rico, New Jersey, and Virgin Islands)

Federal Emergency Management Agency
Natural and Technological Hazards Division
26 Federal Plaza, Room 1337
New York, New York 10278-0002

(212) 225-7200

REGION III

(Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia)

Federal Emergency Management Agency
Natural and Technological Hazards Division
Liberty Square Building
(Second Floor)
105 South Seventh Street
Philadelphia, Pennsylvania 19106-3316

(215) 931-5750

Region IV

(Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee)

Federal Emergency Management Agency
Natural and Technological Hazards Division
1371 Peachtree Street, Northeast
Suite 700
Atlanta, Georgia 30309-3108

(404) 853-4418

REGION V

(Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin)

Federal Emergency Management Agency
Natural and Technological Hazards Division
175 West Jackson Boulevard
(Fourth Floor)
Chicago, Illinois 60604-2698

(312) 408-5533

REGION VI

(Arkansas, Louisiana, New Mexico, Oklahoma, and Texas)

Federal Emergency Management Agency
Natural Hazards Branch
Federal Regional Center
800 North Loop 288
Denton, Texas 76201-3698

(817) 898-5127

REGION VII

(Iowa, Kansas, Missouri, and Nebraska)

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FEDERAL EMERGENCY MANAGEMENT AGENCY
FEDERAL INSURANCE ADMINISTRATION

REVISIONS TO
NATIONAL FLOOD INSURANCE PROGRAM MAPS

Application/Certification Forms and Instructions

for

Conditional Letters of Map Revision,
Letters of Map Revision, and
Physical Map Revisions

NOVEMBER 1992

RSD-1

INSTRUCTIONS FOR COMPLETING THE APPLICATION/CERTIFICATION FORMS FOR CONDITIONAL LETTERS OF MAP REVISION, LETTERS OF MAP REVISION, AND PHYSICAL MAP REVISIONS

GENERAL

In 1968, the U.S. Congress passed the National Flood Insurance Act, which created the National Flood Insurance Program (NFIP). The NFIP was designed to reduce future flood losses through local floodplain management and to provide protection for property owners against potential losses through flood insurance.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt floodplain management ordinances containing certain minimum requirements intended to reduce future flood losses. The community is also responsible for submitting data to the Federal Emergency Management Agency (FEMA) reflecting revised flood hazard information so that NFIP maps can be revised as appropriate. This will allow risk premium rates and floodplain management requirements to be based on current data.

Submissions to FEMA for revisions to effective Flood Insurance Studies (FISs) by individual and community requestors will require the signing of application/certification forms. These forms will provide FEMA with assurance that all pertinent data relating to the revision is included in the submittal. They will also assure that: (a) the data and methodology are based on current conditions; (b) qualified professionals have assembled data and performed all necessary computations; and (c) all individuals and organizations impacted by proposed changes are aware of the changes and will have an opportunity to comment on them. The circumstances for which this package is applicable are as follows:

Conditional Letter of Map Revision (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).
Letter of Map Revision (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.)
Physical Map Revision (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.)

Please note that for the following circumstances, this package is not applicable. Instead, the package entitled Amendments and Revisions to National Flood Insurance Program Maps, Application/ Certification Forms and Instructions for Conditional Letters of Map Amendment, Letters of Map Amendment, Conditional Letters of Map Revision (Based on Fill), and Letters of Map Revision (Based on Fill) is appropriate.

Letter of Map Amendment (LOMA)	A letter from FEMA removing an existing structure or a legally defined parcel of land unaltered by fill from an SFHA (see 44 CFR Ch. I, Part 70).
Conditional Letter of Map Amendment (CLOMA)	A letter from FEMA conditionally removing a proposed structure or a legally defined parcel of land unaltered by fill from an SFHA (see 44 CFR Ch. I, Parts 70 and 72).
Letter of Map Revision Based on Fill (LOMR-BOF)	A letter from FEMA removing an existing structure or a legally defined parcel of land elevated by the placement of fill from an SFHA (see 44 CFR Ch. I, Section 65.5).
Conditional Letter of Map Revision Based on Fill (CLOMR-BOF)	A letter from FEMA conditionally removing a proposed structure or a legally defined parcel of land to be elevated by the placement of fill from an SFHA (see 44 CFR Ch. I, Section 65.5 and Part 72).

NFIP regulation, CFR Ch.I, specifies the requirements regarding the submittal of revision requests to FEMA. A document entitled Appeals, Revisions, and Amendments to Flood Insurance Maps, A Guide for Community Officials, dated January 1990, provides background on the NFIP and an expanded explanation of these requirements.

NFIP Regulation, 44 CFR Ch. I, Part 59, contain general provisions of the NFIP with which all requestors and community officials involved in revision requests should be familiar.

NFIP Regulation, 44 CFR Ch. I, Section 65.2, contain definitions relative to certification of data, analyses, and structural works. This information is important to all professionals certifying technical information contained with revision requests and should be carefully reviewed prior to signing the application/certification forms.

Part 72 of the NFIP regulations, published at 44 CFR 72, presents information regarding the reimbursement procedure that FEMA has initiated to allow for the recovery of costs associated with the review of requests for Conditional LOMRs, LOMRs, or Physical Map Revisions, thereby reducing the expense to the general taxpayer. The initial, minimum fees for FEMA's review and processing of CLOMRs, LOMRs, and Physical Map Revisions requests are as follows:

	CLOMR	LOMR	PMR
• Bridge or culvert only	$490	$690	$690
• Channel modification only	$560	$760	$760
• Channel modification and new bridge or culvert	$735	$935	$935
• Levees, berms, or other structural modifications	$945	$1,145	$1,145
• Structural measures on alluvial fan	$2,800	$3,000	$3,000
• Review of revised hydrology	$245	---	---
• "As-Built" request for previous CLOMR	---	$200	$200

Before a determination is issued, the requestor will be billed for any actual costs incurred during the review that exceed the initial fee. If the total cost will exceed $1,500, FEMA will advise the requestor and obtain approval in writing before costs in excess of $1,500 are incurred, except for requests involving levees and/or berms, or structural measures on alluvial fan. For those requests, the requestor will be notified if costs will exceed $2,500 and $5,000, respectively.

If the revision requests results in either a LOMR or a Physical Map Revision, the requestor will be charged a fee of $560 per revised panel to cover the costs of cartographic preparation. Please note that any initial fee already submitted will be applied to this request only if all of the required data are received within 90 days of the receipt of the original request by FEMA. Check or money orders should be made payable to The National Flood Insurance Program.

Exempt from these reimbursement procedures for either proposed or "as-built" conditions are requests for projects that are for public benefit and are intended to reduce the flood hazard to existing development in identified flood hazard areas as opposed to planned floodplain development. Also exempt are requests based solely on the submission of more detailed information and requests to correct NFIP map errors.

A request for a revision to the effective FIS information (FIRM, FBFM, and /or FIS report) is usually a request that FEMA replace the effective floodplain boundaries, flood profiles, floodway boundaries, etc., with those determined by the requestor. Before FEMA will replace the effective FIS information with the revised, the requestor must: (a) provide all of the data used in determining the revised floodplain boundaries, flood profiles, floodway boundaries, etc. (b) provide all data necessary to demonstrate that the physical modifications to the floodplain have been adequately designed to withstand the impacts of the 100-year flood event and will be adequately maintained (c) demonstrate that the revised information (e.g., hydrologic and hydraulic analyses and the resulting floodplain and floodway boundaries) are consistent with the effective FIS information.

Completed application/certification forms should be neatly packaged in order, with the appropriate enclosure following each form submitted. A notebook-style format is ideal. The complete package should be submitted to the appropriate FEMA Regional Office. The addresses and telephone numbers of the ten Regional Offices, as well as information regarding which areas they support, are provided inside the back cover of this document. The address and telephone number of the Headquarters office in Washington, DC, are also provided.

Additional information is contained on the forms. Wherever necessary, attach additional sheets required to provide the information requested on the forms.

Commonly Used Acronyms

FEMA	Federal Emergency Management Agency.
NFIP	National Flood Insurance Program.
BFE	Base Flood Elevation. It is the height of the base flood, usually in feet, in relation to the datum used, or the depth of the base flood usually in feet, above the ground surface. The base flood is the flood that has a 1 percent probability of being equaled or exceeded in any given year (also referred to as the 100-year flood).
FIS	Flood Insurance Study. An engineering study performed under contract to FEMA to identify flood-prone areas and to determine BFEs, flood insurance rate zones, and other flood risk data for a community.
FIRM	Flood Insurance Rate Map. An official map of a community, on which the Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.
FBFM	The Flood Boundary and Floodway Map. The floodplain management map issued by FEMA that depicts, on the basis of detailed analyses, the boundaries of the 100- and 500- year floodplain and the regulatory 100-year floodway.
SFHA	Special Flood Hazard Area. Areas inundated by a flood having a 1 percent probability of being equaled or exceeded in any given year (also referred to as the 100-year flood).
FHBM	The Flood Hazard Boundary Map. The initial flood insurance map issued by FEMA that identified on the basis of approximate analyses, the areas of 100-year flood hazard in a community.
CHHA	Coastal High Hazard Area. An area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources.

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

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

Physical changes include watershed development, flood control structures, etc. Note that fees will be assessed for FEMA's review of proposed and "as-built" projects, as outlined in NFIP regulation 44 CFR Ch. I, Part 72. Improved methodology may be a different technique (model) or adjustments to models used in the effective FIS. Improved data include revised as well as new data. Floodway modifications involve any shift in the FEMA-designated floodway boundaries, regardless of whether the shift is mappable.

Flooding source refers to a specific lake, stream, ocean, etc. This should match the flooding source name shown on the FIRM, if it has been labeled. (Examples: Lake Michigan, Duck Pond, or Big Hollow Creek.) Project Name/Identifier can be the name of a flood control project or other pertinent structure having an impact on the effective FIS, the name of a subdivision or area, or some other identifying phrase.

The map number, panel number, community number and effective date can be obtained from the FIRM title block. The sample FIRM panels (Figures 1 and 2) provide a convenient source of information to fill in item 5.

NFIP Compliance

If the community or communities disagree with the proposed revision, a signed statement should be attached to the request explaining the reasons or bases for disagreement.

The community should refer to the document entitled Appeals, Revisions and Amendments to Flood Insurance Maps: A Guide for Community Officials, dated January 1990.

Requested Response from FEMA

In order to avoid confusion between FEMA and the revision requestor, the requestor should identify the desired response from FEMA. Brief descriptions of possible responses are provided in the introduction; more detail regarding these responses and the data required to obtain each response are provided in the NFIP regulations, 44 CFR Ch. I, and in the document entitled Appeals, Revisions and Amendments to Flood Insurance Maps: A Guide for Community Officials, dated January 1990.

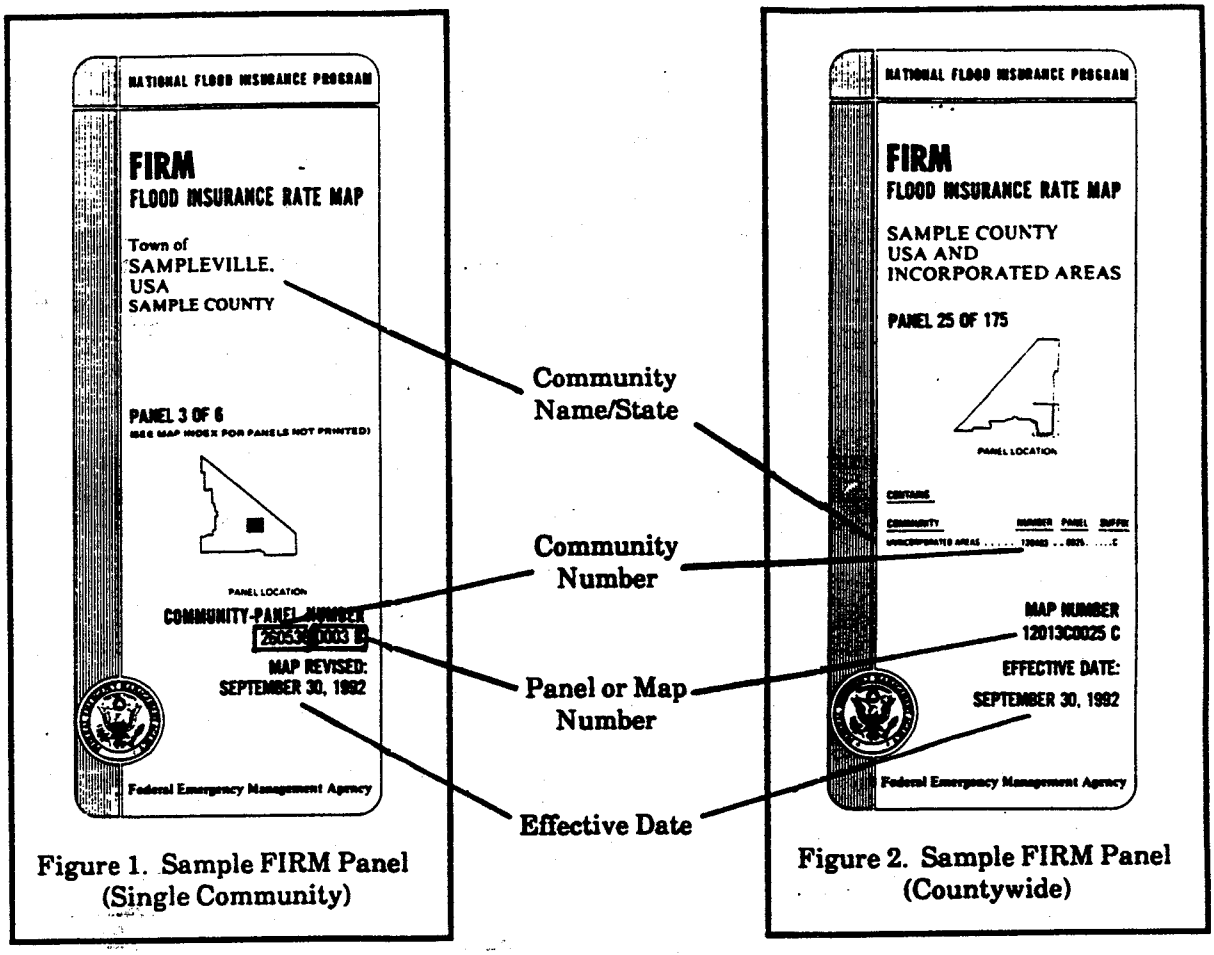

Figure 1. Sample FIRM Panel (Single Community)

Figure 2. Sample FIRM Panel (Countywide)

Signature and Title of Revision Requestor

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

Signature and Title of Community Officials

The person signing this certification should be the CEO for the community involved in this revision request or a legally designated official by the CEO. If more than one community is affected by the change, the community official from the community that is most affected should sign the form and letters from the other affected communities should be enclosed.

INSTRUCTIONS FOR COMPLETING THE PROFESSIONAL CERTIFICATION FORM (FORM 2)

The licensed professional engineer and/or land surveyor should have a current license in the State in which one of the impacted communities resides and should provide the number of years of experience in the specific area of expertise being certified, not the number of years as a licensed professional engineer and/or land surveyor. While the individual signing this form is not required to have obtained the supporting data or performed the analyses, he or she must have supervised and reviewed the work. This form must be submitted with each request.

Viewing the physical changes (Item 4) involves an on-site visit and observation of all features upon completion of the project. Examination of photographs is not a substitute for on-site visits.

If not familiar with all analyses conducted within the expertise cited on this form (Item 5) or with all construction procedures involved with the construction of the completed project (Item 6), the individual signing this form should attach a statement indicating the basis for concluding that all analyses and construction were performed in accordance with sound engineering practice. The individual signing this form should take care to identify other experts who may not be licensed engineers and their assistance regarding the assessment of analyses and construction practices.

Please note that more than one certification form may be required to include all disciplines involved in project completion.

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

INSTRUCTIONS FOR COMPLETING THE HYDROLOGIC ANALYSIS FORM (FORM 3)

This form is to be completed when discharges other than those used in FIS are proposed. Information requested is used to compare revised data to FIS data, compare revised discharges to FIS discharges, and to determine the merit of using revised methods and data over those used in the FIS.

For revisions based on alternative methodologies or improved data, an explanation as to why the alternative methodology or improved data provides better results over the FIS must be presented and supported throughout the form.

Attachment A - Statistical Analysis of Gage Records (one per gage record):

Statistical analyses of gage data are based on the guidelines set out in Bulletin 17B by the Interagency Advisory Committee on Water Data.

Systematic data refer to peak discharge data observed and recorded regularly over a period of time by a government agency or private firm. Historical data refers to peak discharge data observed outside the systematic period and recording only isolated outstanding events. Historical data should be documented whenever possible.

For data to be homogeneous, the long-term trend of the data should remain constant. In other words, the probability distribution used to describe it is independent of time. An example of non-homogeneous data would be peak discharge data at the confluence of two streams following two different flow regimes.

Adjustments made to the statistical data/record, such as the use of a second gaging station to compensate for a short record or adjustments for zero flood years.

Bulletin 17B recommends the use of the log-Pearson Type III (LP3) distribution for the statistical analysis of flood data. However, there may be situations where the LP3 distribution is inappropriate and another probability distribution must be used. Other distributions include Extreme Value (Gumbel) and log-normal (Galton). The use of alternative distributions must be justified and fully documented.

Comparison with other analyses includes comparing the analysis with another station on a hydrologically similar stream or using an alternative analysis (e.g. regression equations) to verify the reasonableness and logic of the results.

Attachment B - Regression Analysis (one per stream)

The source of the regression equations must be given along with a proper bibliographical reference. The U.S. Geological Survey (USGS), in cooperation with State agencies in charge of monitoring water data, has developed regression equations on a state-by-state basis. As these are revised regularly, FEMA will accept only the most recently published regression equation report. Other agencies also put out regression analyses reports, or a regional analyses can be performed.

Stream stations are grouped in hydrologic regions in which certain basin parameters have been found to have roughly the same influence on the peak flows as evidenced by the multiple regression analysis. It can happen that a stream watershed may encompass more than one region, in which case some proportionality of the influence of each region upon the peak discharge must be considered.

Most regression equations are developed for rural or undeveloped conditions. These results can be modified to reflect urban or developed conditions. If urbanized conditions were considered, the

methodology for developing the urban discharges must be described and/or referenced and the percentage of the watershed that is urbanized must be given.

Because regression equations are based on compilation of data from several gage stations, a certain amount of natural basin storage is inherent in the equations. However, regression equations are not designed to handle watersheds controlled by major storage features such as flood control structures. If such structures exist, a full account of how flood storage was considered must be given.

Attachment C - Precipitation/Runoff Model (One Per Model)

Baseflow is defined as the estimated flow occurring in the stream before the flood event occurs.

Because there are many different precipitation/runoff models, many with a different theoretical basis, it is very difficult, if not impossible, to prove that one model provides superior results over another. Therefore, it must be shown that the types of parameters, the theoretical basis, and source of data provide superior results.

If possible, a precipitation runoff model should be compared and calibrated to a known flood event in order to justify the values of the parameters and the assumptions made in the model. All calibration and verification runs should be described and the results discussed. Please attach copies of the calibration and verification runs.

Attachment D - Confidence Limits Evaluation

When revised discharges are not significantly different than the FIS discharges, FEMA may require a confidence limit analysis at a later date to complete the review.

INSTRUCTIONS FOR COMPLETING THE RIVERINE HYDRAULIC ANALYSIS FORM (FORM 4)

This form is to be completed when the request involves a hydraulic analysis for riverine flooding that differs from that used to develop the FIRM.

To obtain copies of the effective FIS models, either the community or FEMA Regional offices should be contacted for direction. A list of FEMA Regional offices is located at the end of the instructions. If the effective models are not available, the requestor must generate models that duplicate the FIS profiles and the elevations shown in the Floodway Data Table in the FIS report to within 0.1 foot or contact FEMA Headquarters for guidance. FEMA Headquarters should be contacted if this model cannot be produced. If an alternative hydraulic model is used, it must be shown that the use of the original model is inappropriate and the new model must be calibrated to reproduce the FIS profiles within 0.1 foot.

Only the duplicate effective and the revised or post-project conditions models are required to be submitted. The corrected effective model may be submitted to provide a more detailed analysis than the duplicate effective model at the project site or fix any technical deficiencies. The existing or pre-project models may be required to support conclusions about the actual impacts of the project associated with the revised or post-project model or to establish more up-to-date models on which to base the revised or post-project conditions model. The revised or post-project conditions model must always include the existing and post-project conditions. Additional information about these models is contained on the form.

The information requested on the Hydraulic Analysis Form are intended to document the steps taken by the requestor in the process of preparing the revised or post-project conditions hydraulic models and the resulting revised FIS information. The following guidelines should be followed when completing the form:

(a) All changes to the duplicate and subsequent models must be supported by certified topographic information, bridge plans, constructions plans, survey notes, etc.

(b) Changes to the hydraulic models should be limited to the stream reach for which the revision is being requested. Cross-sections upstream and downstream of the revised reach should be identical to those in the effective model. If this is done, water surface elevations and topwidths computed by the revised models should match those in the effective models upstream and downstream of the revised reach as required.

(c) There must be consistency between the revised hydraulic models, the revised floodplain and floodway delineations, the revised flood profiles, topographic work map, annotated FIRMs and/or FBFMs, construction plans, bridge plans, etc.

For SFHAs designated as Zone A, the existing or pre-project model and the revised or post-project model,or other hydraulic analyses for existing and revised conditions are required to determine the 100-year flood profile. The existing model or analysis is required to support conclusions about the actual impacts of the project associated with the revised or post-project model or analysis.

INSTRUCTIONS FOR COMPLETING THE RIVERINE/COASTAL MAPPING FORM (FORM 5)

This form is to be completed when mapping changes to either the FIRM or FBFM are proposed and to assure that the revised floodplain and floodway boundary information tie-into the effective information so that a consistent NFIP map is maintained. In addition, the questions asked and information required are to determine the impacts of the revision, including increases in SFHA and shifts in floodway both on and off the requestor's property.

When fill is placed in the 100-year floodplain and the request is to alter 100-year flood boundary, in order to permanently remove the filled area from the floodplain, the fill must be compacted and protected against erosion from moving flood waters.

An insurable structure is defined as a walled and roofed building, other than a gas or liquid storage tank, that is principally above ground and affixed to a permanent site, as well as a manufactured home on a permanent foundation. For the latter purpose, the term includes a building while in the course of construction, alteration or repair, but does not include building materials or supplies intended for use in such construction, alteration or repair, unless such materials or supplies are within an enclosed building on the premises.

INSTRUCTIONS FOR COMPLETING THE CHANNELIZATION FORM (FORM 6)

This form is to be completed when any portion of the stream channel is altered or relocated. When the Channelization Form is submitted, a Riverine Hydraulic Analysis Form must also be submitted.

The purpose of the Channelization Form is to assure that the channel will function properly as designed and pass the 100-year flood as determined by the hydraulic analysis. Typically, channelization increases the channel velocity above the natural channel velocity. Documentation must be provided that assures that the channel lining will withstand the velocities associated with the 100-year flood. Additional considerations are the stability of the flow regime and the affects of sediment transport.

INSTRUCTIONS FOR COMPLETING THE BRIDGE/CULVERT FORM (FORM 7)

This form is to be completed when the request involves a new bridge or culvert or a new or revised analysis of an existing bridge or culvert.

Typically a revision is not requested to reflect a new analysis of a previously studied existing structure. If this is the case, an explanation of why the new analysis was performed is required. Typically, the structure is analyzed using the same method of analysis used for the flooding source. If a different method is used for the structure, justification why the hydraulic analysis utilized for the flooding source could not analyze the structure must be enclosed.

Culvert Length or Bridge Width:	The culvert length or bridge width in direction of flow must be entered.
Culvert/Bridge Area:	If a computer model is used to analyze the structure, the calculated culvert/bridge area may be different than the total culvert/bridge area in cases of low flow.
Elevations above which flow is effective for the entire cross-section:	These elevations are needed to ensure that the flow is restricted to the effective cross-section.
Top Widths:	Top widths are the horizontal distance between stations of the floodplain boundaries, floodway boundaries, and the limits of effective and ineffective flow areas in a cross-section.

INSTRUCTIONS FOR COMPLETING THE LEVEE/FLOODWALL SYSTEM ANALYSES FORM (FORM 8)

The purpose of this form is to assure that the levee or floodwall is designed and/or constructed to provide protection from the 100-year flood, in full compliance with 44 CFR Ch. I, Section 65.10 of the National Flood Insurance Program (NFIP) regulations, before reflecting its effects on an NFIP map. A complete engineering analysis must be submitted in support of each section of this form. In addition, a vicinity map along with a complete set of flood profile sheets, plan sheets, and layout detail sheets must be submitted. These sheets must be numbered, and an index must be provided that clearly identifies those sheets specifically relating to the levee or floodwall in question.

INSTRUCTIONS FOR COMPLETING THE COASTAL ANALYSIS FORM (FORM 9)

The information requested on the Coastal Analysis Form is intended to document the steps taken by the requestor in the process of preparing the revised models or analyses and the resulting revised FIS information. The following guidelines should be followed when completing the form:

a. All changes to effective models must be supported by certified topographic information, structure plans, survey notes, storm surge data, meteorological data, etc.

b. The reanalysis of the effective study must tie-in with areas not restudied.

c. All equations or models used must be referenced.

INSTRUCTIONS FOR COMPLETING THE COASTAL STRUCTURES FORM (FORM 10)

The Coastal Structures Form is to be completed when a revision to coastal flood hazard elevations and/or areas is requested based on coastal structures being credited as providing protection from the base flood. If the coastal structure is a levee/floodwall, complete the Levee/Floodwall System Analysis Form in lieu of this form. When the Coastal Structures Form is submitted, the Coastal Analysis Form should also be submitted.

The purpose of the Coastal Structures Form is to assure that the structure is designed and constructed to provide protection from the base flood without failing or causing an increase in flood hazards to adjacent areas. Documentation must be provided that assures a coastal structure is designed and constructed to withstand the wind and wave forces associated with the base flood. Additional concerns include the impact to areas directly landward of the structure that may be subjected to overtopping and erosion along with possible failure of the structure due to undermining from the backside and the possible increase in erosion at the ends of the structure to unprotected properties. The evaluation of protection provided by sand dunes must follow the criteria outlined in 44 CFR Ch. I, Section 65.11.

INSTRUCTIONS FOR COMPLETING THE DAM FORM (FORM 11)

The Dam Form is to be filled out when there is an existing, proposed, or modified dam along a stream studied in detail. Any flood control storage to be considered in the hydrologic analysis for the dam should be totally dedicated to flood control. If the dam is not certified to safely pass the 100-year flood and the dam has a reasonable probability of failure during the 100-year flood, a dam break analysis should be submitted. The dam break analysis should provide consistent results, use empirical peak discharges from actual dam failures, require minimal input data, and perform river routing of the failure hydrograph by dynamic procedures, which includes attenuation and translation. The NFIP does not involve appraisal of dam safety adequacy; however, the FISs should include impacts of structures when subjected to 100-year flood hydrographs. Local, State, and/or Federal laws address dam safety features.

INSTRUCTIONS FOR COMPLETING THE ALLUVIAL FAN FLOODING FORM (FORM 12)

The purpose of this form is to assure that a structural flood control measure in areas subject to alluvial fan flooding is designed and/or constructed to provide protection from the 100-year flood, in compliance with 44 CFR Ch. I, Section 65.13 of the National Flood Insurance Program (NFIP) regulations, before it is recognized on a NFIP map. Please be aware that elevation of a parcel of land or a structure by fill or other means only, will not serve as a basis for removing areas subject to alluvial fan flooding from an area of special flood hazards. See Section 65.13 of the NFIP regulations. Complete engineering analyses must be submitted in support of each section of this form. In addition, it may be necessary to complete other forms relating to specific flood control measures, such as levees/floodwalls, channelization, or dams.

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New York, New York 10278-0002

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Inquiries to FEMA Headquarters should be addressed to the Risk Studies Division at the following address:

Federal Emergency Management Agency
Federal Insurance Administration
Office of Risk Assessment
500 C Street, SW
Washington, D.C. 20472

(202)646-2767

FEMA USE ONLY

FORM 1

REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM

1. The basis for this revision request is (are): (check all that apply)
   - ☐ Physical change
     - ☐ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☐ Improved data
   - ☐ Floodway revision
   - ☐ Other _____
     Explain _____
2. Flooding Source: _____
3. Project Name/Identifier: _____
4. FEMA zone designations affected: _____
   (example: A, AH, AO, A1-A30, A99, AE, V, V1-V30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

	Community No.	Community Name	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

6. The submitted request 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	☐ Dam	☐ Sediment Transport
☐ Lakes	☐ Coastal	☐ Interior Drainage
Affected by wind/wave action	☐ Fill	☐ Structural
☐ Yes	☐ Pump Station	☐ Geotechnical
☐ No	☐ None	☐ Land Surveying
☐ Other (describe)	☐ Other (describe)	☐ Other (describe)
_____	_____	_____

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

Floodway Information

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

If yes, give reason: _____

_____

Attach request to revise the floodway from community CEO or designated official.

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.

Does the State have jurisdiction over the floodway or it's 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.

Proposed Encroachments

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 increase at any location by more than 0.000 feet? ☐ Yes ☐ No

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 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 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.

Revision Requestor Acknowledgement

- Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, 65, and 72, I believe that the proposed revision ☐ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

Community Official Acknowledgement

- Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☐ Yes ☐ No
- 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 acknowledgement and/or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

Operation and Maintenance

- Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐ Yes ☐ No

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

Requested Response from FEMA

- 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.)
___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 _____

Forms Included

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 riverine flooding 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 4)
• The request is based solely on updated topographic information	☐ Riverine/Coastal Mapping (Form 5)
• The request involves any type of channel modification	☐ Channelization (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 or revised levee/floodwall system	☐ Levee/Floodwall System Analysis (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 (Form 10)
• The request involves an existing, proposed, or modified dam	☐ Dam Form (Form 11)
• This request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

Initial Review Fee

- The minimum initial review fee for the appropriate request category has been included.

☐ Yes ☐ No

If yes, the amount submitted is $ _____.

or

- This request is for a project that is for public benefit and is intended to reduce the flood hazard to existing development in identified flood hazard areas as opposed to planned floodplain development.

☐ Yes ☐ No

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

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

Signature of Revision Requestor	Signature of Community Official
Printed Name and Title of Revision Requestor	Printed Name and Title of Community Official
Company Name	Community Name
Date _____	Date _____

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.

FEMA USE ONLY

FORM 2

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

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

2. I am licensed with an expertise in _____
[example: water resources (hydrology, hydraulics, sediment transport, interior drainage)* structural, geotechnical, land surveying.]

3. I have _____ 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 design, were performed in accordance with sound engineering practices:

_____

7. Based 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: _____
(please print or type)

Title: _____
(please print or type)

Registration No. _____ Expiration Date: _____

State _____

Type of License _____

_____
Signature

_____
Date

_____
Seal
(Optional)

*Specify Subdiscipline

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

FEMA USE ONLY

FORM 3

HYDROLOGIC ANALYSIS FORM

Community Name: _____

Flooding Source: _____

Project Name/Identifier: _____

Hydrologic Analysis in FIS

☐ Approximate study stream (Zone A)

☐ Detailed study stream (briefly explain methodology) _____

_____

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) _____

_____

_____

Bridge/Cul

☐ 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.

Approval of Analysis

☐ Approval of the hydrologic analysis, including the resulting peak discharge value (s) has been provided by the appropriate local, state, or Federal Agency. (i.e., _____

_____)

Attach evidence of approval.

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

Review of Results

Stream _____

Comparison of 100-year Discharges

Location:	FIS:	Revised:
_____	_____ cfs	_____ cfs
_____	_____ cfs	_____ cfs
_____	_____ cfs	_____ cfs
_____	_____ cfs	_____ cfs
_____	_____ cfs	_____ cfs

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

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.

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: _____

Gage Record Information

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

_____

Gaging Station: _____

Drainage area at gage: _____ mi^2

Number of years of data: _____

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
_____	☐	☐	_____
_____	☐	☐	_____
_____	☐	☐	_____
_____	☐	☐	_____
_____	☐	☐	_____

- 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 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.

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: _____

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:

_____

_____

_____

(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 computations and supporting maps.

Attachment C: Precipitation/Runoff Model

		FIS:	Revised:
1.	Method or model used: Version: Date:	_____ _____ _____	_____ _____ _____
2.	Source of rainfall depth:	_____	_____
3.	Source of rainfall distribution:	_____	_____
4.	Rainfall duration:	_____	_____
5.	Areal adjustment to precipitation (%):		_____
6.	Hydrograph development method:	_____	_____
7.	Loss rate method: Source of soils information: Source of land use information:	_____ _____	_____ _____ _____
8.	Channel routing method:	_____	_____
9.	Reservoir routing:	☐ Yes ☐ No	☐ Yes ☐ No
10.	Baseflow considerations: If yes, explain how baseflow was determined:	☐ Yes ☐ No	☐ Yes ☐ No
11.	Snowmelt considerations:	☐ Yes ☐ No	☐ Yes ☐ No
12.	Model calibration: If yes, explain how calibration was performed.	☐ Yes ☐ No	☐ Yes ☐ No
13.	Future land use conditions: If yes, explain why.		☐ Yes ☐ No

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, and supporting maps.

Attachment D: Confidence Limits Evaluation

Stream: _____

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.

FEMA USE ONLY

FORM 4

RIVERINE HYDRAULIC ANALYSIS FORM

Community Name: _____

Flooding Source: _____

Project Name/Identifier: _____

Reach to be Revised

Downstream limit _____

Upstream limit _____

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 _____

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: _____

_____

_____

Models Submitted

Full input and output listings along with files on diskette (if available) for each of the models listed below and a 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). Only the Duplicate Effective and the Revised or Post-Project Conditions models must be submitted. See instructions for directions on when other models may be required. Only the 100-year flood profile is required for SFHAs with a Zone A designation.

☐ 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.

☐ 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.

☐ Existing or Pre-Project Conditions Model — Natural ☐ Floodway ☐

The duplicate effective or corrected effective model is modified to produce the existing or pre-project conditions model to reflect any modifications that have occurred within the floodplain since the date of the effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the corrected effective or duplicate effective model.

☐ 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.

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

Model Parameters
(from model used to revise 100-year water surface elevations)

1. Discharges:

	Upstream Limit	Downstream Limit
10-year	_____	_____
50-year	_____	_____
100-year	_____	_____
500-year	_____	_____

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined _____

_____

_____

	Starting Water Surface Elevation
10-year	_____
50-year	_____
100-year	_____
Floodway	_____
500-year	_____

3. Give range of friction loss coefficients _____

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: _____

_____

_____

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.

_____

_____

_____

Model Parameters (Cont'd)

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

_____

_____

_____

_____.

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.

2. What is the maximum head loss between cross-sections? _____

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

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

5. Floodway determination

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

b. What is the maximum surcharge for the revised conditions? _____ foot

c. What is the maximum velocity? _____ fps

d. What type of erosion protection is provided? _____

Explain: _____

_____

_____

Model Parameters
(from model used to revise 100-year water surface elevations)

1. Discharges:

	Upstream Limit	Downstream Limit
10-year		
50-year		
100-year		
500-year		

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined

Water surface elevation was based on slope area method.

	Starting Water Surface Elevation
10-year	
50-year	
100-year	
Floodway	
500-year	

3. Give range of friction loss coefficients 0.045 - 0.12

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
NA		

Explain: New flood insurance 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.

Cross sections were digitized by mapping company.

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

All cross sections are stationed from left to right looking downstream with the control line set at 10,000. Cross sections are located at intervals along the wash to define flow carrying capacity of the wash and adjacent floodplain. Sections were situated perpendicular to flow extending over the banks across the entire floodplain section. Sections are spaced approximately 500 ft. apart or they were changes in discharge or changes in slope, shape or roughness across the floodplain.

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.

2. What is the maximum head loss between cross-sections? _____

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

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

5. Floodway determination

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

   b. What is the maximum surcharge for the revised conditions? NA foot

   c. What is the maximum velocity? NA fps

   d. What type of erosion protection is provided? NA

   Explain: Natural stream channel.

Results (Cont'd)

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:

_____

_____

_____

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

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.

NA

_____

_____

_____

Please attach a completed comparison table entitled: Water Surface Elevation Check.

Revised FIRM/FBFM and Flood Profiles

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 NA within NA feet and upstream of the project at cross section NA within NA feet.

B. The revised floodway elevations tie into those computed by the effective FIS model, downstream of the project at cross section NA within NA feet and upstream of the project at cross section NA within NA feet.

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.

Proceed to Riverine/Coastal Mapping Form.

Community Name: _____

Flooding Source: _____

Project name/Identifier: _____

Water Surface Elevation Chec

	Effective			Duplicate Effective			Corrected Effective			Existing/Pre-Project			Revised/Project		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL	FCWSEL	SURC.	NCWSEL	FCWSEL	SURC.	NCWSEL	FCWSEL	SURC.	NCWSEL	FCWSEL	SUI

Comments:

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

Results (Cont'd)

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:

_____

_____

_____

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

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.

_____

_____

_____

Please attach a completed comparison table entitled: Water Surface Elevation Check.

Revised FIRM/FBFM and Flood Profiles

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 and upstream of the project at cross section _____ within _____ feet.

B. The revised floodway elevations tie into those computed by the effective FIS model, downstream of the project at cross section _____ within _____ feet and upstream of the project at cross section _____ within _____ feet.

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.

Proceed to Riverine/Coastal Mapping Form.

Water Surface Elevation Check

Community Name: _____

Flooding Source: _____

Project name/Identifier: _____

	Effective			Duplicate Effective			Corrected Effective			Existing/Pre-Project			Revised/Project		
SECNO	NCWSEL[1]	FCWSEL[2]	SURC.[3]	NCWSEL	FCWSEL	SURC.	NCWSEL	FCWSEL	SURC.	NCWSEL	FCWSEL	SURC.	NCWSEL	FCWSEL	SURC.

Comments:

1 - 100-year (natural) Water Surface Elevation

2 - Encroachment (floodway) Water Surface Elevation

3 - Surcharge Value

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FORM 5

RIVERINE/COASTAL MAPPING FORM

Community Name: _____

Flooding Source: _____

Project Name/Identifier: _____

Mapping Changes

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

		Included
A.	Revised 100- year floodplain boundaries (Zone A)	☐ Yes ☐ No ☐ N/A
B.	Revised 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 1929, NAVD 1988, etc.)	☐ 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: _____

_____

_____

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.)? _____

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

   a. Effective FIS _____ scale _____ Contour interval

   b. Revision Request _____ scale _____ Contour interval

Note: Revised topographic information must be of equal or greater detail

Mapping Changes (Continued)

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.

   _____

   _____

   _____

   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.

   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:

   _____

   _____

   _____

7. If a V-zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? ☐ 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.

Earth Fill Placement

1. Has fill been placed in the regulatory floodway? ☐ Yes ☐ No

   If yes, please attach completed Riverine Hydraulic Form.

2. Has fill been 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.

3. Has fill been placed in a V-zone? ☐ Yes ☐ No

   If yes, is the fill protected from erosion by a flood control structure such as a revetment or seawall? ☐ Yes ☐ No

   If yes, attach the coastal structures form.

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FORM 6

CHANNELIZATION FORM

Community Name: _____

Flooding source: _____

Project Name/Identifier: _____

Extent of Channelization

Downstream limit: _____

Upstream limit: _____

Channel Description

1. Describe the inlet to the channel _____
_____
_____.

2. Briefly describe the shape of the channel (both cross sectional and planimetric configuration) and its lining (channel bottom and sides) _____
_____
_____

3. Describe the outlet from the channel _____
_____
_____.

4. The channelization includes:

- ☐ Levees
- ☐ Drop structures
- ☐ Superelevated sections
- ☐ Transitions in cross sectional geometry
- ☐ Debris basin/detention basin
- ☐ Energy dissipater
- ☐ Other _____
_____.

5. Attach the following:

   a. Certified engineering drawings showing channel alignment and locations of inlet, outlet, and items checked in Item 4

   b. Typical cross sections and profiles of channel banks and invert

1. What is the 100-year discharge? _____ cfs

2. Do the cross sections in the hydraulic model match the typical cross sections in the plans? ☐ Yes ☐ No

3. Are the channel banks higher than the 100-year flood elevations everywhere? ☐ Yes ☐ No

4. Are the channel banks higher than the 100-year flood energy grade lines everywhere? ☐ Yes ☐ No

5. Is the land on both sides of the channel above the adjacent 100-year flood elevation at all points along the channel? ☐ Yes ☐ No

6. What is the range of freeboard? _____ - _____ feet

7. What is the range of the 100-year flood velocities? _____ - _____ ft/sec

8. What is the lining type? (both bottom and sides) _____

Explain how the channel lining prevents erosion and maintains channel stability (attach documentation) _____

_____

9. What is the design elevation in the channel based on?:

☐ Subcritical flow
☐ Critical flow
☐ Supercritical flow
☐ Energy grade line

Is 100-year flood profile based on the above type of flow? ☐ Yes ☐ No

If no, explain: _____

_____

10. Is there the potential for a hydraulic jump at the following locations?

Inlet to channel	☐ Yes	☐ No
Outlet of channel	☐ Yes	☐ No
At Drop Structures	☐ Yes	☐ No
At Transitions	☐ Yes	☐ No

Other location. Explain: _____

If the answer to any of the above is yes, please explain how the hydraulic jump is controlled and the effects of the hydraulic jump on the stability of the channel.

Explain: _____

_____

_____

_____

_____

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 and/or the capacity of the channel?

☐ Yes ☐ No

B. Based on the conditions of the watershed and stream bed, is there a potential for sediment transport (including scour and deposition) to affect the 100-year water-surface elevations and/or the capacity of the channel?

☐ Yes ☐ No

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

A. What is the estimated sediment (bed) load?

_____ cfs (attach gradation curve)

Explain method used to estimate load _____

_____

_____

_____

_____

B. Is the 100-year flood velocity anywhere within the channel less than the 100-year flood velocity of the inlet? ☐ Yes ☐ No

C. Will sediment accumulate anywhere within the channel? ☐ Yes ☐ No

D. Will deposition or scour occur at or near the inlet? ☐ Yes ☐ No

E. Will deposition or scour occur at or near the outlet? ☐ Yes ☐ No

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FORM 7

BRIDGE/CULVERT FORM*

Community Name: _____
Flooding Source: _____
Project Name/Identifier: _____

Identifier

1. Name of roadway, railroad, etc.: _____
2. Location of bridge/culvert along flooding source (in terms of stream distance or cross-section identifier): _____
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 bridge/culvert previously modeled in the FIS (Explain why new analysis was performed.) _____

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. Entrance geometry of culvert/ type of bridge opening (e.g. 30° - 75° wing walls with square top edge, sloping embankments and vertical abutments) _____
3. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO,HY8) _____

   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 explanation)

Note: If any items do not apply to submitted hydraulic analysis, indicate by N/A

*One form per new/revised bridge/culvert

Analysis

Sketch the downstream 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 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.

Analysis (Cont'd)

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).

← flow _____ . . . _____ . . . _____

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

Culvert length or bridge width (ft.) _____

Calculated culvert/bridge area (ft^2)
by the hydraulic model, if applicable _____

Total culvert/bridge area (ft^2) _____

Analysis (Cont'd)

Elevations Above Which Flow is Effective for Overbanks

	Left Overbank	Right Overbank
Upstream face	_____	_____
Downstream face	_____	_____

Minimum Top of Road Elevation

	Left Overbank	Right Overbank
Upstream face	_____	_____
Downstream face	_____	_____

100-Year Elevations

	Water-Surface Elevations	Energy Gradient Elevations
Upstream face	_____	_____
Downstream face	_____	_____

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

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

Weir length (ft.) _____

Top Widths

	Floodplain	Floodway
Upstream face	_____	_____
Downstream face	_____	_____

Top Widths

	Effective Flow	Effective and Ineffective Flow
Upstream face	_____	_____
Downstream face	_____	_____

Loss Coefficients

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

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 _____

_____

_____

_____

_____

B. Will sediment accumulate anywhere through the bridge/culvert?

☐ Yes ☐ No

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

_____

Floodway Analysis

Explain method of bridge encroachment (floodway run) _____

_____

_____

Comments (explain any unusual situations):

_____

_____

_____

_____

_____

_____

_____

Attach analysis

FEMA USE ONLY

FORM 8

LEVEE/FLOODWALL SYSTEM ANALYSES FORM

Community Name: _____

Flooding Source: _____

Project Name/Identifier: _____

Reach to be Revised

Downstream limit: _____
Upstream limit: _____

This Levee/Floodwall analysis is based on:

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

Levee/Floodwall System Elements

1. Levee elements and locations are:

   - ☐ earthen embankment, dike, berm, etc. Station _____ to _____
   - ☐ structural floodwall Station _____ to _____
   - ☐ Other (describe) _____ Station _____ to _____

   Structural Type:

   - ☐ monolithic cast-in place reinforced concrete
   - ☐ reinforced concrete masonry block
   - ☐ sheet piling
   - ☐ others (describe) _____

2. Has this levee/floodwall system been certified by a Federal agency to provide protection against the 100-year flood event?

   ☐ Yes ☐ No

   If yes, by which agency? _____

   If yes, complete only the interior drainage section on pages 7 and 8 of 9 of this form and the operation and maintenance section of Form 1.

Levee/Floodwall System Elements (Cont'd)

3. Attach certified drawings containing the following information (indicate drawing sheet numbers):

   a. Plan of the levee embankment and floodwall structures. Sheet Numbers _____

   b. A profile of the levee/floodwall system showing the 100-year water surface elevation, levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers _____

   c. A profile of the 100-year water surface elevation, closure opening outlet and inlet invert elevations, type and size of opening , and kind of closure device. Sheet Numbers _____

   d. A layout detail for the embankment protection measures. Sheet Numbers _____

   e. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers _____

Freeboard

1. The minimum freeboard provided above the 100-year water surface elevation is:

   Riverine

   3.0 feet or more at the downstream end and throughout ☐ Yes ☐ No

   3.5 feet or more at the upstream end ☐ Yes ☐ No

   4.0 feet immediately upstream of all structures and constrictions ☐ Yes ☐ No

   Coastal

   1.0 foot above the height of the one percent wave for the 100-year stillwater surge elevation or maximum wave runup (whichever is greater). ☐ Yes ☐ No

   2.0 feet above 100-year stillwater surge elevation ☐ Yes ☐ No

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

   If no is answered to any of the above, please explain where and why: _____

   _____

2. Tabulate the elevations at critical locations (tabulate values at each levee crest grade change)

Station	Location	100-Year Water Surface Elevation	Levee Crest	Freeboard (ft.)
_____	Upper end	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	Lower end	_____	_____	_____

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

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 the freeboard for the levee/floodwall?

☐ 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 _____

_____

_____

_____

_____

B. Will sediment accumulate anywhere along the levee/floodwall (such as along any bends in the channel)?

☐ Yes ☐ No

If yes, what is the minimum freeboard at these locations? _____ feet.

Closures

1. Openings through the levee system:

☐ exist ☐ do not exist

If openings exist, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

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

Geotechnical and geologic data:

In addition to the required detail analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following levee system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers EM-1110-2-1906 Form 2086).

Embankment Protection

1. The maximum levee slope landside is _____

2. The maximum levee slope floodside is _____

3. The range of 100-year riverine flood velocities along the levee? _____ (min.) to _____ (max.)

4. Embankment material is protected by (describe the kind): _____
_____
_____
_____

5. Riprap Design Parameters: (Include references) ☐ Velocity; ☐ Tractive stress

Reach	Sideslope	Flow depth	Velocity	Curve or Straight	Stone Riprap D_{100}	Stone Riprap D_{50}	Stone Riprap Thickness	Depth of Toedown
Sta __ to __								
Sta __ to __								
Sta __ to __								

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

6. Has a bedding/filter analysis & design been included ☐ Yes ☐ No

Describe the analysis used for other kinds of protection used (include copies of the design analysis): _____
_____
_____
_____

Note: Attach engineering analysis to support construction plans.

Embankment and Foundation Stability

1. Describe the basis for selection of critical location for analysis: _____

_____

☐ Overall height: Sta _____, height _____ ft.

☐ Limiting foundation soil strength:

Sta _____, depth _____ to _____

strength Ø = _____ degrees, c = _____ psf

☐ slope: SS = _____ (h) to _____ (v)

(Repeat as needed on an added sheet for additional locations)

2. Specify the embankment stability analyses methodology used (e.g. circular arc, sliding block, infinite slope, etc.): _____

_____

3. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	_____	1.3
II	Sudden drawdown	_____	1.0
III	Critical flood stage	_____	1.4
IV	Steady seepage at flood stage	_____	1.4
VI	Earthquake (Case I or III)	_____	1.0

(Reference: U.S. Army Corps. of Engineers EM-1110-2-1913 Table 6-1)

4. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

Describe methodology used: _____

_____

5. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

6. The duration of 100-year flood hydrograph against the embankment is ___ Hrs.

Note: Attach engineering analysis to support construction plans.

Floodwall and Foundation Stability

1. Design analysis submittal is based on Code:

   ☐ UBC (1988) or ☐ Other (specify) _____

2. Stability analysis submitted provides for:

   ☐ Overturning; ☐ Sliding; If not, explain _____

3. Loading included in the analyses were:

   ☐ Lateral earth @ P_A = _____ psf; P_p = _____ psf
   ☐ Surcharge -- Slope @ _____, ☐ surface _____ psf
   ☐ Wind @ P_w = _____ psf
   ☐ Seepage (Uplift); ☐ Earthquake @ P_{eq} = _____ %g
   ☐ 100-year significant wave height _____ ft.
   ☐ 100-year significant wave period _____ sec.

4. Summary of Stability Analysis Results: Factors of Safety. Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min) Overturn	Criteria (Min) Sliding	Sta _____ To _____ Overturn	Sta _____ To _____ Sliding	Sta _____ To _____ Overturn	Sta _____ To _____ Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood & Impact	1.5	1.5				
Dead, Soil & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; COE EM 1110-2-2502)

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

5. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load	Short Term Load
Computed design maximum	_____ psf	_____ psf
Maximum allowable	_____ psf	_____ psf

6. Foundation scour protection ☐ is, ☐ is not provided, (describe)

   _____

Note: Attach engineering analysis to support construction plans.

Settlement

1. Anticipated potential settlement has been determined and incorporated into the specified construction elevations to maintain the established freeboard margin.
   ☐ Yes ☐ No
2. The computed range of settlement is _____ ft. to _____ ft.
3. Settlement of the levee crest is determined to be primarily from:
   ☐ Foundation consolidation
   ☐ Embankment compression
   ☐ Other (describe) _____
4. Differential settlement of floodwalls
   ☐ has ☐ has not been accommodated in the structural design and construction.

Note: Attach engineering analysis to support construction plans.

Interior Drainage

1. Specify size of each interior watershed
   Draining to pressure conduit _____
   Draining to ponding area _____
2. Relationships Established
   Ponding elevation vs. storage ☐ Yes ☐ No
   Ponding elevation vs. gravity flow ☐ Yes ☐ No
   Differential head vs. gravity flow ☐ Yes ☐ No
3. The river flow duration curve is enclosed ☐ Yes ☐ No
4. Specify the discharge capacity of the pressure conduit _____
5. Which Flooding Conditions Were Analyzed?
   - Gravity flow (Interior Watershed) ☐ Yes ☐ No
   - Common storm (River Watershed) ☐ Yes ☐ No
   - Historical ponding probability ☐ Yes ☐ No
   - Coastal wave overtopping ☐ Yes ☐ No

   If no, explain why: _____
6. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection
   ☐ Yes ☐ No

   If no, explain why: _____
7. The rate of seepage through the levee system for the 100-year flood is _____ cfs

Interior Drainage (Cont'd)

8. The length of levee system used to derive this seepage rate is _____ ft.

9. Will a pumping plant(s) be used for interior drainage? ☐ Yes ☐ No

If yes, indicate the number of pumping plants: _____

For each pumping plant, list:	Plant #1	Plant#2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operations be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: U.S. Army Corps of Engineers EM 1110-2-3101, 3102, 3103, 3104, and 3105)

Note: Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

Other Design Criteria

1. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem.

Hydrocompaction ☐ is ☐ is not a problem.

Heave/differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem.

2. For each of these problems, state the basic facts and corrective action taken.

_____

_____

_____

_____

If the levee or floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?

☐ Yes ☐ No

Note: Attach supporting documentation.

The planned/installed works are in full compliance with NFIP regulation Section 44 CFR Ch. 1. 65.10

☐ Yes ☐ No

Operational Plan and Criteria

1. The operation plan incorporates all the provisions for closure devices as required in section 65.10 (c)(1), of the NFIP regulations ☐ Yes ☐ No

2. The operation plan incorporates all the provisions for interior drainage as required in section 65.10 (c)(2), of the NFIP regulations ☐ Yes ☐ No

If no to either of the above,please explain.

_____

_____

_____

_____

FEMA USE ONLY

FORM 9

COASTAL ANALYSIS FORM

Community Name: _____

Flooding Source: _____

Project Name/Identifier: _____

Coastline to be Revised

Describe limits of study area: _____

_____

_____

_____

Effective FIS

The area being revised was:*

- ☐ studied in the FIS by approximate methods
- ☐ studied in the FIS with only the stillwater surge elevation designated
- ☐ studied in the FIS by detailed methods with:
  - ☐ wave runup computations
  - ☐ wave height computations
  - ☐ dune erosion computations
  - ☐ storm surge modeling. Specify model used:
    - ☐ SPLASH
    - ☐ TTSURGE
    - ☐ FEMA STORM SURGE
    - ☐ SLOSH
    - ☐ WIFM
    - ☐ OTHER _____

*Check all that apply

Revised Analyses

Check all analyses used to prepare the revision.

- ☐ Stillwater elevation determinations (complete Section 1)
- ☐ Erosion considerations (complete Section 2)
- ☐ Wave height analysis (complete Sections 2 and 3)
- ☐ Wave runup analysis (complete Sections 2 and 3)
- ☐ New shore protection structures (attach completed Coastal Structures form)
- ☐ Other

If other, give basis of revision request with an explanation:

_____

_____

1. Stillwater Elevation Determinations

How were stillwater elevations determined?

- ☐ gage analysis
- ☐ storm surge analysis
- ☐ other - explain _____

If revised gage analysis, list gages utilized:

Gage Number	Number of Years of Record	Gage Site Location

Provide copies of gage data and revised analysis.

Specify what datum was used in the calculations. _____

If not the FIS datum have the calculations been adjusted to the FIS datum?

☐ Yes ☐ No ☐ Specify Conversion factor _____

If revised storm surge analysis, was FEMA's storm surge model utilized?

☐ Yes ☐ No

If yes, describe in detail differences between current analysis and revised analysis, and why revised analysis should replace current analysis. _____

2. To be completed for revised analyses (i.e., erosion, wave height, and wave runup)

If FEMA procedures were utilized to perform the revision, describe in detail each difference between the current and the revised analysis, and why the revised analysis should replace the current analysis. _____

If FEMA procedures were not utilized to perform the revision, provide full documentation on methodology and/or models used, including operational program, detailed differences between methodology and/or model utilized and FEMA's methodology and/or model. Also, explain why new methodology and/or model should replace current methodology and/or model. _____

3. To be completed for wave height and wave runup analyses

Overtopping analysis is typically considered when wave heights and/or wave runup are close to or greater than the crest of shore protection structures or natural land forms.

Was an overtopping analysis performed for any coastal shore protection structures or natural land forms that may be overtopped?

☐ Yes ☐ No

If yes, explain methodology utilized and describe in detail the results of the analysis. ___

Results

Stillwater storm surge elevation _____

Maximum wave height elevation _____

Maximum wave runup elevation _____

Have areas designated as coastal high hazard areas (V-zones) increased?

☐ Yes ☐ No

If yes, describe where they have increased. _____

_____

The base (100-year) flood elevations have: ☐ increased ☐ decreased

What was the greatest increase? _____ feet

What was the greatest decrease? _____ feet

The 100-year flood boundary has: ☐ increased ☐ decreased

Describe where it has increased or decreased. _____

_____

_____

_____

_____

Please provide a map with revised shoreline due to either erosion or accretion, if appropriate.

Note: If any items do not apply to submitted coastal analysis, indicate by N/A.

FEMA USE ONLY

FORM 10

COASTAL STRUCTURES FORM

Community Name: _____

Flooding Source: _____

Project Name/Identifier: _____

Background

Name of structure (if applicable): _____

Structure location: _____

_____

Type of structure:

- ☐ Levee/dike*
- ☐ Revetment
- ☐ Breakwater
- ☐ Other _____
- ☐ Bulkhead
- ☐ Seawall
- ☐ Soft Shore Protection (i.e., sand dunes)

*Note: **If the coastal structure is a levee/floodwall, complete the Levee/Floodwall System Analyses Form. The remainder of this form does not need to be completed.**

Material structure is composed of:

- ☐ Stone
- ☐ Concrete
- ☐ Sand
- ☐ Earthen fill
- ☐ Steel
- ☐ Other _____

Is Structure:

☐ New ☐ Existing ☐ Proposed

If existing, describe in detail the modifications being made to the structure and the purpose of the modifications. _____

_____

Copies of certified "as-built" plans ☐ are ☐ are not being submitted. If "as-built" plans are not available for submittal, please explain why and submit a sketch with general structure dimensions including: face slope, height, length, depth, and toe elevation referenced to the appropriate datum (example: NGVD 1929, NAVD 1988, etc.).

Has a Federal agency with responsibility for the design of coastal flood protection structures designed or certified that the structure(s) has/have been adequately designed and constructed to provide protection against the base (100-year) flood?

☐ Yes ☐ No

If yes, specify the name of the agency and dates of project completion and/or certification. No other sections of this form need to be completed. If yes: _____

_____

DESIGN CRITERIA

Design Parameters

Physical parameters representing the base (100-year) flood event or greater were used to design the coastal flood protection structure.

☐ Yes ☐ No

The number of design water levels that were evaluated _____ (number) range from mean low water _____ feet to the 100-year stillwater surge elevation of _____ feet. The critical water level is _____ feet. The datum that these elevations are referenced to is _____ (example: NGVD 1929, NAVD 1988, etc.)

Wave heights and periods were computed for each water level analyzed.

☐ Yes ☐ No

If no, specify which water levels were analyzed. _____

_____

100-year significant wave height is _____
100-year significant wave period is _____
100-year one-percent wave height is _____

Were breaking wave forces used to design the structure?

☐ Yes ☐ No

If no, please explain why they were not used for design. _____

_____

_____

Settlement

What is the settlement rate expected at the site of the structure? _____

_____

Please provide a settlement analysis.

Freeboard

Does the structure have 1 foot of freeboard above the height of the one-percent wave for the 100-year stillwater surge elevation or maximum wave runup (whichever is greater)?

☐ Yes ☐ No

Does the structure have freeboard of at least 2 feet above the 100-year stillwater surge elevation?

☐ Yes ☐ No

FEMA does not typically recognize structures as providing 100-year flood protection if they do not meet the freeboard criteria listed above. Please note, occasionally exceptions are made to the minimum freeboard requirement. Please consult the National Flood Insurance Program Regulation 65.10, regarding freeboard requirements.

Toe Protection

Specify the type of toe protection. _____

_____

If no toe protection is provided, provide analysis of scour potential and attach an evaluation of structural stability performed with potential scour at the toe.

Backfill Protection

Will the structure be overtopped during the 100-year flood event?

☐ Yes ☐ No

If the the structure will be overtopped, what measures are used to prevent the loss of backfill from rundown over the structure, drainage landward, under or laterally around the ends of the structure, or through seams and drainage openings in the structure?

_____

_____

_____

_____

_____

_____

Structural Stability - Minimum water level

For coastal revetments, was a geotechnical analysis of potential failure in the landward direction by rotational gravity slip performed for maximum loads associated with minimum seaward water level, no wave action, saturated soil conditions behind the structure, and maximum toe scour?

☐ Yes ☐ No

For gravity and pile-supported seawalls, were engineering analyses of seaward sliding, seaward overturning, and of foundation adequacy using maximum pressures developed in the sliding and overturning calculations performed?

☐ Yes ☐ No

For anchored bulkheads, were engineering analyses performed for shear failure, moment failure, and adequacy of tiebacks and deadmen to resist loadings under low-water conditions?

☐ Yes ☐ No

Structural Stability - Critical Water Level (Note: All structures must be designed to resist the maximum loads associated with the critical water level to be credited as providing 100-year protection.)

For coastal revetments were geotechnical analyses performed investigating the potential failure in the seaward direction by rotational gravity slip or foundation failure due to inadequate bearing strength?

☐ Yes ☐ No

For revetments, were engineering analyses of rock, riprap, or armor blocks' stability under wave action performed or uplift forces on the rock, riprap, or armor blocks?

☐ Yes ☐ No

Are the rocks graded:

☐ Yes ☐ No

Are soil or geotextile filters being used in the design?

☐ Yes ☐ No

For gravity and pile supported seawalls, were engineering analyses of landward sliding, landward overturning, and foundation adequacy performed?

☐ Yes ☐ No

For anchored bulkheads, were engineering analyses of shear and moment failure performed using "shock" pressures?

☐ Yes ☐ No

For all analyses marked "No" above for the appropriate type of structure, please explain why the analyses were not performed.

Material Adequacy

The design life of the structure given the existing conditions at the structure site is _____ years.

Ice and Impact Alignment

Will the structure be subjected to ice forces? ☐ Yes ☐ No

If yes, was it designed for such forces? ☐ Yes ☐ No

If yes, attach analysis.

Will the structure be subjected to impact forces from boats, ships, or large debris?

☐ Yes ☐ No

If yes, was it designed for those impact forces? ☐ Yes ☐ No

If yes, attach impact analysis.

Structure Plan Alignment

The structure is:

☐ isolated
☐ part of a continuous structure with redundant return walls at frequent intervals.

Please provide a map showing the location of the structure and any natural land features which shelter the structure from wave actions.

Adverse Impact Evaluation

The structure is:

- ☐ existing
- ☐ new
- ☐ an enlargement of an existing structure
- ☐ a replacement structure of the same size and design as what was previously at the site

If the structure is new or enlarged, will the structure impact flooding and erosion for areas adjacent to the structure?

- ☐ No
- ☐ Yes, please explain _____

_____

_____

_____

_____

Community and/or State Review

Has the design, maintenance, and impacts of the structure been reviewed and approved by the community, and any Federal, State, or local agencies having jurisdiction over flood control and coastal construction activities in the area the structure impacts?

☐ Yes ☐ No

If yes, please provide a list of agencies who have reviewed and approved the project.

_____

_____

_____

If no, explain why review and approval by the appropriate community or agency has not been obtained.

_____

_____

_____

Enclose all design analyses that apply.

FEMA USE ONLY

FORM 11

DAM FORM

Community Name: _____

Flooding Source: _____

Project Name/Identifier: _____

Identifier

Name of dam: _____

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

_____

_____

_____

Check one of the following:

☐ Existing dam
☐ New dam
☐ Modifications of existing dam (describe modifications) _____

_____

_____

Was the dam designed by _____Federal agency _____State agency
_____Local government agency _____Private organization?

Background

Does the dam have dedicated flood control storage? ☐ Yes ☐ No

Does the project involve revised hydrology? ☐ 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 any necessary debris and sediment yield analysis.

Does the revised hydrology affect the 100-year water-surface elevation behind the dam or downstream of the dam?

☐ Yes ☐ No

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

Results

	Stillwater Elevation Behind the Dam	
	FIS	Revised
10-year	_____	_____
50-year	_____	_____
100-year	_____	_____
500-year	_____	_____
Normal Pool Elevation	_____	_____

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:

Height: _____
Crest Elevation: _____
100-year flood storage capacity: _____
Freeboard (measured from 100-year water surface elevation): _____

Spillway(s):

Type: ☐ gated ☐ ungated
Width: _____
Height: _____
Crest Elevation: _____

Outlet(s):

Type: ☐ gated ☐ ungated
Width: _____
Height: _____
Diameter: _____
Invert Elevation: _____

Explain flow regulation plan: _____

_____

_____

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

Answer N/A to any questions which are not applicable

FEMA USE ONLY

FORM 12

ALLUVIAL FAN FLOODING FORM

Community Name: _____

Flooding Source: _____

Project Name/Identifier: _____

Area to be Revised

Downstream limit: _____

Upstream limit: _____

Describe flood zone designation as shown on the effective FIRM for area to be revised (i.e. Zone AO with depth and velocity, Zone AO with depth, or Zone A) _____

Attach a topographic map(s) which show the following items:

- ☐ The revised flood boundaries with revised depths and velocities (if applicable) that tie into the effective boundaries
- ☐ The correct alignment and location of all structural features

Structural Flood Control Measures

The following structures are proposed or built: (Check all that apply).

- ☐ Channelization (Attach completed form)
- ☐ Levee/Floodwall (Attach completed form)
- ☐ Dam (Attach completed form)
- ☐ Sedimentation Basin
- ☐ Other (describe) _____
- ☐ _____

_____

Have the impacts and the design and maintenance requirements of the structural measures been reviewed and approved by all impacted communities and by state and local agencies that have jurisdiction over flood control activities?

☐ Yes ☐ No

Attach copies of letters stating communities' and agencies' approval.

Hydrologic and Sediment Analyses

1. 100-year discharge at the apex: Peak Flow _____ cfs

   Is the 100-year apex discharge that is listed above, the discharge presented in the effective FIS?

   ☐ Yes ☐ No

   If no, submit the following:

   a) Attach a plot of the flood frequency curve on log-normal probability paper and include the name of the flooding source and the drainage area above the apex, and the mean, standard deviation, and skew coefficient of the curve.

   b) Attach the Hydrologic Analysis Form.

2. Sediment load associated with the 100-year apex discharge: Peak Flow _____ cfs

   Volume _____ acre-feet

   Explain method used to estimate sediment load. Attach all calculations.

   _____

   _____

   _____

   _____

   _____

3. Debris load associated with the 100-year apex discharge: Peak Flow _____ cfs

   Volume _____ acre-feet

   Explain method used to estimate debris load. Attach all calculations.

   _____

   _____

   _____

   _____

   _____

Hydrologic and Sediment Analyses (Cont'd)

4. List the bulking factor, if any, used for this project. _____

5. Complete the following for potential adverse conditions (such as deforestation of the watershed by fire):

100-year discharge at the apex:	Peak Flow _____ cfs
	Volume _____ acre-feet
Sediment load associated with the 100-year discharge:	Peak Flow _____ cfs
	Volume _____ acre-feet
Debris load associated with the 100-year discharge:	Peak Flow _____ cfs
	Volume _____ acre-feet

Attach all supporting calculations.

6. Attach engineering analyses which demonstrate that flooding (including local runoff) from sources other than the apex is insignificant or has been accounted for in the design.

Structural Analyses

For channelization and/or levee/floodwall projects, answer the following:

1. Do the constructed or proposed structural measures provide protection from hazards associated with the possible relocation of flow paths from other parts of the fans?

☐ Yes ☐ No

2. Do the constructed or proposed structural measures affect flood hazards (including depth, velocity, scour, and sediment deposition) on other areas of the fan?

☐ Yes ☐ No

Explain the methodology used to assess the impact. _____

_____

_____

Note: Attach detailed engineering analyses to support answers if not included as part of completion of other forms.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
LETTER OF INTEREST EVALUATION CRITERIA
FLOODPLAIN DELINEATIONS
FCD 93-05, 93-06 AND 93-07

1. **FIRM'S CAPABILITIES** **(35 Maximum Points)**

The capabilities of the prime Consultant and any Subconsultant/Subcontractors of taking on the new workload will be assessed by the county.

Does the prime Consultant possess the personnel, resources, and financial capabilities to undertake this work?

Can the project team start and complete the project in accordance with the furnished contract schedule?

Does the LOI indicate the project-specific special requirements will be met?

2. **STAFF QUALIFICATIONS/RESUMES** **(30 Maximum Points)**

Only permanent, full time personnel currently employed by either the prime Consultant, subconsultants or subcontractors can be indicated as "employees"; on-call, parttime or anticipated staff must clearly be identified as such.

Does the project team currently have personnel with the necessary qualifications to complete the project?

If subconsultants are used, do they also have the necessary qualifications?

Are possible on-call, parttime, or anticipated staff clearly identified as such?

3. **EXPERIENCE ON SIMILAR PROJECTS** **(20 Maximum Points)**

The qualifications and experience of new Consultants or Consultant not previously having County experience will be reviewed equally with those having prior County experience.

Has the project team previously successfully completed similar projects?

Has the prime Consultant completed projects of this type on time and within budget?

Does the prime Consultant have experience in dealing with project-applicable governmental regulations, policies and procedures?

4. **LOCATION OF WORK** **(10 Maximum Points)**

Preference will be given to Consultants with the capability of performing the work within resident Maricopa County offices. If insufficient information is provided, zero points will be awarded.

Does the Letter of Interest clearly state where all of the contract work will be performed?

Scoring:

All work done in Maricopa County	10 points*
All work done in Arizona	5 points
Some work done out of State	2 points
All work done out of State	zero points

* **Drafting, Autocad, and similar plan sheet preparation type work done outside Maricopa County will not be subject to a point deduction.**

5. **MBE/WBE ASSURANCES AFFIDAVIT FORM** **(5 Points or Zero Points)**

Five points will be awarded only if the criteria for "A" and "C" are met; if not, zero points will be awarded. The lack of a signed and notarized affidavit (criteria "C") will be cause for the LOI to be rejected.

A. Has the prime Consultant firm indicated that it has a current affirmative action plan or policy statement on file with the Public Works Contract Administration Office? Consultants may also file an affirmative action plan or policy statement with their submittal.

B. Is the prime Consultant firm a County-Certified MBE/WBE firm, and is its certification number supplied?

C. Has the prime Consultant firm submitted a signed and notarized "MBE/WBE Assurances Affidavit"

6. **CURRENT AND ACTIVE PRIME CONSULTANT'S ARTICLE FIVE CONTRACTS WITH MARICOPA COUNTY DEPARTMENTS/DISTRICTS/AGENCIES**

NOTE: This item shouldn't be confused with a firm's abilities to perform the contract work; this is covered within Category #1, Firm's Capabilities.
A "current" contract is defined as an executed (by the Board chairman) contract with a

prime Consultant, as of the date which Consultant Letters of Interest are due. An "incomplete" contract is defined as a contract with a prime Consultant which has not been accepted as being complete. An "Active" contract is defined as a contract with a prime Consultant in which the contract work is either incomplete or the contract managing department/district has not informed the Consultant of that contract's inactive status.

Scoring (for current, active and incomplete contracts):

Over	$125,000			minus 10 points
Between	$115,000	and	$124,999	minus 9 points
Between	$105,000	and	$114,999	minus 8 points
Between	$ 95,000	and	$104,999	minus 7 points
Between	$ 85,000	and	$ 94,999	minus 6 points
Between	$ 75,000	and	$ 84,999	minus 5 points
Less than	$ 75,000			minus 4 points

Additional minus points:

Annual or on-call type contract	minus 2 points
More than one current, active and incomplete contract	minus 2 points

Leanna Cumberland,
Chief, Contracting Branch

Date

FLOOD CONTROL DISTRICT
of
Maricopa County

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

Neil S. Erwin, P.E., Chief Engineer and General Manager

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
LETTER OF INTEREST REQUEST NOTICE
FCD 93-05, 93-06 AND 93-07
FLOODPLAIN DELINEATION

The Flood Control District of Maricopa County is soliciting Letters of Interest (LOI's) from Engineering Consultants for Floodplain Delineation for three floodplain studies. The proposed floodplain delineation studies average 15 river miles in length. The studies will meet or exceed the criteria set forth in the Federal Emergency Management Agency (FEMA), Flood Insurance Study Guidelines and Specifications for Study Contractors publication, FEMA 37, March, 1991. The studies must also comply with Arizona Department of Water Resources requirements for flood studies.

The scope of work for the floodplain delineation studies will involve public coordination, field surveying, aerial mapping, hydrology, floodplain delineation, and a final report for several study areas. The study results will be submitted to FEMA for a Letter of Map Revision (LOMR).

The consultant shall use the procedures outlined in the Drainage Design Manual for Maricopa County. The U.S. Army Corps of Engineers computer program HEC-1 Flood Hydrology Package will be used for the hydrologic analysis, and the computer program HEC-2 Water Surface Profiles will be used for the floodplain delineation.

Letters must be received at the Flood Control District of Maricopa County, 2801 West Durango, Phoenix, Arizona 85009 by 4:00 p.m. on April 7, 1993 and addressed to the Chief, Contracting Branch.

The consultant agrees to provide services to accomplish the work, under the direction of a Registered Engineer with the State of Arizona in the appropriate discipline.

Letters of Interest must be brief. Five (5) copies of no more than five (5) 8½ x 11 inch pages, as prescribed below will be accepted. Five (5) additional pages of pre-printed supportive information including graphs, photographs, references and brochures may be submitted. A Standard Form 255 may also be submitted, and will not be included within either page count limitation. Late submittals or submittals not complying with either the format or page count limitation will result in the Letter of Interest being rejected.

LETTER OF INTEREST SUBMITTAL FORMAT

	CATEGORY	NUMBER OF PAGES
*	Introductory Letter	1 (Not included in total)
1.	Firms' Capabilities	*
2.	Staff Qualifications	*
3.	Experience on Similar Projects	*
4.	Location of Work	*
5.	Current Prime Consultant Contracts	*
6.	MBE/WBE Assurances Affidavit	* (Not included in total)

* Distribution of category pages by Consultant.
Remember this is a request for Letters of Interest, not a Request for Proposals.

From the Letters of Interest received, the Consultant Selection Panel will shortlist at least two more firms than the number of anticipated contracts. Those firms selected for the shortlist will be provided additional instructions by the Chief, Contracting Branch. Those firms not selected for further consideration will be notified of nonselection.

MARICOPA COUNTY MBE/WBE PROGRAM POLICY AND CONTRACT PARTICIPATION GOALS

Maricopa County will endeavor to ensure in every way possible that minority and women-owned business enterprises shall have every opportunity to participate in providing professional services, purchased goods, and contractual services to Maricopa County without being discriminated against on the grounds of race, religion, sex, age, disability or national origin.

For each of these contracts, a M/WBE goal of ten percent (10%) has been established for Minority/Women Owned Business Enterprises. Instructions and any required forms are included within the LOI packet.

CONSULTANTS ARE ADVISED TO READ THE "PROFESSIONAL SERVICES CONSULTANT CONTRACTING REQUIREMENT" AND CONTACT THE COUNTY MINORITY BUSINESS OFFICE IMMEDIATELY UPON RECEIPT OF THIS NOTICE. ALTHOUGH A CONTRACT MAY NOT HAVE STATED M/WBE GOALS, THE UTILIZATION OF M/WBE SUBCONSULTANTS/SUBCONTRACTORS IS GOVERNED BY THESE CONTRACTING REQUIREMENTS.

LOI PACKET AND CONTACT DATA

The Letter of Interest Packet, consisting of: (1) the LOI Evaluation Criteria; (2) the Professional Services Consultant Contracting Requirements insert (which contains any required M/WBE affidavit forms); and (3) a listing of County-certified MBE/WBE firms (supplied via the County Minority Business Office) is available for pickup at the Flood Control District of Maricopa County, 2801 West Durango, Phoenix, Arizona 85009.

Leanna Cumberland
Chief, Contracting Branch

Date

Attachments

Options - Type X Priority , Confidential , Acknowledge ,

SPEED MEMO

From: dtep Date: 04-09-93 11:34

To: beri , , , , , , ,

: , , , , ,

CC: Alem , , , , , , ,

: , , , , ,

D-List:

Subject: Topo cost breakdown (MEMO)

Bill, the following is the cost breakdown associated with the Topographic Mapping Project.

North of CAP	
Existing GPS Control	$180,000
Control Densification	$ 58,000
Point Paneling	$ 42,000
Terrain Data Compilation	$313,600
Digital Orthophotography	$108,000
Total Project Cost	$701,600
South of CAP	
Existing GPS Control	$ 62,000
Control Densification	$ 19,500
Point Paneling	$ 10,000
Terrain Data Compilation	$179,200
Digital Orthophotography	$ 42,000
Total Project Cost	$312,700
Total Entire City	$1,014,300

2' interval

1' interval

@ ± 148 sq mi

$ 4740 sq. mi.

Desert Groom Bolt

54 sq mi

$ 256,000

40 sq mi

$ 7817 / sq mi.

85% Drains to IB Wash

$ 266,000

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

INTEROFFICE MEMORANDUM

Subject: Request for letters of interest for next years floodplain delineation studies

File:

To: Ed Raleigh

From: ~~Pedro Calza~~ PAC
Tim Murphy TM

Date: 3-13-92

Via: Dave Johnson

Attached for your approval is our request for letters of interest on the floodplain delineation studies for next year. We are currently looking at a MBE/WBE participation of 10%. If you have no problems with any of this, please forward everything on to Leanna.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

INTEROFFICE MEMORANDUM

Subject: Letters of Interest for Floodplain Delineation Studies **File:**

To: Leanna Cumberland **From:** Pedro Calza, Tim Murphy **Date:** 3-13-92

The scope of work for the Floodplain Delineation Studies involve providing ground control; mapping; hydrology; and floodplain delineations for six study areas. The floodplain delineations range from 8 to 25 river miles in length.

The studies will meet or exceed the criteria set forth in the Federal Emergency Management Agency (FEMA), Flood Insurance Study Guidelines and Specifications For Study Contractors publication, FEMA 37, March 1991. The studies must also comply with Arizona Department of Water Resources requirements for flood studies.

Two of the studies will require the contractor to develop the hydrologic and hydraulic information and do some field survey. The District will supply digital terrain models for these two study areas. For the other four studies the contractor will have to develop the topographic and hydraulic information and the District will supply the hydrologic information. The contractor may have to make some slight changes to the hydrologic information.

10. Use this space to provide any additional information or description of resources (including any computer design capabilities) supporting your firm's qualifications for the proposed project.

Project Overview

Six floodplain delineation studies ranging from 8 to 25 river miles in length and from development of topographic and hydraulic information to complete studies (i.e. topo, hydrology and hydraulics) comprise the projects. Assuming a complete study, the general task outline for conducting the floodplain delineation study is presented below.

Task 1 - Program Management

To facilitate conduct of the project, Malcolm Pirnie will institute and maintain a constant liaison/coordination effort with FCDMC. Activities will include an Authorization to Proceed (Kick-Off) Meeting, Monthly Progress Meetings, and at least two Quality Assurance Meetings.

Task 2 - Data Collection and Review

The following information, at a minimum, will be collected, reviewed, and utilized as necessary in the conduct of the floodplain delineation studies:

- USGS 7.5 or 15 minute topographic quadrangle maps
- SCS soil survey data
- published/unpublished historical flood information
- previous FEMA studies
- other published flood studies
- other applicable studies
- hydrologic/hydraulic technical references

Task 3 - Aerial Surveying and Mapping Specifications

At a minimum, four-foot contour maps of the drainage area, at a scale of 1"=400', will be prepared of the study area. The maps and supporting database will be prepared in ARC/INFO format and will be used in general to delineate the watershed boundaries, subareas, land use, identify channel cross-sections and delineate floodplain boundaries and floodways.

Task 4 - Hydrologic Analysis

The hydrologic analysis will be performed using the latest version of the Corps of Engineers, HEC-1 Flood Hydrograph Package, in accordance with the FEMA guidelines and specifications (FEMA 37) and the FCDMC Hydrologic Design Manual. At a minimum, the analysis will be conducted for the 10-, 50-, 100- and 500-year return period storms.

Task 5 - Floodplain Delineation

The latest version of the U.S. Army Corps of Engineers, HEC-2, Water Surface Profiles Package will be used to obtain floodplain and floodway delineations for the 100-year return frequency storm in accordance with the FEMA guidelines and specifications (FEMA 37).

Task 6 - Deliverables

Project deliverables will, in general, include:

- reports
- maps
- computer diskettes
- meeting minutes

All reports will be prepared in draft form according to the requirements of the FCDMC, FEMA (FEMA 37) and the ADWR (TR 90-3). The draft reports will be submitted to the FCDMC for review and comment. Following review by FCDMC, a final report which incorporates FCDMC comments/corrections will be prepared.

11. The foregoing is a statement of facts.

Signature: _____ Typed Name and Title: _____ Date:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
REQUEST FOR PROFESSIONAL CONSULTANT SERVICES
FCD 92-04 - 92-09

The Flood Control District of Maricopa County will accept Letters of Interest (LOI's) from Engineering Consultants for six contracts to perform the necessary work for the Floodplain Delineation Studies. Letters must be received at the Flood Control District of Maricopa County, 2801 West Durango, Phoenix, Arizona 85009 by 4:00 p.m. on April 14, 1992 and addressed to the Chief, Contracting Branch.

The scope of work for the Floodplain Delineation Studies involve providing ground control; mapping; hydrology; and floodplain delineations for six study areas. The floodplain delineations range from 8 to 25 river miles in length.

The studies will meet or exceed the criteria setforth in the Federal Emergency Management Agency (FEMA), Flood Insurance Guidelines and Specifications for Study Contractors publication, FEMA 37, March 1991. The studies must also comply with Arizona Department of Water Resources requirements for flood studies.

Two of the studies will require the consultant to develop the hydrologic and hydraulic information and do some field survey. The District will supply digital terrain models for these two study areas. For the other four sudies the consultant will have to develop the topographic and hydraulic information and the District will supply the hydrologic information. The consultant may have to make some slight changes to the hydrologic information.

Letters of interest must be brief. Six (6) copies of no more than six 8 1/2 x 11 pages as formatted below will be accepted. Five (5) additional pages of pre-printed supportive information, including graphs, photographs; resumes, references, brochures may be submitted. Standard Forms 254 and 255 may be submitted but will not be included in the page count limitation. Any data outside of either the format or page count limitations, or late submittals, will result in the LOI's being rejected.

LETTER OF INTEREST FORMAT

	CATEGORY	NUMBER OF PAGES
	Introductory Letter	1 (Not included in total)
1.	Firm's Capability	1
2.	Staff Qualifications	2 page maximum
3.	Experience on Similar Projects	1
4.	Location of Work	1/2
5.	MBE/WBE Assurances Affidavit Form	1
6.	Current Prime Consultant Contracts	1/2

Remember this is a request for Letters of Interest, not a Request for Proposals.

From the letters received, at least two more firms than the number of anticipated contracts will be short-listed using the enclosed evaluation criteria. Those firms selected for the short-list will be provided additional instructions by the Chief, Contracting Branch. Those firms not selected for further consideration will be notified of nonselection.

Maricopa County will endeavor to ensure in every way possible that minority and women-owned business enterprises shall have every opportunity to participate in providing professional services, purchased goods, and contractual services to Maricopa County without being discriminated against on the grounds of race, religion, sex, age, handicap, or national origin.

For these contracts, goals of MBE ten (10) percent are established for Minority/Women-Owned Business Enterprises. The required form is included within this Letter of Interest packet.

Leanna Cumberland
Chief, Contracting Branch

Enclosures (2)
1. Letter of Interest Evaluation Criteria
2. MBE/WBE Professional Services Consultant Contracting Requirements
3. Directory of Certified MBE/WBE Firms

LETTER OF INTEREST EVALUATION CRITERIA

1. FIRM'S CAPABILITIES (20 points)

The capabilities of the prime Consultant and any subconsultant/subcontractors of taking on the new workload will be assessed by the County.

Does the project team possess the personnel, resources, and financial capabilities to undertake this work?

Can the project team start and complete the project in accordance with the furnished contract schedule?

Doe the LOI indicate that project-specific special requirements will be met? They are as follows: **(i.e. CADD-based design etc. fill in by project manager**

2. STAFF QUALIFICATION (35 points)

Only permanent, full-time personnel currently employed by either the prime Consultant, subconsultants or subcontractors can be indicated as "employees"; on-call, part-time, or anticipated staff must clearly be identified as such.

Does the project team currently have personnel with the necessary qualifications to complete the project?

If sub-consultants are used, do they also have the necessary qualifications?

Are on-call, part-time, or anticipated staff clearly identified as such?

3. EXPERIENCE ON SIMILAR PROJECTS (30 points)

The qualifications and experience of new Consultants or Consultants not previously having County experience will be reviewed equally with those having prior County experience.

Has the project team previously successfully completed similar projects.

Has the project team completed projects of this type on time and within budget?

Does the project team have experience in dealing with project-applicable governmental regulations, policies, and procedures?

4. LOCATION OF WORK (10 maximum points).

Preference will be given to project teams with the capability of performing the work within resident Maricopa County offices. If insufficient information is provided, zero points will be awarded.

Does the LOI clearly and definitively state where all of the contract work will be performed?

Scoring:

All work done in Maricopa County	10 points
All work done in Arizona	5 points
Some work done out of state	2 points
All work done out of state	0 points

5. MBE/WBE ASSURANCE AFFIDAVIT FORM (5 points or 0 points)

Five points will be awarded only if the criteria for "A" and "C" are met; if not, zero points will be awarded. The lack of a signed and notarized affidavit (criteria "C") will cause the LOI to be rejected.

A. Has the prime Consultant firm indicated that it has a current affirmative action plan on file with the District?

B. Is the prime Consultant firm a County-certified MBE/WBE firm, and is it's certification number supplied?

C. Has the prime Consultant firm submitted a signed and notarized "MBE/WBE Assurances Affidavit"?

6. CURRENT AND ACTIVE PRIME CONSULTANT'S ARTICLE FIVE CONTRACTS WITH MARICOPA COUNTY DEPARTMENTS/DISTRICTS/AGENCIES

NOTE: This item should not be confused with a firm's abilities to perform the contract work; this is covered within Category #1, Firm's Capabilities.

A "current" contract is defined as an executed (by the Board chairman) contract with a prime Consultant, as of the date which Consultant Letters of Interest are due. An "incomplete" contract is defined as a contract with a prime Consultant which has not been accepted as being complete. An "active" contract is defined as a contract with a prime Consultant in which the contract work is either incomplete or the contract managing department/district has not informed the Consultant of that contact's inactive status.

Scoring (for current, active, and incomplete contracts):

Over	$125,000		minus 10 points
Between	$115,000	and $124,999	minus 9 points
Between	$105,000	and $114,999	minus 8 points
Between	$ 95,000	and $104,999	minus 7 points
Between	$ 85,000	and $ 94,999	minus 6 points
Between	$ 75,000	and $ 84,999	minus 5 points
Less than	$ 75,000		minus 4 points

Additional minus points:

Annual or on-call type contact	minus 2 points
More than one current, active and incomplete contact	minus 2 points

FLOOD CONTROL DISTRICT
of
Maricopa County

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

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
LETTER OF INTEREST REQUEST NOTICE
FCD 93-01
DYSART ROAD DRAINAGE IMPROVEMENTS

The Flood Control District of Maricopa County is soliciting Letters of Interest (LOI's) from Engineering Consultants for the Dysart Road Drainage Improvements Project.

Letters must be received at the Flood Control District of Maricopa County, 2801 West Durango, Phoenix, Arizona 85009 by 4:00 p.m. on February 25, 1993 and addressed to the Chief, Contracting Branch.

The consultant agrees to provide services to accomplish the work, under the direction of a Registered Engineer with the State of Arizona in the appropriate discipline. The Dysart Drain is an existing channel, (co-owned and operated by Luke Air Force Base (LAFB) and the Flood Control District of Maricopa County (FCDMC) extending from Reems Road/Northern Avenue, east, approximately four and one-half (4½) miles, to the Agua Fria River. The channel exhibits negative slope from a point between Dysart road and El Mirage Road, upstream to Litchfield Road. This reverse slope is due to differential subsidence of approximately twelve (12) feet at Litchfield Road. Major tasks of the project will be to design and provide construction plans and specifications for a new channel along the existing channel alignment. The channel capacity should be 100 year return frequency, taking into account current and future (40 year horizon) subsidence. In addition, design and provide construction plans and specifications for a detention basin or basins, in the vicinity of Reems Road and Northern Avenue, to intercept the water which presently flows down Reems Road and around the west side of Luke AFB. The basin should meter the flows to the Dysart Drain. The design and preparation of plans for two bridges or box culverts may also be required. Design hydrology for the project has been determined as part of the White Tanks-Agua Fria AMDS, and will be provided to the design consultant.

Letters of Interest must be brief. Five (5) copies of no more than five (5) 8½ x 11 inch pages, as prescribed below will be accepted. Five (5) additional pages of pre-printed supportive information including graphs, photographs, references and brochures may be submitted. A Standard Form 255 may also be submitted, and will not be included within either page count limitation. Late submittals or submittals not complying with either the format or page count limitation will result in the Letter of Interest being rejected.

LETTER OF INTEREST SUBMITTAL FORMAT

	CATEGORY	NUMBER OF PAGES	
*	Introductory Letter	1	(Not included in total)
*	MBE/WBE Assurances Affidavit	1	(Not included in total)
1.	Firms' Capabilities	*	
2.	Staff Qualifications	*	
3.	Experience on Similar Projects	*	
4.	Location of Work	*	
5.	Current Prime Consultant Contracts	*	

* Distribution of category pages by Consultant.
Remember this is a request for Letters of Interest, not a Request for Proposals.

From the Letters of Interest received, the Consultant Selection Panel will shortlist at least two more firms than the number of anticipated contracts. Those firms selected for the shortlist will be provided additional instructions by the Chief, Contracting Branch. Those firms not selected for further consideration will be notified of nonselection.

MARICOPA COUNTY MBE/WBE PROGRAM POLICY AND CONTRACT PARTICIPATION GOALS

Maricopa County will endeavor to ensure in every way possible that minority and women-owned business enterprises shall have every opportunity to participate in providing professional services, purchased goods, and contractual services to Maricopa County without being discriminated against on the grounds of race, religion, sex, age, disability or national origin.

For this contract, a M/WBE goal of ten percent (10%) percent is established for Minority/Women-Owned Business Enterprises. Instructions and any required forms are included within the LOI packet.

CONSULTANTS ARE ADVISED TO READ THE "PROFESSIONAL SERVICES CONSULTANT CONTRACTING REQUIREMENT" AND CONTACT THE COUNTY MINORITY BUSINESS OFFICE IMMEDIATELY UPON RECEIPT OF THIS NOTICE. ALTHOUGH A CONTRACT MAY NOT HAVE STATED M/WBE GOALS, THE UTILIZATION OF M/WBE SUBCONSULTANTS/SUBCONTRACTORS IS GOVERNED BY THESE CONTRACTING REQUIREMENTS.

LOI PACKET AND CONTACT DATA

The Letter of Interest Packet, consisting of: (1) the LOI Evaluation Criteria; (2) the Professional Services Consultant Contracting Requirements insert (which contains any required M/WBE affidavit forms); and (3) a listing of County-certified MBE/WBE firms (supplied via the County Minority Business Office) is available for pickup at the Flood Control District of Maricopa County, 2801 West Durango, Phoenix, Arizona 85009.

Leanna Cumberland
Chief, Contracting Branch

January 21, 1993
Date

LC:ses

Attachments

DYSART DRAIN IMPROVEMENT PROJECT
FCD 93-01
SUPPLEMENTAL DESCRIPTION
January 20, 1993

The existing channel, approximately 4.5 miles long, extends from the Agua Fria River (on the half section alignment between Northern and Glendale Ave.), west to Northern Avenue and Reems Road. The channel is lined to Litchfield Road and is unlined west of Litchfield Road. The channel has negative slope due to subsidence. The subsidence is caused by groundwater pumping (12' at Litchfield, 18' at Reems/Olive, 1957 - 1990).

Maintenance of the existing channel is shared by FCD and Luke Air Force Base (LAFB). From LAFB to the Agua Fria River, the channel is located on land owned in fee by LAFB.

Storm Water runoff originates north of the base. Reems Road has an inverted crown, concentrating water from about 40+ square miles to Reems/Northern. Natural split: water flows east into the channel, and south along west side of base. Water is also concentrated by the RR to the east, and flows into the channel. Discharge is about 3,000 cfs at the Agua Fria River. Flooding during the 100 year event covers much of the Base, Base housing, and local commercial development. Water flowing south from Reems Road, around the west side of the Base also causes flooding.

Existing structures that will have to be demolished and replaced- lined channel, two bridges, two 640' long 5' x 5.5' CBCs.

Project intended to capture the water flooding the Base. Up size the channel for 100 year capacity, also allow for future subsidence (40 year horizon) assuming a linear, projected rate (to be provided by FCD). The Safe Yield Requirements of the Groundwater Management Act become effective in the year 2025 (pumping = infiltration), at which time the subsidence will decrease, (using an exponential decay function), for 10 years. Existing ROW is 130' - intend to stay within that corridor, except for the basins.

Detention basin(s) will be placed in the vicinity of Reems/Northern to capture flows from the north along Reems. Flow is then metered out of the basin to the channel. The basin may also be sized to accommodate additional water so as to downsize the channel (TBD).

FCD has a feasibility study ongoing, an outgrowth of the area drainage study, to examine alternatives. The study will be finished this April. Design consultant will be given base map at 1"=40' scale, hydrology, projected rate of subsidence, some (most) utility locations, cross sections at 200' intervals for lined channel section, 100' intervals for unlined channel section, design alternative for the drainage system with various major elements (channel, bridges, boxes, basins) identified with approximate dimensions and locations.

FCD is investigating the 404 process and designer will assist in preparing the application package, if required. Designer may have to deal with NPDES requirements for discharge into the Agua Fria River.

Project will be cost shared between FCD and LAFB. FCD will administer contract for design. Construction will also be cost shared. Federal money for construction will be available October '94. Permits, cost sharing agreements, and design completion must precede that date, as far in advance as possible.

FCD and LAFB both will be represented on the selection committee for the designer.

Project is relatively high profile - consultant will need staff with good engineering/public relations skills - need to be able to translate engineering jargon to non-engineers, and conversely, the needs of the various project partners into engineering components.

NOTE: This description is intended to eliminate, or significantly reduce requests (telephone, etc.) from consultants. It is not intended to be all inclusive, nor is it a limiting document as to project design, tasks, or requirements, since the feasibility study is ongoing. Results of the feasibility study will be distributed to the shortlisted consultants, and will serve as the basis for their technical proposals, to be submitted to FCD and LAFB.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
LETTER OF INTEREST EVALUATION CRITERIA

FCD 93-01

1. FIRM'S CAPABILITIES (35 maximum points)

The capabilities of the prime Consultant and any Subconsultant/Subcontractors of taking on the new workload will be assessed by the county.

Does the prime Consultant possess the personnel, resources, and financial capabilities to undertake this work?

Can the project team start and complete the project in accordance with the furnished contract schedule?

Does the LOI indicate the project-specific special requirements will be met?

2. STAFF QUALIFICATIONS/RESUMES (30 maximum points)

Only permanent, full time personnel currently employed by either the prime Consultant, subconsultants or subcontractors can be indicated as "employees"; on-call, parttime or anticipated staff must clearly be identified as such.

Does the project team currently have personnel with the necessary qualifications to complete the project?

If subconsultants are used, do they also have the necessary qualifications?

Are possible on-call, parttime, or anticipated staff clearly identified as such?

3. EXPERIENCE ON SIMILAR PROJECTS (20 maximum points)

The qualifications and experience of new Consultants or Consultant not previously having County experience will be reviewed equally with those having prior County experience.

Has the project team previously successfully completed similar projects?

Has the prime Consultant completed projects of this type on time and within budget?

Does the prime Consultant have experience in dealing with project-applicable governmental regulations, policies and procedures?

4. LOCATION OF WORK (10 maximum points)

Preference will be given to Consultants with the capability of performing the work within resident Maricopa County offices. If insufficient information is provided, zero points will be awarded.

Does the Letter of Interest clearly state where all of the contract work will be performed?

Scoring:

All work done in Maricopa County	10 points*
All work done in Arizona	5 points
Some work done out of State	2 points
All work done out of State	zero points

* **Drafting, Autocad, and similar plan sheet preparation type work done outside Maricopa County will not be subject to a point deduction.**

5. MBE/WBE ASSURANCES AFFIDAVIT FORM (5 points or zero points)

Five points will be awarded only if the criteria for "A" and "C" are met; if not, zero points will be awarded. The lack of a signed and notarized affidavit (criteria "C") will cause the LOI to be rejected.

A. Has the prime Consultant firm indicated that it has a current affirmative action plan or policy on file with the Public Works Contracts Administration Office? Consultants may also file an affirmative action plan or policy statement with their submittal.

B. Is the prime Consultant firm a County-Certified MBE/WBE firm, and is its certification number supplied?

C. Has the prime Consultant firm submitted a signed and notarized "MBE/WBE Assurances Affidavit"

6. CURRENT AND ACTIVE PRIME CONSULTANT'S ARTICLE FIVE CONTRACTS WITH MARICOPA COUNTY DEPARTMENTS/DISTRICTS/AGENCIES

NOTE: This item shouldn't be confused with a firm's abilities to perform the contract work; this is covered within Category #1, Firm's Capabilities.

A "current" contract is defined as an executed (by the Board chairman) contract with a prime Consultant, as of the date which Consultant Letters of Interest are due. An "incomplete" contract is defined as a contract with a prime Consultant which has not been accepted as being complete. An "Active" contract is defined as a contract with a prime Consultant in which the contract work is either incomplete or the contract managing department/district has not informed the Consultant of that contract's inactive status.

Scoring (for current, active and incomplete contracts):

Over	$125,000			minus 10 points
Between	$115,000	and	$124,999	minus 9 points
Between	$105,000	and	$114,999	minus 8 points
Between	$ 95,000	and	$104,999	minus 7 points
Between	$ 85,000	and	$ 94,999	minus 6 points
Between	$ 75,000	and	$ 84,999	minus 5 points
Less than	$ 75,000			minus 4 points

Additional minus points:

Annual or on-call type contract	minus 2 points
More than one current, active and incomplete contract	minus 2 points

Leanna Cumberland,
Chief, Contracting Branch

January 21, 1993
Date

MARICOPA COUNTY
MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM
PROFESSIONAL SERVICES CONSULTANT CONTRACTING REQUIREMENTS

A. The following conditions will apply in the calculation of the percentage attainment:

1. All MBE/WBE firms used in attainment of the goal must be certified with the Maricopa County Minority Business Office (MBO). The MBO is located at 100 West Clarendon, Suite 1420, Phoenix, 85013, telephone 506-8653. In addition, only those firms certified prior to the Letter of Interest submittal date (advertised solicitations) or Proposal due date (consultant Register-based selections) will be considered in the attainment of the goal.

2. Prime consultant subcontracts to MBE or WBE:
The MBE/WBE amount to be applied to the goal will be based on that portion (dollar value) of the contract that the MBE/WBE performs. For example, if a prime consultant subcontracts work amounting to $100,000 of a contract for which the total project cost is $1,000,000, the MBE/WBE participation will be credited as 10 percent.

3. Prime Minority Consultant:
An MBE/WBE prime consultant will be credited with the MBE/WBE participation for that portion of the contract which they themselves perform, plus those portions subcontracted to other MBE/WBE firms. For example, if an MBE/WBE prime consultant proposes to perform 50 percent of a project quoted at $1,000,000 and subcontracts 25 percent to an MBE/WBE firm, MBE/WBE participation will be credited as 75 percent, or $750,000.

4. Minority-non-Minority Joint Venture:
A joint venture consisting of MBE/WBE participation and non-MBE/WBE business enterprises, functioning as a prime consultant, will be credited with minority participation on the basis of the percentage of profit accruing to the MBE/WBE firm. For example, if a MBE/WBE and non-MBE/WBE joint venture proposes to perform 50 percent of a $1,000,000 project and 50 percent of the joint venture profits ($500,000) are to accrue to the MBE/WBE partner in the joint venture, MBE/WBE participation will be credited at 25 percent or $250,000.

5. Lower Tier Non-MBE/WBE Participation:
MBE/WBE subconsultants/subcontractors proposing to further subcontract to non-MBE/WBE consultants/contractors shall not have that portion of subcontracting activity considered when determining the percentage of MBE/WBE participation.

6. MBE/WBE Suppliers:
Any MBE/WBE supplier that performs a commercially useful function, manufactures or substantially alters the material or product it supplies will have that portion of activity considered when determining the percentage of MBE/WBE participation.

7. MBE/WBE Trucking:
Credit for trucking by MBEs or WBEs will be the amount to be paid when the MBE or WBE trucker will perform the trucking with his/her trucks, tractors, and employees or when a MBE or WBE trucking broker has signed agreements with MBE and WBE truckers.

B. Required forms:
THREE AFFIDAVITS ARE REQUIRED. The first form, the "MBE/WBE Assurances Affidavit" must be completed and submitted with the Letter of Interest (LOI) if M/WBE contract goals have been established. FAILURE TO DO SO SHALL BE CAUSE FOR REJECTION OF THE LETTER OF INTEREST, if M/WBE contract goals have been established. The information in this affidavit will be binding on the consultant.

The second form, the "Proposed MBE/WBE Participation Affidavit" must be completed and submitted with the Technical Proposal submittal, if M/WBE contract goals have been established. FAILURE TO DO SO SHALL BE CAUSE FOR REJECTION OF THE TECHNICAL PROPOSAL, if M/WBE contract goals have been established. The affidavit will list the proposed MBE/WBE participation by MBE/WBE firm name and the related percentage value of proposed MBE/WBE contracts. The information in this affidavit will be binding on the consultant to the extent that any subsequent percentages listed on the "Actual MBE/WBE Participation Affidavit" (see following) may be increased and not decreased, and, if any listed MBE/WBE's are unable to enter into a subcontract with the consultant, the consultant must provide a written report and request to the Procurement Officer through the Owner's representative in accordance with instructions provided elsewhere (Substitution of Subcontractors or Subconsultants) in this document.

The third form, "Actual MBE/WBE Participation Affidavit" must be completed and returned by the selected consultant TO THE MINORITY BUSINESS OFFICE BY 4:00 P.M. ON THE SEVENTH CALENDAR DAY AFTER THE SUCCESSFUL COMPLETION OF CONTRACT FEE NEGOTIATIONS. The Affidavit will list the MBE/WBE participation percentage by MBE/WBE firm name and the related dollar value of the MBE/WBE contract. The information in this Affidavit is binding on the consultant, to the extent that any amounts may be increased and not decreased, and that if any listed MBE/WBE's are unable to enter into a subcontract with consultant, the consultant must provide a written report to the Procurement Officer through the Owner's representative in accordance with instructions provided elsewhere (Substitution of Suibcontractors or Subconsultants) in this document.

C. Good Faith Efforts:
Technical proposals which fail to meet MBE or WBE minimum goals at levels which equal or exceed established goals may be considered nonresponsive unless good faith efforts can be determined. Only MBE and WBE firms certified by Maricopa County prior to the Letter of Interest submittal date (advertised solicitations) or Proposal due date (Consultant Register-based selections), and which will perform a commercially useful function will be counted toward meeting the participation goals.

Any portion of the work that a proposed MBE or WBE firm will subcontract to other than a certified firm, regardless of tier, will not be counted toward the applicable goals. Prime consultants who do not fulfill the established MBE and WBE goals must demonstrate, through detailed and comprehensive documentation, that "good faith" efforts had been made to solicit, assist and utilize MBE and WBE firms to meet participation goals.

The County Minority Business Office (MBO) will assist prime consultants in identifying possible qualified and interested MBE and WBE subconsultants/subcontractors to meet designated MBE and WBE goals. A M/WBE listing will be furnished (supplied via the County MBO) as part of the solicitation packet, which consultant may utilize in identifying MBE and WBE firms. It will be the responsibility of the prime consultant to obtain the MBE and WBE firms necessary to meet the MBE and WBE goals.

FAILURE TO CONTACT THE MBO FOR ASSISTANCE IN COMPLYING WITH THESE GOALS MAY RESULT IN NOT HAVING IMPLEMENTED "GOOD FAITH" EFFORTS. Contact may be in writing, by telephone, or in person. If by phone or in person, name of MBO person spoken to should be obtained and written within the "good faith efforts" documentation submittal.
(The Minority Business Office is located at 100 West Clarendon, Suite 1420, Phoenix, Arizona 85013. Telephone number is 506-8653.)

FAILURE TO IMPLEMENT "GOOD FAITH" EFFORTS IN ACCORDANCE WITH THE MARICOPA COUNTY MINORITY BUSINESS ENTERPRISE PROGRAM TO THE SATISFACTION OF MARICOPA COUNTY MAY RESULT IN THE REJECTION OF THE TECHNICAL PROPOSAL.

If information submitted by a prime consultant indicates that established MBE and WBE goals have not been met, the consultant shall be required to provide sufficient documentation to demonstrate that he/she has complied with MBE and WBE requirements or good faith efforts. Good faith efforts will be determined by both quality and intensity of these efforts. Documentation provided to the Minority Business Office (MBO) must include:

1. The date proposer requested assistance in writing, in person, or by telephone from the MBO. The proposer should request assistance from the MBO office in order for a determination of good faith efforts to be made. As Maricopa County M/WBE listings are updated frequently, proposers shall contact the MBO to ensure that they have the most recent edition.

2. Names, addresses and telephone numbers; dates of notification of Maricopa County certified MBEs and WBEs solicited by direct mail for this project; and dates and methods used for follow up of initial solicitations to determine with certainty whether MBEs or WBEs were interested in subcontracting/subconsulting. (SEE FOLLOWING NOTE)

3. Items of work for which proposer requested sub-quotes, proposals or materials to be supplied by MBEs and WBEs; information furnished to interested MBEs and WBEs such as specifications and requirements of the work; plans; and any breakdown of items of work into economically or professionally feasible units to facilitate MBE and WBE participation.

4. Names of MBEs and WBEs who submitted quotes or proposals for any of the work indicated above and were not accepted by the prime consultant. An explanation of why MBEs or WBEs contacted will not be awarded subcontracts. If fee was the reason for rejection of the proposal or quote, the proposal or quote of rejected MBEs and WBEs and the fee of the selected subcontractor/subconsultant shall be submitted. Since utilization of available MBEs and WBEs is the program objective, fee differences will not automatically be considered as cause for a prime consultant's rejection of MBE and WBE proposals or quotes.

5. Documentation of written notices or telephone calls to a reasonable number of M/WBEs soliciting their participation in sufficient time to allow M/WBEs to participate effectively. All M/WBEs listed on the Maricopa County Certification list which provide applicable goods and services for subject procurement/project should be contacted.

NOTE: The above good faith efforts must have been conducted during the solicitation response period and PRIOR TO THE SUBMITTAL DATE, with substantial time in order to allow for a response from potential M/WBE subconsultants/subcontractors. Original contact by a prime consultant just prior to or on the submittal date will not be construed as having provided sufficient response time for submission of subcontract proposals or quotes.

The following efforts can also be utilized in demonstrating "Good Faith" in soliciting M/WBE participation.

1. A description of the efforts made to assist MBEs and WBEs whose proposals or quotes were rejected to be more competitive in their subcontracting proposals or quotes. These efforts could include assistance in meeting bonding or insurance requirements, critiquing their proposals, etc.

2. Names and dates of advertisement of each newspaper, trade paper, and minority focus paper in which a request for MBE and WBE participation for this project was placed by the proposer.

Consultants are encouraged to seek M/WBEs in the same geographical area in which the work is to be performed or goods provided. If the proposer cannot meet the established goals using M/WBEs from the geographical area, the proposer should expand its search to a reasonable wider geographical area.

The MBO will make the final decision as to whether good faith efforts were met, based on the information submitted.

D. Appeal Process for Contract Award:
If the owner is considering award of a contract to a prime consultant other than the top-ranked prime consultant because of failure to meet MBE and WBE participation goals or good faith efforts, or rejecting any consultant's proposal because of inadequate good faith documentation, that consultant will be notified and give an opportunity to protest the decision. This protest will be made in accordance with the Maricopa County Procurement Code, Article 9, MCI-905, which is incorporated by reference.

E. Contract Compliance:
Failure of any consultant, subconsultant or subcontractor to comply with any of the requirements of the Maricopa County Minority and Women-Owned Business Program shall be a material breach of contract. During the term of an awarded contract, the prime consultant shall:

1. Fulfill the MBE and WBE participation commitments submitted;

2. Continue to make every effort to utilize MBEs and WBEs;

3. Require that their subconsultants and subcontractors make every effort to utilize MBEs and WBEs;

4. Maintain records necessary for monitoring their compliance with provisions contained in the M/WBE Program.

The primary responsibility for assuring the consultant's compliance with these M/WBE contract requirements after award rests with the Owner's designated representative. The Owner's designated representative should ascertain that no one other than the approved MBE or WBE subconsultant/subcontractor are performing the work, and that MBE and WBE subconsultant/subcontractor substitutes have been approved in advance. The prime consultant shall not perform any MBE or WBE contract work items without prior approval by the Owner's procurement officer, through the Owner's designated representative.

The Owner's procurement officer shall advise the Minority Business Office immediately of any circumstances where a consultant appears to be in violation of the MBE and WBE contract requirements. An investigation will be held by the MBO and a recommendation for corrective action shall be forwarded to the Owner's procurement officer. Intentional noncompliance with the MBE and WBE requirements may result in withholding funds on items already completed, in termination of the contract, and/or formal debarment from future contracts. The Maricopa County Minority Business Office (MBO) reserves the right to inspect all records of the consultant, MBEs and WBEs concerning this project.

The MBO will conduct MBE and WBE compliance reviews on a regular basis.

F. Substitution of Subconsultants or Subcontractors:
The prime consultant shall request approval to replace an approved MBE or WBE subconsultant/subcontractor that is unable or unwilling to perform successfully on a contract with another MBE or WBE. This failure does not remove the consultant's responsibility for meeting the MBE and WBE participation goals of the contract. A written request for substitution must be made to the Owner's procurement officer, through the designated Owner's representative of the Procurement Agency. The substitute MBE or WBE obtained to perform an equal or greater dollar value of work must be approved by the Owner's procurement officer, through the designated Owner's representative, prior to beginning of any work by the substitute MBE or WBE. The request for substitution must include, but is not limited to the following:

1. Reason for substitution.

2. Name, address, and telephone number of the approved MBE or WBE.

3. Name, address and telephone number of the MBE or WBE substitute.

4. Item, numbers, description of work and the proposed MBE and/or WBE dollar amount.

5. Good faith effort documentation if the substitute subcontractor is not an MBE or WBE.

G. Requests for Pay:
Each request for Pay must be accompanied by a Maricopa County Minority/Women-Owned Business Enterprise Program "MBE/WBE Participation Report", in the form as provided by the County.

The final pay request shall include a listing of total contract MBE/WBE participation. Line numbers and a description of actual work performed shall also be included. If, at the time of contract completion, the MBE and WBE commitments are not actually attained, the report is to provide an explanation of failure to comply. These reports shall be submitted within thirty (30) days of contract completion, PRIOR TO RELEASE OF ANY REMAINING CONTRACT RETENTION.

MARICOPA COUNTY
MINORITY/WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM
MBE/WBE ASSURANCES AFFIDAVIT

(NOTE: FAILURE TO COMPLETE AND SUBMIT THIS AFFIDAVIT WITH THE LETTER OF INTEREST WILL BE CAUSE FOR REJECTION OF THE SUBMITTAL.)

The undersigned, fully cognizant of the Maricopa County MBE/WBE Program requirements and of the goal established, hereby certifies that in the preparation of this Letter of Interest,

_____
(the entity submitting the Letter of Interest)

(CHECK ONE)

_____ Will meet the established goal for participation by Minority/Women-Owned Business Enterprises.

_____ Will provide the necessary documentation to the County Minority Business Office to establish that a good faith effort was made, and submit such documentation with a Technical Proposal.

_____
Name of Firm

_____
Signature

_____
Title

STATE OF ARIZONA)
)ss
County of Maricopa)

Subscribed and sworn to before me this _____ day of _____, 1993.

_____
Notary Public

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
REQUEST FOR PROFESSIONAL CONSULTANT SERVICES
FCD 92-04 - 92-09

The Flood Control District of Maricopa County will accept Letters of Interest (LOI's) from Engineering Consultants for six contracts to perform the necessary work for the Floodplain Delineation Studies. Letters must be received at the Flood Control District of Maricopa County, 2801 West Durango, Phoenix, Arizona 85009 by 4:00 p.m. on April 14, 1992 and addressed to the Chief, Contracting Branch.

The scope of work for the Floodplain Delineation Studies involve providing ground control; mapping; hydrology; and floodplain delineations for six study areas. The floodplain delineations range from 8 to 25 river miles in length.

The studies will meet or exceed the criteria setforth in the Federal Emergency Management Agency (FEMA), Flood Insurance Guidelines and Specifications for Study Contractors publication, FEMA 37, March 1991. The studies must also comply with Arizona Department of Water Resources requirements for flood studies.

Two of the studies will require the consultant to develop the hydrologic and hydraulic information and do some field survey. The District will supply digital terrain models for these two study areas. For the other four sudies the consultant will have to develop the topographic and hydraulic information and the District will supply the hydrologic information. The consultant may have to make some slight changes to the hydrologic information.

Letters of interest must be brief. Six (6) copies of no more than six 8 1/2 x 11 pages as formatted below will be accepted. Five (5) additional pages of pre-printed supportive information, including graphs, photographs; resumes, references, brochures may be submitted. Standard Forms 254 and 255 may be submitted but will not be included in the page count limitation. Any data outside of either the format or page count limitations, or late submittals, will result in the LOI's being rejected.

LETTER OF INTEREST FORMAT

	CATEGORY	NUMBER OF PAGES
	Introductory Letter	1 (Not included in total)
1.	Firm's Capability	1
2.	Staff Qualifications	2 page maximum
3.	Experience on Similar Projects	1
4.	Location of Work	1/2
5.	MBE/WBE Assurances Affidavit Form	1
6.	Current Prime Consultant Contracts	1/2

Remember this is a request for Letters of Interest, not a Request for Proposals.

From the letters received, at least two more firms than the number of anticipated contracts will be short-listed using the enclosed evaluation criteria. Those firms selected for the short-list will be provided additional instructions by the Chief, Contracting Branch. Those firms not selected for further consideration will be notified of nonselection.

Maricopa County will endeavor to ensure in every way possible that minority and women-owned business enterprises shall have every opportunity to participate in providing professional services, purchased goods, and contractual services to Maricopa County without being discriminated against on the grounds of race, religion, sex, age, handicap, or national origin.

For these contracts, goals of MBE ten (10) percent are established for Minority/Women-Owned Business Enterprises. The required form is included within this Letter of Interest packet.

Leanna Cumberland
Chief, Contracting Branch

Enclosures (2)
1. Letter of Interest Evaluation Criteria
2. MBE/WBE Professional Services Consultant Contracting Requirements
3. Directory of Certified MBE/WBE Firms

LETTER OF INTEREST EVALUATION CRITERIA

1. FIRM'S CAPABILITIES (20 points)

The capabilities of the prime Consultant and any subconsultant/subcontractors of taking on the new workload will be assessed by the County.

Does the project team possess the personnel, resources, and financial capabilities to undertake this work?

Can the project team start and complete the project in accordance with the furnished contract schedule?

Doe the LOI indicate that project-specific special requirements will be met? They are as follows: **(i.e. CADD-based design etc. fill in by project manager**

2. STAFF QUALIFICATION (35 points)

Only permanent, full-time personnel currently employed by either the prime Consultant, subconsultants or subcontractors can be indicated as "employees"; on-call, part-time, or anticipated staff must clearly be identified as such.

Does the project team currently have personnel with the necessary qualifications to complete the project?

If sub-consultants are used, do they also have the necessary qualifications?

Are on-call, part-time, or anticipated staff clearly identified as such?

3. EXPERIENCE ON SIMILAR PROJECTS (30 points)

The qualifications and experience of new Consultants or Consultants not previously having County experience will be reviewed equally with those having prior County experience.

Has the project team previously successfully completed similar projects.

Has the project team completed projects of this type on time and within budget?

Does the project team have experience in dealing with project-applicable governmental regulations, policies, and procedures?

4. LOCATION OF WORK (10 maximum points).

Preference will be given to project teams with the capability of performing the work within resident Maricopa County offices. If insufficient information is provided, zero points will be awarded.

Does the LOI clearly and definitively state where all of the contract work will be performed?

Scoring:

All work done in Maricopa County	10 points
All work done in Arizona	5 points
Some work done out of state	2 points
All work done out of state	0 points

5. MBE/WBE ASSURANCE AFFIDAVIT FORM (5 points or 0 points)

Five points will be awarded only if the criteria for "A" and "C" are met; if not, zero points will be awarded. The lack of a signed and notarized affidavit (criteria "C") will cause the LOI to be rejected.

A. Has the prime Consultant firm indicated that it has a current affirmative action plan on file with the District?

B. Is the prime Consultant firm a County-certified MBE/WBE firm, and is it's certification number supplied?

C. Has the prime Consultant firm submitted a signed and notarized "MBE/WBE Assurances Affidavit"?

6. CURRENT AND ACTIVE PRIME CONSULTANT'S ARTICLE FIVE CONTRACTS WITH MARICOPA COUNTY DEPARTMENTS/DISTRICTS/AGENCIES

NOTE: This item should not be confused with a firm's abilities to perform the contract work; this is covered within Category #1, Firm's Capabilities.

A "current" contract is defined as an executed (by the Board chairman) contract with a prime Consultant, as of the date which Consultant Letters of Interest are due. An "incomplete" contract is defined as a contract with a prime Consultant which has not been accepted as being complete. An "active" contract is defined as a contract with a prime Consultant in which the contract work is either incomplete or the contract managing department/district has not informed the Consultant of that contact's inactive status.

Scoring (for current, active, and incomplete contracts):

Over	$125,000		minus 10 points
Between	$115,000	and $124,999	minus 9 points
Between	$105,000	and $114,999	minus 8 points
Between	$ 95,000	and $104,999	minus 7 points
Between	$ 85,000	and $ 94,999	minus 6 points
Between	$ 75,000	and $ 84,999	minus 5 points
Less than	$ 75,000		minus 4 points

Additional minus points:

Annual or on-call type contact	minus 2 points
More than one current, active and incomplete contact	minus 2 points

MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM
PROFESSIONAL SERVICES CONSULTANT CONTRACTING REQUIREMENTS

A. The following conditions will apply in the calculation of the percentage attainment:

1. All MBE/WBE firms used in attainment of the goal must be certified with the Maricopa County Minority Business Office (MBO). The MBO is located in the Maricopa County Highway Department building, 2901 West Durango Street, Phoenix, telephone 506-8656. In addition, only those firms certified at least five (5) calendar days prior to the Letter of Interest submittal date will be considered in the attainment of the goal.

2. Prime consultant subcontracts to MBE or WBE:
   The MBE/WBE amount to be applied to the goal will be based on that portion (dollar value) of the contract that the MBE/WBE performs. For example, if a prime consultant subcontracts work amounting to $10,000 of a contract for which the total project cost is $100,000, the MBE/WBE participation will be credited as 10 percent.

3. Prime Minority Consultant:
   An MBE/WBE prime consultant will be credited with the MBE/WBE participation for that portion of the contract which they themselves perform plus those portions subcontracted to other MBE/WBE firms. For example, if an MBE/WBE prime consultant proposes to perform 50 percent of a project quoted at $100,000 and subcontract 25 percent to an MBE/WBE firm, MBE/WBE participation will be credited as 75 Percent, or $75,000.

4. Minority-Non-Minority Joint Venture:
   A joint venture consisting of MBE/WBE participation and non-MBE/WBE business enterprises, functioning as a prime consultant, will be credited with minority participation on the basis of the percentage of profit accruing to the MBE/WBE firm. For example, if a MBE/WBE and non-MBE/WBE joint venture proposes to perform 50 percent of a $100,000 project and 50 percent of the joint venture profits ($10,000) are to accrue to the MBE/WBE partner in the joint venture, MBE/WBE participation will be credited at 25 percent or $5,000.

5. Lower Tier Non-MBE/WBE Participation:
   MBE/WBE subconsultants/subcontractors proposing to further subcontract to non-MBE/WBE consultants/ contractors shall not have that portion of subcontracting activity considered when determining the percentage of MBE/WBE participation.

6. MBE/WBE Suppliers:

Any MBE/WBE supplier that manufactures or substantially alters the material or product it supplies will have that portion of activity considered when determining the percentage of MBE/WBE participation.

7. MBE/WBE Trucking:

Credit for trucking by MBEs or WBEs will be the amount to be paid when the MBE or WBE trucker will perform the trucking with his/her trucks, tractors, and employees or when a MBE or WBE trucking broker has signed agreements with MBE and WBE truckers.

B. Required forms:

Three Affidavits are included as part of this section. The first form, the "MBE/WBE Assurances Affidavit", must be completed and submitted with the Letter of Interest. FAILURE TO DO SO SHALL BE CAUSE FOR REJECTION OF THE LETTER OF INTEREST. The information in this affidavit will be binding on the consultant to the extent that Technical Proposal percentages may be increased and not decreased, and that if any listed MBE/WBE's are not proposed to be listed on the Technical Proposal's "Proposed MBE/WBE Participation Affidavit", the consultant will provide a written report and request to the Procurement Officer through the Owner's representative in accordance with instructions provided elsewhere (Substitution of Subcontractors or Subconsultants) in this document.

The "Proposed MBE/WBE Participation Affidavit" must be completed and submitted with the Technical Proposal submittal. FAILURE TO DO SO SHALL BE CAUSE FOR REJECTION OF THE TECHNICAL PROPOSAL. The affidavit will list the proposed MBE/WBE participation by MBE/WBE firm name and the related percentage value of the MBE/WBE contract. The information in this affidavit will be binding on the consultant to the extent that any subsequent percentages on the "Actual MBE/WBE Participation Affidavit" may be increased and not decreased, and that if any listed MBE/WBE's are unable to enter into a contract with the consultant being notified of his/her selection, the consultant will provide a written report and request to the Procurement Officer through the Owner's representative in accordance with instructions provided elsewhere (Substitution of Subcontractors or Subconsultants) in this document.

A SAMPLE of the "Actual MBE/WBE Participation Affidavit" that must be completed and returned by the top-ranked consultant by the close of business hours on the seventh calendar day after the successful completion of contract negotiations is provided for information purposes. The Affidavit will list the MBE/WBE participation by MBE/WBE firm name and the related dollar value of the MBE/WBE contract. The information in this Affidavit is binding on the consultant, to the extent that any amounts may be increased and not decreased, and that if any listed MBE/WBE's are

unable to enter into a subcontract with consultant, the consultant will provide a written report to the Procurement Officer through the Owner's representative in accordance with instructions provided elsewhere (Substitution of Subcontractors or Subconsultants) in this document.

C. Good Faith Efforts:

Consultant Technical Proposals which fail to meet MBE or WBE minimum goals at levels which equal or exceed established goals may be rejected unless good faith efforts can be determined. Only MBE and WBE firms certified by Maricopa County five (5) calendar days prior to the Technical Proposal submittal date, and which will perform a commercially useful function will be counted toward meeting the participation goals. Any portion of the work that a proposed MBE or WBE firm will subcontract to other than another certified firm, regardless of tier, will not be counted toward the applicable goals.

The top-ranked consultant who does not fulfill the established MBE and WBE goals must demonstrate, through detailed and comprehensive documentation, that "good faith" efforts have been made to solicit, assist and utilize MBE and WBE firms to meet participation goals.

Reasonable "good faith" efforts expected could include but are not limited to:

1. Written notification to MBEs and WBEs that their participation in the contract is solicited.

2. Selection of portions of the proposed work which can be performed by MBE and WBE firms.

The County Minority Business Office (MBO) will assist prime consultants in identifying possible qualified and interested MBE and WBE subconsultants and subcontractors to meet designated MBE and WBE goals. A M/WBE directory will be furnished (by County MBO), which consultants may utilize in identifying MBE and WBE firms. It will be the responsibility of the prime consultant to obtain the MBE and WBE firms necessary to meet the MBE and WBE goals.

FAILURE TO CONTACT THE MBO FOR ASSISTANCE IN COMPLYING WITH THESE GOALS MAY RESULT IN NOT HAVING IMPLEMENTED "GOOD FAITH" EFFORTS. Contact may be in writing, by telephone, or in person. If by phone or in person, name of MBO person spoken to should be obtained and vwritten within the "good faith efforts" documentation submittal.

FAILURE TO IMPLEMENT "GOOD FAITH" EFFORTS IN ACCORDANCE WITH THE MARICOPA COUNTY MINORITY BUSINESS ENTERPRISE PROGRAM TO THE SATISFACTION OF MARICOPA COUNTY, COULD RESULT IN THE REJECTION OF THE TECHNICAL PROPOSAL.

Documentation to support consultant's "good faith" efforts should include:

1. Names and dates of advertisement of each newspaper, trade paper, and minority focus paper in which a request for MBE and WBE participation for this project was placed by the consultant.

2. Names, addresses and telephone numbers; and dates of notification of certified MBEs and WBEs solicited by direct mail for this project; and dates and methods used for follow up of initial solicitations to determine with certainty whether MBEs or WBEs were interested in subcontracting/subconsulting.

3. Items of work for which the prime consultant requested sub proposals/quotes, or materials to be supplied by MBEs and WBEs; information furnished to interested MBEs and WBEs such as specifications and requirements of the work; and any breakdown of items of work into economically or professionally feasible units to facilitate MBE and WBE participation.

4. Names of MBEs and WBEs who submitted proposals/quotes for any of the work indicated above and were not accepted by the prime consultant. An explanation of why MBEs or WBEs contacted were not awarded subcontracts. If fee was the reason for rejection of the proposal/quote, the price proposal/quote of rejected MBEs or WBEs and fee of the selected subcontractor/subconsultant shall be submitted. Since utilization of available MBEs and WBEs is the program objective, fee differences will not automatically be considered as cause for rejection of MBE and WBE proposal or quotes.

5. The names of MBEs and WBEs who were selected as subcontractors or subconsultants, the portion of work to be performed and reason for selection.

6. A description of the efforts made to assist MBEs and WBEs whose proposals/quotes were rejected to be more competitive in their subcontracting proposals/quotes. These efforts could include assistance in meeting bonding or insurance requirements, critiquing their proposals, etc.

7. The date the prime consultant requested assistance written, in person, or by telephone, from the MBO.

The MBO will determine if good faith efforts were met based on the information submitted.

D. Appeal Process for Contract Selection:

If the Owner is considering entering into contract negotitaions with a prime consultant other than the top ranked prime consultant because of failure to meet MBE and WBE participation goals or good faith efforts, the top ranked consultant will be notified and given an opportunity to protest the decision. This protest will be made in accordance with the Maricopa County Procurement Code, Article 9, MCI-905, which is incorporated by reference.

E. Contract Compliance:

Failure of any prime consultant, subconsultant or subcontractor to comply with any of the requirements of the Maricopa County Minority and Women-Owned Business Program shall be a material breach of contract. During the term of an awarded contract, the prime consultant shall:

1. Fulfill the MBE and WBE participation commitments submitted with their proposal;

2. Continue to make every effort to utilize MBEs and WBEs;

3. Require that their subconsultants and subcontractors make every effort to utilize MBEs and WBEs;

4. Maintain records necessary for monitoring their compliance with provisions contained in the M/WBE Program.

The primary responsibility for assuring the consultant's compliance with these M/WBE contract requirements after award rests with the Owner's designated representative. The Owner's designated representative should ascertain that no one other than the approved MBE or WBE subconsultants or subcontractors are performing the work, and that MBE and WBE subconsultant/ subcontractor substitutes have been approved in advance. The prime consultant shall not perform any MBE or WBE contract work items without prior approval by the Owner's designated representative.

The Owner's designated representative shall advise the Minority Business Office immediately of any circumstances where a consultant appears to be in violation of the MBE and WBE contract requirements. An investigation will be held by the MBO and a recommendation for corrective action shall be forwarded to the Owner's designated representative. Intentional noncompliance with the MBE and WBE requirements may result in withholding funds

and/or formal debarment from future contracts. The Maricopa County Minority Business Office (MBO) reserves the right to inspect all records of the consultant, MBEs and WBEs concerning this project.

The MBO will conduct MBE and WBE compliance reviews on a regular basis.

F. Substitution of Subcontractors or Subconsultants:

The prime consultant shall request approval to replace an approved MBE or WBE subconsultant/subcontractor that is unable or unwilling to perform successfully on a contract with another MBE or WBE. This failure does not remove the prime consultant's responsibility for meeting the MBE and WBE participation goals on the contract. A written request for substitution must be made to the Owner's Procurement Officer, through the appropriate Owner's representative of the Procurement Agency. The substitute MBE or WBE, obtained to perform an equal or greater dollar value of work, must be approved by the Owner's representative, prior to beginning of any work by the substitute MBE or WBE. The request for substitution must include, but is not limited to the following:

1. Reason for substitution.

2. Name, address, and telephone number of the approved MBE or WBE.

3. Name, address and telephone number of the MBE or WBE substitute.

4. Item, numbers, description of work and the proposed MBE and/or WBE dollar amount.

5. Good faith effort documentation if the substitute subconsultant or subcontractor is not an MBE or WBE.

G. Requests for Pay:

Each Request for Pay must be accompanied by a Maricopa County "MBE Program", Participation Report in the form as provided in these documents.

The final pay request shall include a listing of total contract MBE/WBE participation. Work task definitions and a description of actual work performed shall also be included. If, at the time of contract completion, the MBE and WBE commitments are not actually attained, the report is to provide an explanation of failure to comply. These reports shall be submitted within thirty (30) days of contract completion, PRIOR TO RELEASE OF ANY REMAINING CONTRACT RETENTION.

Leanna Cumberland
Chief, Contracting Branch

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
MINORITY/WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM
MBE/WBE ASSURANCES AFFIDAVIT

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS AFFIDAVIT WITH THE LETTER OF INTEREST SUBMITTAL SHALL BE CAUSE FOR REJECTION OF THE SUBMITTAL.

The undersigned, fully cognizant of the Maricopa County MBE/WBE Program requirements and of the contract goals established, hereby certifies that in the preparation of this Letter of Interest,

_____,
(the entity submitting the Letter of Interest)

(CHECK ONE)

____ Will meet the **established** goal for participation by Minority/Women-Owned Business Enterprises.

____ Will provide the necessary documentation to Minority Business Office to establish that a good faith effort was made and submit the documentation with the Technical Proposal.

_____
Name of Firm

_____
Signature

_____
Title

STATE OF ARIZONA)
)ss.
County of Maricopa)

Subscribed and sworn to before me this _____ day of _____, 199__, by _____.

_____
Notary Public

MARICOPA COUNTY
MINORITY/WOMEN-OWNED BUSINESS ENTERPRISES PROGRAM

MBE/WBE PARTICIPATION REPORT
(To be attached with Request for Pay)

Date: _____

Consultant: _____
Contact Person: _____
Address: _____

Telephone: _____

Project: _____
_____

Contract Number: _____
For Pay Period of: _____

Subcontractor: _____
Person to Contact: _____
Address: _____
Telephone Number: _____

Type of Firm: _____
Class of Work: _____

Subcontract Amount: _____
Amount Earned
(Commission) This Period: _____
Total Earned by This Subcontractor: _____

Total MBE/WBE Contract Goal, %: 10
Total Cumulative MBE/WBE
Participation on This Contract, %: 10

MBE/WBE subcontract payment made
during this reporting period (yes or no): _____

cc: Minority Business Office
Maricopa County Highway Building
2901 West Durango Street
Phoenix, Arizona 85009

3

Trying to Print correctly - will insert -

S A M P L E

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
MINORITY/WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM
Actual Minority/Women-owned Participation

Name of Prime Consultant

FCD 92-04 - 92-09
Project Number

Contact Person

Total Amount of Contract

Street No.

City State Zip

Minority/Women-owned Firm	Principal	Address	Type of Work	Contr

The undersigned has entered into a formal agreement with the minority consultants/contractors listed above in the exec with the Flood Control District of Maricopa County.

Signature

Title

Date

Copy to: Minority Business Office
Maricopa County Highway Department
2901 West Durango Street
Phoenix, Arizona 85009

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
MINORITY/WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM
Proposed Minority/Women-owned Participation

Name of Prime Consultant

FCD
Project Number

Contact Person

Total Amount of Contract

Street No.

City State Zip

Minority/Women-owned Firm	Principal	Address	Type of Work	Propo

The undersigned has entered into a formal agreement with the minority consultants/contractors listed above in the exec with the Flood Control District of Maricopa County.

Signature

Title

Date

Copy to: Minority Business Office
Maricopa County Highway Department
2901 West Durango Street
Phoenix, Arizona 85009

LETTER OF INTEREST FORMAT

	CATEGORY	NUMBER OF PAGES
	Introductory Letter	1 (Not included in total)
1.	Firm's Capability	1
2.	Staff Qualifications	2 page maximum
3.	Experience on Similar Projects	1
4.	Location of Work	1/2
5.	MBE/WBE Assurances Affidavit Form	1
6.	Current Prime Consultant Contracts	1/2

Remember this is a request for Letters of Interest, not a Request for Proposals.

From the letters received, at least two more firms than the number of anticipated contracts will be short-listed using the enclosed evaluation criteria. Those firms selected for the short-list will be provided additional instructions by the Chief, Contracting Branch. Those firms not selected for further consideration will be notified of nonselection.

Maricopa County will endeavor to ensure in every way possible that minority and women-owned business enterprises shall have every opportunity to participate in providing professional services, purchased goods, and contractual services to Maricopa County without being discriminated against on the grounds of race, religion, sex, age, handicap, or national origin.

For these contracts, goals of MBE ten (10) percent are established for Minority/Women-Owned Business Enterprises. The required form is included within this Letter of Interest packet.

Leanna Cumberland
Chief, Contracting Branch

Enclosures (2)
1. Letter of Interest Evaluation Criteria
2. MBE/WBE Professional Services Consultant Contracting Requirements
3. Directory of Certified MBE/WBE Firms

jlt

COORD: PSC

DRJ

EAR

DAB

INFO: MBO (by separate copy)

FILE: Contracting Branch

FINAL 12/31/91

MARICOPA COUNTY (DEPARTMENT) (DISTRICT)
LETTER OF INTEREST EVALUATION CRITERIA

(NOTE TO CONTRACTS ADMINISTRATOR/PROCUREMENT OFFICER: The Letter of Interest evaluation criteria are to be used for Consultant contracts with estimated fees exceeding $75,000. The maximum assigned possible score for each category 1 through 3 must fall within the allowable range indicated; each category maximum value may be tailored to meet specific project requirements. The point values indicated within categories 4, 5, and 6 cannot be changed. The maximum score, categories 1 through 5, must be 100 points. If there are no M/WBE participation goals for a contract, delete category 5 and renumber category 6; the maximum score, categories 1 through 4, must then equal 100 points.

The maximum category points and category special requirements must be fixed before the Letters of Interest are publicly advertised or transmitted to Consultants listed with a department's/district's Consultant Register.)

1. FIRMS' CAPABILITIES (20 to 35 maximum points)

The capabilities of the prime Consultant and any subconsultants/subcontractors of taking on the new workload will be assessed by the County.

Does the project team possess the personnel, resources, and financial capabilities to undertake this work?
Can the project team start and complete the project in accordance with the furnished contract schedule?
Does the LOI indicate that project-specific special requirements will be met? They are as follows:
(NOTE TO CONTRACTS ADMINISTRATOR/PROCUREMENT OFFICER: List any additional qualifying LOI evaluation criteria determined to be important to the evaluation of LOI's: i.e., CADD-based design; establishment of a construction jobsite inspection and contract administration office; etc.)

2. STAFF QUALIFICATIONS (20 to 35 maximum points)

Only permanent, fulltime personnel currently employed by either the prime Consultant, subconsultants or subcontractors can be indicated as "employees"; on-call, part-time, or anticipated staff must clearly be identified as such.

Does the project team currently have personnel with the necessary qualifications to complete the project?
If sub-consultants are used, do they also have the necessary qualifications?
Are on-call, part-time, or anticipated staff clearly identified as such?

3. EXPERIENCE ON SIMILAR PROJECTS (20 to 35 maximum points)

The qualifications and experience of new Consultants or Consultants not previously having County experience will be reviewed equally with those having prior County experience.

Has the project team previously successfully completed similar projects?

Has the project team completed projects of this type on time and within budget?

Does the project team have experience in dealing with project-applicable governmental regulations, policies, and procedures?

4. LOCATION OF WORK (10 maximum points)

Preference will be given to project teams with the capability of performing the work within resident Maricopa County offices. If insufficient information is provided, zero points will be awarded.

Does the Letter of Interest clearly and definitively state where all of the contract work will be performed?

Scoring:

All work done in Maricopa County	10 points
All work done in Arizona	5 points
Some work done out of State	2 points
All work done out of State	0 points

5. MBE/WBE ASSURANCE AFFIDAVIT FORM (5 points or zero point)

Five points will be awarded only if the criteria for "A" and "C" are met; if not, zero points will be awarded. The lack of a signed and notarized affidavit (criteria "C") will cause the LOI to be rejected.

A. Has the prime Consultant firm indicated that it has a current affirmative action plan on file with the department/district?

B. Is the prime Consultant firm a County-certified MBE/WBE firm, and is it's certification number supplied?

C. Has the prime Consultant firm submitted a signed and notarized "MBE/WBE Assurances Affidavit"?

6. CURRENT AND ACTIVE PRIME CONSULTANT'S ARTICLE FIVE CONTRACTS WITH MARICOPA COUNTY DEPARTMENTS/DISTRICTS/AGENCIES

NOTE: This item shouldn't be confused with a firm's abilities to perform the contract work; this is covered within Category #1, Firm's Capabilities.

A "current" contract is defined as an executed (by the Board chairman) contract with a prime Consultant, as of the date which Consultant Letters of Interest are due. An "incomplete" contract is defined as a contract with a prime Consultant which has not been accepted as being complete. An "active" contract is defined as a contract with a prime Consultant in which the contract work is either incomplete or the contract managing department/district has not informed the Consultant of that contract's inactive status.

Scoring (for current, active, and incomplete contracts):

Over	$		minus 10 points
Between	$	and $	minus 9 points
Between	$	and $	minus 8 points
Between	$	and $	minus 7 points
Between	$	and $	minus 6 points
Between	$ 75,000	and $	minus 5 points
Less than	$ 75,000		minus 4 points

Additional minus points:

Annual or on-call type contract	minus 2 points
More than one current, active and incomplete contract	minus 2 points

(NOTE TO CONTRACTS ADMINISTRATOR/PROCUREMENT OFFICER: The Director of Public Works, via the Article Five Oversight Committee, will annually assign the range of contract values to be used; the contract value associated with a minus ten points will be the median value of all Article Five consultant contracts awarded during the previous year.)

_____ _____

Signature Date
(Name of Contracts Administrator)
(Procurement Officer)

XX:xxx

SCOPE OF WORK
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOODPLAIN DELINEATION AND TOPOGRAPHIC MAPPING
FOR _____

GENERAL

The project consists of approximately ___ river miles of floodplain and floodway delineations for _____, as shown on Exhibit ___. This will require the development of the necessary topographic data and ___ square miles of watershed hydrology.

The consultant will develop the hydrology using the Corps of Engineer's HEC-1 computer model, and the floodplain and floodway delineations using the HEC-2 computer model. The consultant must use sound engineering judgement in the development of the hydrologic and hydraulic models. The results of the models must be analyzed carefully and refinements made to the input parameters in order to obtain the most realistic results.

All work must meet Arizona Department of Water Resources (ADWR) and Federal Emergency Management Agency (FEMA) requirements for floodplain delineations. The results of this study must be reviewed and accepted by FEMA prior to the finalization of this contract.

All work under this Scope will be completed within ____ calendar days from the date of Notice to Proceed, including 60 days for District reviews.

TASK 1 - COORDINATION

1.1 The consultant will submit a project schedule showing coordination meetings and completion dates for each of the tasks in the scope within 14 days of Notice To Proceed. The consultant shall update this project schedule when appropriate.

1.2 The consultant shall participate in regular coordination meetings (at least every three weeks) with the District's Project Manager and in milestone coordination meetings in the development of the hydrologic and hydraulic analyses. The consultant is responsible for the minutes of any meetings. Whenever possible, coordination and milestone meetings should be combined.

1.3 The consultant shall submit monthly progress reports at least 5 days before submittal of monthly invoices. The report shall be brief and should be no longer than two typed pages. At a minimum, the monthly report shall contain the following:

a. A description of the work accomplished by task during the reporting month.

b. Percent (%) completed for the month and percent (%) cumulative completed for each task.

c. A brief description of the work to be accomplished the following month.

d. A description of any problems encountered.

1.4 The consultant is responsible for placing the legal advertising at the beginning of the study, notifying the public of the study. The ad will be run in a widely circulated newspaper two times, with approximately one week between runs. The ad must also be run two times in a local newspaper that serves the area being studied. After the ad is run the consultant will supply the District with the original affidavits of publication from the newspaper(s) for each day that the ad ran.

1.5 The consultant will notify all property owners and obtain any necessary Rights of Entry for the study area. The District will assist the consultant as may be necessary to complete this task. The consultant will furnish the District with a list of all the property owners notified and a sample Right of Entry letter.

1.6 The consultant shall meet with officials from _____ _____. The purpose of this meeting is to identify local flooding problems and obtain information on current and planned public works projects, channel modifications, storm-drainage systems, development, and obtain the current corporate limits.

1.7 The consultant shall plan and conduct two public meetings. The meetings shall conform to FEMA guidelines. The consultant shall be responsible for the acquisitions of all materials, meeting rooms, public notices, minutes of the meeting, etc., concerning the public meetings. The first meeting shall be held to inform the public of the purpose and scope of the study. The second meeting will be to inform the public and obtain public comment on the study results, and shall take place prior to the submittal of the final report to FEMA.

1.8 Prior to finalizing of the hydrologic analysis, the consultant will submit hydrologic maps, HEC-1 model, and hydrologic report to ADWR and any other governmental agency reviewers through the District. The consultant will respond to questions by the reviewers and make modifications to the hydrologic maps, HEC-1 model, and hydrologic report if necessary.

1.9 The consultant will submit delineation maps, hydraulics report, and HEC-2 model, to ADWR, FEMA for review by the Technical Evaluation Contractor (TEC), and any other governmental agency reviewers through the District. The consultant will respond to questions by the reviewers and make modifications to the delineation maps, hydraulics report, and HEC-2 model as required.

TASK 2 - DATA COLLECTION

2.1 The consultant will collect and review pertinent data from the District and other outside sources. Data to be collected will include previous flood hazard reports and hydrology for the study area; existing topographic mapping; historical flooding information; as-built plans for existing structures; FEMA Flood Hazard Boundary

Maps and any Letters of Map Amendment and/or Revisions, and other pertinent information.

2.2 A written report summarizing the data collected will be submitted to the District for information purposes. A preliminary draft of this report is due within 90 days of Notice to Proceed.

TASK 3 - TOPOGRAPHIC MAPPING

3.1 An aerial survey subcontractor shall be retained by the consultant as part of this contract. The consultant shall coordinate all the aerial surveying work with the aerial surveying subcontractor to ensure that the specifications of the aerial surveying work are met. The consultant is responsible for ensuring that the topographic mapping covers the area of delineation. Quality control on surveys will be per FEMA Document 37, Flood Insurance Study Guidelines and Specifications for Study Contractors, March 1991.

3.2 A Digital Terrain Model shall be developed as part of the topographic mapping. Digital contour and planimetric data developed for this study shall be delivered according to the District's GIS specifications.

3.3 Prepare topographic mapping to a _-foot contour interval, with a scale of 1 inch = ___ feet, with spot elevations and/or 1-foot contours on all section line and mid-section line roads.

3.4 Ground Control:

a. The consultant shall provide all survey control using 1983 NAD.

b. The consultant shall systematically set panel points and establish horizontal and vertical control throughout the areas to be mapped for use in compilation by the aerial survey contractor. Where readily available, surveys will tie into the State Plane Coordinate System. Field control shall be sufficient to readily allow for compilation of maps by the aerial survey contractor at the desired map scale and contour interval, and will be based on the National Geodetic Vertical Data of 1929 (NGVD).

c. The horizontal and vertical control points shall be located and marked by the consultant. The controls for the aerial mapping shall be in sufficient numbers and shall be in locations which will be compatible with the accuracy of the mapping requirements. The controls shall be of at least third order accuracy. Section corners, quarter corners, and mid-section points shall be used for control points wherever possible.

3.5 The consultant shall provide permanent non-erasable topographic mylars of the work study drawings. The drawings shall be 24" X 36" in size, with a scale of 1 inch = ___ feet and a contour interval of _ feet for all mapping with the exception of section line roads which will have a contour interval of 1 foot. A cover sheet will be provided with the project title, date of topographic mapping, and a location map showing geographic range covered by each specific mapping sheet. Each drawing shall include the floodplain and

floodway delineations and a minimum of a north arrow, scale, section corners and quarter corners, current and proposed streets and highway names, State Plane Coordinate System, major drainage features, corporate boundaries, cross section lines, channel station center line, index map, description and elevation of control points and ERMs, and reference marks used in ground control. See Exhibit _ for how the drawings are to be laid out. The mapping will have an accuracy such that ninety percent (90%) of all contours shall be within one-half contour of the true elevations and the remaining ten percent (10%) of the contours shall not be in error by more than one contour interval.

3.6 Sketch maps no larger than 11" x 17" for the study area must be included in the narrative report along with the flood profile maps.

3.7 Hydrologic work maps should be at a scale of 1 inch = 2000 feet (or larger scale if available) and shall include: reproducible transparent overlay maps of existing drainage patterns, subwatersheds; major flow paths; and general topographic maps.

TASK 4 - FIELD SURVEY

4.1 Prepare topographic mapping to a _ foot contour interval with a scale of 1 inch = ___ feet, with spot elevations or 1 foot contours on all section line and mid-section line roads, for floodplain/floodway delineation areas as identified in Task 6 or FEMA criteria, whichever is more stringent

4.2 Ground Control for Floodplain Delineations:

a. All topographic mapping and survey work shall meet or exceed Federal Emergency Management Agency (FEMA) minimum criteria as defined in FEMA Document 37, Flood Insurance Study Guidelines and Specifications for Study Contractors, March 1991. This would include, but is not limited to: the establishment of "permanent" elevation reference marks (ERM's); field control; and verification of profiles by the ground survey profile procedure.

b. Horizontal and Vertical Control: Systematically set panel points and establish horizontal and vertical control throughout the area to be mapped for use in compilation by the aerial survey contractor. Where readily available, surveys will tie into State Plane Coordinate System 1983 NAD. Field control shall be sufficient, at least one "permanent" point per mile, such point(s) being used as Elevation Reference Marks (ERMs). Surveys will be based on National Geodetic Vertical Datum (NGVD), per FEMA guidelines. "Permanent" survey points shall consist of existing monumentation, such as brass caps or similar survey monuments. Where additional monumentation is needed, survey markers conforming to Maricopa Association of Governments (MAG) Uniform Standard Detail for Public Works Construction, detail 120-1, Type C, shall be placed 2" +/- above grade, and topped with a brass cap. Elevation Reference Marks will be labelled on available maps and described in a manner which allow them to be readily located in the field.

c. All aerial targets are to be removed following completion of the topographic mapping.

4.3 The consultant shall verify the accuracy of the mapping by the procedures called for in FEMA Document 37 or other methods approved by FEMA. This shall include the verification of cross sections used in the floodplain delineation.

4.4 Field surveys or "as-built" plans of all bridges, culverts, and hydraulic structures are to be obtained by the consultant. This information should be reduced and compiled into an 11"x 17" (maximum size) drawing for inclusion in the final report. The information presented in the drawing should be in a format appropriate for use in the HEC-2 model. Field surveys or "as-built" plans of bridges, culverts, hydraulic structures, and routing reaches must also be obtained where necessary for proper hydrologic modeling. It may be necessary to field survey some structures since the as-built plans may not be on 1929 NGVD.

TASK 5 - HYDROLOGY

5.1 The hydrologic study of the watershed will be delivered to the District under separate cover from the hydraulic analysis. The consultant shall use the U.S. Army Corps of Engineers computer program HEC-1, 1991 Version, to develop a hydrologic model for the area. Using appropriate hydrologic judgement, sub-basins are to be identified that provide reasonable depiction of the watershed condition. The sub-basins must be as homogeneous as possible, using watershed area, watershed type (mountainous and flat lands or urban and undeveloped areas), and time of concentration as criteria. Sub-basin break-downs will be done in sufficient detail to provide peak discharges at structures, major road crossings, confluences, and at boundary lines. An appropriate time step and number of ordinates is to be selected that allows for complete calculation of the flood hydrograph without sacrificing resolution of the flood peak. All calculations, or assumptions used in developing sub-basin and routing parameters shall be documented and made a part of the appendix for the hydrology report. Field surveys may need to be taken for HEC-1 modeling purposes.

5.2 Four meetings associated with four tasks, and two field trips shall be held with the Flood Control District staff at the following milestones:

a. One field trip at the start of the project to scope out the critical points of the watershed and problem areas.

b. Meeting number 1 as soon as basic data are gathered and the sub-basins have been delineated. Sample HEC-1 parameter estimations should also be presented and discussed at this meeting. A copy of the draft maps of the sub-basins must be delivered to the District at this meeting.

c. Meeting number 2 after all the parameters have been estimated. A draft copy of the parameters must be delivered to the District at least one week prior to this meeting.

d. Meeting number 3 after the preliminary HEC-1 results have been obtained and a draft report has been prepared. A copy of the draft report and the copy of the HEC-1 on a floppy disc, compatible with the Districts computer, must be delivered two weeks prior to the meeting. A second copy of each will be forwarded by the District to ADWR for their review and comment.

e. Meeting number 4 to review comments by the District and ADWR one week after the consultant has received the review comments. The District will require a minimum of two weeks to review the report and the model. A second field trip may be scheduled for the same day so the results obtained could be discussed.

5.3 The specific hydrologic techniques to be used in this study are:

a. Rainfall Depth: Point precipitation values will be determined using the information and procedures described in the Drainage Design Manual for Maricopa County, Arizona: Volume I - Hydrology.

Rainfall Distribution: Peak discharges and peak volumes for the 100-year 6-hour storm will be estimated using the District's Distribution(s). Peak discharges and peak volumes for the 100-year 24-hour storm will be estimated using the SCS Type II rainfall distribution.

b. Areal Reduction: The point precipitation values will be areally reduced for critical concentration points. Areal reduction for the 6 hour rainfall duration will be applied using the curves in the Drainage Design Manual for Maricopa County, Arizona: Volume I - Hydrology. NOAA HYDRO-40 will be used with the 24 hour rainfall reduction. Copies can be obtained from the District.

c. Rainfall Excess: The Green and Ampt methodology will be utilized for estimation of rainfall losses. The Lotus spreadsheet and procedures, provided by the District, will be used to determine composite parameter values for each sub-basin.

d. Unit Hydrograph: The Clark and S-Graph method should be used following the procedures outlined in the Drainage Design Manual for Maricopa County, Arizona: Volume I - Hydrology. The choices in methodology will be to the discretion of the consultant, with consent from the District.

e. Time of Concentration and S-Graph Lag Equation: The Papadakis method should be used with the Clark unit hydrograph, along with the MCUHP1 computer program, to determine the time of concentration. If this method results in unsuitable times of concentration, other method(s) must be used and compared for the most realistic result. The S-graph lag equation, along with the MCUHP2 computer program, should be used with the appropriate S-graph (Phoenix mountain or Phoenix Valley).

f. Channel Routing: Channel routing will be accomplished using either the Muskingum-Cunge or the Normal-Depth option of HEC-1. The choice of methodology will be at the discretion of the consultant, with consent from the District. Average cross sections will be developed utilizing available mapping and

field reconnaissance data. Sufficient field cross sections will be taken to ensure that routing reaches are reasonable and representative of field conditions.

The HEC-1 routing parameters for the reaches modeled using HEC-2 will be adjusted after the HEC-2 cross sections are available. The resulting velocities and depths, for all reaches, must be assessed for realistic values.

g. Reservoir Routing: Detailed analysis of structures and ponding areas will be accomplished using the Modified Puls reservoir routing option of HEC-1. Stage versus discharge tables for hydraulic structures will be estimated using appropriate hydraulic methodology.

h. Channel Transmission Losses: Attempts should be made to estimate infiltration losses through channel bottoms based on existing field data or literature. If sufficient data is not available, the final report must acknowledge so and explain how the peaks and volumes of flow are affected by not including the transmission losses.

5.4 The District will provide appropriate references to facilitate parameter estimation.

5.5 Output of the computer model should be reviewed to see if the peak flows and volumes are realistic. Adjustments to input for obtaining the most realistic results is normal to the scope.

5.6 Every attempt must be made to recover historic stream gage data and use it to compare with the results obtained by the hydrologic model. Major differences must be discussed in the final report.

5.7 It is required that the consultant obtain the approval of the District at each of the following steps:

a. Soil maps, watershed boundary maps, and land use maps.

b. HEC-1 parameter estimation.

c. HEC-1 flow diagram and input parameters.

d. HEC-1 results.

5.8.1 The final hydrologic report should include the following sections and documentation using ADWR standards (as a minimum):

a. Scope of the study.

b. Description of the watershed.

c. Previous studies and reports.

d. Methodology.

e. Assumptions.

f. Results.

g. Comparison of the results with other studies and/or stream

gages.

h. Conclusion.

i. List of references and agencies contacted.

5.8.2 Tables and Figures for the main Text:

a. Location map (maximum size 11"x 17") at the appropriate scale.

b. Table showing the flow peaks and volumes at critical concentration points for different rainfall events.

c. Table showing the critical peaks and volumes for major concentration points as compared to previous studies (where available).

d. Table(s) showing the major parameters for all sub-basins (slope, area, soil loss calculations, friction, total rainfall, time of concentration or lag, major structures, etc.).

5.8.3 Tables and Figures for the appendices:

a. Topographic base map(s) showing the sub-basins, routing reaches, Tc flow paths or lag flow paths, major man-made structures, and references (i.e. street names, Township, Range, Section, etc.) at a scale of 1 inch = 2000 feet.

b. Soils map(s) at the same scale as the base map.

c. Land use map(s) at the same scale as above.

d. Schematic map for the HEC-1 showing the sub-basins (area, Tc), the flow paths, the routing reaches (length, slope, friction, width, velocities, transmission losses, etc.), order of combining the hydrographs, channel, pipe or culvert dimensions (where appropriate).

e. Pertinent data on all the structures in the watershed (such as spillway elevation, rating curves, etc.).

f. One set of study maps (i.e. sub-basin boundary maps, flow path maps, soils maps, land use maps) to be folded and delivered in a binder.

Specific deviations from this hydrologic scope shall not be undertaken without the specific written concurrence from the Flood Control District.

TASK 6 - FLOODPLAIN AND FLOODWAY DELINEATION

6.1 Floodplain and floodway delineations must be obtained using the U.S. Army Corps of Engineers HEC-2 Water Surface Profiles computer model, version 4.6.2, May 1991, and methodology acceptable to FEMA. This model will simulate the effects of floodplain geomorphology, flow changes, bridges, culverts, hydraulic roughness factors, effective flow limitations, split-flows, and other considerations. The consultant will prepare the study using the guidelines established in

FEMA Document 37, Flood Insurance Study Guidelines and Specification for Study Contractors, March 1991, and FIA Document 12, Appeals, Revisions, and Amendments to Flood Insurance Maps, January 1990.

6.2 The delineation work shall meet requirements for floodplain and floodway delineations as prescribed by FEMA and the Arizona Department of Water Resources.

6.3 The consultant is to make refinements to the HEC-2 model based on review of the model results by the District, ADWR, FEMA, and the Technical Evaluation Contractor. The consultant shall review the HEC-2 model results for reasonableness. Adjustments to the input parameters for obtaining the most realistic results is normal to the scope.

6.4 The consultant will prepare working maps and models of the 100-year floodplain and floodway during the course of the hydraulic modeling analysis for review by the District at progress and milestone meetings. Floodways are to be determined using equal conveyance encroachment methods to start with, but only encroachment method 1 will be used in the final analysis. The floodway encroachment is to be as near the one foot maximum rise in elevation as possible.

6.5 The consultant must obtain District approval at each of the following steps:

a. Field reconnaissance report and estimation of Manning's "n" values.

b. Proposed location and alignment of the cross sections and channel centerline.

c. Floodplain (natural) delineation.

d. Floodway delineation using equal conveyance encroachment.

e. Floodway delineation using encroachment method 1.

f. Final Hydraulics Report.

6.6.1 The consultant will conduct a field reconnaissance of the full study reach. This will include observation of channel and floodplain conditions for estimation of Manning's "n" values; photographic documentation of floodplain characteristics; determination of channel bank stations; observation of possible overflow areas; inspection of levees or other flood control structures; and measurement of bridge dimensions.

6.6.2 Mannings "n" values are to be determined using the methodology in the USGS report, Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona, April 1991. Copies of the report are available through the District.

6.6.3 A draft report on the field reconnaissance will be submitted to the District for review and approval prior to beginning the HEC-2 modeling. The report will present the determination of channel and overbank "n" values using captioned color photographs or color photocopies. The report will also discuss floodplain conditions affecting the delineation, describe structures and obstructions, and provide color photos or photocopies of major hydraulic structures.

Photo locations, structures, and "n" values will be displayed on reduced scale mapping include in the report. The final report will be included in the Final Hydraulics Report.

6.7.1 The location and alignment of cross sections and channel centerline will be submitted for the District's review and approval prior to digitizing the cross section data. Cross section stationing will be from left to right looking downstream with the thalweg as station 10,000. Cross sections will be spaced approximately every 500 feet, unless geographic or structural constraints dictate otherwise. Identification of cross sections will be in river miles, increasing upstream. The stationing will tie into the specified river mile of the existing FEMA studies. Cross section orientation may need to be altered after running of HEC-2 model to make sure that they are perpendicular to flow per FEMA criteria.

6.7.2 All cross sections will be plotted using a pen plotter. The cross section plots will show water surface profiles, ineffective flow areas, "n" values, encroachments, channel stationing and other pertinent information. All plots are to be accompanied by a legend. These plots are to be available at all reviews.

6.7.3 Cross section plots are limited to one plot at the following three stages of work: (a.) a plot of digitized "GR", STCHL, STCHR, centerline (station 10,000) to be used as a check of input data and for working sections during compilation of the floodplain model; (b.) a plot of the cross section for the completed floodplain run which shows the floodplain water surface elevation, ineffective flow areas, "n" factor, and encroachments to be used as working sections for development of the floodway model; (c.) a plot of the final floodway model cross sections which will show Type 1 encroachments, encroached water surface, and flow velocity, in addition to data covered in items (a.) and (b.). These cross sections will be submitted as part of the Final Hydraulics Report.

6.8 Bridges and culverts must be modeled in compliance with HEC-2 modeling requirements for the selected routine. Where multiple bridges occur, each bridge will be modeled separately. The HEC-2 modeling results for bridges, culverts, and other hydraulic structures must be checked by using an independent method approved by the District to analyze these structures.

6.9 For floodplains identified as ponding areas, it is preferable to analyze the area by using the HEC-2 model, which will provide the District with water surface elevations. If appropriate, the consultant shall identify in the ponded floodplains a floodway. The purpose of this floodway is to allow the pond to seek a constant stage throughout the areal extent of the ponds, versus the creation of two independent ponds.

6.10 Flood zones must be determined according to FEMA criteria and clearly labelled on the final drawings.

6.11 The total area of the floodplain and floodway must be determined for each reach in square miles and acres.

6.12 The final report for the floodplain/floodway delineation study will include, but is not limited to the following:

I. Introduction

a. Purpose of study
b. Authority for study
c. Coordination and acknowledgments
d. Public notification and contact

II. Area Studied
a. Scope of study
b. Community description
c. Principal flood problems
d. Flood protection measures

III. Engineering methods
a. Hydrologic analyses
b. Hydraulic analyses

IV. Floodplain Management applications
a. Flood boundaries
b. Floodways

V. Insurance applications and CRS summary

VI. Other studies

VII. Location of data

VIII. Bibliography

IX. Reduced Delineation Maps (11"x17")

X. ERM's

TASK 7 - FINAL PRODUCTS

7.1. Mapping:

a. One complete set of 9" X 9" contact prints of the aerial stereo photographs sequentially numbered and catalogued.

b. One complete set of contour maps, blueline, draft copy for Flood Control District reference during the project, delivered immediately following completion of the topographic mapping.

c. One complete set of contour maps at 1"= ___' scale with the floodplain delineations in reproducible form (mylar) and nine blueline copies as outlined in Task 3.

d. One set of transparent overlays of photo-mylars.

e. One complete set of mylars for the foldout maps (no larger than 11" x 17") used in the reports.

7.2 Digitized topographic data and floodplain/floodway boundaries in conformance with the District's GIS Specifications.

7.3 Six hardcopies of the HEC-2 and HEC-1 printouts and a copy of the HEC-2 and HEC-1 model input/output on 5-1/4", 1.2 Mb diskettes compatible with an IBM-AT personal computer.

7.4 Tabular list of control points (ERM's) used with descriptions, elevations, and coordinates.

7.5 The consultant will produce a final report incorporating the comments of the District, FEMA and other reviewers. Six copies of the Hydrologic and Hydraulics reports as outlined in Tasks 5 & 6 respectively, will be delivered.

7.6 Documentation for this study will be as outlined in ADWR Sate Standard Attachment 1-90, Instructions for Organizing and Submitting Technical Documentation for Flood Studies, September 1991.

7.7 Two (2) copies of the current FIRM panels showing the proposed delineation.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Contract Change Order No._____

Date:_____ FCD Contract No./Name:_____

To:_____, Contractor.

You are hereby directed to make the herein described changes from the plans and specifications or do the following described work not included in the plans and specifications on the above-mentioned project.

Changes requested by:_____

Provide description of work to be done, estimate of quantities, and prices to be paid. Segregate between additional work at contract price, agreed price, and actual cost. Unless otherwise stated, rates for rental of equipment on actual cost work cover only such time as equipment is actually used and no allowance will be made for idle times.

* (1) Estimate of increases and/or decreases in contract items at contract prices.
** (2) Estimate of extra work at agreed price and/or actual cost.

Sheet No._____of_____

Bid Item No.	Description	Estimated Quantity	As Built Quantity	Difference, + or -	Unit Price	Difference + or -
TOTAL						

We, the undersigned contractor, having given careful consideration to the change(s) proposed, hereby agree, if this proposal is approved, that we will provide all equipment, furnish all material (except as may otherwise be noted above), and perform all services necessary for the work above specified, and we will accept as full payment therefor the prices shown above.

By reason of this proposed change_____days extension of time will be allowed.
Total new contract amount through this Change Order No._____ $ _____

Contractor:_____ By:_____

_____ Title:_____

_____ Date:_____

Recommended by:_____

Date:_____

Approved by:_____
Chief Engineer and General Manager

Date:_____

04/92 cao:oss

Architects/Engineers
Change Order Justification/Authorization Memorandum

Date:

File No.
Contract No. FCD
Change Order No.

MEMO TO:

FROM:

Request a Change Order to Contract FCD

The change order is required because

The following financial information is submitted:

Initial Contract Amount $_____

Change Order Authorization Limit
Total Change: A/E - 20% or $ 20,000.00 max $_____

Individual Change:
A/E - 15% or $ 15,000.00 max $_____

Amount Previously Authorized in Change Orders: $_____

Change Order Authorization Remaining: $_____

Amount Requested for this Change: $_____

Remaining Change Order Authority $_____

I certify that this change is required to accomplish the overall task for which this contract was initiated.

Funds are available to accomplish this Change Order.

_____
Project Manager

_____
Controller

Concur: _____
Division Chief

I certify that this change order is within the limits authorized by the County Procurement Code.

_____
Chief, Contracting Branch

APPROVED/DISAPPROVED

_____
Chief Engineer and General Manager

Copy to: Contract File, Controller, Division Chief, and Project Manager

Revised
12/24/91

Architects/Engineers
Change Order Justification/Authorization Memorandum

Date:

File No.
Contract No. FCD
Change Order No.

MEMO TO:

FROM:

Request a Change Order to Contract FCD

The change order is required because

The following financial information is submitted:

Initial Contract Amount $_____

Change Order Authorization Limit
Total Change: A/E - 20% or $ 20,000.00 max $_____

Individual Change:
A/E - 15% or $ 15,000.00 max $ _____

Amount Previously Authorized in Change Orders: $_____

Change Order Authorization Remaining: $_____

Amount Requested for this Change: $_____

Remaining Change Order Authority $_____

I certify that this change is required to accomplish the overall task for which this contract was initiated.

Funds are available to accomplish this Change Order.

_____
Project Manager

_____
Controller

Concur: _____
Division Chief

I certify that this change order is within the limits authorized by the County Procurement Code.

_____
Chief, Contracting Branch

APPROVED/DISAPPROVED

_____
Chief Engineer and General Manager

Copy to: Contract File, Controller, Division Chief, and Project Manager

Revised
12/24/91

Architects/Engineers
Change Order Justification/Authorization Memorandum

Date:

File No.
Contract No. FCD
Change Order No.

MEMO TO:

FROM:

Request a Change Order to Contract FCD

The change order is required because

The following financial information is submitted:

Initial Contract Amount $_____

Change Order Authorization Limit
Total Change: A/E - 20% or $ 20,000.00 max $_____

Individual Change:
A/E - 15% or $ 15,000.00 max $ _____

Amount Previously Authorized in Change Orders: $_____

Change Order Authorization Remaining: $_____

Amount Requested for this Change: $_____

Remaining Change Order Authority $_____

I certify that this change is required to accomplish the overall task for which this contract was initiated.

Funds are available to accomplish this Change Order.

_____
Project Manager

_____
Controller

Concur: _____
Division Chief

I certify that this change order is within the limits authorized by the County Procurement Code.

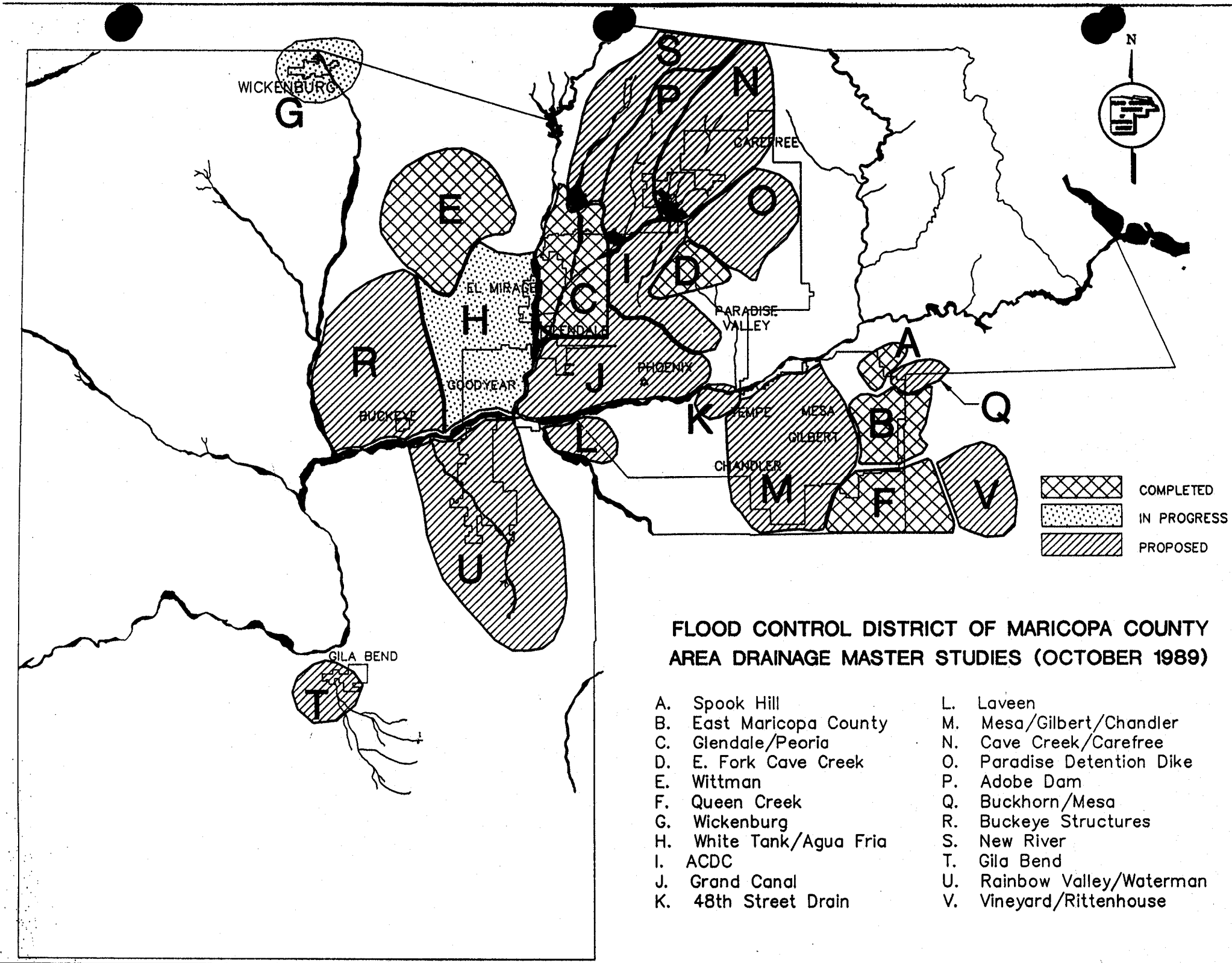
_____
Chief, Contracting Branch

APPROVED/DISAPPROVED

_____
Chief Engineer and General Manager

Copy to: Contract File, Controller, Division Chief, and Project Manager

Revised
12/24/91



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
AREA DRAINAGE MASTER STUDIES (OCTOBER 1989)

A. Spook Hill
B. East Maricopa County
C. Glendale/Peoria
D. E. Fork Cave Creek
E. Wittman
F. Queen Creek
G. Wickenburg
H. White Tank/Agua Fria
I. ACDC
J. Grand Canal
K. 48th Street Drain
L. Laveen
M. Mesa/Gilbert/Chandler
N. Cave Creek/Carefree
O. Paradise Detention Dike
P. Adobe Dam
Q. Buckhorn/Mesa
R. Buckeye Structures
S. New River
T. Gila Bend
U. Rainbow Valley/Waterman
V. Vineyard/Rittenhouse

FEMA SUBMITTAL

1. FEMA kick off letter to FEMA Region IX, Washington D.C., Jim Morris ADWR. Noting study area.

2. Letter to city/town officials. Need to get letter of concurrence from city/town acknowledging the study.

3. Kick off meeting:

   Go over the scope.
   Clarification of deliverable
   News add in AZ Republic --- must get the original "cut out" add with affidative of publication from paper. Add should include the study limits and date of completion.
   Review schedule
   Need monthly update -- substantiate billing with a brief narrative of tasks completed
   Review Substantial Completion

4. Log in all activities.

FLOOD CONTROL DISTRICT
of
Maricopa County

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

D. E. Sagramoso, P.E., Chief Engineer and General Manager

SEP 10 1991

Mr. Ray Lenaburg
Project Officer
FEMA Region IX, Building 105
Presidio of San Francisco
San Francisco, California 94129

SUBJECT: Proposed Delineations

Dear Mr. Lenaburg:

This letter is to advise you that the Flood Control District of Maricopa County has contracted to perform floodplain redelineations of several river reaches in Maricopa County.

For these studies, aerial mapping will be utilized to obtain up-to-date data on topography. Also, the U.S. Army Corps of Engineers' HEC-1 and HEC-2 computer models will be used to estimate the discharges and floodplain/floodway boundaries. The studies are expected to be completed by July 1992.

The proposed delineations and contractors are as follows:

1. 15 miles of the Gila Bend area--Burgess & Niple, Inc.
2. 22 miles of the Buckeye area--McLaughlin Kmetty Engineers, Ltd.
3. 12 miles on Deadman Wash--Howard Needles Tammen and Bergendoff
4. 12 miles on White Tanks Wash--Alpha Engineering Group, Inc.
5. 11 miles on Rainbow Valley Wash--Simons, Li & Associates, Inc.
6. 9 miles of Luke Wash--Coe and Van Loo Consultants, Inc.

If you have any questions, please call me or Tim Murphy at (602) 262-1501.

Sincerely,

Pedro Calza

Pedro Calza
Floodplain Branch Manager

PAC/TMM/ag

COORD: ~~TMM~~ Tim

INFO: ~~DKH~~, ~~GL~~, ~~BKH~~ BKH, JMO, ~~RGN~~

FILE: Hydrology
FCD 90-64 White Tanks Wash FIS
FCD 90-65 Deadman Wash FIS
FCD 90-66 Rainbow Wash FIS
FCD 90-67 Gila Bend Area FIS
FCD 90-68 Luke Wash FIS
FCD 90-69 Buckeye Area FIS

INVOICE NO. 04196

ANNOUNCEMENT OF INTENT
TO PERFORM FLOOD ELEVATION STUDY

The Flood Control District of Maricopa County (FCDMC) has contracted Coe & Van Loo Consulting Engineers, Inc. (CVL) to perform a floodplain redelineation for Skunk Creek from the Arizona Canal Diversion Channel at downstream end to Central Arizona Project at the upstream end. This study will examine and evaluate the flood hazard areas in the community to determine the flood elevation for this area. Those elevations will then be used to determine the flood insurance rates used by the Federal Emergency Management Agency.

This announcement is intended to inform all interested person and communities of the commencement of this study so that they may have an opportunity to bring any relevant technical information to the attention of FCDMC/FEMA, so that they could be considered during the course of this study. Your comments should be addressed to Mr. Joe Tram, hydrologists at the Flood Control District of Maricopa County or Mr. Ashok Patel at CVL.

Published: Arizona Republic, June 20,27, 1990.

AFFIDAVIT OF PUBLICATION

THE ARIZONA REPUBLIC / *The Phoenix Gazette*

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

MICHAEL KELLOGG, being first duly sworn, upon oath deposes and says: That he is the 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
XXXXXXXXXXXXXXXXXXXX*The Phoenix Gazette*XX

JUNE 20, 27, 1990

Sworn to before me this

29TH day of

JUNE A.D. 19 90

OFFICIAL SEAL
MARY LEE MEASEL
NOTARY PUBLIC - STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1991

Notary Public

ARIZONA DEPARTMENT OF WATER RESOURCES
15 South 15th Avenue, Phoenix, Arizona 85007
Telephone (602) 542-1541
Fax (602) 256-0506

FIFE SYMINGTON
Governor

RITA P. PEARSON
Director

March 17, 1993

Mr. Stanley Smith
Flood Control District of Maricopa County
3335 W. Durnago Street
Phoenix, Arizona 85009

Dear Mr. Smith:

Section 48-3605A. of the Arizona Revised Statutes mandates that "The Director of the Department of Water Resources shall develop and adopt criteria for establishing the one hundred-year flood and delineating floodplains." The State Standards Work Group, consisting of two rural and two urban floodplain administrators, the Chair of the Arizona Floodplain Managers Association (AFMA) Technical Committee and representatives of the Department was established to assist the Director with these responsibilities.

Standards adopted by the Department become State requirements. The first such standard is the "Requirement for Flood Study Technical Documentation," State Standard 1-90, which became effective September 1, 1990.

State Standard 2-92, "Requirement for Floodplain Delineation and Riverine Environments," and the associated State Standard Attachment 2-92, "Delineation of Riverine Floodplains in Arizona" has been adopted by the Department. A copy of the new State Standard is enclosed for your use. Upon receipt of this standard, it becomes a requirement and you should apply it when and where applicable.

If you have any questions regarding either of the State Standards, please don't hesitate to call Bill Jenkins or Terri Miller.

Sincerely,

C. Laurence Linser, P.E.
Deputy Director
Engineering and Adjudications

CLL:DRL:js

SS2-92

ARIZONA DEPARTMENT OF WATER RESOURCES

15 South 15th Avenue, Phoenix, Arizona 85007
Telephone (602) 542-1553
Fax (602) 256-0506

April 15, 1991

John Matticks
Assistant Administrator
Office of Risk Assessment
Federal Insurance Administration
Federal Emergency Management Agency
Washington, D.C. 20472

Dear John:

Over the past couple of years the Department has been reviewing the hydrology of all flood studies completed by the Maricopa County Flood Control District (MCFCD). I now feel this is unnecessary with the completion of their new Hydrology Manual and the increased expertise of their staff. This dovetails nicely with my plans to concentrate on Arizona's rural communities who in general, lack the technical expertise to adequately review hydrologic and hydraulic analysis.

Please accept MCFCD submitted studies as if we had reviewed them, although the Department is always available if sspecial problems or question need to be coordinated.

See you in Denver.

Sincerely,

James R. Morris

James R. Morris, P.E.
Chief
Flood Management Section

JRM:bw

cc: Russ Cruff, MCFCD

ARIZONA DEPARTMENT OF WATER RESOURCES

15 South 15th Avenue, Phoenix, Arizona 85007
Telephone (602) 542-1553
Fax (602) 256-0506

FIFE SYMINGTON
Governor

ELIZABETH ANN RIEKE
Director

April 15, 1991

John Matticks
Assistant Administrator
Office of Risk Assessment
Federal Insurance Administration
Federal Emergency Management Agency
Washington, D.C. 20472

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See you in Denver.

Sincerely,

James R. Morris

James R. Morris, P.E.
Chief
Flood Management Section

JRM:bw

cc: Russ Cruff, MCFCD

August 30, 1990

ARIZONA
DEPARTMENT
OF WATER
RESOURCES

Rose Mofford, Governor
N. W. Plummer
Director

15 South 15th Avenue
Phoenix, Arizona 85007

Dear Floodplain Administrator:

Under the authority of ARS 48-3605 (A), the Director of the Arizona Department of Water Resources is responsible for setting criteria for the delineation of 100-year floodplains. For this purpose the Department has created the State Standards Workgroup whose mission it is to suggest technical standards that should be used to delineate 100-year floodplains in Arizona.

The workgroup recommends specific standards to ADWR which are then sent to all floodplain administrators in the State and the Arizona Floodplain Management Association for review. After review comments have been incorporated, the standard will then be adopted by the Department as a state requirement.

Attached is State Standard 90-1 which is the first standard to be adopted by the Department following the procedure described above. It requires that all flood studies submitted to the Department or to the Federal Emergency Management Agency meet certain minimum technical documentation guidelines. The purpose of this requirement is to ensure that technical documentation materials will be available in the future that adequately describe past flood studies. This will prevent the loss of this material as well as ensuring that sufficient documentation is available for adequate review.

Questions or comments on the Standard or its implementation should be directed to Jim Morris, Chief, Flood Management Section at (602) 542-1541.

Sincerely,

N.W. Plummer
Director

NWP/JRM/tb

Enclosure

MESSAGE DISPLAY FOR JAN OPSTEIN

[redacted] fpm
CC tjl
[redacted] lc
CC mjc

From: Joe Tram
Postmark: Jun 04,91 4:09 PM Delivered: Jun 04,91 4:10 PM

Subject: Final Submittals/Scoping/GIS Info/Budget

Message:
At the time of final submittals of floodplain contracts, Tom LaMarche must to be included to assure that information is being received is compatable with computers, GIS, ARC-INFO etc.. Ana will be generating a standard form that must be signed by Tom, or his designated appointtee, indicating that they have received the information and that they concur that it meets our requirements. This form must be in the file prior to the file being closed out. Tom must also be included in the routing and sign off prior to final file closure. In addition, all new studies must be submitted to him for review and concurment that the information that is being requested is not a duplication of GIS information that is available from highway, Marta, or other agencies. Tom is not dictating what is being required for a study, but only reviewing for compatibility with the system and duplication of information from other sources. Again, he will be [redacted]quired to sign off on all scopes prior to them being sent out, or [redacted]nal negotiations. The project hydrologist is responsible for the [redacted]formation that is required at the final submittal. Finally, prior [redacted]any letters of interest being sent out, a detailed cost breakdown, (Pedro's spreasheet) must be submitted including survey, aerial and GIS estimates to assure study is within budget and no surprises occur.

----------X----------

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 assistant 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*~~

August 10, 1989

INVOICE NO. 09852
ANNOUNCEMENT OF INTENT TO PERFORM FLOOD ELEVATION STUDY

The Flood Control District of Maricopa County (FCDMC) has contracted URS Consultants, Inc., to perform a floodplain delineation for the Upper Centennial Wash, the Aguila Farm Channel, and Grass Wash from the Maricopa/Yuma County boundary to Aguila, Arizona and surrounding area.

These studies will examine and evaluate the flood hazard areas in the community to determine the flood elevation for those areas. These elevations will then be used to determine the flood insurance rates used by the Federal Emergency Management Agency.

This announcement is intended to inform all interested persons and communities of the commencement of this study so that they may have an opportunity to bring any relevant technical information to the attention of FCDMC/FEMA, so that they could be considered during the course of this study. Your comments should be addressed to Mr. Pedro Calza or Mr. Joe Tram, Hydrologists at the Flood Control District of Maricopa County.

Published: Arizona Republic, August 10, 1989.

Sworn to before me this

17th day of

August A.D. 19 89

OFFICIAL SEAL
MARY LEE MEASEL
NOTARY PUBLIC - STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires Marc. .. 1991

Notary Public

AFFIDAVIT OF PUBLICATION

THE ARIZONA REPUBLIC / *The Phoenix Gazette*

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

MICHAEL KELLOGG, being first duly sworn, upon oath deposes and says: That he is the 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
XXXXXXXXXXXXXXXXXXXX
The Phoenix Gazette

JUNE 20, 27, 1990

INVOICE NO. 04196
ANNOUNCEMENT OF INTENT
TO PERFORM FLOOD ELEVATION STUDY
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Published: Arizona Republic, June 20,27, 1990.

Sworn to before me this

29TH day of

JUNE A.D. 19 90

OFFICIAL SEAL
MARY LEE MEASEL
NOTARY PUBLIC - STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1991

Notary Public

FARM PROGRAM FACT SHEET

1992 Wheat Program

United States Department of Agriculture • Agricultural Stabilization and Conservation Service

February 1992

SIGN-UP PERIOD — General sign-up period is February 10 through April 17, 1992.

TARGET PRICE — The target price is $4.00 per bushel.

LOAN RATE — The national average loan rate is $2.21 per bushel.

ACREAGE REDUCTION PROGRAM (ARP) — Producers must reduce their wheat plantings by 5 percent of their wheat acreage base to be eligible for loans, purchases, and payments for the 1992 wheat crop. A paid land diversion program will not be implemented.

MAXIMUM PAYMENT ACREAGE — The maximum payment acreage (MPA) will be 85 percent of the wheat acreage base, less the quantity of reduced acres required in the annual acreage reduction program. Producers have several planting flexibility options on the cropland affected by the 15 percent reduction in payment acres (the "normal flex acres").

DEFICIENCY PAYMENTS — Wheat producers are eligible to earn deficiency payments on the actual acreage planted, within their maximum payment acreage. Acres for payment will include acres devoted to wheat, plus Conserving Use and minor oilseeds designated as wheat under the 0/92 provision. The projected payment rate is $0.65 per bushel.

ADVANCE PAYMENTS — Producers may request an advance portion of the projected deficiency payment at signup payable in cash. The advance will be made on the basis of 40 percent of the projected total deficiency payment rate, including emergency compensation commonly known as "Findley payments." The advance payment rate is $0.26 per bushel for wheat.

ACREAGE CONSERVATION RESERVE (ACR) — Eligible cropland equal to 5 percent of the farm's wheat acreage base must be devoted to an Acreage Conservation Reserve (ACR). Alternate crops may not be produced on ACR land.

The ACR acreage must be protected from wind, weeds, and water erosion throughout the year. At least half of the ACR acreage must be planted or maintained in an annual or perennial cover, but not to exceed 5 percent of the crop acreage base. This cover requirement does not apply in arid areas, including summer fallow areas. Cost-sharing is available to plant a perennial cover that must be maintained for 3 years.

continued next page

FARMER-OWNED RESERVE (FOR)

The limit on the Farmer-Owned Reserve (FOR) for wheat is 300 million bushels (about 8.0 million metric tons). Whether entry of 1992-crop wheat into the FOR will be allowed will be determined in December, 1992. This determination will be based on the projected ending stocks-to-use ratio as of May 31, 1993; market prices for the 90 days preceding December 15, 1992; and the quantity of wheat in the FOR.

Additional 1992 wheat program details, including crop acreage bases, planting flexibility, haying, grazing, "0/92" provisions and compliance requirements, are outlined in a separate Common Program Provisions fact sheet. The common provisions also apply to the 1992 crops of feed grains, rice, upland cotton, extra long staple cotton, and oilseeds.

United States Department of Agriculture

Agricultural Stabilization and Conservation Service

Program Aid Number 1288

Emergency Conservation Program

Approved Practices

Emergency practices approved to rehabilitate farmland damaged by a natural disaster may include:

- Removing from farmlands and field roadways debris that could significantly interfere with normal farming operations.

- Grading, shaping, and filling gullies; releveling irrigated farmland; incorporating sand or silt deposits into the soil; and reestablishing permanent plant cover on areas subject to critical wind or water erosion.

- Restoring or replacing seriously damaged permanent fences, dams, ponds, sod waterways, drainage and irrigation systems, terraces, wells, pipelines, and other facilities.

- Installing pipelines, tanks and troughs; building or deepening wells; and developing springs or seeps for livestock water.

- Special plowing to rough up the land's surface for wind erosion control.

Other emergency conservation measures identified and recommended by the county committee may also be authorized under ECP.

Farmers and ranchers may enter into pooling agreements to solve mutual conservation problems.

For additional information on ECP, contact your county ASCS office.

December 1980
Slightly Revised June 1990

High winds blow away rich topsoil, causing serious erosion problems.

Floodwaters wash out crops and greatly reduce the productive agricultural land needed to grow them.

Searing drought results in acute shortages of critically needed water for livestock and for irrigation systems that are normally used to service orchards and vineyards.

These and other natural disasters leave in their wake fields strewn with debris and severely damaged or demolished conservation structures required to protect soil and water resources. Farmland is ruined, and the means of production are seriously impaired.

The farmer or rancher is left with a crippled operation and confronted with massive repair costs because of conditions over which no individual has any control.

When a devastating natural disaster strikes, the U.S. Department of Agriculture's (USDA) Agricultural Stabilization and Conservation Service (ASCS) shares with farmers and ranchers the costs of restoring the land to predisaster conditions, through the Emergency Conservation Program (ECP). USDA's Soil Conservation Service provides technical assistance.

Benefits

The benefits of ECP extend beyond the farm and ranch to the local community and to the marketplace nationwide. A productive agriculture, dependent on good farmland properly cared for, is essential to the well-being of all our people. ECP helps assure that America's agricultural production will continue to provide the Nation with ample food and natural fibers; it supports a prosperous rural economy and contributes to the dollar's value in foreign markets.

New Problems

ECP assistance is available only to help solve new conservation problems caused by a natural disaster – problems that impair or endanger the land, that materially affect the productive capacity of crop acreage, that represent unusual damage which – except for wind erosion – is not likely to recur frequently in the same area, and that are so costly to repair that Federal assistance is needed to return the land to productive agricultural use. Conservation problems existing prior to the disaster are not eligible for ECP assistance.

Local Decisions

In keeping with local administration of ASCS programs, county and State farmer committees determine whether a disaster is of such magnitude that emergency measures are required. The Agricultural Stabilization and Conservation county committee determines eligibility for ECP assistance on an individual basis, and, in consultation with the State ASC committee, implements the ECP for farms and ranches affected by windstorms, floods, and other natural disasters, except drought. When severe drought conditions exist, the ASCS Deputy Administrator for State and County Operations decides whether ECP assistance is justified.

MARICOPA COUNTY ASCS NEWS

MARCH 1992

1992 PROGRAM SIGN - UP

Producers are encouraged to come into the county office as soon as possible to sign-up into the 1992 ARP Program. There is a lot of paper work that needs to be done in order to sign up so plan on allowing at least 1 hour per farm to sign-up. A complete review of all owners, addresses, acreages and current leases will be REQUIRED prior to receiving program benefits. Proof of ownership and current addresses are REQUIRED before any records can be updated. For further information, contact the county office.

REPORTING PLANTED CROP ACREAGE (CERTIFICATION)

May 15, 1992 is the deadline to report all Wheat, Barley and Oat CABS. Producers who have a wheat, barley or oat base must certify to acreage planted or "zero" certify to protect the base. Producers on farms participating in the program are REQUIRED to certify ALL cropland acreage or program benefits will be withheld. Producers on nonparticipating farms requesting P&CP credit for zero acreage reports shall also be REQUIRED to report all cropland on the farm to ensure that the normal historical plantings of fruits and vegetables are not exceeded.

REMEMBER: FOR full base protection you must have one of the following:

Participating Farms: the planted acreage, ACR, CUPAY, FLEX & CUPCP must total the base for full protection.

Nonparticipating Farms: one of the following:

1. "zero" acreage report with Fruit & Vegetable plantings below historical average.

2. planted the full base

When you certify your acreage if you do not understand how it will affect your 1993 bases, please ask the program assistant to show you immediately. The time to make corrections (if we can) is at the time you certify.

****
*
* APRIL 1, 1992 IS THE DEADLINE TO SUBMIT ELS COTTON PRODUCTION. *
*
* ELS PRODUCTION FILED AFTER THE DEADLINE WILL BE SUBJECT TO A *
* $ 15.00 FEE. *
*
* FAILURE TO FILE PRODUCTION EVIDENCE WILL RESULT IN A ZERO ACTUAL YIELD *
* FOR 1991 AND WILL AFFECT YOUR PAYMENT YIELD!!!! *
*
****

CONTRACT VIOLATIONS AND FAILURE TO FULLY COMPLY

In 1991, if a farm was found to be out of compliance with program regulations, and the producer did not request or COC did not determine that a good faith effort was made by the producer to accurately report acreage of 1 crop, the crop was ineligible for program benefits. All other crops remained eligible for program benefits.

For 1992 and future years, if the producer does not request, or COC does not determine good faith for any crop, ALL OF THE FOLLOWING WILL APPLY TO THE FARM:

* all participating program crops shall be INELIGIBLE for any benefits
* all advance payments shall be refunded and liquidated damages shall apply to all participating program crops
* all crops shall be ineligible for price support benefits
* all crops shall be ineligible for disaster benefits, it available

It is very important that you certify your farm correctly. INCORRECT CERTIFIED ACREAGES CAN COST YOU MONEY.

FOREIGN-OWNED AGRICULTURAL LAND

Foreign Investors who have bought or sold land in Maricopa County are reminded to report the transaction within 90 days to the ASCS Office. The Foreign disclosure report is required by law, and those who fail to report or who are late reporting could face possible fines. Individuals or companies that specialize in land holdings, land transfers or management services should contact the county ASCS Office for additional details of the Foreign Disclosure Act.

ACP REMINDER

March is approval month for ACP Cost Sharing on such conservation practices as concrete ditch-lining, land leveling, erosion control barriers, pipelines and sumps. If you are planning to do any of these projects it is recommended that you apply early. Contact Jackie at the county office for further details.

PAYMENT LIMITATION

Remember, ALL MEMBERS in partnerships must sign Certification of No Change or Minor Changes to be eligible for payment. Current leases must be in the office before the County Committee can approve a farming operation. Deadline to file Payment Limitation documents is April 17, 1992. Questions?? Contact Shirley at the county office.

IRRIGATED ACREAGE MAXIMUM (IAM) APPEALS

DASCO has advised that some relief may be granted for appeals of IAM's. There are two areas where relief has been authorized.

Producers may file an appeal using criteria No. 1 which states:

* the history of the farming operation shows a decrease in the irrigated acreage of program crops and an increase in the irrigated acreage of a nonprogram crop.

Producers wishing to request an appeal will be required to reduce their ELS cotton P&CP to zero (0) for each of the years 1988-1990. The ELS acreage planted can then be considered as nonprogram crop irrigated acreage in applying the IAM appeal provisions.

The other area pertains to producers who do not relinquish their ELS cotton P&CP. Those producers who participated in the 1991 Wheat or Feed Grain program and based their decision to participate on the assumption that their HWY would be fully irrigated may request relief under the erroneous notice provisions. Producer requesting relief under this provision shall provide the County Committee with a statement why erroneous notice provisions should apply.

PRODUCERS HAVE 15 DAYS FROM RECEIPT OF THIS NEWSLETTER TO APPLY FOR THE MENTIONED PROVISIONS.

For further details, contact Ken or Angela at the County Office.

IMPORTANT DATES TO REMEMBER

March 27, 1992 .....Disaster documentation deadline
April 1, 1992 .....ELS Production Deadline
County Committee Meeting
April 17, 1992 .....Deadline to sign-up in the ARP Program
May 15, 1992 .....Deadline to certify Wheat, Barley & Oats
July 15, 1992 .....Deadline to certify Cottons, ACR, CUPAY, etc.

Maricopa County ASCS Office
3150 N 35th Ave, Suite 6
Phoenix, Arizona 85017

BULK RATE
U. S. POSTAGE PAID
USDA-ASCS

TWO EXAMPLES OF ZERO-92 PROVISION

Same Farm as in Examples 1, 2, 3, and 4. See other side.

Line	Item	Units	EXAMPLE 5A. Farm with 0-92 Provision for Wheat, Normal Flex Acres to Sunflower — Example 5a: Wheat		Example 5a: Sunflower	EXAMPLE 5B. Farm with 0-92 Provision for Wheat, Normal Flex Acres to Sunflower, and 0-92 Acres Planted to Sunflower — Example 5b: Wheat		Example 5b: Sunflower	Example 5b: Sunflower
1	Crop Acreage Base	acres	100.0			100.0			
2	Required ACR	acres	-15.0			-15.0			
3	Permitted Acres	acres	85.0			85.0			
4	Normal Flex Acres	acres	-15.0			-15.0			
5	Maximum Payment Acres	acres	70.0			70.0			
6	Planted on Payment Acres	acres	0.0			0.0		70.0	
7	Actual yield	bu/ac	38			38	Lb/ac	1,150	
8	Production	bu	0			0	cwt	805	
9	Sell at market price*	$/bu	2.55			2.55	$/lb	0.105	
10	Revenue from sale	$	0			0		8,453	
11	Planted on Non-Payment Acres	acres	0.0		115.0	0.0			115.0
12	Actual yield	bu/ac	38	Lb/ac	1,150	38	Lb/ac		1,150
13	Production	bu	0	cwt	1,323	0	cwt		1,323
14	Sell at market price*	$/bu	2.55	$/lb	0.105	2.55	$/lb		0.105
15	Revenue from sale	$	0		13,886	0			13,886
16	Eligible Acres for Deficiency	acres	64.4			64.4			
17	Program yield	bu/ac	34			34			
18	Program production	bu	2,190			2,190			
19	Deficiency Payment Rate	$/bu	1.45			1.45			
20	Revenue from Deficiency	$	3,175			3,175			
21	Total Revenue by Crop	$	3,175		13,886	3,175		8,453	13,886
22	Actual Planted Acres	acres	0.0		115.0	0.0		70.0	115.0
23	Cost per acre	$/ac	55		55	55		55	55
24	Acres in ACR	acres	85.0			15.0			
25	Cost per acre	$/ac	15			15			
26	Total Production Cost	$	-1,275		-6,325	-225		-3,850	-6,325
27	**Income by Crop**	$	1,900		7,561	2,950		4,603	7,561
28	**Farm Income**				**9,461**				**15,114**

Normal Flex (15acres) planted to sunflower.

92% of 70.0 acres

Normal Flex (15 acres) planted to sunflower.

92% of 70.0 acres

0-92 allows planting of minor oilseeds (e.g., canola, flax, sunflower, etc.) on payment acres.

Higher than Examples 2, 3, & 4, "normal" weather.

** Or put under loan. Crops planted on Flex Acres are eligible for price support loan if available for the crop.*

Note. Producers planting minor oilseeds on 0-92 acreage have option of retaining Deficiency Payment or oilseed Marketing Loan, but not both.

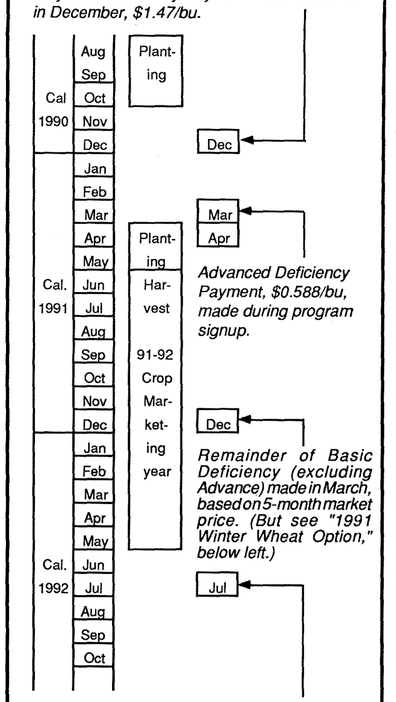
SUMMARY OF ALL 18 EXAMPLES

Results of Examples 1 - 4 (Other Side) and Examples 5A and 5B (At Left)

Example	Government	Planted on payment acres	Planted on non-payment acres: Normal Flex	Planted on non-payment acres: Optional Flex	Conditions	Wheat income	Sunflower income	Farm income
							Dollars	
1	No	0	wheat		"Normal" weather	4,190	6,575	10,765
					"Bad" weather	6,590	8,015	14,605
					"Perfect" weather	4,605	6,850	11,455
					Strong market	7,800	10,830	18,630
2	ACR 15%	wheat	wheat	0	"Normal" weather	6,788	6,575	13,363
					"Bad" weather	5,615	8,015	13,630
					"Perfect" weather	7,616	6,850	14,466
					Strong market	7,595	10,830	18,425
3	ACR 15%	wheat	sun-flower	0	"Normal" weather	6,159	7,561	13,720
					"Bad" weather	4,626	9,217	13,843
					"Perfect" weather	6,926	7,878	14,803
					Strong market	6,425	12,455	18,880
4	ACR 15%	wheat	sun-flower	sun-flower	"Normal" weather	5,247	8,219	13,466
					"Bad" weather	3,933	10,019	13,952
					"Perfect" weather	5,904	8,563	14,467
					Strong market	5,475	13,538	19,013
5A	0-92	0	sunfl.	0	"Normal" weather	1,900	7,561	9,461
5B	0-92	sunfl.	sunfl.	0	"Normal" weather	7,552	7,561	15,114

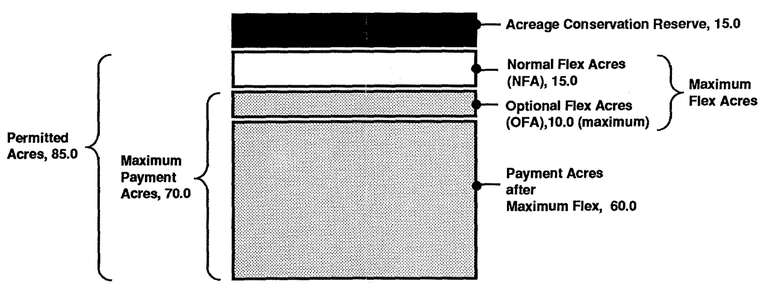
- ***Worst wheat income in these examples is without government program, unless conditions are "bad" weather or a strong market.***
- ***Best wheat income in these examples is with perfect weather, low prices, and large Deficiency Payments, and also with a strong market;***
- ***In these examples, farm incomes are slightly better when "flex acres" are planted to sunflower, but this depends directly on the prevailing ratio of sunflower-to-wheat market prices and costs.***

WHEAT PAYMENT CALENDAR



MAIN PROVISIONS OF 1990 FARM LEGISLATION FOR 1991 WHEAT CROP

Acreage Conservation Reserve (ACR) & Planting Flexibility



- *1991 wheat ACR is 15 percent of Crop Acreage Base (CAB). This ACR must be put into an approved cover.*
- *Normal Flex Acres (NFA) are 15 percent of CAB and are not eligible for Deficiency Payments. Thus, Maximum Payment Acres for 1991 wheat crop are 70 percent of CAB.*
- *Optional Flex Acres (OFA) are up to another 10 percent of CAB, and are not eligible for Deficiency Payments.*
- *On both NFA and OFA, producers may plant other crops than wheat, without loss of wheat CAB. Permitted crops on flex acres are any program crop, any oilseed, any designated industrial or experimental crop, and any other crop except any fruit or vegetable (including potatoes, dry edible beans, lentils and peas — and any other crops prohibited by the Secretary).*
- *1991 Winter Wheat Option. Producers may elect to receive Deficiency Payments on the full permitted acres (85, in above example) but with the Deficiency Payment Rate calculated on the 12-month market price instead of the 5-month market price. The estimated Deficiency Payment Rate for this option is $1.40/bu compared with $1.47/bu without the option. The Advance Deficiency Payment Rate for this option is $0.56/bu compared with $0.588/bu without the option.*

Target Price, Loan Rate, & Deficiency Payment Rate

- *Wheat Target Price for 1991 is $4.00/bu.*
- *Basic Loan Rate for wheat in 1991 is $2.52/bu, and Maximum Basic Deficiency Payment Rate is $4.00 - $2.52 = $1.48.*
- *Announced Loan Rate for wheat in 1991 is $2.04/bu, and Maximum Emergency Compensation is $2.52 - $2.04 = $0.48.*
- *Maximum Total Deficiency Payment is $1.48 + $0.48 = $1.96.*
- *Actual Deficiency Payment Rate for wheat will be the smaller of (1) Target Price minus Loan Rate, or (2) Target Price minus Market Price, as determined by market prices in first 5 months of 91-92 marketing year. (But see 1991 Winter Wheat Option at left.)*
- *Estimated Deficiency Payment Rate for wheat, announced December 31, 1990, is $1.47/bu.*
- *Advanced Deficiency Payment Rate for wheat is $0.588/bu.*
- *Sunflower Loan Rate for 1991 is 8.9 cents/lb. (Same for canola, rapeseed, safflower, mustard seed, and flaxseed.)*
- *A Marketing Loan program will be in effect for 1991 crop oilseeds.*

APPROACH TO 1991 WHEAT PROGRAM

- The examples in this publication are meant to illustrate the mechanisms contained in the new 1990 Farm Act and the 1990 Budget Reconciliation Act.
- To decide the merits of being in the 1991 wheat program or not, including the 0-92 provision, producers must apply their own cost estimates, price assumptions, and other factors specific to their individual situations.
- Producers electing to participate in the 1991 wheat program must comply with the Acreage Conservaton Reserve (ACR) of 15 percent, and must also decide what to plant on their Normal Flex Acres (NFA, 15 percent) and on their Optional Flex Acres (OFA, 10 percent maximum). Other crops such as sunflower are permitted on "flex" acres, but Deficiency Payments are **not** made on such acres. Thus the planting decisions on flex acres depend directly on market prices and individual production costs, and in the case of OFA on the amount of Deficiency Payment foregone to switch away from the program crop (wheat).
- Zero Certification. Producers may also decide to plant no wheat, report to ASCS no planted wheat, and plant entire wheat Crop Acreage Base (CAB) to another crop. If so, producer earns no Deficiency Payments, but wheat CAB is protected for future years.

A USDA-ASCS & USDA-ES STAFF BRIEFING

1991 WHEAT PROGRAM

Main Provisions and Numerical Examples

Directed at Plains State wheat farmers.

Includes explanation of "Normal Flex Acres," "Optional Flex Acres," and sample calculations of farm income for more than one dozen cases — with different yield and price assumptions.

January 1991
U.S. Department of Agriculture
Washington, DC

This publication is based on "The 1990 Farm Act and the 1990 Budget Reconciliation Act," USDA-ERS No. 1489, December 1990, and on materials supplied by James A. Langley, ASCS Program Planning and Development. It was designed and written on contract to ASCS by William J. Hudson, The ProExporter Network, Maumee, Ohio.

FOR MORE INFORMATION ON 1991 WHEAT PROGRAM

- Your State and local Extension Service has computer spreadsheets and other decision aids available for analysis of producer options for the 1991 commodity programs.
- You may also order *The 1990 Farm Act and the 1990 Budget Reconciliation Act*, USDA-ERS, MP-1489, 36 pages in easy-to-understand language and charts. Price $8.00.

Call toll-free, 1-800-999-6779. Charge your purchase, pay by check, or request invoice. When calling, also ask for free subscription to USDA-ERS Reports Catalog.

FOUR EXAMPLES UNDER FOUR CONDITIONS OF WEATHER AND PRICES

One Farm Used in all Examples

- **200 acres to plant**
- **38 bu/ac wheat yield, at $55/ac cost**
- **1150 lb/ac sunflower yield, at $55/ac cost**
- **100 acre wheat base, with program yield of 34 bu/ac**

Prices, yields, and costs are not official USDA projections, but have been selected merely to illustrate the mechanisms of the 1991 wheat program.

EXAMPLE 1.
Farm Without Government Program

Wheat Crop Acreage Base, 100 acres

EXAMPLE 2.
Farm with 15% ACR, No Flex, Plant Full Wheat Permitted

Wheat Crop Acreage Base, 100 acres

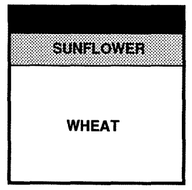
ACR 15

Permitted Acres, 85

(Payment Acres for wheat, 70)

EXAMPLE 3.
Farm with 15% ACR, Plants Only Normal Flex to Sunflower

Wheat Crop Acreage Base, 100 acres



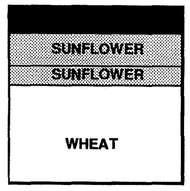
ACR, 15

Normal Flex Acres, 15

Payment Acres for wheat, 70

EXAMPLE 4.
Farm with 15% ACR, Plants Maximum Flex to Sunflower

Wheat Crop Acreage Base, 100 acres



ACR, 15

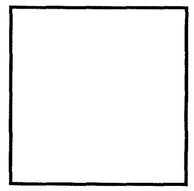
Normal Flex Acres, 15

Optional Flex Acres, 10

Payment Acres for wheat, 60

YOUR CASE

Wheat Crop Acreage Base, 100 acres



Condi-tions	Line	Item	Units	Example 1 Wheat	Example 1 Sunflower	Example 2 Wheat	Example 2 Sunflower	Example 3 Wheat	Example 3 Sunflower	Example 4 Wheat	Example 4 Sunflower	Your Case Wheat	Your Case Sunflower	Line	Formula
	1	Crop Acreage Base	*acres*	100.0		100.0		100.0		100.0		100.0		1	
	2	Required ACR	*acres*	0.0		-15.0		-15.0		-15.0		-15.0		2	
	3	Permitted Acres	*acres*			85.0		85.0		85.0		85.0		3	1-2
	4	Normal Flex Acres	*acres*			-15.0		-15.0		-15.0		-15.0		4	
	5	Maximum Payment Acres	*acres*	0.0		70.0		70.0		70.0		70.0		5	3-4
	6	Planted on Payment Acres	*acres*			70.0		70.0		60.0				6	
	7	Actual yield	*bu/ac*			38		38		38				7	
	8	Production	*bu*			2,660		2,660		2,280				8	6x7
	9	Sell at market price*	*$/bu*			2.55		2.55		2.55				9	
	10	Revenue from sale	*$*			6,783		6,783		5,814				10	8x9
"Normal" Weather	11	Planted on Non-Payment Acres	*acres*	100.0	100.0	15.0	100.0	0.0	115.0	0.0	125.0			11	
	12	Actual yield	*bu/ac*	38	*Lb/ac* 1,150	38	1,150	38	1,150	38	1,150			12	
	13	Production	*bu*	3,800	*cwt* 1,150	570	1,150	0	1,323	0	1,438			13	11x12
	14	Sell at market price*	*$/bu*	2.55	*$/lb* 0.105	2.55	0.105	2.55	0.105	2.55	0.105			14	
	15	Revenue from sale	*$*	9,690	12,075	1,454	12,075	0	13,886	0	15,094			15	13x14
	16	Eligible Acres for Deficiency	*acres*	0.0		70.0		70.0		60.0				16	
	17	Program yield	*bu/ac*			34		34		34				17	
	18	Program production	*bu*			2,380		2,380		2,040				18	16x17
	19	Deficiency Payment Rate	*$/bu*			1.45		1.45		1.45				19	
	20	Revenue from Deficiency	*$*			3,451		3,451		2,958				20	24x25
	21	Total Revenue by Crop	*$*	9,690	12,075	11,688	12,075	10,234	13,886	8,772	15,094			21	10+15+20
	22	Actual Planted Acres	*acres*	100.0	100.0	85.0	100.0	70.0	115.0	60.0	125.0			22	
	23	Cost per acre	*$/ac*	55	55	55	55	55	55	55	55			23	
	24	Acres in ACR	*acres*	0.0		15.0		15.0		15.0				24	
	25	Cost per acre	*$/ac*	15		15		15		15				25	
	26	Total Production Cost	*$*	-5,500	-5,500	-4,900	-5,500	-4,075	-6,325	-3,525	-6,875			26	22x23 + 25x26
	27	**Income by Crop**	*$*	4,190	6,575	6,788	6,575	6,159	7,561	5,247	8,219			27	21-26
	28	**Farm Income**		**10,765**		**13,363**		**13,720**		**13,466**				28	wheat + sunfl.
"Bad" Weather	29	Change actual yield to	*bu/ac*	31	*Lb/ac* 850	31	850	31	850	31	850			29	
	30	Change market price to	*$/bu*	3.90	*$/lb* 0.159	3.90	0.159	3.90	0.159	3.90	0.159			30	
	31	Revenue from sale becomes	*$*	12,090	13,515	10,277	13,515	8,463	15,542	7,254	16,894			31	(6+11)x29x30
	32	Deficiency Payment Rate becomes	*$/bu*			0.10		0.10		0.10				32	
	33	Revenue from Deficiency is	*$*			238		238		204				33	32x18
	34	Total Revenue becomes	*$*	12,090	13,515	10,515	13,515	8,701	15,542	7,458	16,894			34	31+33
	35	**Income by Crop**	*$*	6,590	8,015	5,615	8,015	4,626	9,217	3,933	10,019			35	34-26
	36	**Farm Income**	*$*	**14,605**		**13,630**		**13,843**		**13,952**				36	wheat + sunfl.
"Perfect" Weather	37	Change actual yield to	*bu/ac*	43	*Lb/ac* 1,300	43	1,300	43	1,300	43	1,300			37	
	38	Change market price to	*$/bu*	2.35	*$/lb* 0.095	2.35	0.095	2.35	0.095	2.35	0.095			38	
	39	Revenue from sale becomes	*$*	10,105	12,350	8,589	12,350	7,074	14,203	6,063	15,438			39	(6+11)x37x38
	40	Deficiency Payment Rate becomes	*$/bu*			1.65		1.65		1.65				40	
	41	Revenue from Deficiency is	*$*			3,927		3,927		3,366				41	40x18
	42	Total Revenue becomes	*$*	10,105	12,350	12,516	12,350	11,001	14,203	9,429	15,438			42	39+41
	43	**Income by Crop**	*$*	4,605	6,850	7,616	6,850	6,926	7,878	5,904	8,563			43	42-26
	44	**Farm Income**	*$*	**11,455**		**14,466**		**14,803**		**14,467**				44	wheat + sunfl.
Strong Market	45	Actual yield remains	*bu/ac*	38	*Lb/ac* 1150	38	1150	38	1150	38	1150			45	
	46	Change market price to	*$/bu*	3.50	*$/lb* 0.142	3.50	0.142	3.50	0.142	3.50	0.142			46	
	47	Revenue from sale becomes	*$*	13,300	16,330	11,305	16,330	9,310	18,780	7,980	20,413			47	(6+11)x45x46
	48	Deficiency Payment Rate becomes	*$/bu*			0.50		0.50		0.50				48	
	49	Revenue from Deficiency is	*$*			1,190		1,190		1,020				49	48x18
	50	Total Revenue becomes	*$*	13,300	16,330	12,495	16,330	10,500	18,780	9,000	20,413			50	47+49
	51	**Income by Crop**	*$*	7,800	10,830	7,595	10,830	6,425	12,455	5,475	13,538			51	50-26
	52	**Farm Income**	*$*	**18,630**		**18,425**		**18,880**		**19,013**				52	wheat + sunfl.

Normal Flex Acres left in wheat

Normal Flex Acres (15 acres) planted to sunflower.

Normal and Optional Flex Acres planted to sunflower

Reduced by Optional Flex to sunflower

Substantial Deficiency Payment vs. Example 1

Remains same as Example 2

Higher than Example 1 due to Deficiency

Examples 3 and 4 are higher than Example 2, but revenues depend on sunflower-to-wheat price ratio.

Yields down, prices up

Deficiency becomes larger as price falls

Examples 3 and 4 are higher than Example 2, if sunflower yields resist drought more than wheat yields.

Yields up, prices down

Yields normal, but prices up due to heavy demand

** Or put under loan. Crops planted on Flex Acres are eligible for price support loan if available for the crop.*

In strong market of Example 1, cash prices must rise above $3.50 for wheat and $0.142 for sunflower before non-participant's farm income equals that of Example 4, in which participant put maximum flex to sunflower.

TWO EXAMPLES OF ZERO-92 PROVISION

Same Farm as in Examples 1, 2, 3, and 4. See other side.

Line	Item	Units	EXAMPLE 5A. Farm with 0-92 Provision for Corn, Normal Flex Acres to Soybeans — Example 5a CORN	Example 5a BEANS	EXAMPLE 5B. Farm with 0-92 Provision for Corn, Normal Flex Acres to Soybeans, and 0-92 Acres Planted to Canola — Example 5b CORN	Example 5b OTHER**	Example 5b BEANS
1	Crop Acreage Base	acres	100.0		100.0		
2	Required ACR	acres	-7.5		-7.5		
3	Permitted Acres	acres	92.5		92.5		
4	Normal Flex Acres	acres	-15.0		-15.0		
5	Maximum Payment Acres	acres	77.5		77.5		
6	Planted on Payment Acres	acres	0.0		0.0	77.5	
7	Actual yield	bu/ac	120		120	40	
8	Production	bu	0		0	3,100	
9	Sell at market price*	$/bu	2.30		2.30	5.50	
10	Revenue from sale	$	0		0	17,050	
11	Planted on Non-Payment Acres	acres	0.0	115.0	0.0		115.0
12	Actual yield	bu/ac	120	40	120		40
13	Production	bu	0	4,600	0		4,600
14	Sell at market price*	$/bu	2.30	5.75	2.30		5.75
15	Revenue from sale	$	0	26,450	0		26,450
16	Eligible Acres for Deficiency	acres	71.3		71.3		
17	Program yield	bu/ac	114		114		
18	Program production	bu	8,128		8,128		
19	Deficiency Payment Rate	$/bu	0.45		0.45		
20	Revenue from Deficiency	$	3,658		3,658		
21	Total Revenue by Crop	$	3,658	26,450	3,658	17,050	26,450
22	Actual Planted Acres	acres	0.0	115.0	0.0	77.5	115.0
23	Cost per acre	$/ac	145	65	145	97	65
24	Acres in ACR	acres	85.0	0.0	7.5		
25	Cost per acre	$/ac	20	20	20		
26	Total Production Cost	$	-1,700	-7,475	-150	-7,518	-7,475
27	**Income by Crop**	$	1,958	18,975	3,508	9,533	18,975
28	**Farm Income**		**20,933**			**32,015**	

Normal Flex (15acres) planted to beans.

92% of 77.5 acres

92% of 77.5 acres

Normal Flex (15 acres)planted to beans.

Less than Examples 2, 3, & 4

**Example here is canola. 0-92 allows planting of minor oilseeds (e.g., canola, flax, sunflower, etc.) on payment acres.

** Or put under loan. Crops planted on Flex Acres are eligible for price support loan if available for the crop.*

Note. Producers planting minor oilseeds on 0-92 acreage have option of retaining Deficiency Payment or oilseed Marketing Loan, but not both.

SUMMARY OF ALL 18 EXAMPLES

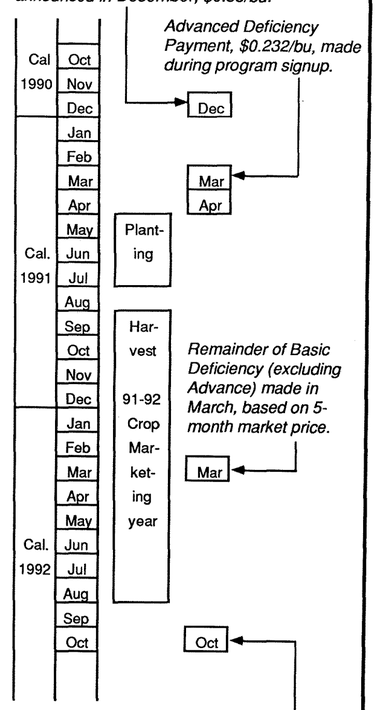
Results of Examples 1 - 4 (Other Side) and Examples 5A and 5B (At Left)

Example	Government	Planted on payment acres	Planted on non-payment acres: Normal Flex	Planted on non-payment acres: Optional Flex	Conditions	Corn income	Soybean income	Farm income
							Dollars	
1	No	0	Corn		"Normal" weather	13,100	16,500	29,600
					"Bad" weather	15,500	18,250	33,750
					"Perfect" weather	12,500	16,675	29,175
					Demand bull market	17,300	20,020	37,320
2	ACR 7.5%	corn	corn	0	"Normal" weather	15,943	16,500	32,443
					"Bad" weather	14,188	18,250	32,438
					"Perfect" weather	18,039	16,675	34,714
					Demand bull market	16,736	20,020	36,756
3	ACR 7.5%	corn	soybeans	0	"Normal" weather	13,978	18,975	32,953
					"Bad" weather	11,863	20,988	32,850
					"Perfect" weather	16,164	19,176	35,340
					Demand bull market	14,141	23,023	37,164
4	ACR 7.5%	corn	soybeans	soybeans	"Normal" weather	12,155	20,625	32,780
					"Bad" weather	10,313	22,813	33,125
					"Perfect" weather	14,059	20,844	34,903
					Demand bull market	12,297	25,025	37,322
5A	0-92	0	beans	0	"Normal" weather	1,958	18,975	20,933
5B	0-92	canola	beans	0	"Normal" weather	13,040	18,975	32,015

- ***Worst corn income in these examples is without government program, unless conditions are "normal" weather and a strong market;***
- ***Best corn income in these examples is with perfect weather, low prices, and large Deficiency Payments;***
- ***In these examples, farm incomes are slightly better when "flex acres" are planted to soybeans, but this depends directly on the prevailing ratio of soybean-to-corn market prices.***

PAYMENT CALENDAR

Projected Deficiency Payment Rate announced in December, $0.58/bu.



Advanced Deficiency Payment, $0.232/bu, made during program signup.

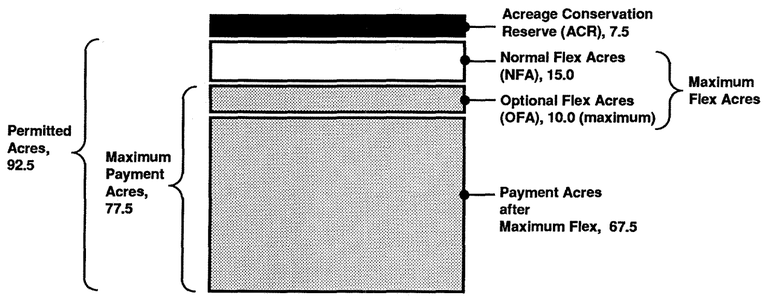
Remainder of Basic Deficiency (excluding Advance) made in March, based on 5-month market price.

Final portion (Emergency Compensation) made during October.

MAIN PROVISIONS OF 1990 FARM LEGISLATION FOR 1991 CORN CROP

Acreage Conservation Reserve (ACR) & Planting Flexibility

Example: Corn Crop Acreage Base (CAB) of 100 Acres



- *1991 corn ACR is 7.5 percent of Crop Acreage Base (CAB). This ACR must be put into an approved cover.*
- *Normal Flex Acres (NFA) are 15 percent of CAB and are not eligible for Deficiency Payments. Thus, Maximum Payment Acres for 1991 corn crop are 77.5 percent of CAB.*
- *Optional Flex Acres (OFA) are up to another 10 percent of CAB, and are not eligible for Deficiency Payments.*
- *On both NFA and OFA, producers may plant other crops than corn, without loss of corn CAB. Permitted crops on flex acres are any program crop, any oilseed, any designated industrial or experimental crop, and any other crop except any fruit or vegetable (including potatoes, dry edible beans, lentils and peas — and any other crops prohibited by the Secretary).*

Target Price, Loan Rate, & Deficiency Payment Rate

- *Corn Target Price for 1991 is $2.75/bu.*
- *Basic Loan Rate for corn in 1991 is $1.89/bu, and Maximum Basic Deficiency Payment Rate is $2.75 - $1.89 = $0.86.*
- *Announced Loan Rate for corn in 1991 is $1.62/bu, and Maximum Emergency Compensation is $1.89 - $1.62 = $0.27.*
- *Maximum Total Deficiency Payment is $0.86 + $0.27 = $1.13.*
- *Actual Deficiency Payment Rate for corn will be the smaller of (1) Target Price minus Loan Rate, or (2) Target Price minus Market Price, as determined by market prices in first 5 months of 91-92 marketing year.*
- *Estimated Deficiency Payment Rate for corn, announced December 31, 1990, is $0.58/bu.*
- *Advanced Deficiency Payment Rate for corn is $0.232/bu.*
- *Soybean Loan Rate for 1991 is $5.02/bu, subject to a Loan origination fee of 2 percent. (Value of Loan to producer is $4.92/bu.)*
- *A Marketing Loan program will be in effect for 1991 crop soybeans and other oilseeds.*

APPROACH TO 1991 CORN PROGRAM

- The examples in this publication are meant to illustrate the mechanisms contained in the new 1990 Farm Act and the 1990 Budget Reconciliation Act.
- To decide the merits of being in the 1991 corn program or not, including the 0-92 provision, producers must apply their own cost estimates, price assumptions, and other factors specific to their individual situations.
- Producers electing to participate in the 1991 corn program must comply with the Acreage Conservation Reserve (ACR) of 7.5 percent, and must also decide what to plant on their Normal Flex Acres (NFA, 15 percent) and on their Optional Flex Acres (OFA, 10 percent maximum). Other crops such as soybeans are permitted on "flex" acres, but Deficiency Payments are **not** made on such acres. Thus the planting decisions on flex acres depend directly on market prices and individual production costs, and in the case of OFA on the amount of Deficiency Payment foregone to switch away from the program crop (corn).
- Zero Certification. Producers may also decide to plant no corn, report to ASCS no planted corn, and plant entire corn Crop Acreage Base (CAB) to another crop. If so, producer earns no Deficiency Payments, but corn CAB is protected for future years.

A USDA-ASCS & USDA-ES STAFF BRIEFING

1991 CORN PROGRAM

Main Provisions and Numerical Examples

Directed at corn-soybean farmers. Includes explanation of "Normal Flex Acres," "Optional Flex Acres," and sample calculations of farm income for more than one dozen cases — with different yield and price assumptions.

January 1991
U.S. Department of Agriculture
Washington, DC

This publication is based on "The 1990 Farm Act and the 1990 Budget Reconciliation Act," USDA-ERS No. 1489, December 1990, and on materials supplied by James A. Langley, ASCS Program Planning and Development. It was designed and written on contract to ASCS by William J. Hudson, The ProExporter Network, Maumee, Ohio.

FOR MORE INFORMATION ON 1991 CORN PROGRAM

- Your State and local Extension Service has computer spreadsheets and other decision aids available for analysis of producer options for the 1991 commodity programs.
- You may also order *The 1990 Farm Act and the 1990 Budget Reconciliation Act*, USDA-ERS, MP-1489, 36 pages in easy-to-understand language and charts. Price $8.00.

Call toll-free, 1-800-999-6779. Charge your purchase, pay by check, or request invoice. When calling, also ask for free subscription to USDA-ERS Reports Catalog.

FOUR EXAMPLES UNDER FOUR CONDITIONS OF WEATHER AND PRICES

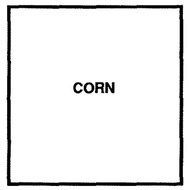
One Farm Used in all Examples

- **200 acres to plant**
- **120 bu/ac corn yield, at $145/ac cost**
- **40 bu/ac soybean yield, at $65/ac cost**
- **100 acre corn base, with program yield of 114 bu/ac**

Prices, yields, and costs are not official USDA projections, but have been selected merely to illustrate the mechanisms of the 1991 corn program.

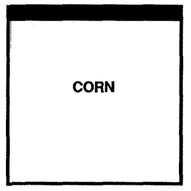
EXAMPLE 1.
Farm Without Government Program

Corn Crop Acreage Base, 100 acres



EXAMPLE 2.
Farm with 7.5% ACR, No Flex, Plant Full Corn Permitted

Corn Crop Acreage Base, 100 acres



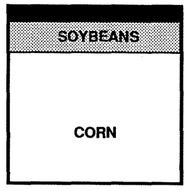
ACR, 7.5

Permitted Acres, 92.5

(Payment Acres for corn, 77.5)

EXAMPLE 3.
Farm with 7.5% ACR, Plants Only Normal Flex to Soybeans

Corn Crop Acreage Base, 100 acres



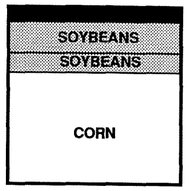
ACR, 7.5

Normal Flex Acres, 15

Payment Acres for corn, 77.5

EXAMPLE 4.
Farm with 7.5% ACR, Plants Maximum Flex to Soybeans

Corn Crop Acreage Base, 100 acres



ACR, 7.5

Normal Flex Acres, 15

Optional Flex Acres, 10

Payment Acres for corn, 67.5

YOUR CASE

Corn Crop Acreage Base, 100 acres

Condi-tions	Line	Item	Units	Example 1 CORN	Example 1 BEANS	Example 2 CORN	Example 2 BEANS		Example 3 CORN	Example 3 BEANS		Example 4 CORN	Example 4 BEANS		Your Case CORN	Your Case BEANS	Line	Formula
"Normal" Weather	1	Crop Acreage Base	acres	100.0		100.0			100.0			100.0			100.0		1	
	2	Required ACR	acres	0.0		-7.5			-7.5			-7.5			-7.5		2	
	3	Permitted Acres	acres			92.5			92.5			92.5			92.5		3	1-2
	4	Normal Flex Acres	acres			-15.0			-15.0			-15.0			-15.0		4	
	5	Maximum Payment Acres	acres	0.0		77.5			77.5			77.5			77.5		5	3-4
	6	Planted on Payment Acres	acres			77.5			77.5			67.5					6	
	7	Actual yield	bu/ac			120			120			120					7	
	8	Production	bu			9,300			9,300			8,100					8	6x7
	9	Sell at market price*	$/bu			2.30			2.30			2.30					9	
	10	Revenue from sale	$			21,390			21,390			18,630					10	8x9
	11	Planted on Non-Payment Acres	acres	100.0	100.0	15.0	100.0	*Normal Flex Acres left in corn*	0.0	115.0	*Normal Flex Acres planted to soybeans*	0.0	125.0	*Normal and Optional Flex Acres planted to soybeans*			11	
	12	Actual yield	bu/ac	120	40	120	40		120	40		120	40				12	
	13	Production	bu	12,000	4,000	1,800	4,000		0	4,600		0	5,000				13	11x12
	14	Sell at market price*	$/bu	2.30	5.75	2.30	5.75		2.30	5.75		2.30	5.75				14	
	15	Revenue from sale	$	27,600	23,000	4,140	23,000		0	26,450		0	28,750				15	13x14
	16	Eligible Acres for Deficiency	acres	0.0		77.5			77.5			67.5		*Reduced by Optional Flex to soybeans*			16	
	17	Program yield	bu/ac			114			114			114					17	
	18	Program production	bu			8,835			8,835			7,695					18	16x17
	19	Deficiency Payment Rate	$/bu			0.45			0.45			0.45					19	
	20	Revenue from Deficiency	$			3,976		*Substantial Deficiency Payment vs. Example 1*	3,976		*Remains same as Example 2*	3,463					20	24x25
	21	Total Revenue by Crop	$	27,600	23,000	29,506	23,000		25,366	26,450		22,093	28,750				21	10+15+20
	22	Actual Planted Acres	acres	100.0	100.0	92.5	100.0		77.5	115.0		67.5	125.0				22	
	23	Cost per acre	$/ac	145	65	145	65		145	65		145	65				23	
	24	Acres in ACR	acres	0.0		7.5	0.0		7.5	0.0		7.5	0.0				24	
	25	Cost per acre	$/ac	20		20	20		20	20		20	20				25	
	26	Total Production Cost	$	-14,500	-6,500	-13,563	-6,500	*Higher than Example 1 due to Deficiency*	-11,388	-7,475		-9,938	-8,125				26	22x23 + 25x26
	27	**Income by Crop**	$	13,100	16,500	15,943	16,500		13,978	18,975		12,155	20,625				27	21-26
	28	**Farm Income**		**29,600**		**32,443**			**32,953**			**32,780**					28	Corn+beans
		Examples 3 and 4 are higher than Example 2, but revenues depend on soybean-to-corn price ratio.																
"Bad" Weather	29	Change actual yield to	bu/ac	100	33	100	33	*Yields down, prices up*	100	33		100	33				29	
	30	Change market price to	$/bu	3.00	7.50	3.00	7.50		3.00	7.50		3.00	7.50				30	
	31	Revenue from sale becomes	$	30,000	24,750	27,750	24,750		23,250	28,463		20,250	30,938				31	(6+11)x29x30
	32	Deficiency Payment Rate becomes	$/bu			0.00			0.00			0.00					32	
	33	Revenue from Deficiency is	$			0			0			0					33	32x16
	34	Total Revenue becomes	$	30,000	24,750	27,750	24,750		23,250	28,463		20,250	30,938				34	31+33
	35	**Income by Crop**	$	15,500	18,250	14,188	18,250		11,863	20,988		10,313	22,813				35	34-26
	36	**Farm Income**	$	**33,750**		**32,438**			**32,850**			**33,125**					36	Corn+beans
		Examples 3 and 4 are higher than Example 2, if bean yields resist drought more than corn yields.																
"Perfect" Weather	37	Change actual yield to	bu/ac	135	45	135	45	*Yields up, prices down*	135	45		135	45				37	
	38	Change market price to	$/bu	2.00	5.15	2.00	5.15		2.00	5.15		2.00	5.15				38	
	39	Revenue from sale becomes	$	27,000	23,175	24,975	23,175		20,925	26,651		18,225	28,969				39	(6+11)x37x38
	40	Deficiency Payment Rate becomes	$/bu			0.75		*Deficiency becomes larger as price falls*	0.75			0.75					40	
	41	Revenue from Deficiency is	$			6,626			6,626			5,771					41	40x16
	42	Total Revenue becomes	$	27,000	23,175	31,601	23,175		27,551	26,651		23,996	28,969				42	39+41
	43	**Income by Crop**	$	12,500	16,675	18,039	16,675		16,164	19,176		14,059	20,844				43	42-26
	44	**Farm Income**	$	**29,175**		**34,714**			**35,340**			**34,903**					44	Corn+beans
Strong Market	45	Actual yield remains	bu/ac	120	40	120	40	*Yields normal, but prices up due to heavy demand*	120	40		120	40				45	
	46	Change market price to	$/bu	2.65	6.63	2.65	6.63		2.65	6.63		2.65	6.63				46	
	47	Revenue from sale becomes	$	31,800	26,520	29,415	26,520		24,645	30,498		21,465	33,150				47	(6+11)x45x46
	48	Deficiency Payment Rate becomes	$/bu			0.10			0.10			0.10					48	
	49	Revenue from Deficiency is	$			884			884			770					49	48x16
	50	Total Revenue becomes	$	31,800	26,520	30,299	26,520		25,529	30,498		22,235	33,150				50	47+49
	51	**Income by Crop**	$	17,300	20,020	16,736	20,020		14,141	23,023		12,297	25,025				51	50-26
	52	**Farm Income**	$	**37,320**		**36,756**			**37,164**			**37,322**					52	Corn+beans

** Or put under loan. Crops planted on Flex Acres are eligible for price support loan if available for the crop.*

In strong market of Example 1, cash prices must rise to $2.63 for corn and $6.58 for beans before non-participant's farm income equals that of Example 4, in which participant put maximum flex to soybeans.

Cave Creek / Care Free Flood Insurance Study - Hydrology

Preferred Hydrologic Methods for the Cave Creek/ Carefree hydrology:

Rainfall :	100 year, 24 hour storm. SCS type II distribution.
Areal Reduction :	NOAA HYDRO-40 (FCD will provide a copy of the report).
Loss Rate :	Green and Ampt as described in the Hydrology Manual (Tables of parameters to be provided) if the version of HEC-1 dated Dec. 5, 1988 is used.
	or Initial and uniform loss rate (tables of parameters to be provided).
Unit Hydrograph :	SCS dimensionless.
Channel Routing :	Normal depth routing where good channel data is available. Muskingum for all other routing.
HEC-1 Version:	1988 version preferred, otherwise 1981 version with 1985 modifications.

Submittals for review by the Watershed Management Branch of the Hydrology Division will include the following upon completion:

1. Preliminary plans and maps (separate maps for soil classifications, sub-basin boundaries including the routing reaches).

2. Sample calculations to determine basin parameters for approval prior to the parameter determination for all the subbasins.

3. All calculations to determine basin parameters.

4. HEC-1 model along with the parameters used to prepare the HEC-1 coding. A running model on floppy disk and a schematic drawing of the basins shall accompany the HEC-1 model. The following symbols shall be used to prepare the schematic drawing along with the terminology to be used in the model:

LEGEND

Subarea calculation (SUB)

Combined hydrograph (CO)

Route hydrograph (R, or RO)

Divert hydrograph (D, or DIV)

Basin or Retention area Route

5. Preliminary and final report and product.

Note: The FCD requests prior notice to when the products will be submitted for review to allow scheduling by reviewer. All efforts will be made to return comments within one week after submittal.

Federal Emergency Management Agency
Washington, D.C. 20472
Federal Insurance Administration

Fee Charges and Requirements for Map Revisions

On June 30, 1992 the Federal Insurance Administration (FIA) published a Final Rule in the *Federal Register*, Volume 57, Number 126, regarding changes to 44 CFR Parts 65 and 72 of the National Flood Insurance Program (NFIP) regulations.

These changes were implemented effective October 1, 1992 and impact persons requesting revisions to NFIP maps on or after that date. The primary change involves a fee requirement for map revision and Letter of Map Revision (LOMR) requests, much like the current fee requirements for conditional requests. This action is being implemented to reduce expenses to the NFIP and will contribute to maintaining the NFIP as self-supporting.

Part 72.5 of the aforementioned regulations provides exemption from fees for:

(a) Revisions or amendments to correct errors or to include the effects of natural changes within the areas of special flood hazard.

(b) LOMRs, as determined to be appropriate by the Federal Insurance Administrator, issued to remove single residential lots or structures from the area of special flood hazard based solely on the placement of fill outside of the regulatory floodway. The Administrator's determination shall be based, in part, on whether the LOMR is being sought by an individual property owner or whether it is being requested prior to the transfer of ownership of the property in question from a developer to an individual property owner.

(c) Federal, State and local governments shall be exempt from fees for projects they sponsor if the Administrator determines or the requesting agency certifies that the particular project is for public benefit and primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to commencement of construction of the flood control project. Projects undertaken primarily to protect planned flood plain development are not eligible for fee exemption.

The initial fee schedule is reprinted on the reverse of this Notice. Please note that the initial fee represents the *minimum* engineering review and administrative processing costs associated with each type of project. The initial fee does not include costs for labor and materials associated with the cartographic processing and preparation of a map revision.

Initial Fee Schedule

The hourly rate upon which the following fees and pre-authorized spending limits are based, is $35 per hour.

(a) for CLOMAs and for CLOMRs, the initial fees have been established by prior rulemaking. Those initial fees, subject to the provisions of § 72.4, shall be paid by the requestor in the following amounts:

(1) Single lot CLOMA	$175
(2) Single lot CLOMR (based strictly on the proposed placement of fill outside the regulatory floodway)	175
(3) Multi-lot/subdivision CLOMA	245
(4) Multi-lot/Subdivision CLOMR (based strictly on the placement of fill outside the regulatory floodway)	245
(5) Review of new hydrology	245
(6) New bridge or culvert (no channelization)	490
(7) Channel modifications only	560
(8) Channel modification and new bridge or culvert	735
(9) Levees, berms, or other structural measures	945
(10) Structural measures on alluvial fans	2,800

(b) For LOMRs or map revisions that follow a CLOMR issued by FEMA, the initial fee, subject to the provisions of § 72.4, for all categories listed under paragraph (c) below will be $200, so long as the as-built conditions are the same as the proposed conditions upon which FEMA based the issuance of the CLOMR. There are no fees for LOMAs. There are no fees for single lot LOMRs, which meet the requirements set forth in § 72.5(b) of the final rule, and are based strictly on the placement of fill outside of the regulatory floodway, regardless of whether they are issued following a CLOMA or CLOMR.

(c) For LOMRs or map revisions which do not follow a CLOMR issued by FEMA, the initial fee, subject to the provisions of § 72.4, shall be paid by the requestor in the following amounts:

(1) Multi-lot/Subdivision LOMR (based strictly on the placement of fill outside the regulatory floodway)	$445
(2) New bridge or culvert (no channelization)	630
(3) Channel modification only	760
(4) Channel modification and new bridge or culvert	935
(5) Levees, berms, or other structural measures	1,145
(6) Structural measures on alluvial fans	3,000

(d) For projects involving combinations of the actions listed under paragraphs (a), (b), or (c) above, the initial fee shall be that charged for the most expensive action of those that compose the combination.

(e) Following completion of FEMA's review for any CLOMA, CLOMR, LOMR, or map revision, the requestor will be billed at the established hourly rate for any actual costs exceeding the initial fee incurred during the review. The hourly rate is currently $35.00 per hour.

(1) In the event that the revision request results in a map revision, the requestor will be notified and billed for costs of cartographic preparation and processing of the revised map. This work will not be initiated until FEMA has received payment. The cost of reprinting and distributing the revised Flood Insurance Rate Map (FIRM) or Flood Boundary Floodway Map (FBFM), or both, will be borne by FEMA.

(f) Requestors of CLOMAs, CLOMRs, LOMRs and map revisions will be notified of the anticipated total cost if the total cost of processing the request, including estimated costs for cartographic preparation and processing of a map revision, will exceed the pre-authorized spending limits listed in (1) through (4) below. The pre-authorized spending limits vary according to the type of review performed and are based on the established hourly rate.

(1) CLOMAs, CLOMRs, LOMRs and map revisions based on fill outside the regulatory floodway	$700
(2) CLOMRs, for the review of new hydrology and CLOMRs, LOMRs and map revisions based on channel modifications, bridges and culverts, or a combination of these	1,500
(3) CLOMRs, LOMRs and map revisions based on levees, berms, or other structural measures	2,500
(4) CLOMRs, LOMRs and map revisions based on structural measures on alluvial fans	5,000

(g) In the event that processing costs are anticipated to exceed the pre-authorized spending limits listed in (1) through (4) above, processing of the request will be suspended pending FEMA receipt of written approval from the requestor to proceed.

(h) The entity that applies to FEMA through the local community for review will be billed for the cost of the review. The local community incurs no financial obligation for fees under the reimbursement procedures of 33 CFR part 72 as a result of transmitting the application by another party to FEMA.

(i) Payment of both the initial fee and final cost shall be by check or money order payable to U.S. funds to the National Flood Insurance Program and must be received by FEMA before the CLOMA, CLOMR, or LOMR will be issued, or before the cartographic processing will begin for a map revision.

(Catalog of Federal Domestic Assistance No. 83.100, "Flood Insurance.")

Dated: June 22, 1992.

C.M. "Bud" Schauerte,

Administrator, Federal Insurance Administration.

[FR Doc. 92-153161 Filed 6-29-92; 8:45 am]

BILLING CODE 6718-03-M

ARIZONA DEPARTMENT OF WATER RESOURCES
15 South 15th Avenue, Phoenix, Arizona 85007
Telephone (602) 542-1541
Fax (602) 256-0506

FIFE SYMINGTON
Governor

RITA P. PEARSON
Director

March 17, 1993

Mr. Stanley Smith
Flood Control District of Maricopa County
3335 W. Durnago Street
Phoenix, Arizona 85009

Dear Mr. Smith:

Section 48-3605A. of the Arizona Revised Statutes mandates that "The Director of the Department of Water Resources shall develop and adopt criteria for establishing the one hundred-year flood and delineating floodplains." The State Standards Work Group, consisting of two rural and two urban floodplain administrators, the Chair of the Arizona Floodplain Managers Association (AFMA) Technical Committee and representatives of the Department was established to assist the Director with these responsibilities.

Standards adopted by the Department become State requirements. The first such standard is the "Requirement for Flood Study Technical Documentation," State Standard 1-90, which became effective September 1, 1990.

State Standard 2-92, "Requirement for Floodplain Delineation and Riverine Environments," and the associated State Standard Attachment 2-92, "Delineation of Riverine Floodplains in Arizona" has been adopted by the Department. A copy of the new State Standard is enclosed for your use. Upon receipt of this standard, it becomes a requirement and you should apply it when and where applicable.

If you have any questions regarding either of the State Standards, please don't hesitate to call Bill Jenkins or Terri Miller.

Sincerely,

C. Laurence Linser, P.E.
Deputy Director
Engineering and Adjudications

CLL:DRL:js

SS2-92

ARIZONA DEPARTMENT OF WATER RESOURCES

ENGINEERING DIVISION

REQUIREMENT FOR FLOODPLAIN DELINEATION IN RIVERINE ENVIRONMENTS

The Director of the Arizona Department of Water Resources under the authority outlined in ARS 48-3605(A) establishes the following standard for delineation of floodplains in riverine environments in Arizona:

Flood elevations and floodway limits determined for use in fulfilling the requirements of approved local community and county flood damage prevention ordinances will be determined by applying the alternative procedures outlined in State Standard Attachment 2-92 entitled "Delineation of Riverine Floodplains in Arizona" (SSA 2-92) or by an alternative procedure reviewed and accepted by the Director.

For the purpose of application of these procedures, floodplains will include all watercourses officially identified by the Federal Emergency Management Agency as part of the National Flood Insurance Program; all watercourses which have been identified by a local floodplain administrator as having significant potential flood hazards; and all watercourses with drainage areas more than 1/4 of a square mile or a 100-year estimated flow rate of more than 500 cubic feet per second. Application of the procedures outlined in SSA 2-92 will not be necessary if the local community or county has in effect a drainage, grading or stormwater ordinance which, in the opinion of the Director, results in the same or a more stringent level of flood protection than application of the procedure would ensure.

This requirement is effective January 1, 1993. Copies of this State Standard and State Standard Attachment 2-92 can be obtained by contacting the Department's Engineering Division at (602) 542-1541.

STATE OF ARIZONA

DEPARTMENT OF WATER RESOURCES

ENGINEERING DIVISION

DELINEATION OF

RIVERINE FLOODPLAINS

IN ARIZONA

STATE STANDARD ATTACHMENT

SSA 2-92

SEPTEMBER, 1992

DISCLAIMER OF LIABILITY

The methods contained in this publication are intended to be a reasonable way of setting minimum floodplain management requirements where better data or methods do not exist. As in all technical methods, engineering judgement and good common sense must be applied and the methods rejected where they obviously do not offer a reasonable solution.

It must be recognized that while the criteria established herein will generally reduce flood damages to new and existing development, there will continue to be flood damages in Arizona. Where future-condition hydrology (which considers the cumulative effects of development) is not used, future development will probably increase downstream runoff which may result in flooding. Unlikely or unpredictable events such as earthquakes or dam failures may also cause extreme flooding.

The Arizona Department of Water Resources is not responsible for the application of the methods outlined in this publication and accepts no liability for their use. Sound engineering judgement is recommended in all cases.

The Arizona Department of Water Resources reserves the right to modify, update, or otherwise revise this document and its methodologies. Questions regarding information or methodologies contained in this document and/or floodplain management should be directed to the local floodplain administrator or the office below:

Engineering Division
Arizona Department of Water Resources
15 South 15th Avenue
Phoenix, Arizona 85007

Phone: 602-542-1541
FAX: 602-256-0506

TABLE OF CONTENTS

I. INTRODUCTION

The intent of this document is to provide a brief background regarding the National Flood Insurance Program (NFIP), the role of the Arizona Department of Water Resources (ADWR) regarding floodplain management and the NFIP, and to provide methodologies for determining riverine type flood hazard areas within Arizona. Alluvial fan type flood hazards are not addressed.

The purpose of determining the 100-year peak flood discharge, the floodplain or area of inundation, and the water surface elevation of the 100-year flood is to regulate the use of flood prone areas, to reduce or eliminate damage to property, to prevent the disruption of normal activities, and prevent the hazard to life and health which floods may cause. It is necessary to adopt flood hazard identification criteria which are uniform throughout the state and which provide the desired degree of protection. However, the criteria must by flexible enough to allow individuals to use accepted or approved methodologies which may not be included in this document. To be approved, a methodology must be sent to ADWR for review and receive approval for use in writing from the appropriate ADWR representative and the floodplain administrator for the community in which it will be applied.

A brief discussion of the National Flood Insurance Program, the role of the Arizona Department of Water Resources, and floodplain and floodway standards are provided in Appendices A, B, and C, respectively.

II. HIERARCHY OF PROCEDURES

A. General

Although the data needed for floodplain management and flood hazard identification are straightforward by definition, the procedures for determining them are widely varied. The principal elements needed are summarized below in three steps. In some instances, it may be necessary to determine the quantity of flow, velocity, scour potential, and/or other flood characteristics for a particular location.

The steps generally required to delineate a floodplain and floodway are:

1. Estimation of the peak discharge during a 100-year flood along the stream reach under consideration. This is the highest rate of flow expected during the flood event and is commonly measured in the U.S. as cubic feet per second (CFS).

2. Determination of the floodplain or area of inundation resulting from the 100-year peak discharge. That is the width of the floodplain in any given location usually determined using a series of cross sections of the ground surface oriented perpendicular to the direction of the flow.

3. The determination of the floodway which must be reserved for the conveyance of flood waters using the 100-year peak discharge using the local jurisdiction's encroachment criteria.

This document has attempted to make every effort to present acceptable floodplain hazard identification procedures which have been used or proposed for use in Arizona. However, a driving force in floodplain management throughout the United States is the Federal Emergency Management Agency (FEMA), which has provided the vast majority of floodplain delineations in Arizona. Because it is vital for all Arizona communities to remain eligible for the NFIP, any study in Arizona which has been adopted by the FEMA shall be considered the minimum base for floodplain management for the specific study area or flooding source in Arizona. That is to say that the rate and quantity of flow, the water surface elevations, the floodplain, and the floodway as accepted by FEMA are the minimum values to be used. A first step by a community before performing any analyses should be to investigate if there is an existing FEMA study which has been performed for the subject area. ADWR will assist any community if they require help with regard to the subject area being located in an existing detailed FEMA study. If the subject area is located within an existing FEMA flood hazard area delineated by detailed methods, a Level 3 analysis will be required if any changes are proposed. In cases where a community feels strongly that a FEMA study is incorrect, ADWR will assist in all ways possible in the appeal of that study to FEMA and the correction of its deficiencies.

For floodplains where no delineation has been performed, the methods presented in this publication are acceptable for use in floodplain hazard identification. Level 1 will generally produce more conservative results than Level 2. Likewise Level 2 will generally produce more conservative results than Level 3. Alternative methodologies other than those presented herein for Level 1 and Level 2 studies will be submitted to ADWR in advance for review and approval before they are used. All Level 1 and Level 2 studies must be substantiated with written

documentation submitted to the community for review prior to approval. Level 3 studies will be conducted and documented according to FEMA and ADWR floodplain analyses guidelines and requirements. Level 3 is the level of engineering detail necessary to conduct or revise a detailed flood insurance study to FEMA standards. Communities and/or property owners are encouraged, and in some cases will be required in order to comply with local, state, or federal regulations, to spend the necessary time and money to perform an engineering study to ensure that all new construction in Arizona is protected against flood damages. Documentation of studies should follow the guidelines in "Instructions For Organizing And Submitting Technical Documentation For Flood Studies" SSA 1-90.

Throughout this document Level 1, Level 2, and Level 3, refer to increasing levels of effort of analysis. **It should be understood that generally the least effort relates to the most conservative results.**

A more detailed description of each approved hierarchial methodology is presented below.

B. Level 1

Level 1 will provide conservative values for flood depths and floodway widths so that finished floor elevations and set-backs can be estimated for a structure with very little data. Within the Level 1 floodway fringe, the regulatory elevation shall be a minimum of 1 foot above highest adjacent existing ground elevation. If a drainage structure such as a combination culvert/roadway dip-section, bridge, or embankment of any kind is to be placed across a watercourse, a higher level analysis is required.

The purpose of the method in Level 1 is to present criteria for floodplain management which are simple to use and require data which are readily available. This alternative estimates flood depth and floodway width independent of detailed topography and site specific hydrology. Data was compiled from FEMA flood insurance studies in Arizona using depth, floodway width and drainage area size. Regression analyses were performed using this data for various regions in Arizona. The drainage area for streams to be studied can be determined from U.S. Geological Survey topographic quadrangle maps. Detailed information on the development of the regression equations outlined in this report is available from the Engineering Division of ADWR.

A Level 1 example is provided in Appendix D.

C. Level 2

Level 2 requires the estimation of the 100-year peak discharge (hydrology) and the 100-year floodplain (hydraulics) using simplified engineering procedures. If a drainage structure such as a combination culvert/roadway dip-section bridge, or embankment of any kind is to be placed across a watercourse, a Level 3 analysis may be required. The Level 2 procedures are:

1. Hydrology

Use 100-year peak discharge curves for Arizona counties provided in Appendix E for drainage areas greater than one square mile and use the rational method for drainage areas having less than one square mile (640 acres).

2. Hydraulics

Provide normal depth calculations at several representative cross-section locations adjacent to the proposed improvement/development. Cross-sections should also be located both upstream and downstream of the proposed improvement/development. Cross sections will be spaced at 300 to 500 feet intervals with a minimum of three cross sections required along short reaches. Calculations must include pre- and post- developed conditions. Manning's equation is recommended for use in the normal depth calculations. Floodplains will be delineated using normal depth or critical depth, whichever is greater.

It is recommended that structures not be placed in the 100-year floodplain without some type of floodway analysis. At a minimum an assessment of flood depth and velocity should be performed and structures should not be placed within the area where the following minimum criteria are exceeded.

Houses built on foundations:

Depth X Velocity > 10 and a depth in excess of 2.5 ft.

Mobile homes:

Depth X Velocity > 6 and a depth in excess of 1.5 ft.

A Level 2 example is provided in Appendix F.

D. Level 3

Level 3 requires the estimation of the 100-year discharge (hydrology), and the 100-year floodplain and floodway (hydraulics) using more sophisticated engineering procedures than in Level 1 or Level 2. The Level 3 analyses will generally be more expensive, however, an overall cost savings may be realized in drainage structure and/or floodproofing construction costs. Level 3 documentation will comply with those defined in SSA 1-90 (Instructions for Organizing and Submitting Technical Documentation for Flood Studies) by the Arizona Department of Water Resources.

Methods approved for use in hydrologic analyses include frequency/peak discharge estimation using the computer programs TR-55 and TR-20 by the Soil Conservation Service and HEC-1 by the Corps of Engineers for synthetic peak discharge estimation. Where possible any synthetic peak discharge estimation techniques should be calibrated to locally observed hydrologic conditions.

Hydraulic analyses will be conducted using step backwater methodology. The computer model HEC-2 by the Corps of Engineers is preferred.

A Level 3 example is not provided in this document.

IV. APPENDICES

Appendix A: National Flood Insurance Program

The United States Congress passed the National Flood Insurance Act of 1968 as a first attempt to provide relief for individuals with property in flood-prone areas and to begin to develop uniform standards for floodplain management. Since 1968, the Act has been amended several times. This Appendix contains passages from the Act wherein the definition of community includes the state.

The National Flood Insurance Act of 1968 was enacted by Title XIII of the Housing and Urban Development Act of 1968 (L. 90-448, August 1, 1968) to provide previously unavailable flood insurance protection to property owners in flood-prone areas. Mudslide protection was added to the Program by the Housing and Urban Development Act of 1969. Flood-related erosion protection was added to the Program by the Flood Disaster Protection Act of 1973 (L. 93-234, December 31, 1973). The Flood Disaster Protection Act of 1973 requires the purchase of flood insurance on and after March 2, 1974, as a condition of receiving any form of Federal or federally-related financial assistance for acquisition or construction purposes with respect to insurable buildings and mobile homes within an identified special flood, mudslide (i.e., mudflow), or flood-related erosion hazard area that is located within any community participating in the Program. The Act also requires that on and after July 1, 1976, or one year after a community has been formally notified by the Administrator of its identification as a community containing one or more special flood, mudslide (i.e., mudflow) or flood-related erosion hazard areas, no such Federal financial assistance, shall be provided within such an area unless the community in which the area is located is then participating in the Program, subject to certain exceptions.

To qualify for the sale of federally-subsidized flood insurance a community must adopt and submit to the Administrator as part of its application, floodplain management regulations, satisfying at a minimum the criteria designed to reduce or avoid future flood, mudslide (i.e., mudflow) or flood-related erosion damages. These regulations must include effective enforcement provisions.

The NFIP has been successful in requiring new buildings to be protected from damage by the 100-year flood. However, the program had few incentives for communities to do more than enforce the minimum regulatory standards. Flood insurance rates had been the same in all participating communities, even though some do much more than regulate construction of new buildings to the national standards.

Until 1990 the program did little to recognize or encourage community activities to reduce flood damages to existing buildings, to manage development in areas not mapped by the NFIP, to protect new buildings beyond the minimum NFIP protection level, to help insurance agents obtain flood data, or to help people obtain flood insurance. Because these activities can have a great impact on the insurance premium base, flood damages, flood insurance claims, and federal disaster assistance payments, the Federal Insurance Administration (FIA) has implemented the Community Rating System (CRS). The deadline for the first applications to participate in the CRS program were due to FEMA Region IX offices by December 5, 1990.

Flood insurance premium credits are available in communities based on their CRS classification. There are ten classes with Class 1 having the greatest premium credit and Class 10 having no premium credit. A community's CRS class is based on the number of credit points calculated for the activities that are undertaken to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. A community is automatically in Class 10 unless it applies for CRS classification and it shows that the activities it is implementing warrant a better class. The amount of premium credit for each class is published annually by the Flood Insurance Administration. The CRS rewards those communities that are doing more than the minimum NFIP requirements which encourage their residents to prevent or reduce flood losses. The system also provides an incentive for communities to initiate new flood protection activities.

Appendix B: Arizona Department of Water Resources

In 1973, the Arizona Legislature required the Arizona Water Commission (now the Arizona Department of Water Resources) to develop and adopt criteria for the 50- and 100-year floods for use by the Arizona communities for the purpose of floodplain management. In response, the Water Commission published Floodplain Delineation Criteria and Procedures, Report Number Four in October 1973.

In 1979, the Governor designated the Arizona Water Commission as the State Coordinating Agency for the National Flood Insurance Program (NFIP). In 1980, the Legislature created the Arizona Department of Water Resources (ADWR). The State NFIP responsibility was then shifted to the ADWR. The State Statutes do not spell out any specific duties for the coordinating agency, although the Water Commission/ADWR has had certain responsibilities for floodplain management since 1973.

The Arizona Legislature added a specific requirement for ADWR to develop and adopt criteria for floodplain delineation throughout the state under ARS Titles 45 and 48, in 1984. This requirement has led the Department to review, revise and supplement the criteria established in 1973. The National Flood Insurance Act as amended in 1986 lists 12 duties and responsibilities for the state:

1. Enact enabling legislation in floodplain management. The Legislature adopted such legislation in 1973 and has amended it as needed.

2. Encourage and assist communities in qualifying for participation in the NFIP. All Arizona communities with flood prone areas are participating in the NFIP.

3. Assist communities in the adoption of ordinances. The ADWR staff works continually with communities to keep their ordinances up-to-date with the NFIP and the State Statutes.

4. Provide communities and the public with information on floodplain management. ADWR staff works with the public and communities on an ongoing basis. A Community Assistance Handbook and a quarterly newsletter are two of the methods used. ADWR staff also meet with community officials and speak at public meetings.

5. Assist communities in disseminating elevation requirements for flood-prone areas. Due to limited staff, ADWR refers most public requests for information to the communities. ADWR staff assists communities in obtaining information and understanding it so that they may respond effectively to public requests.

6. Assist in the delineation of flood-prone areas. ADWR has delineated floodplains and contributed financially to such delineations. Staff reviews delineations performed by others.

7. Recommend priorities for Federal floodplain management activities within the state. ADWR has worked with a number of Federal agencies on priorities.

8. Notify FIA of community failures in floodplain management. ADWR works with communities to correct deficiencies in their programs. In extreme cases, staff will notify FIA of problems.

9. Establish state floodplain management standards. Current State Statutory requirements equal or exceed the minimum FIA requirements.

10. Assure coordination and consistency of floodplain management activities with other agencies. ADWR meets with other agencies as necessary to coordinate activities.

11. Assist in the identification and implementation of flood hazard mitigation recommendations. ADWR has several mitigation functions and works with other agencies as necessary to optimize mitigation opportunities.

12. Participate in floodplain management training activities. ADWR staff support quarterly workshops for community staff and others on floodplain management and assist in training when opportunities arise.

Appendix C: 100-Year Floodplain and Floodway Standards

The 100-Year Floodplain

Throughout the United States the standard for floodplain management is the 100-year flood or peak discharge. This is a flood with a one percent chance of being equalled or exceeded in any given year. Since there is seldom enough data to accurately define the 100-year flood at a particular location, the value is estimated from existing records using statistical and/or empirical hydrologic engineering methods. Inherent in the estimating procedure is the risk that as additional data becomes available our estimates may require revision. Also, peak discharge estimates assume that weather characteristics remain constant and that the watershed and channel characteristics remain the same.

The FIA and FEMA have adopted the 100-year flood as the national standard for floodplain management and floodplain study purposes. The 100-year flood is also referred to as the regulatory flood or base flood. In addition to floodplain studies, the 100-year flood is also used in the design of numerous drainage structures. Primary considerations in determining the level of flood protection necessary are health and safety, acceptable risk, and cost. Flood control projects such as dams and emergency spillways which provide protection to critical downstream or adjacent developments, are sometimes designed to a much higher standard (i.e., the 250-year, 1,000-year, or Probable Maximum Flood). Storm drains for street drainage may be designed to a much lower standard for cost saving reasons, and when the capacity of the storm drain is exceeded, the excess storm water may cause flooding.

While the specific standards for floodplain management can be debated, the concept is sound and a uniform standard must be used. The Federal Office of Management and Budget reevaluated the 100-year flood standard for the National Flood Insurance Program in the early 1980's and found no reason to change. It is anticipated that none of the criteria presently used by Federal Emergency Management Agency will change in the near future.

FEMA criteria and the Arizona Revised Statutes require that all residences and occupied structures must be constructed so that their lowest floor is a minimum of one-foot above the 100-year water surface elevation of the 100-year flood. Local floodplain regulation standards must meet the minimum federal and state standards. However, a community may adopt stricter local floodplain regulations if they wish. Several communities in Arizona have adopted tougher floodplain regulations.

The 100-Year Floodway

The FEMA floodway standard is essential to the success of floodplain management. Any development in a floodplain which obstructs the flow of water generally causes the water surface elevation to be higher across the rest of the floodplain. Without any limitations on floodplain encroachment it would be difficult to manage or control new development in floodplains which could adversely impact existing structures. Under the Arizona Revised Statutes and the National Flood Insurance Program, floodplain encroachment is allowed only to the extent that it causes no more than a one foot rise in the 100-year water surface elevation when considered across the entire floodplain. The remaining unencroached area is reserved for conveyance of the 100-year flood and is referred to as the regulatory floodway. Once a regulatory floodway is established, no further development is allowed within this special conveyance area without approval of the local community and FEMA. Technical data which supports the floodway revision must be provided. A community may adopt stricter floodway regulations if they wish. Several communities throughout Arizona and the U.S. have adopted regulations which require that floodway encroachments raise the natural water surface elevation less than the one foot FEMA criteria (e.g., one-tenth foot, one-half foot).

Appendix D: Level 1 Equations and Example

Flood Depth Estimation

Three depth equation regions are presented for use in Figure 1. Flood depth estimating equations are presented below for each region shown on Figure 1.

Flood depth = Y (feet)
Drainage Area = DA (sq. mi.)
Floodway Width = FW (feet)

Region I-D

The area north of the Mogollon Rim, including the upper Verde River Basin.

$Y = 5.47 \times DA^{0.213}$

Note: The Little Colorado River at and below Woodruff is excluded.

Region II-D

The area including Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Mohave and Yavapai Counties, except above the Mogollon Rim.

$Y = 9.89 \times DA^{0.132}$

Region III-D

The area including LaPaz, Pima, Pinal, Santa Cruz and Yuma Counties, except the Colorado River mainstream.

$Y = 7.62 \times DA^{0.118}$

Floodway Width Estimation

Four floodway-width equation regions are presented for use in Figure 2. Floodway width estimating equations are presented below for each region shown on Figure 2.

Region I-W

Includes the area north of the Mogollon Rim, including the Arizona Strip (north of the Grand Canyon) and the Verde River watershed upstream from Sycamore Creek (near Perkinsville):

$FW = 105 \times DA^{0.449}$

Region II-W

The area including Apache, Gila, Graham, Greenlee, LaPaz, Mohave and Yuma Counties below the Mogollon Rim.

$FW = 157 \times DA^{0.407}$

Region III-W

The area including portions of Cochise, Coconino, Santa Cruz and Yavapai Counties below the Mogollon Rim and in the Verde River Basin below Sycamore Creek.

$FW = 218 \times DA^{0.261}$

Region IV-W

The area including Maricopa, Pima and Pinal Counties.

$FW = 377 \times DA^{0.289}$

For areas not included above contact the Arizona Department of Water Resources for guidance.

Example

Estimates Needed:

Elevation and floodway set-back requirements for a proposed development in Cochise County on Double Dry Creek. The drainage area at the site is 17 square miles as estimated from a U.S.G.S. topographic 7.5 minute quadrangle map.

Calculations:

Flood Depth - Cochise County is in Region II-D. For drainage area of 17 square miles:

$Y = 9.89 \times 17^{0.132} = 14$ feet

Floodway Width - Cochise County is Region III-W. For drainage area of 17 square miles:

$FW = 218 \times 17^{0.261} = 457$ ft.

Application of Analyses

Flood elevation requirements would be set as 14 feet + 1 foot freeboard or 15 feet from the low point on the wash bottom. In addition, the structure should be located a minimum of 457 feet/2 or 229 feet from the center of the wash. The results of this analysis could be checked for reasonableness by the floodplain manager in the field. A Level 2 or Level 3 analysis may be required.

Figure 1

MAP OF REGIONS FOR FLOOD DEPTH FORMULAE

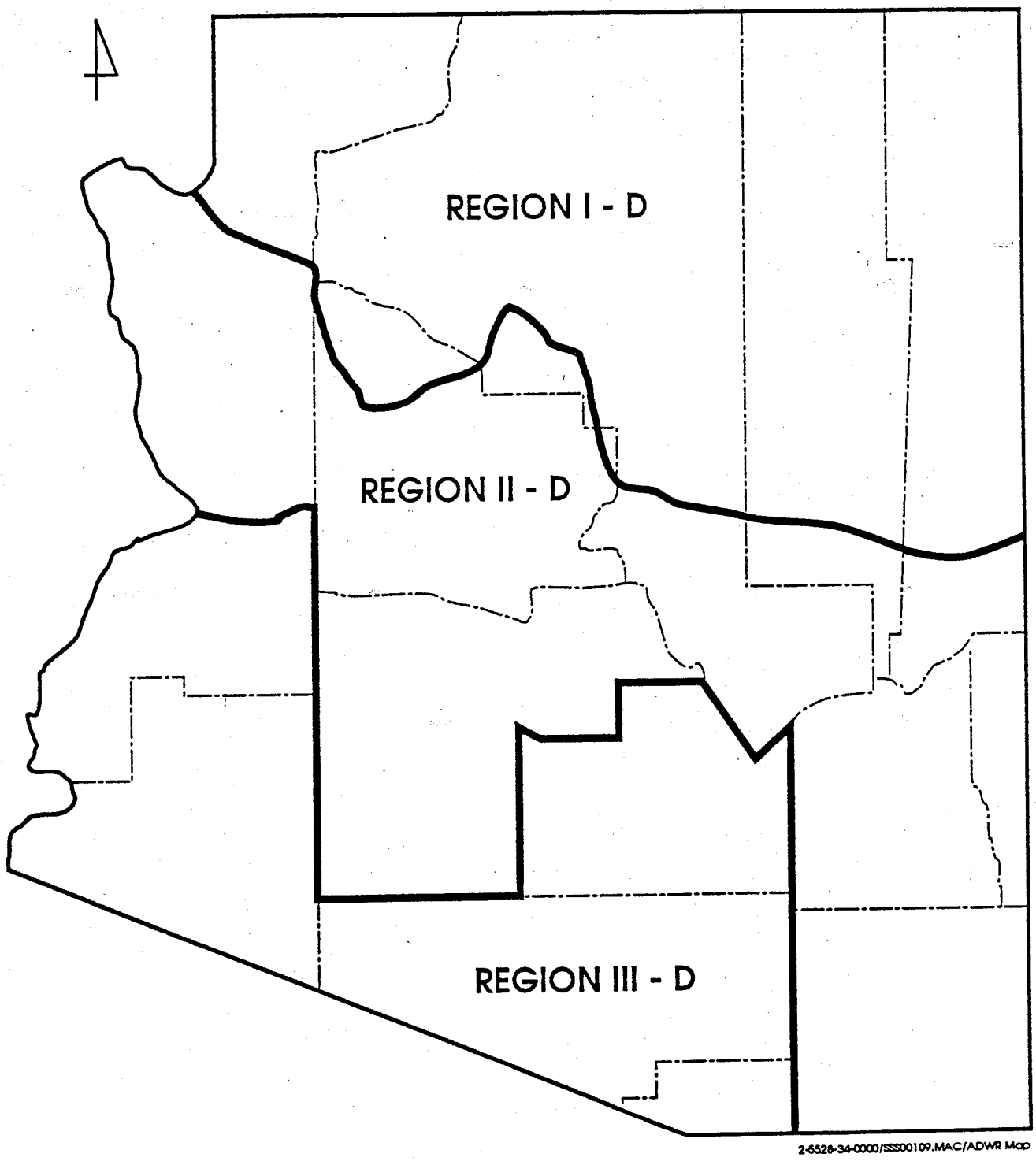
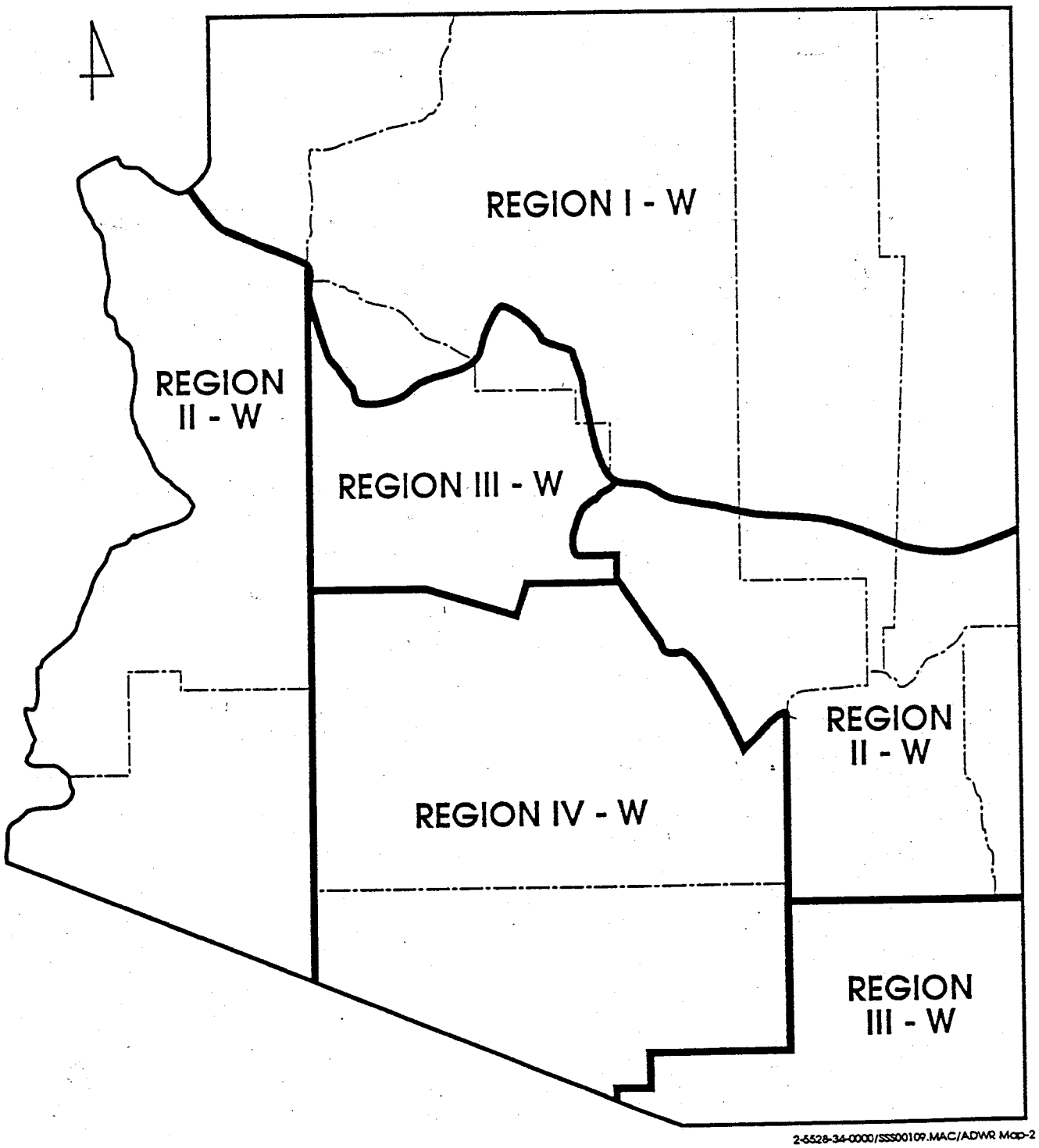
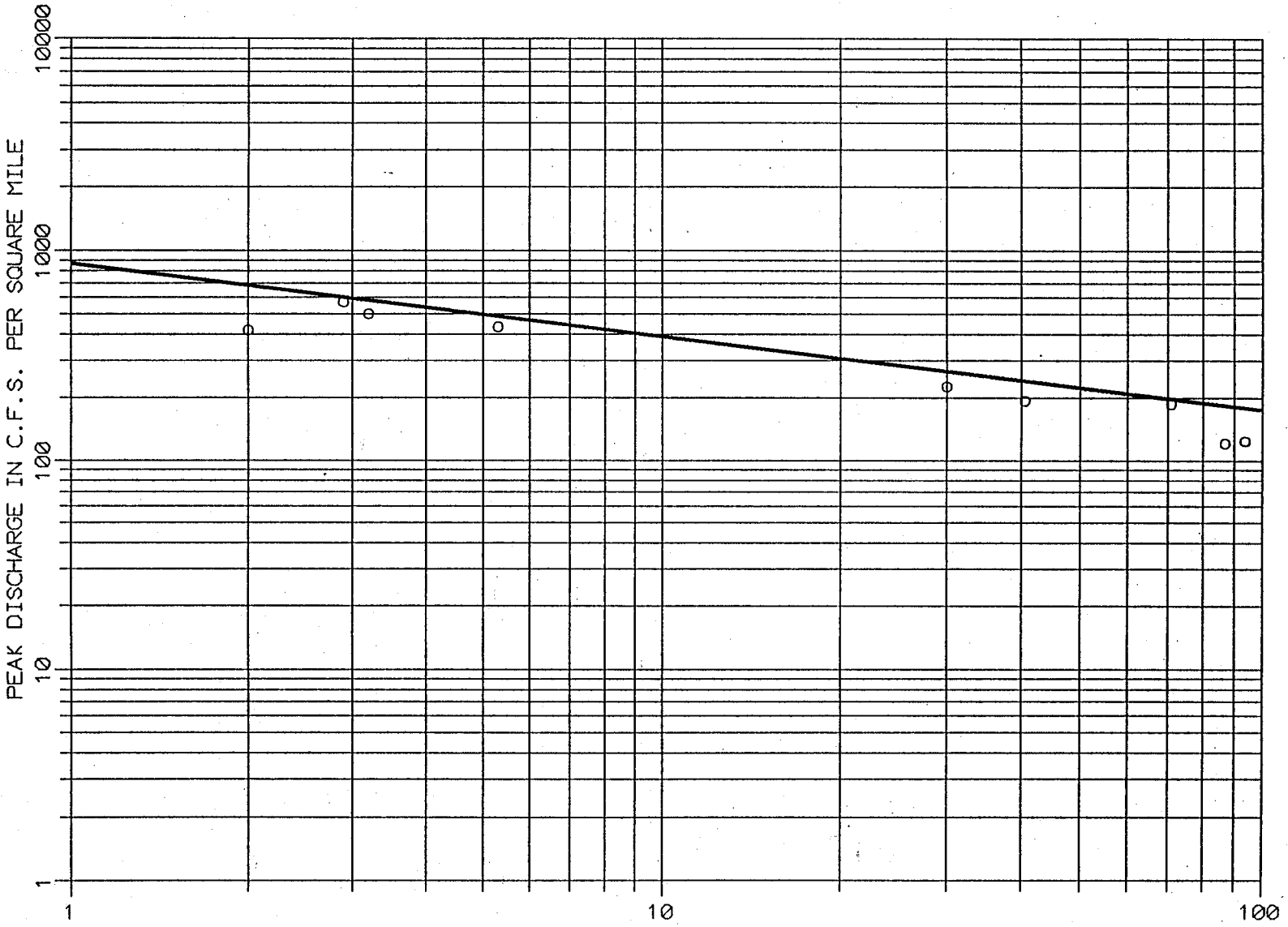


Figure 2

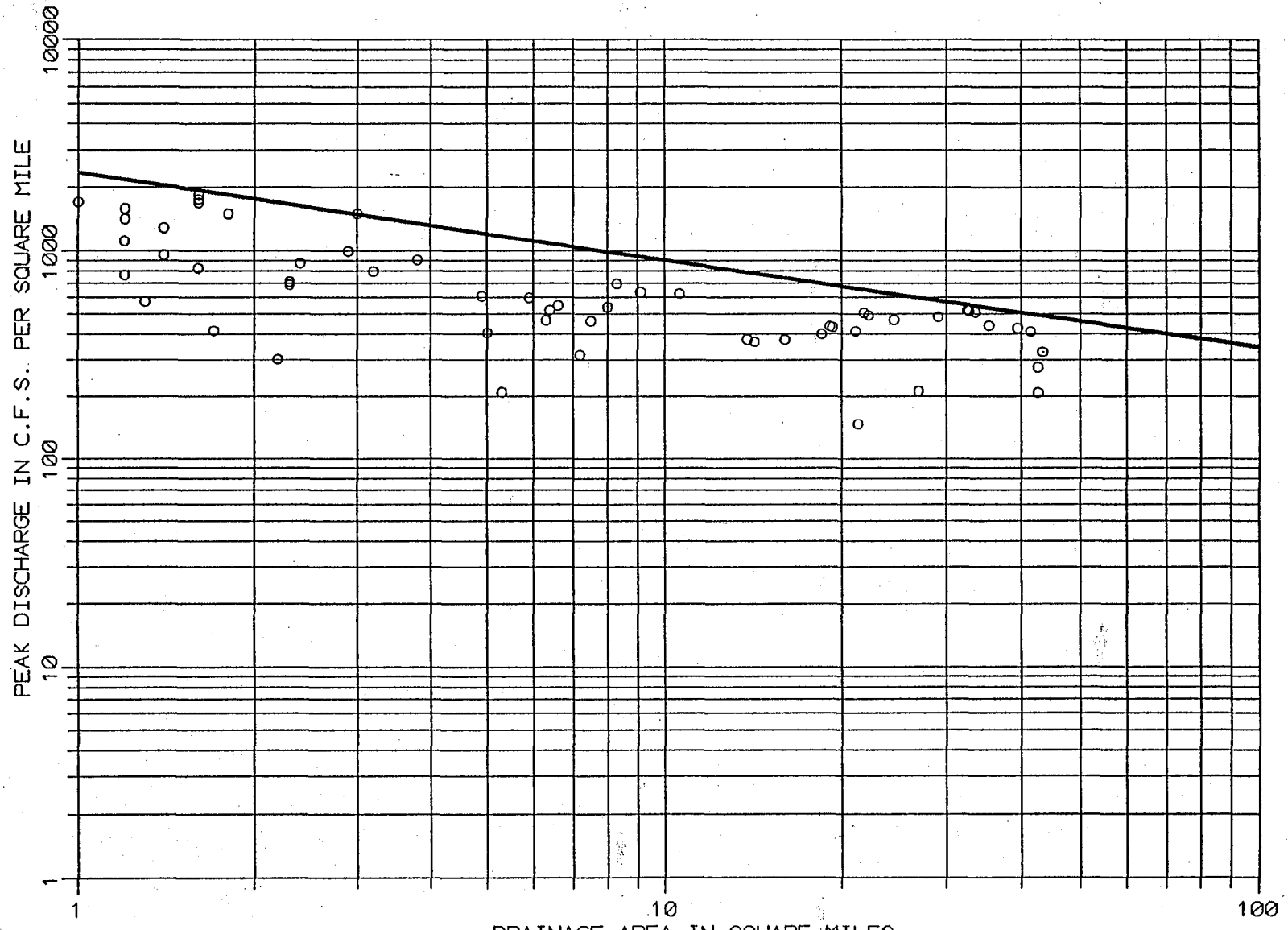
MAP OF REGIONS FOR FLOODWAY WIDTH FORMULAE



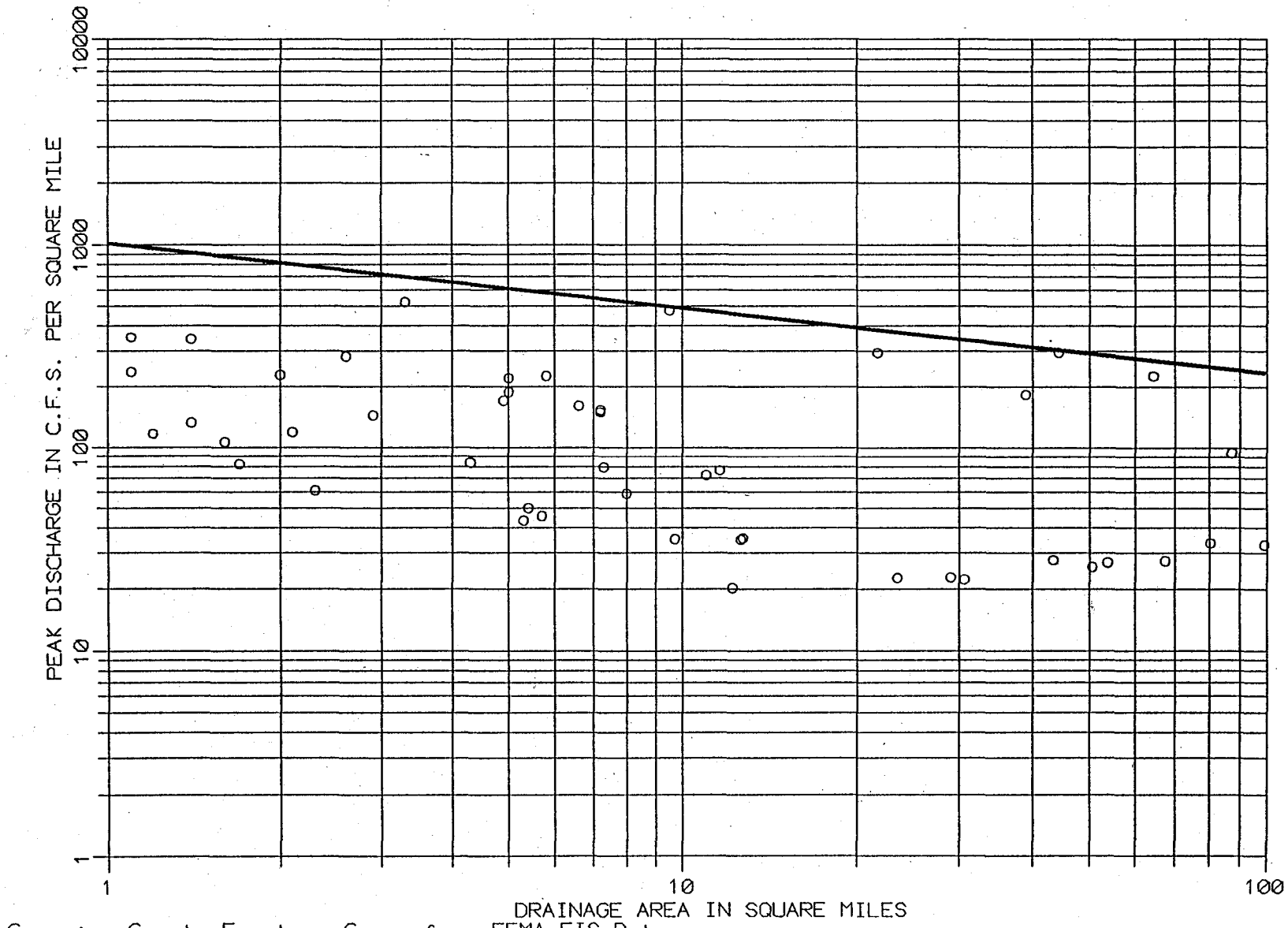
Appendix E: 100-Year Peak Discharge Curves for Arizona Counties



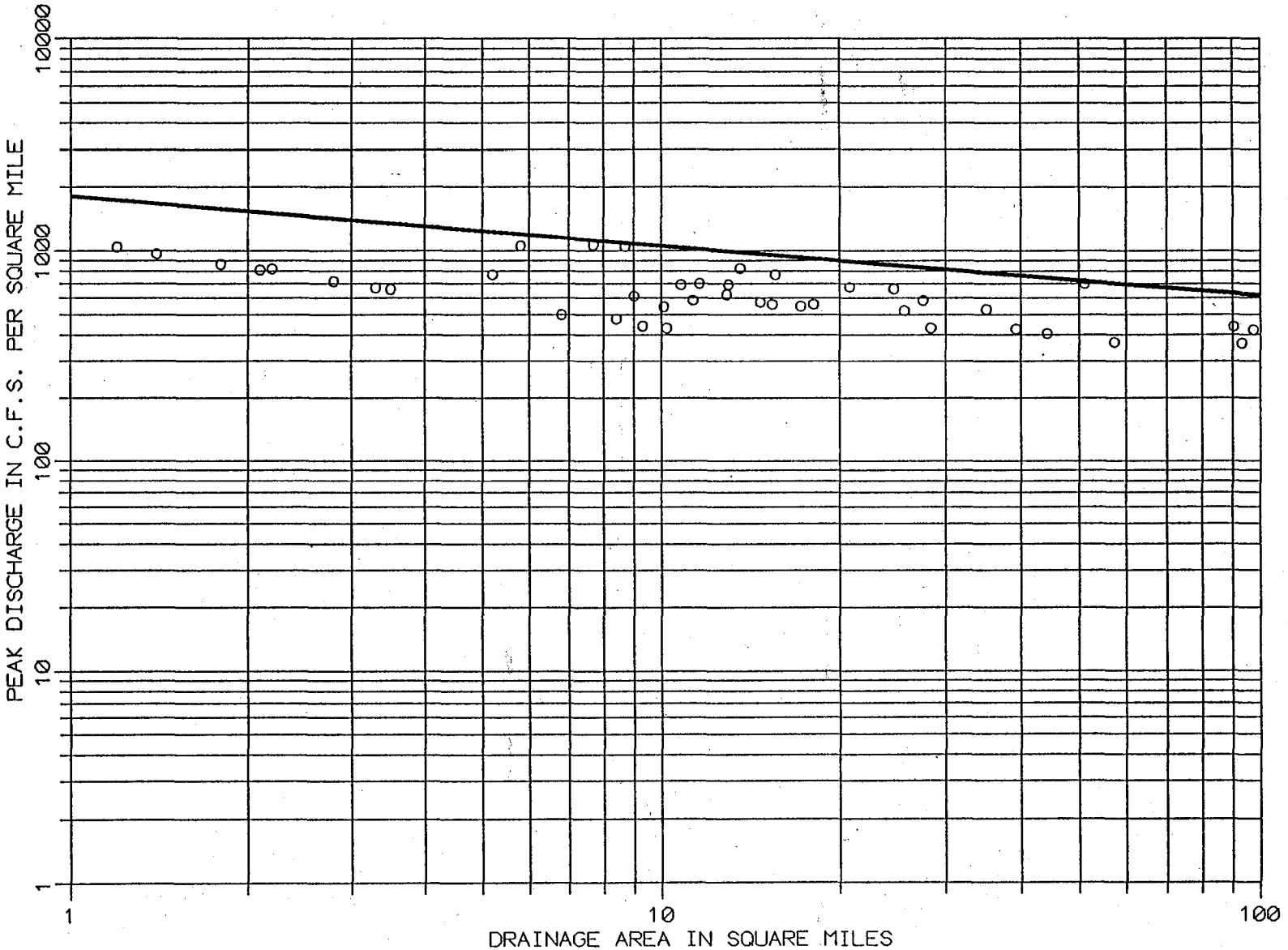
Apache County and Navajo County Envelope Curve from FEMA FIS Data



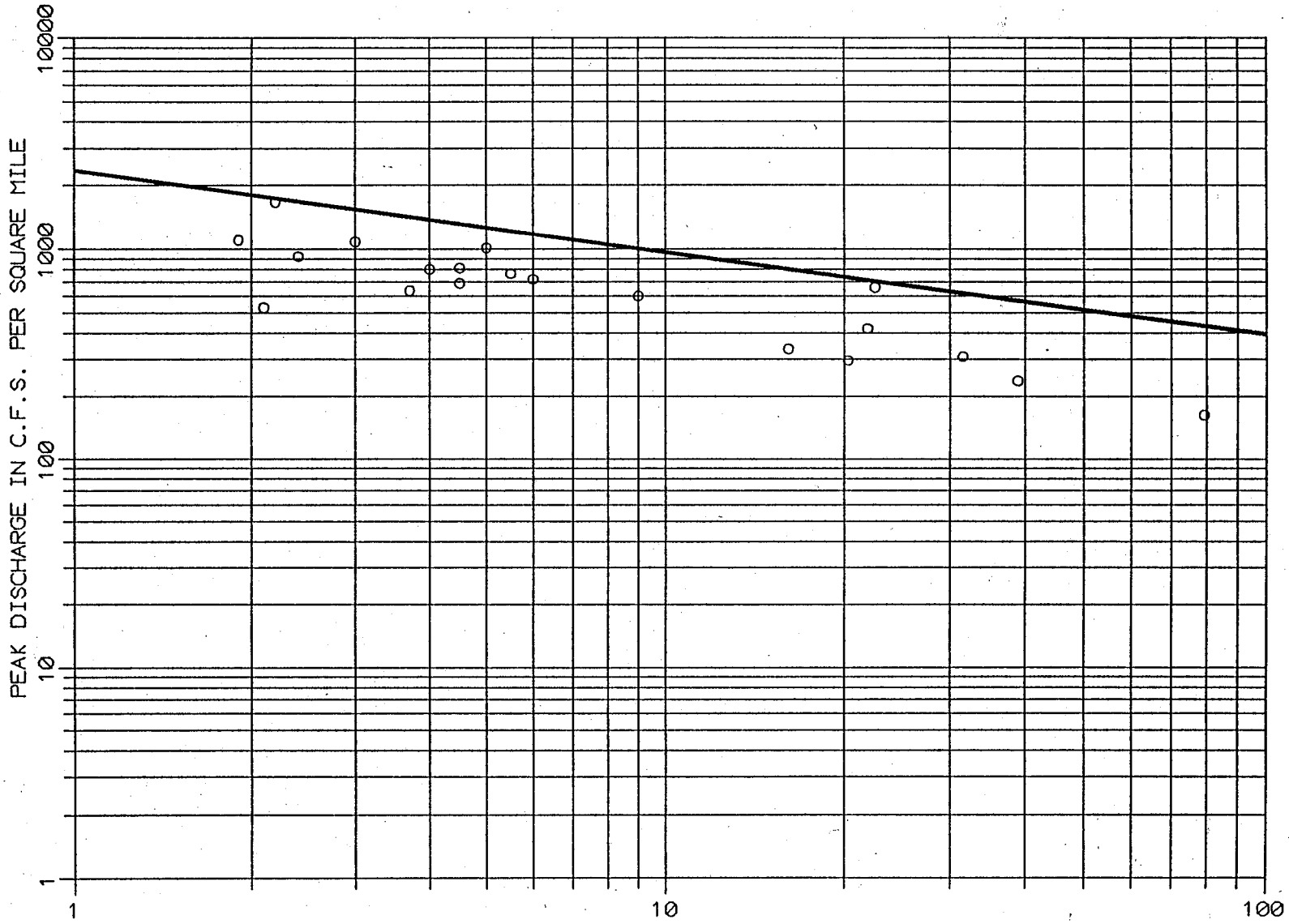
Cochise County Envelope Curve from FEMA FIS Data



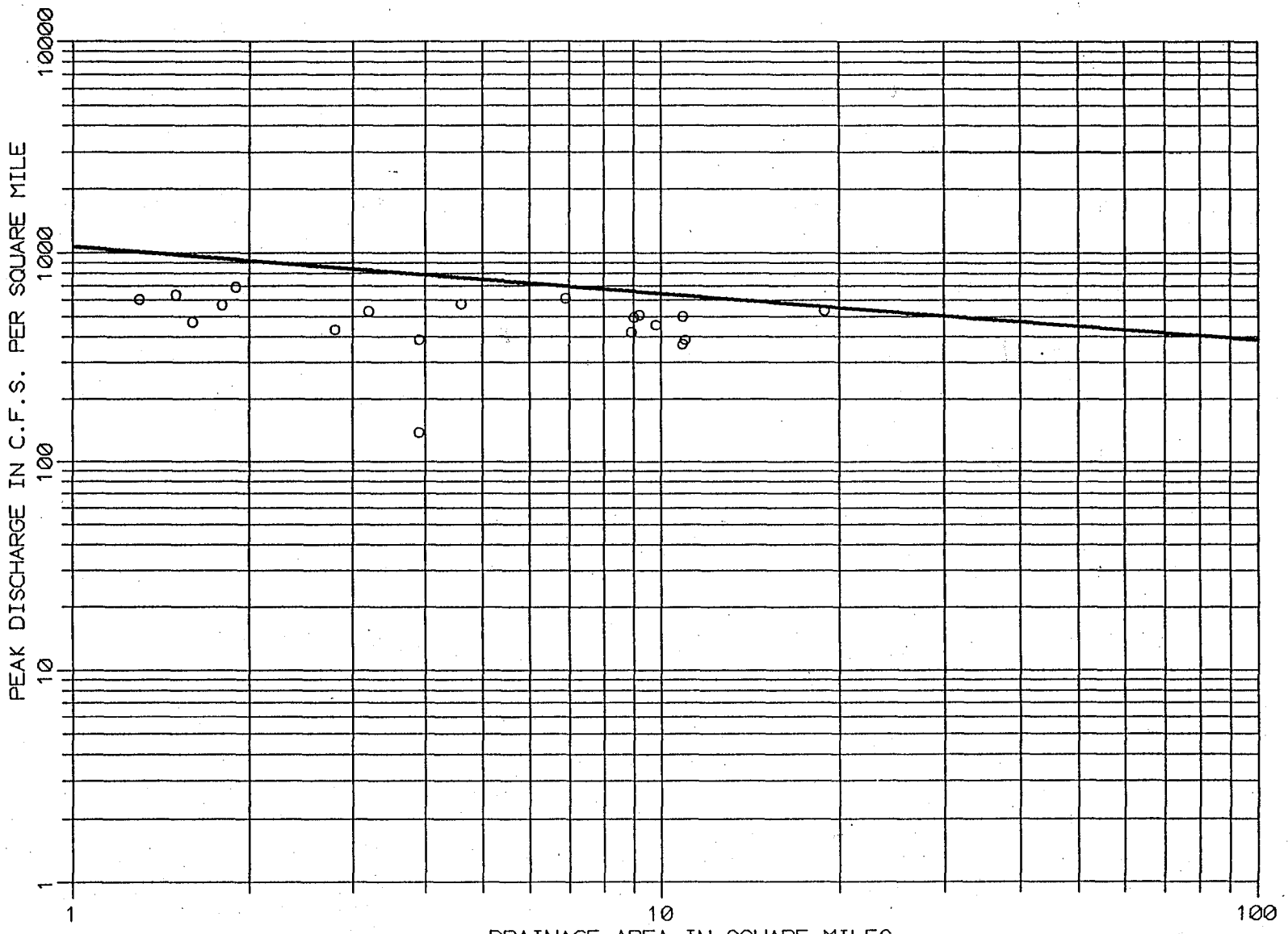
Coconino County Envelope Curve from FEMA FIS Data



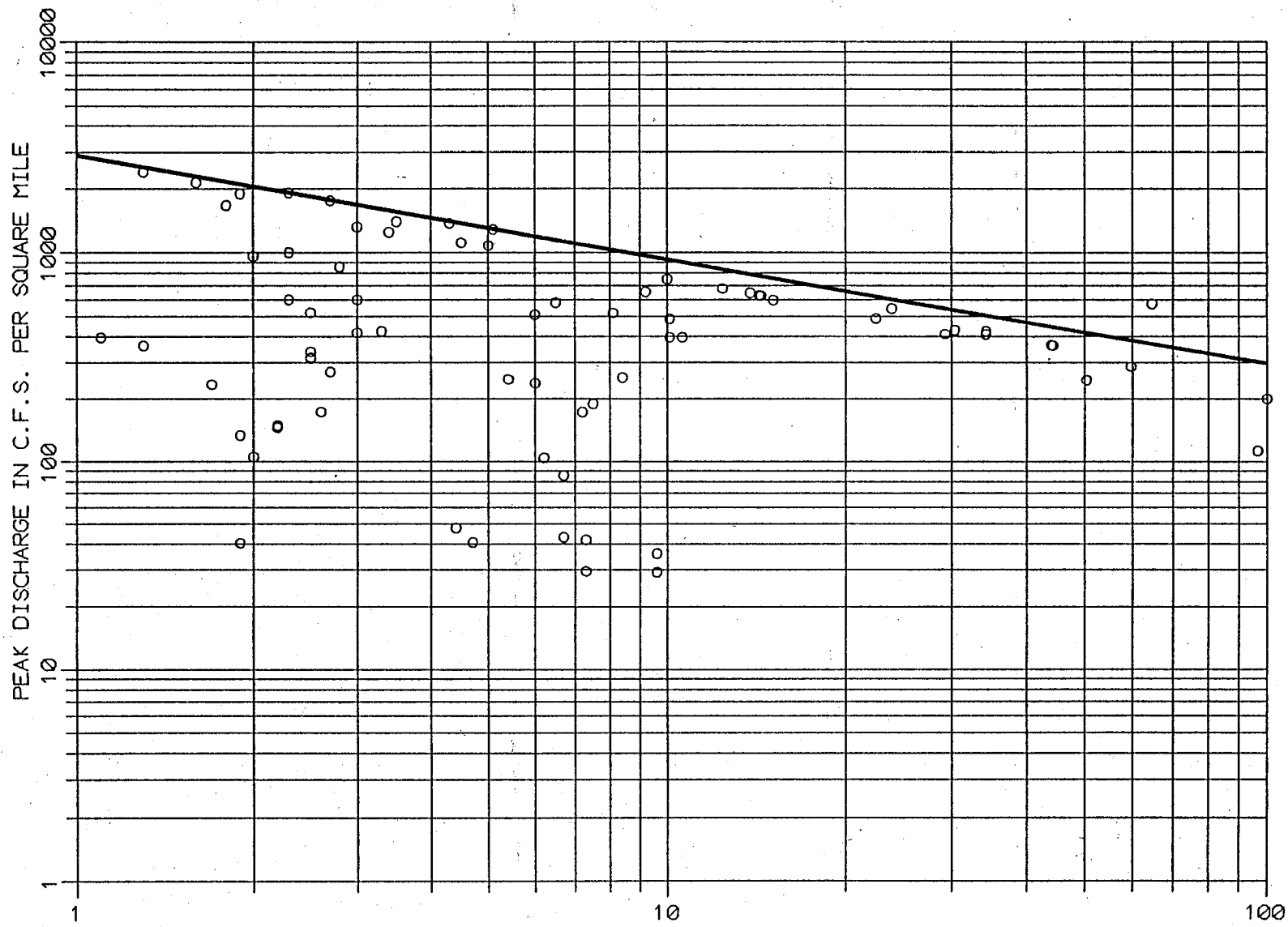
Gila County Envelope Curve from FEMA FIS Data



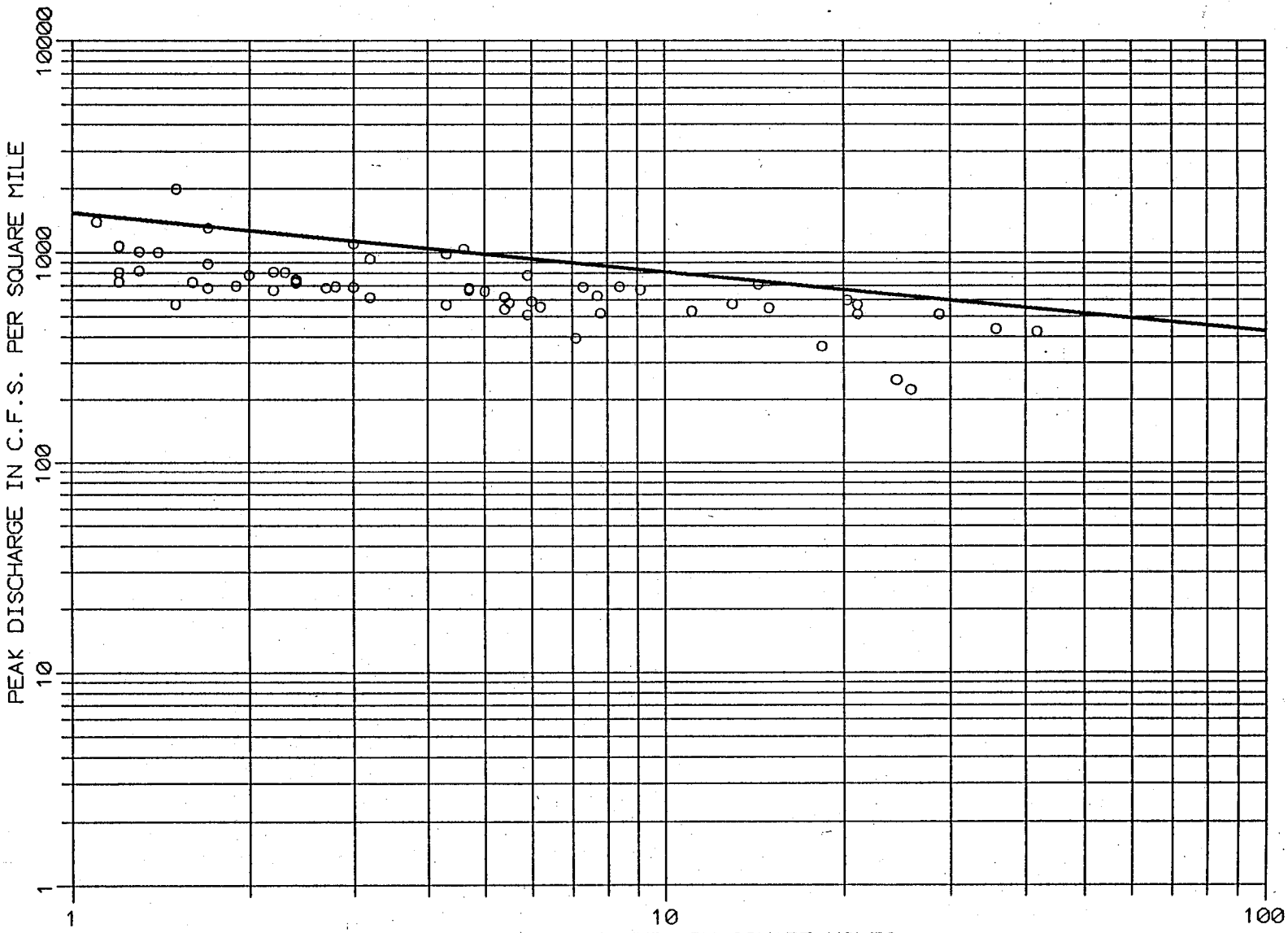
Graham County and Greenlee County Envelope Curve from FEMA FIS Data



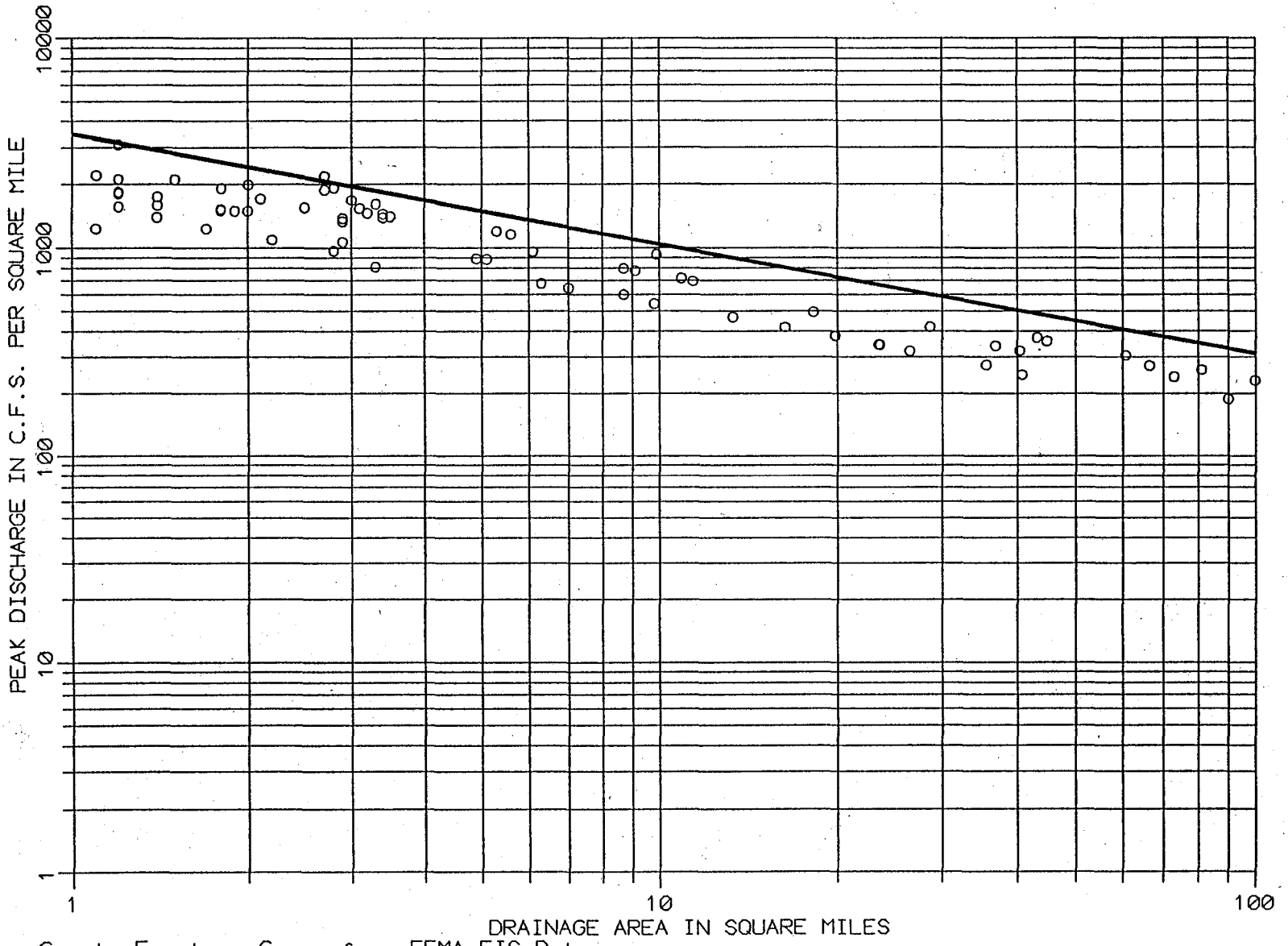
La Paz County and Yuma County Envelope Curve from FEMA FIS Data



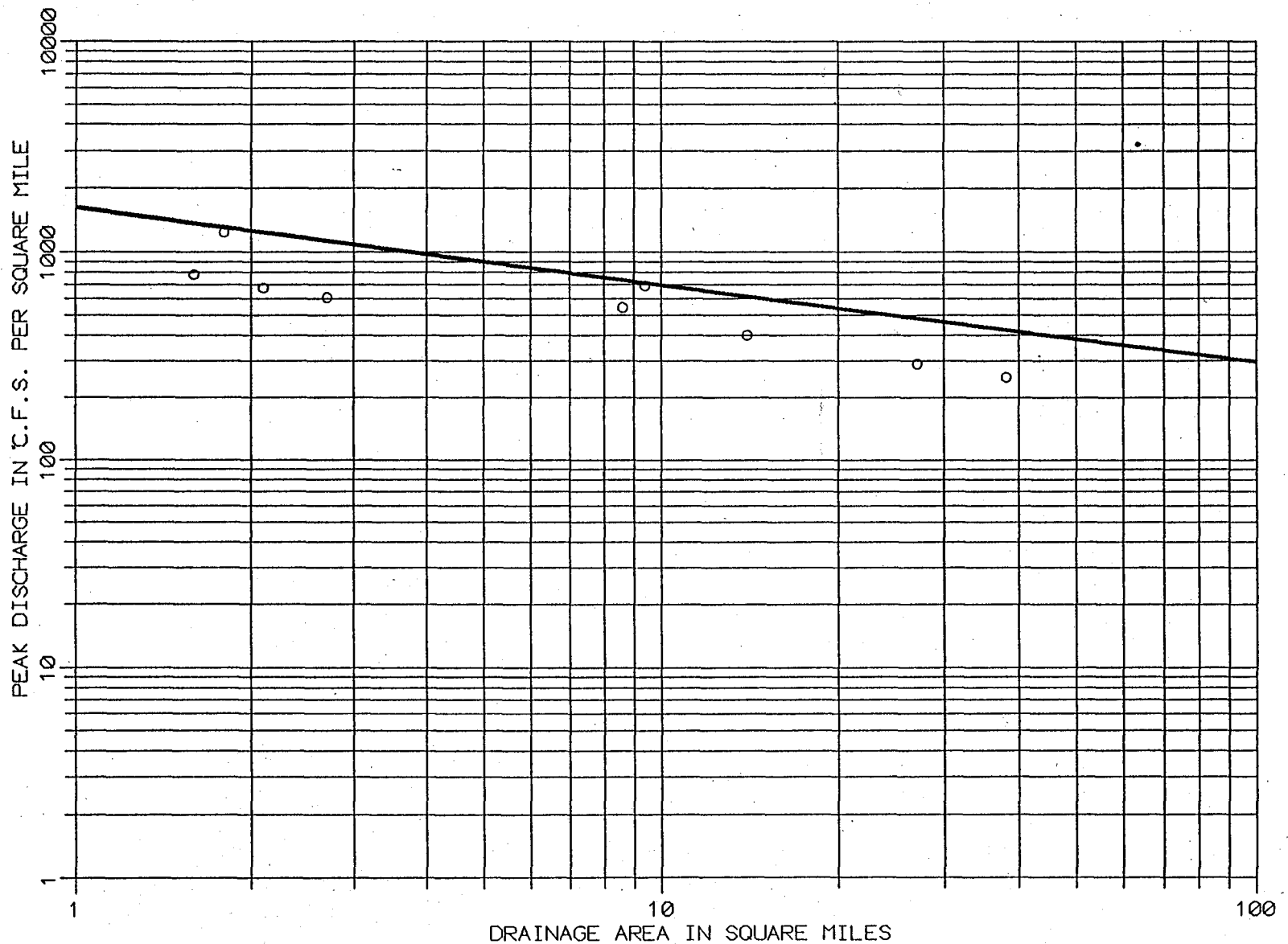
Maricopa County Envelope Curve from FEMA FIS Data



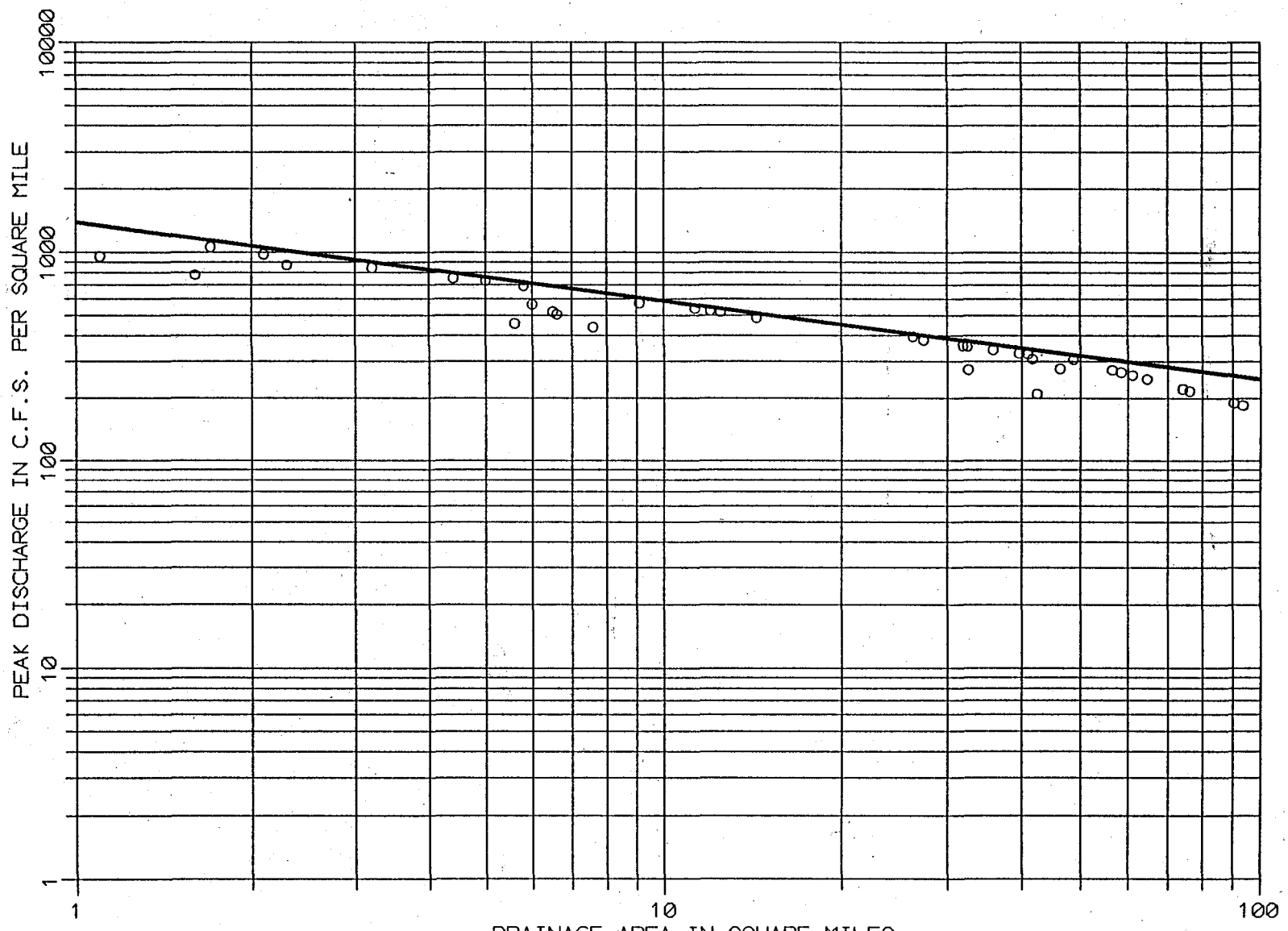
Mohave County Envelope Curve from FEMA FIS Data



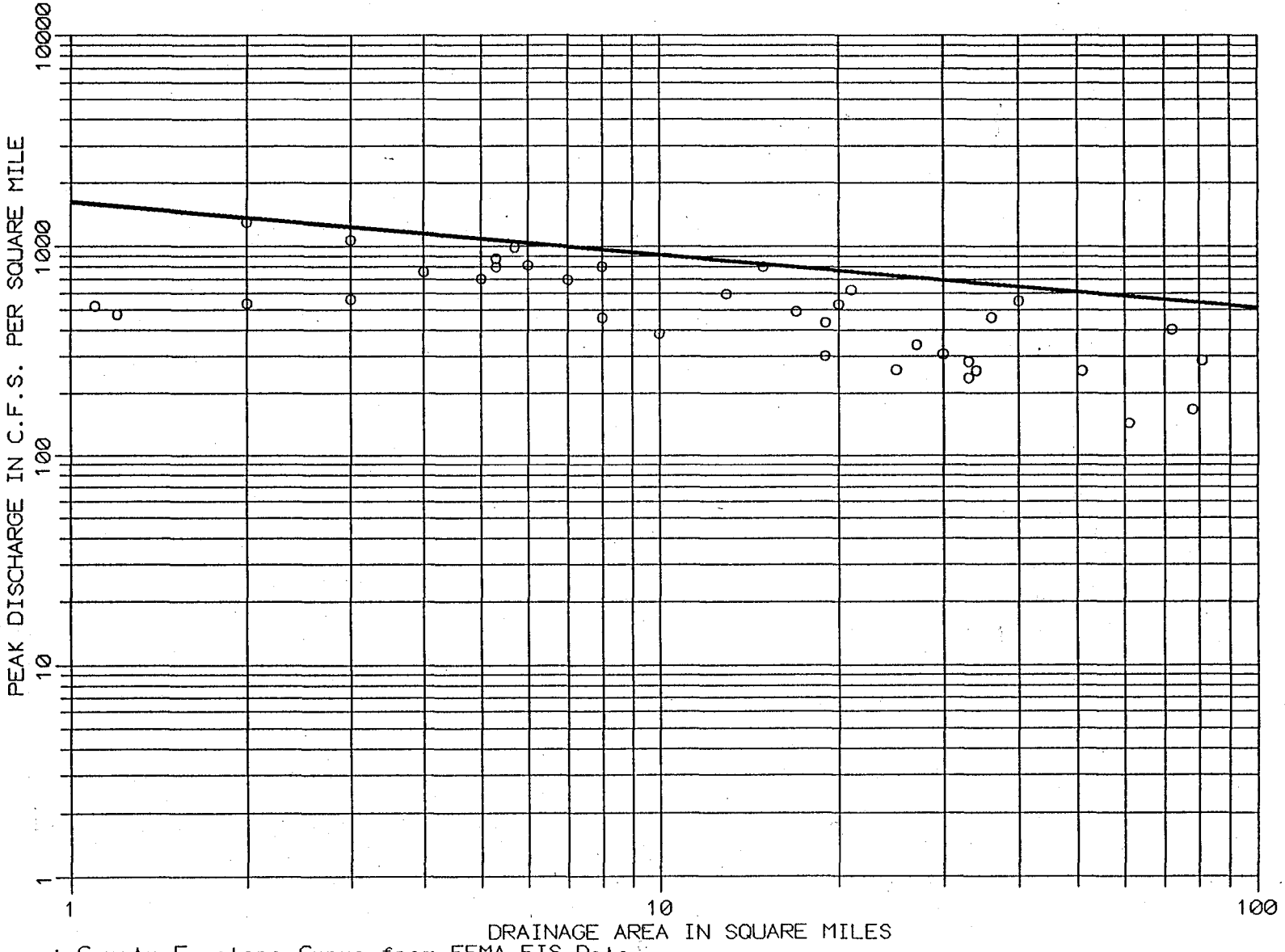
Pima County Envelope Curve from FEMA FIS Data



Pinal County Envelope Curve from FEMA FIS Data



Santa Cruz County Envelope Curve from FEMA FIS Data



Yavapai County Envelope Curve from FEMA FIS Data

Appendix F: Level 2 Example

Manning's Equation:

Water flows in a sloping drainage channel because of the force of gravity. The flow is resisted by the friction between the water and the wetted surface of the channel. The rate of flow (Q), the depth of flow (Y), and the velocity of flow (V) depend upon the channel shape, roughness and slope.

Manning's Equation for velocity of flow in open channel is:

$V = [1.49\ R^{2/3}\ S^{1/2}]\ /n$

V = Mean velocity in feet per second (fps)
n = Manning coefficient of channel roughness
R = Hydraulic radius, in feet
S = Channel slope, in feet per feet

$R = A/WP$

A = Cross-sectional area of the flowing water in square feet
WP = Wetted Perimeter, in feet

$Q = AV$ = rate of flow by continuity equation

Various hydraulic textbooks and handbooks provide tables of "n" values for various types of channels. A conservative estimate of "n" is recommended for this level of study. When channel cross-section consists of different roughness, the cross-section should be subdivided and different roughness should be used for main channel and overbanks.

Example: (See Figure 3)

Given: Q100 = 375 cfs, n = 0.030, slope = 0.005 ft/ft

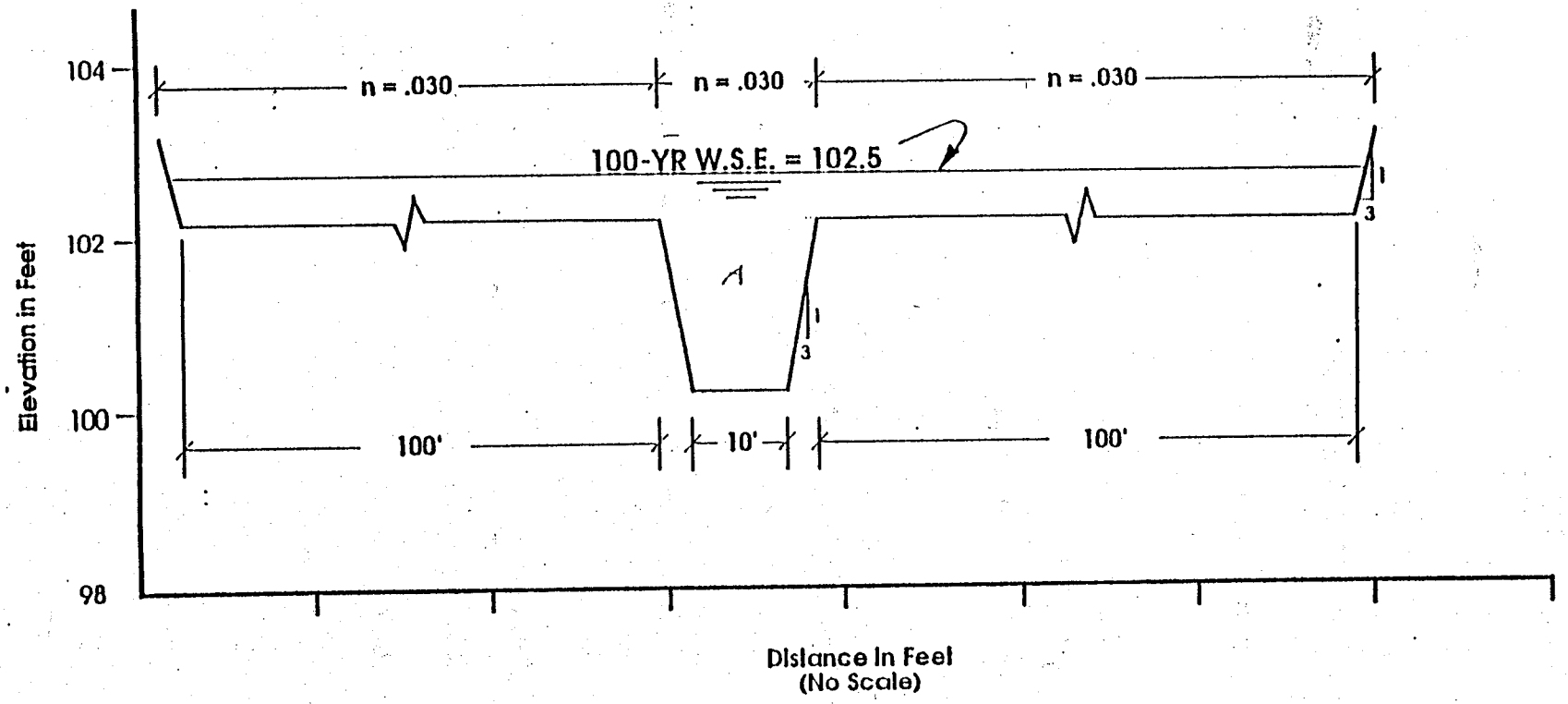
Normal Depth Y_n

Find: Velocity and depth of flow solution by trial and error to find normal depth:

Try Elev. 102 ft. Where: $Y_n = 2$ ft

Areas = $[(22 + 10)/2]/2 = 32$ ft^2
WP = $10 + 2(6.3) = 22.6$ ft
R = $32/22.6 = 1.4$ ft
V = $[1.49\ (1.41)^{2/3}\ (0.005)^{1/2}]/0.030 = 4.4$ fps
Q = $32(4.4) = 141.$ cfs
141 cfs < 375 cfs (not deep enough)

Figure 3
NORMAL DEPTH EXAMPLE CROSS SECTION



2 5528-34 0000/SS500109/ADWR fig 3

Try elev. = 102.5, Where: Y_n = 2.5 ft.

$A = [(225 + 222)\ 0.5]/2 + 32 = 143.75\ ft^2$
$A = (0.5 \times 22) + 32 = 43\ ft^2$

WP - 225.86 ft

$R = 143.75/225.86 = 0.64$ ft
$V = [1.49\ (0.64)^{2/3}\ (0.005)^{1/2}]/0.030 = 2.61$ fps
$Q = 143.75(2.61) = 375$ cfs
Qcap = Q100

Therefore: Y_n = 2.5 ft

V = 2.61 fps
100-yr. water surface elevation = 102.5 ft

Critical Depth, Y_c

Check the flow regime using the following relationships:

1. If $Q^2/g > A^3/T$ then the flow is supercritical
2. If $Q^2/g = A^3/T$ then the flow is at critical depth
3. If $Q^2/g < A^3/T$ the flow is subcritical

Q = Peak Discharge (cfs)
g = 32.2 ft/sec
A = Conveyance Area (ft^2)
T = Top Width (ft)

Checking Example:

$(375)^2/32.2 < (143.75)^3/225$
$4{,}367 < 13{,}202$

Therefore, flow is subcritical.

Solution

The water surface elevation solution of 102.5 feet (Y_n = 2.5 ft) should be used. If the flow regime is critical or supercritical then additional analysis should be made and the energy gradeline rather than the normal depth should be used. This process is repeated at several cross-sections and the respective water surface elevations are estimated. Water surface elevations between two cross-sections may be interpolated and an approximate floodplain plotted. The finished floor elevation of a structure must be a minimum of 1 foot above the highest water surface elevation adjacent to the structure.

Try elev. = 102.5, Where: Y_n = 2.5 ft.

$A = [(225 + 222)\ 0.5]/2 + 32 = 143.75\ ft^2$
$A = (0.5 \times 22) + 32 = 43\ ft^2$

WP - 225.86 ft

$R = 143.75/225.86 = 0.64$ ft
$V = [1.49\ (0.64)^{2/3}\ (0.005)^{1/2}]/0.030 = 2.61$ fps
$Q = 143.75(2.61) = 375$ cfs
Qcap = Q100

Therefore: Y_n = 2.5 ft

V = 2.61 fps
100-yr. water surface elevation = 102.5 ft

Critical Depth, Y_c

Check the flow regime using the following relationships:

1. If $Q^2/g > A^3/T$ then the flow is supercritical
2. If $Q^2/g = A^3/T$ then the flow is at critical depth
3. If $Q^2/g < A^3/T$ the flow is subcritical

Q = Peak Discharge (cfs)
g = 32.2 ft/sec
A = Conveyance Area (ft^2)
T = Top Width (ft)

Checking Example:

$(375)^2/32.2 < (143.75)^3/225$
$4{,}367 < 13{,}202$

Therefore, flow is subcritical.

Solution

The water surface elevation solution of 102.5 feet (Y_n = 2.5 ft) should be used. If the flow regime is critical or supercritical then additional analysis should be made and the energy gradeline rather than the normal depth should be used. This process is repeated at several cross-sections and the respective water surface elevations are estimated. Water surface elevations between two cross-sections may be interpolated and an approximate floodplain plotted. The finished floor elevation of a structure must be a minimum of 1 foot above the highest water surface elevation adjacent to the structure.

JMO

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

INTEROFFICE MEMORANDUM

Subject: GIS Coverages **File:** DLG

To: Division Chiefs **From:** Debbie Gobins **Date:** March 28, 1994

Attached is a list of available GIS Coverages. This list is a preliminary list for reference or to be passed on to your appropriate staff members.

Comments, additions and/or corrections should be directed to me by April 6th.

Thank You.

Coverages March 28, 1994

Coverage Name:	Description:	Path Name of Coverage:	New Pathname:	Category:
COUNTY	Maricopa County Border	/udd/adm.mld/adm.mld/fplain/county	/wombat/fcdbase/admin/county	Administration
		/udd/adm.mld/adm.mld/fplain/dams	/wombat/fcdbase/admin/dams	
SUPRDIST	Supervisory Districts Boundaries	/udd/avx4/cov/cnty_suprvd		Administration
CITIES	City Boundaries	/udd/adm.mld/city/cities	/wombat/fcdbase/admin/cities	Administration
		/udd/adm.mld/city/avon	/wombat/fcdbase/admin/avon	
		/udd/adm.mld/city/buck	/wombat/fcdbase/admin/buck	
		/udd/adm.mld/city/care	/wombat/fcdbase/admin/care	
		/udd/adm.mld/city/cave	/wombat/fcdbase/admin/cave	
		/udd/adm.mld/city/chan	/wombat/fcdbase/admin/chan	
		/udd/adm.mld/city/elmi	/wombat/fcdbase/admin/elim	
		/udd/adm.mld/city/foun	/wombat/fcdbase/admin/foun	
		/udd/adm.mld/city/gila	/wombat/fcdbase/admin/gila	
		/udd/adm.mld/city/gilb	/wombat/fcdbase/admin/gilb	
		/udd/adm.mld/city/glen	/wombat/fcdbase/admin/glen	
		/udd/adm.mld/city/good	/wombat/fcdbase/admin/good	
		/udd/adm.mld/city/guad	/wombat/fcdbase/admin/guad	
		/udd/adm.mld/city/litc	/wombat/fcdbase/admin/litc	
		/udd/adm.mld/city/mesa	/wombat/fcdbase/admin/mesa	
		/udd/adm.mld/city/para	/wombat/fcdbase/admin/para	
		/udd/adm.mld/city/peor	/wombat/fcdbase/admin/peor	
		/udd/adm.mld/city/phoe	/wombat/fcdbase/admin/phoe	
		/udd/adm.mld/city/quee	/wombat/fcdbase/admin/quee	
		/udd/adm.mld/city/scot	/wombat/fcdbase/admin/scot	
		/udd/adm.mld/city/surp	/wombat/fcdbase/admin/surp	
		/udd/adm.mld/city/temp	/wombat/fcdbase/admin/temp	
		/udd/adm.mld/city/toll	/wombat/fcdbase/admin/toll	
		/udd/adm.mld/city/wick	/wombat/fcdbase/admin/wick	
		/udd/adm.mld/city/youn	/wombat/fcdbase/admin/youn	
PHOENIX.LAN/	Satellite Spot Images	/udd/odb2/spot/phoenix		Other
GLENDALE.LAN		/udd/odb2/spot/glendale		

Coverages March 28, 1994

Coverage Name:	Description:	Path Name of Coverage:	New Pathname:	Category:
SECTION	Section & Quarter Section Corners	/udd/adm.mld/section	/wombat/fcdbase/admin/section	Administration
TNR	Township and Range	/udd/adm.mld/adm.mld/fplain/tnr	/wombat/fcdbase/admin/tnr	Administration
USGSN2	Index for USGSCN2	/udd/adm.mld/adm.mld/usr2/mcfcd/usgscn2	/wombat/fcdbase/admin/usgs	Administration
		/cover/usgsquads	/wombat/fcdbase/admin/usgsquads	
MYSTR	Streams within Maricopa County that	/udd/adm.mld/mystr	/wombat/fcdbase/water/mcstrms	Water
	have names in the USGS Quads Maps			
	All streams	/udd/adm.mld/streams	/wombat/fcdbase/water/streams	Water
	Streams for State (utm projection)	/od32a/azhydro		
MARICOPALN	Coverage with Section Lines and related	/od3a/ln/saloe		
	attributes	/od3a/ln/phxnw		
		/od3a/ln/phxne		
		/od3a/ln/trw		
		/od3a/ln/tre		
		/od3a/ln/lhome		
		/od3a/ln/phxsw		
		/od3a/ln/mesaw		
		/od3a/ln/mesae		
		/od3a/ln/datee		
		/od3a/ln/gilaw		
		/od3a/ln/gilae		Cultural Resources
SRPLU	Land Use Map	/od7a/mag/landuse4		
		/cover/mag		Other
LAVEEN/	Aerial Photographs			
PARADISE VALLEY/		/od10b		Other
WICKENBURG/		/od11b		
10 ST. WASH		/od12a		
		/od15a		
		/od15b		
		/od16a		
		/od16b		

Coverage Name:	Description:	Path Name of Coverage:	New Pathname:	Category:
		/od19a		
		/od19b		
		/od20a		
		/od20b		
		/od21a		
		/od21b		
		/od22a		
		/od22b		
		/od23a		
		/od24b		
		/od11b/se01n01e		
		/od11b/se01n01w		
		/od11b/se01n02e		
		/od11b/se01n02w		
		/od11b/sec01n03e		
		/od11b/sw01n01e		
		/od11b/sw01n01w		
		/od11b/sw01n02e		
		/od11b/sw01n02w		
		/od11b/sw01n03e		
		/od15a/1n4e/se01n04e		
		/od15a/1n2w/se01n02w		
		/od15a/1n2w/sw01n02w		
		/od15a/2s5w/ne02s05w		
		/od15a/2s5w/nw02s05w		
		/od15a/2s5w/se02s05w		
		/od15a/3n7e/ne03n07e		
		/od15a/3n7e/se03n07e		
		/od15a/3n7e/nw03n07e		
		/od15a/3n7e/sw03n07e		
		/od15b/1n1e/ne01n01e		
		/od15b/1n1e/nw01n01e		
		/od15b/1n1w/ne01n01w		
		/od15b/1n1w/nw01n01w		
		/od15b/ne03n01e		

Coverage Name:	Description:	Path Name of Coverage:	New Pathname:	Category:
		/od15b/ne04n02e		
		/od15b/nw03n01e		
		/od15b/nw04n02e		
		/od15b/se03n01e		
		/od15b/se04n02e		
		/od15b/sw03n01e		
		/od15b/sw04n02e		
		/od16a/1s3w/ne01s03w		
		/od16a/1s3w/nw01s03w		
		/od16a/1s3w/se01s03w		
		/od16a/1s3w/sw01s03w		
		/od16a/1s4w/ne01s04w		
		/od16a/1s4w/nw01s04w		
		/od16a/1s4w/se01s04w		
		/od16a/1s4w/sw01s04w		
		/od16a/1s5w/ne01s05w		
		/od16a/1s5w/nw01s05w		
		/od16a/1s5w/se01s05w		
		/od16a/1s5w/sw01s05w		
		/0d16b/1n2e/ne01n02e		
		/0d16b/1n2e/nw01n02e		
		/0d16b/1n2w/ne01n02w		
		/0d16b/1n2w/nw01n02w		
		/0d16b/salt/ne01s02w		
		/0d16b/salt/ne02n06e		
		/0d16b/salt/nw01s02w		
		/0d16b/salt/se02n06e		
		/0d16b/salt/sw02n06e		
		/0d10b/salt/ne01n03e		
		/0d10b/salt/nw01n03e		
		/0d10b/salt/ne01n04e		
		/0d10b/salt/nw01n04e		
		/0d10b/salt/ne01n05e		
		/0d10b/salt/nw01n05e		
		/0d10b/salt/se01n05e		

Coverage Name:	Description:	Path Name of Coverage:	New Pathname:	Category:
		/0d10b/salt/sw01n05e		
RD/RDHIWAY/	There is a total RD coverage that has every road			
	in the county. The hiways coverage, the mile road	/chuck/stnet/stnetcounty	/wombat/fcdbase/infra/county	Infrastructure
	coverage were extracted out of the main coverage.	/chuck/stnet/stnet	/wombat/fcdbase/infra/stnet	Infrastructure
		/udd/adm.mld/adm.mld/fplain/stroads	/wombat/fcdbase/infra/stroads	Infrastructure
RDFEW		/udd/adm.mld/adm.mld/fplain/rdfew	/wombat/fcdbase/infra/rdfew	Infrastructure
		/udd/adm.mld/arterial.e00		
PHXSOILS	Soil types for the greater Phoenix area	/od3a/phxsoils/phxne	/wombat/fcdbase/natenv/phxne_soils	Natural Environment
		/od3a/phxsoils/phxse	/wombat/fcdbase/natenv/phxse_soils	Natural Environment
		/od3a/phxsoils/trw	/wombat/fcdbase/natenv/trw_soils	Natural Environment
		/od3a/phxsoils/mesaw	/wombat/fcdbase/natenv/mesaw_soils	Administration
	(state plane)	/od17b/spsoils/soiljoin1	/wombat/fcdbase/natenv/soiljoin1	
	(state plane)	/od17b/spsoils/soiljoin2	/wombat/fcdbase/natenv/soiljoin2	
		/od17b/alris/ALRIS-TILE-NAME/cities		
		/od17b/alris/ALRIS-TILE-NAME/land		
		/od17b/alris/ALRIS-TILE-NAME/soils		
SM2	Soils within Saddleback Basin	/udd/adm.emf/saddle/sm2	/wombat/fcdbase/natenv/soilssb	Natural Environment
SOILS	Soils within Gilbert-Chandler Basin	/od7a/gilchan/soils	/wombat/fcdbase/natenv/mcsoils	Natural Environment
		aux:/udd/pluvial2/mesachan/measchan/soils		
SOILS	Soils within Gila Bend Area Basin	/udd/adm.emf/gila/soils	/wombat/fcdbase/natenv/gbsoils	Natural Environment
SOILS	Soils within Eagle Tail Basin	/udd/adm.emf/harquahala/soils	/wombat/fcdbase/natenv/etsoils	Natural Environment
BASINS	Sub basins within Eagletail Watershed Basin	/udd/adm.emf/harquahala/basins	/wombat/fcdbase/water/etbasins	Water
BASINS	Sub basins within Gila Bend Area Basin	/udd/adm.emf/gila/basins	/wombat/fcdbase/water/gbbasins	Water
BASINS	Sub basins within Saddleback Basin	/udd/adm.emf/saddle/basins	/wombat/fcdbase/water/sbbasins	Water
BASINS	Sub basins within Gilbert-Chandler Basin	/od7a/gilchan/basins	/wombat/fcdbase/water/gcbasins	Water
WASHCN2	Washes within Saddleback Basin	/udd/adm.emf/saddle/washcn2	/wombat/fcdbase/water/sbwashes	Water
LAND USE	Land use within Mesa Gilbert-Chandler Project	/od7a/gilchan/landuse	/wombat/fcdbase/cultres/gclanduse	Culture Resources
	Boundary			

Coverage Name:	Description:	Path Name of Coverage:	New Pathname:	Category:
PHOENIX LAND USE	General Land Use Map	/udd/adm.mrb/skunk/corpsw2	/wombat/fcdbase/floods/corpsw2	Floods & Floodplain
SOUTHMOUNTAIN	Topo, Roads, Washes, & Planometrics.			
	Created a 3d-Model	/udd/adm.mld/southmtn	/wombat/fcdbase/other/3dsmpts	Other
ESTRELLA	Topo, Roads, Washes, & Planometrics. Created			
	a 3d-Model	/udd/adm.mld/star		Other
SANTAN	Topographic Contours / 3d Model			
		/udd/hydro/mesachan/future		Other
WT	Topographic Contours / 3d Model	/fcdbase/WT	/wombat/fcdbase/other/wt	Other
LAVEEN	Topographic Contours	/udd/adm.stb/laveen/elv27	/wombat/fcdbase/admin/topo/laveen	Other
LAVEEN	Topographic Contour Lines	/fcdbase/tinspace/elv27	/wombat/fcdbase/other/cllaveen	Other
		/fcdbase/laveen		
	Topographic Contours / 3d Model	/od33a/trans/ALRIS-TILE-NAMES		
	Transportation for state (from census)			
LANDTOPO		/od17b/alris/ALRIS_NAMES/land	/wombat/fcdbase/admin/topo/ALRIS-NAMES	
TRILBYFIN	Parcels - Trilby Wash Detention Basin			
	Parcels along Salt River	/udd/adm.emf/trilby/trilbyfin	/wombat/fcdbase/prop/trilby	Property
	Parcels alond Skunk Creek	/wombat/crs/par_salt	/wombat/fcdbase/prop/parcsalt	
	Assorted	/wombat/crs/par_skunk	/wombat/fcdbase/prop/parcsknk	
	Parcels in the Wickenburg Area	/wombat/crs/par_lnd	/wombat/fcdbase/prop/parcland	
ADOT	Adot's drainage structure at 37th ave & Beardsley /	/wombat/crs/par_wick	/wombat/fcdbase/prop/parcwick	
	Outer Loop. Created from Adot Construction Drawings.			Infrastructure
PARCEL	Parcels along Skunk Creek. digitized from County	/udd/adm.mrb/skunk/adot	/wombat/fcdbase/infra/dsadot	
	Assessors Maps.			Property
CVL	Floodplain as defined by CVL Study of Skunk Creek.	/udd/adm.mrb/skunk/parcel	/wombat/fcdbase/prop/	
	Digitized from 1" = 400' Maps.			Floods & Floodplains
CENTER	Centerline of Flow as defined by CVL Study.	/udd/adm.mrb/skunk/cvl	/wombat/fcdbase/floods/fpcvl	
	Digitized from 1" = 400' Maps.			Infrastructure
TEXT-XS	Cross Sections of CVL study	/udd/adm.mrb/skunk/center	/wombat/fcdbase/floods/center	

Coverage Name:	Description:	Path Name of Coverage:	New Pathname:	Category:
		/od3a/firm/cross		
COP	Outline of proposed City of Phoenix structure from			Floods & Floodplains
CORPSW1	37th to 43rd Ave.	/udd/adm.mrb/skunk/text_xs	/wombat/fcdbase/infra/outphx	Infrastructure
	Outlines of the Floodplain between 37th & 43rd Ave. as	/udd/adm.mrb/skunk/cop	/wombat/fcdbase/floods/cop	Floods & Floodplain
CORPSW2	defined by Waters of the U.S., before ADOT Structure.			
	Outlines of the Floodplain between 37th & 43rd Ave. as	/udd/adm.mrb/skunk/corpsw1	/wombat/fcdbase/floods/corpsw1	Floods & Floodplain
	defined by Waters of the U.S., after ADOT Structure.			
APACHE	Apache Wash DXF Project File	/udd/adm.mld/apache/SHT3-SHT24C		Water
WATERSHEDS		/udd/adm.mrb/watershed/watershed	/wombat/fcdbase/water/ws	Water
		/cover/watersheds		
ADMS	Area Drainage Master Studies	/udd/adm.mrb/adms/adms	/wombat/fcdbase/admin/adms	Administrative
STRUCTURES	Flood Control Structures (Flood Retarding Structures,	/udd/adm.mld/adm.mld/fplain/dams	/wombat/fcdbase/infra/dams	Infrastructure
	Dams, Channels, Levees, FLoodways, Bank	/udd/adm.mld/adm.mld/fplain/projects	/wombat/fcdbase/infra/projects	Infrastructure
	Stabilization Projects, ...)			
FIRMINDEX	Index for the Firm & Floodway Maps	/udd/adm.mld/adm.mld/fplain/firmindex	/wombat/fcdbase/infra/firmidx	Infrastructure
		/udd/adm.mld/adm.mld/fplain/fcdfpindex	/wombat/fcdbase/infra/fcdidx	Infrastructure
		/od3a/firm/sheet		
USGSGAUGE	Sensors by USGS (Rain/Stream...)	/udd/adm.emf/pluvial/usgsgauge	/wombat/fcdbase/natenv/usgsgauge	Natural Environment
FCDGUAGE	Flood Control District Sensors - (Rain/Stream...)	/fcdbase/guages/newprecip	/wombat/fcdbase/natenv/nprecip	Natural Environment
		/fcdbase/guages/newstage	/wombat/fcdbase/natenv/nstage	
HYDCN1	USGS Hydrological Unit Codes	/emf/hydro/hydcn1	/wombat/fcdbase/natenv/hydusgs	Natural Environment
ZONES	Floodplain Fema Zones	/udd/adm.mld/zones/zones	/wombat/fcdbase/floods/zones	Flood & Floodplains
		/udd/adm.mrb/fplain/zones/fpznfema	/wombat/fcdbase/floods/fpznfema	

Coverage Name:	Description:	Path Name of Coverage:	New Pathname:	Category:
SWE	Surface Water Elevation within the floodway zone	/udd/adm.mrb/fplain/zones/fpsrfelv	/wombat/fcdbase/floods/fpsrfelv	Floods & Floodplains
BM	Bench marks on the area as represented by	/udd/adm.mrb/fplain/zones/ctrl	/wombat/fcdbase/floods/ctrl	Floods & Floodplains
	the Firm Maps			
MC ELEV POINTS		/udd/adm.mld/countyhill	/wombat/fcdbase/floods/ctyhill	Floods & Floodplains

Manual of Photogrammetry

Fourth Edition

Editor-in-Chief
Chester C Slama

Associate Editors
Charles Theurer
Soren W. Henriksen

American Society of Photogrammetry

1000 feet, requiring detailed mapping at a scale of one inch to 50 feet with contours at one-foot or two-foot intervals depending upon conditions. Obviously, this approach will provide a great deal of savings compared to preparing large scale mapping of the entire area under consideration at the outset.

7.1.3.6 Map Accuracy Standards

The accuracy of a map is determined by comparing the position and/or elevation of a feature on a map with the position and elevation of that feature as determined by field surveys. This comparison presumes that there is no discernible error in the survey.

The Office of Management and Budget has stated:

> With the view to the utmost economy and expedition in producing maps which fulfill not only the broad needs for standard or principal maps, but also the reasonable particular needs of individual agencies, standards of accuracy for published maps are defined as follows.
>
> 1. *Horizontal accuracy*. For maps on publication scales larger than 1:20,000, not more than 10 percent of the points tested shall be in error by more than 1/30 inch, measured on the publication scale: for maps on publication scales of 1:20,000 or smaller, 1/50 inch. These limits of accuracy shall apply in all cases to positions of well defined points only. "Well defined" points are those that are easily visible or recoverable on the ground, such as the following: monuments or markers, such as bench marks, property boundary monuments; intersections of roads, railroads, *etc.*; corners of large buildings or structures (or center points of small buildings), *etc.* In general what is "well defined" will also be determined by what is plottable on the scale of the map within 1/100 inch. Thus while the intersection of two road or property lines meeting at right angles, would come within a sensible interpretation, identification of the intersection of such lines meeting at an acute angle would obviously not be practicable within 1/100 inch. Similarly, features not identifiable upon the ground within close limits are not to be considered as test points within the limits quoted, even though their positions may be scaled closely upon the map. In this class would come timber lines, soil boundaries, *etc.*
> 2. *Vertical accuracy*, as applied to contour maps on all publication scales, shall be such that not more than 10 percent of the elevations tested shall be in error more than one-half the contour interval. In checking elevations taken from the map, the apparent vertical error may be decreased by assuming a horizontal displacement within the permissible horizontal error for a map of that scale.
> 3. The accuracy of any map may be tested by comparing the positions of points whose locations or elevations are shown upon it with corresponding positions as determined by surveys of a higher accuracy. Tests shall be made by the producing agency, which shall also determine which of its maps are to be tested, and the extent of such testing.
> 4. Published maps meeting these accuracy requirements shall note this fact in their legends, as follows: "This map complies with national map accuracy standards."
> 5. Published maps whose errors exceed those aforestated shall omit from their legends all mention of standard accuracy.
> 6. When a published map is a considerable enlargement of a map drawing (*manuscript*) or of a published map, that fact shall be stated in the legend. For example, "This map is an enlargement of a 1:20,000 scale map drawing," or "This map is an enlargement of a 1:24,000 scale published map."
> 7. To facilitate ready interchange and use of basic information for map construction among all Federal map-making agencies, manuscript maps and published maps, wherever economically feasible and consistent with the uses to which the map is to be put, shall conform to latitude and longitude boundaries, being 15 minutes of latitude and longitude, or 7½ minutes, or 3¾ minutes in size.

The Reference Guide Outline (The Photogrammetry for Highways Committee, 1968)

> A. *Contours*—Ninety (90) percent of the elevations determined from the solid-line contours of the topographic maps shall have an accuracy with respect to true elevation of one-half (½) contour interval or better and the remaining ten (10) percent of such elevations shall not be in error by more than one contour interval. This accuracy shall apply only to the contours which are on each map. Thus, in each particular area where the intermediate contours have had to be omitted because of the steepness of the ground slopes and only the index contours are delineated on the maps, the accuracy stipulations apply to contour interval of the index contours. Wherever the intermediate contours are not omitted, of course, the accuracies are applicable to the contour interval specified for the topographic maps. In densely wooded areas where heavy brush or tree cover fully obscures the ground and the contours are shown as dashed lines, they shall be plotted as accurately as possible from the stereoscopic model, while making full use of spot elevations obtained during ground-control surveys and all spot elevations measured photogrammetrically in places where the ground is visible.
> B. *Coordinate-Grid Lines*—The plotted position of each plane coordinate grid line shall not vary by more than one one-hundredth (1/100) of an inch from true grid value on each map manuscript.
> C. *Horizontal Control*—Each horizontal control point shall be plotted on the map manuscript within the coordinate grid in which it should lie to an accuracy of one one-hundredth (1/100) of an inch of its true position as expressed by the plane coordinates computed for the point.
> D. *Planimetric Features*—Ninety (90) percent of all planimetric features which are well-defined on the photographs shall be plotted so that their position on the finished maps shall be accurate to within at least one-fortieth (1/40) of an inch of their true coordinate position, as determined by

the test surveys, and none of the features tested shall be misplaced on the finished map by more than one-twentieth (1/20) of an inch from their true coordinate position. The true coordinate position shall be determined by making accurate measurements originating and closing on station markers of the project basic control survey, which shall have a closure accuracy conforming with the requirements for the basic control.

E. *Special Requirements*—When stipulated in special provisions that all specified features (planimetry and contours) shall be delineated on the maps, regardless of whether they can or cannot be seen on the aerial photographs and on stereoscopic models formed therefrom, the consultant shall complete compilation of the required maps by field surveys on the ground so as to comply with all accuracy and completeness stipulations.

F. *Spot Elevations*—Ninety (90) percent of all spot elevations placed on the maps shall have an accuracy of at least one-fourth (¼) the contour interval, and the remaining ten (10) percent shall be not in error by more than one-half (½) the contour interval.

Both versions of these accuracy statements are widely used in specifications for mapping projects.

7.2 Planning and Execution

The most basic photogrammetric project will prove difficult or costly without proper planning. Larger, more complicated projects can evolve quickly into disjointed efforts which in the end will produce unsatisfactory results both for the photogrammetrist and the client. It is incumbent upon the project planner to obtain all relevant source material; to organize this material into a logical and easily understood system; to decipher critical or ambiguous requirements in the project specifications; to determine the most efficient method for meeting project requirements; and finally to prepare a concise and organized job order, including all of the elements which will govern the conduct of work in each department.

7.2.1 AERIAL PHOTOGRAPHY

The aerial photograph is the base upon which the photogrammetric project is built. The success of the project consequently depends greatly on the availability of suitable photographic coverage.

Suitable coverage for a project depends on many factors of which several are of particular importance:

a. scale of photography;
b. overlap between exposures;
c. optical and mechanical characteristics of the taking camera;
d. film base and emulsion type used; and
e. date of photography.

Existing aerial coverage of the project can be ordered from public or some private mapping agencies when available. Such coverage may not be of optimum quality for photogrammetric use. In such instances, purchase of the coverage would constitute poor planning for execution of the project, although it might prove quite useful for advance project estimating and planning. The user should consider carefully whether the compromises which may be necessary with existing aerial photographs can be offset by an immediate savings in time and costs.

New aerial photography flown especially for the photogrammetric project can be designed to meet exact requirements of the project and has much to recommend it. Projects requiring targeting of ground points would necessarily require new aerial coverage. In instances where the user has decided on acquisition of new aerial photographs, a broad selection of film and cameras is available to meet every need.

7.2.1.1 Choice of Emulsion

Films for color and black-and-white photography are manufactured for aerial use. Both types are also manufactured with limited sensitivity in the near infrared[1] part of the spectrum. Each type has certain inherent advantages and limitations which must be carefully considered before use. Chapter VI covers photographic emulsions in detail. The following is a brief outline to assist the planner.

7.2.1.1.1 Panchromatic Emulsions

Panchromatic emulsions are black-and-white types with a color sensitivity similar to that of the human eye. Their sensitivity to blue and ultra-violet usually requires that a yellow antihaze filter be used for aerial work. These emulsions are produced in a wide range of "film speeds" for different conditions. The slower emulsions generally have high resolution, making them ideal for photo enlargements and for many aerial mapping and measurement applications.

Panchromatic films are inexpensive and have a wide exposure latitude as compared to color. They are easy to process and are widely used throughout the industry. Panchromatic emulsions are considered inferior to color for interpretative uses although they are used for multispectral recording.

[1] Not to be confused with infrared thermal detection systems which work on non-photographic principles.

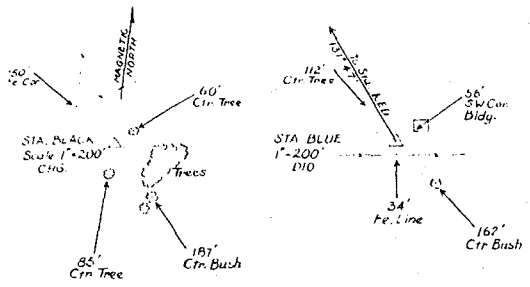


FIGURE 8-18. Identification by reference measurement.

plemental photographs. The identification of control stations is then transferred from the supplemental photographs to the bridging or mapping photographs. With proper precautions, this method provides an accurate means of identification of the control stations on the bridging or mapping photographs. The size of the targets will be determined by the flight height of the supplemental photographs.

The supplemental photographs can be taken from helicopters or small aircraft with hand-held cameras of short focal length (35, 50 or 70 mm). The scale of the supplemental photographs should not be more than 4× the scale of the bridging or mapping photographs. Thus, the flight height for the supplemental photographs may be anywhere from 700 m to 1700 m above ground, depending upon the focal lengths of the cameras used. At least two exposures should be made over each target, preferably in such manner as to provide stereoscopic coverage. While the physical limitations of using hand-held cameras are recognized, every effort should be made to maintain the camera axis as nearly vertical as possible.

The most accurate means of transferring the target identification from the supplemental photographs to the bridging or mapping photographs is by stereoscopic transfer in which one supplemental photograph is fused with a bridging or mapping photograph covering the same area. It is for this reason that it is desirable to take the supplemental photographs at the same scale as the mapping or bridging photographs. This cannot always be done because of flight ceilings of the small aircraft and time limitations. In any case, the scale of the supplemental photographs should be not greater than 4× the scale of the bridging or mapping photographs; reduced-scale prints of the supplemental photographs can then be readily made in the laboratory for the stereoscopic transfer.

8.7.5 IDENTIFICATION OF VERTICAL CONTROL

The preceeding sections relate primarily to the identification of horizontal control, which poses the more critical identification problems, but the methods described may also be used for the identification of vertical control stations.

In most mapping projects, many of the vertical-control stations are separate from the horizontal-control stations and are easier to identify. Images are chosen in selected flat or relatively flat areas. These usually show clearly on the photographs, and the station point can be marked or pricked directly without great difficulty.

The area selected in which a vertical-control station is to be identified on the photographs should be sufficiently level so that a slight horizontal error in setting the floating mark on the identified point does not result in an appreciable error in the elevation reading. Although preferred when such a site is available, it is not essential that the ground be level completely around the vertical control station.

8.8 Field Surveys for Topographic Mapping

8.8.1 INTRODUCTION

Field surveys are required to identify basic control (*see* section 8.7), provide supplementary control, clarify obscured photographic detail, classify cultural features (roads, buildings), locate political boundaries, and check the horizontal and vertical accuracy of the map.

Field surveys are referred to as field inspection or classification surveys (accomplished before compilation) or field edit or completion surveys (after map compilation).

8.8.2 FIELD INSPECTION AND CLASSIFICATION SURVEYS

Field inspection and classification surveys consist of identification of horizontal and vertical control, establishment of supplementary control and providing all data necessary to compile the map. It is sometimes practical and efficient at this time to obtain *all* of the information required and so eliminate the need for a subsequent field completion survey.

All permanently marked horizontal or vertical control points of third-order accuracy or better are shown by proper symbol together with the elevation and designation of each mark.

Spot elevations conforming to special accuracy standards are obtained to provide more accurate elevations for particular points or features than can be interpolated from contours, and to supplement the contour information in flat areas where the contours are widely spaced. These

spot elevations should be on important planimetric features or significant topographic points where they are recoverable and will be helpful to the map user.

The entire road net is checked: newly constructed roads are added; roads not mapworthy are deleted; all roads are classified according to specified standards; federal, state, and county routes are labeled; number of lanes, traffic restrictions, and road and median widths, are noted. Buildings intended for human shelter or activities, such as houses, stores, and factories, are shown as class 1. Prominent barns, warehouses, garages, and the like are shown as class 2. Churches and schools are shown with distinctive symbols. Within built-up urban areas on medium-scale maps, only landmark-buildings, such as churches, schools, and public buildings, are symbolized. Buildings are classified on the fieldsheet, and landmark buildings are named or labeled on the information sheet.

Civil boundaries are mapped almost entirely by field methods. Monuments and other ground evidence must be identified and mapped. Legal descriptions are obtained whenever possible. A limited number of section corners are usually located during control operations and are shown on the compiled manuscript. Using a tentative land net as a guide, the compiler may plot recoverable objects near each probable position of a section corner as a guide for the field location. Compiled fence and crop lines, or cut lines in timber, are also guides for locating section corners and boundaries.

Drainage features, including shorelines, are usually compiled with the *intermittent* symbol—dashes separated by three dots; dashed lines are used where the channel is indefinite on the photographs. Fieldmen are responsible for classifying the hydrographic features as perennial or intermittent streams, for determining the normal water-surface level in certain cases, for ascertaining stream widths where the symbol size depends on this, and in general for field-mapping any hydrographic feature not compiled or compiled incorrectly. The objective in field classification of drainage is to represent by symbol those water features that can be expected to contain water. If, under conditions of average flow, the feature contains water all year, it is classified as perennial. Those features that normally contain water only a part of the year are classified as intermittent. In arid and semiarid regions of the West, dry washes or streams which contain water for only a few hours after a rainstorm or brief, heavy snowmelt are classified in a separate category.

Ordinarily, woodland outlines are classified correctly and shown in correct position during stereocompilation, and the field-completion inspection is limited to finding gross omissions or misinterpretations of the photographs. The inspection during completion surveys should cover dark areas on the photographs which may have been plotted as woodland; changes due to new clearings or new growth; consistency in compiling boundaries where woods are bordered by scattered trees or brush; and mapping and classifying orchards and vineyards. Wooded areas that are submerged are also noted.

Fieldmen have full responsibility for collecting name information. This includes obtaining the existing names of all map features; ascertaining the correct form and spelling; determining the location and limits of the features to which the names apply; and, in some cases, specially investigating names that are controversial or conflicting. To carry out this part of the field completion assignment properly, fieldmen should obtain name information whenever opportunities occur during the job. All available sources of information should be consulted—reference works of various kinds, published maps of the area, official records, and especially local residents. The pre-edit information must be carefully checked, and all discrepancies investigated. In the federal mapmaking agencies, a special report is submitted by the fieldman on each discrepancy that cannot be resolved. This report must be filled out completely and well documented, because it is used as evidence for a decision by the Board on Geographic Names. All names to be published are shown on an overlay in the approximate position they will occupy on the published map. If the application of a name is not clear, this should be indicated by encircling in ink the feature in question or connecting it to the name by an arrow.

Areas of special cultural activity, such as industrial, mining, public recreation, and historic areas, require careful treatment during field completion because of the density of detail and the special interest in these map areas. These features are symbolized on the fieldboard and labeled on the oversheet. Linear features, such as powerlines, pipelines, and fencelines, are shown for their landmark character. Large transmission lines assume such landmark importance that individual steel towers are located and shown.

8.8.3 FIELD COMPLETION AFTER MAP COMPILATION

Field completion after map compilation is essentially planetable mapping in which all additions and changes are made concurrently. The planetable worksheet is a copy of the stereocompilation reproduced on metal-mounted paper or on coated plastic at the appropriate field scale. An extra print may also be prepared for recording supplemental information. It is advisable to have a complete set of control notes, the aerial photographs used for supplemental control, copies of township plats (in public-land states), coastal charts, and other

maps of the area for guidance in obtaining complete name coverage and other mapworthy information. Comments noted by the compiler are also very valuable in calling attention to weak or doubtful areas of compilation.

A fieldman reviews and evaluates the compilation for completeness of detail and for proper topographic expression of features. He studies intricate drainage areas and special features requiring supplementary contours. He determines the best access routes into the mapped area; possible locations for important spot elevations; boundary lines to be mapped or investigated; and any unusual problems that may arise in connection with drainage, roads, urban areas, or other map features. In public-land states, he prepares a preliminary land-net adjustment as a guide in searching for section corners.

The importance of planning on a day-to-day or week-to-week basis cannot be overemphasized. It is essential to efficient field-completion work since fieldmen must consider such a wide variety of problems. They are concerned with map names, boundaries and sectionizing, contour accuracy, roads and road classification, building classification, landmark features, drainage classification, spot elevations, control marks, and, in fact, every feature that appears on the map, taken separately and collectively. For efficiency, several objectives must be accomplished concurrently; for example, a traverse to map a new road serves also to check and correct the contours, classify buildings and drainage, and possibly to locate section corners or boundaries. Return visits to a local area should be avoided by obtaining all the necessary information required in that locality during the first visit.

Field inspection is a detailed comparison of the map compilation with the ground it portrays. Inspection made at a planetable station may reveal deficiencies in the compilation; if so, measurements are made from the same station to correct them. This is not the only inspection procedure, however. While walking over trails, driving over roads or flying over an area, constant inspection should be a habitual practice because it is very useful in detecting errors or omissions. Fieldmen must visualize the terrain in terms of contours and other map symbols. They should detect errors and repair spots where slight reshaping of contours will more nearly portray the features correctly. Familiarity with all items of map content is necessary for the fieldmen to develop skill as topographers.

The basic operation in field completion is planetable mapping. This means that corrections and additions to and deletions from the manuscript are made while actually viewing the features, using the alidade to determine positions and elevations necessary for the process. Map features are tested in the same manner. Both horizontal and vertical accuracy standards must be met by all planetable surveys.

Plotting or recording the assembled information is a major activity in field completion so that it may be completely and clearly presented in standardized form. This information is recorded on either the fieldsheet or the information sheet. Scribing on coated Mylar sheets provides a dimensionally stable, permanent record. For this purpose, a field scribing kit is needed, containing a fine-line graver, a template for symbols, a french curve, a special blade for scribing roads, a building graver, and a supply of extra scribing needles.

8.8.4 ACCURACY CHECKING

Certification that a map meets National Map Accuracy Standards is based on checking relative accuracy during the field-completion phase and specific tests of absolute accuracy.

8.8.4.1 Checking of Horizontal Accuracy

Horizontal accuracy is checked on a sample of three percent of the maps produced, by determining third-order positions for at least 20 well-defined map features per test. At least 90 percent of these tested map positions must agree within 1/50 inch of the surveyed position, for scales of 1:20,000 or smaller. For scales larger than 1:20,000, 1/30 inch is allowed.

8.8.4.2 Checking of Vertical Accuracy

Vertical accuracy is checked on each project with the number of test points determined by the size of the project, but there must be at least 20. More testing is done in areas of low relief where contour intervals are smaller. Field elevations are obtained by stadia traverse, trigonometric leveling, or fly levels, and must be accurate with 0.1 of the contour interval. In order to meet National Map Accuracy Standards on the project, at least 90 percent of the elevations tested on a map must agree with the field elevations within half of the contour interval. In determining vertical accuracy, the apparent vertical error may be decreased by assuming a horizontal displacement within the permissible horizontal error for a map at the scale of the one being tested.

8.9 Field Surveys for Coastal Mapping

Over the past 25 years, techniques and procedures have been accumulated and perfected to collectively form the basis for modern coastal mapping. These operations include premarking

SURVEYORS BE AWARE

The SBTR currently interprets code and rules so that a surveyor/engineer must seal a photogrammetrically prepared map product ie. boundary/topographic even though produced by a non-regulated (no LS/PE) mapping firm. With this condition present, it is beneficial, if not crucial, that each responsible registrant have a working knowledge of the photogrammetric process and skill to validate the resultant map product upon which s/he places his/her seal.

ASPRS INTERIM ACCURACY STANDARDS FOR LARGE-SCALE MAPS

The American Society for Photogrammetry
and Remote Sensing - 1988

These standards have been developed by the Specifications and Standards Committee of the American Society for Photogrammetry and Remote Sensing (ASPRS). It is anticipated that these ASPRS standards may form the basis for revision of the U.S. National Map Accuracy Standards for both small-scale and large-scale maps. A major feature of these ASPRS standards is that they indicate accuracy at ground scale. Thus, digital spatial data of known ground-scale accuracy can be related to the appropriate map scale for graphic presentation at a recognized standard.

These standards concern the definitions of spatial accuracy as they pertain to large-scale topographic maps prepared for special purposes or engineering applications. Emphasis is on the final spatial accuracies that can be derived from the map in terms most generally understood by the users.

1. Horizontal Accuracy:

Horizontal map accuracy is defined as the rms error[1] in terms of the project's planimetric survey coordinates (X, Y) for checked points as determined at full (ground) scale of the map. The rms error is the cumulative result of all errors including those introduced by the processes of ground control surveys, map compilation and final extraction of ground dimensions from the map. The limiting rms errors are the maximum permissible rms errors established by this standard. These limiting rms errors for Class 1. maps are tabulated in Table 1E (feet) and Table 1M (meters) along with typical map scales associated with the limiting errors. These limits of accuracy apply to tests made on well-defined points only[2].

TABLE 1E. — PLANIMETRIC COORDINATE ACCURACY REQUIREMENT (GROUND X OR Y IN FEET) FOR WELL-DEFINED POINTS - CLASS 1. MAPS

PLANIMETRIC (X or Y) ACCURACY[3] (limiting rms error, feet)	TYPICAL MAP SCALE
0.05	1:60
0.1	1:120
0.2	1:240
0.3	1:360
0.4	1:480
0.5	1:600
1.0	1:1,200
2.0	1:2,400
4.0	1:4,800
5.0	1:6,000
8.0	1:9,600
10.0	1:12,000
16.7	1:20,000

* indicates the practical limit for aerial methods - for scales above this line, ground methods are normally used

2. Vertical Accuracy:

Vertical map accuracy is defined as the rms error in elevation in terms of the project's elevation datum for well-defined points only. For Class 1. maps the limiting rms error in elevation is set by the standard at *one-third* the indicated contour interval for well-defined points only. Spot heights shall be shown on the map within a limiting rms error of *one-sixth* of the contour interval.

TABLE 1M — PLANIMETRIC COORDINATE ACCURACY REQUIREMENT (GROUND X AND Y IN METERS) OF WELL-DEFINED POINTS - CLASS 1. MAPS

PLANIMETRIC (X or Y) ACCURACY[3] (limiting rms error, meters)	TYPICAL MAP SCALE
0.0125	1:50
0.025	1:100
0.050	1:200
0.125	1:500
0.25	1:1,000
0.50	1:2,000
1.00	1:4,000
1.25	1:5,000
2.50	1:10,000
5.00	1:20,000

* indicates the practical limit for aerial methods - for scales above this line ground methods are normally used

3. Lower-Accuracy Maps:

Map accuracies can also be defined at lower spatial accuracy standards. Maps compiled with limiting rms errors of twice or three times those allowed for a Class 1. map shall be designated Class 2. or Class 3. maps respectively. A map may be compiled that complies with one class of accuracy in elevation and another in plan. Multiple accuracies on the same map are allowed provided a diagram is included which clearly relates segments of the map with the appropriate map accuracy class.

4. Map Accuracy Test[4]:

Tests for compliance of a map sheet are optional. Testing for horizontal accuracy compliance is done by comparing the planimetric (X and Y) coordinates of well-defined ground points to the coordinates of the same points as determined by a horizontal check survey of higher accuracy. The check survey shall be designed according to the Federal Geodetic Control Committee (FGCC) [FGCC, 1984] standards and specifications to achieve standard deviations equal to or less than *one-third* of the "limiting rms error" selected for the map. The distance between control points (d) used in the FGCC standard for the design of the survey shall be the horizontal ground distance across the diagonal dimension of the map sheet.

Testing for vertical accuracy compliance shall be accomplished by comparing the elevations of well-defined points as determined from the map to corresponding elevations determined by a survey of higher accuracy. For purposes of checking elevations, the map position of the ground point may be shifted in any direction by an amount equal to twice the limiting rms error in position. The vertical check survey should be designed to produce rms errors in elevation differences at check point locations no larger than *1/20th of the contour interval*. The distance (d) between bench marks used in the FGCC standard for the design of the surveys vertical check surveys shall be the horizontal ground distance across the diagonal of the map sheet. Generally, vertical control networks based on surveys conducted according to the FGCC standards for Third Order provide adequate accuracy for conducting the vertical check survey.

[1]see Appendix A., Section A1.
[2]see Appendix A., Section A2.
[3]see Appendix A., Section A3.
[4]see Appendix A., Section A4.

Discrepancies between the X, Y, or Z coordinates of the ground point, as determined from the map and by the check survey, that exceed *three* times the limiting rms error shall be interpreted as blunders and will be corrected before the map is considered to meet this standard.

The same survey datums, both horizontal and vertical, must be used for both the project and the check control surveys. Although a national survey datum is preferred, a local datum is acceptable.

A minimum of 20 check points shall be established throughout the area covered by the map and shall be distributed in a manner agreed upon by the contracting parties[5].

Maps produced according to this spatial accuracy standard shall include the following statement in the title block:

THIS MAP WAS COMPILED TO MEET THE ASPRS STANDARD FOR CLASS 1. MAP ACCURACY

If the map was checked and found to conform to this spatial accuracy standard, the following statement shall also appear in the title block:

THIS MAP WAS CHECKED AND FOUND TO CONFORM TO THE ASPRS STANDARD FOR CLASS 1. MAP ACCURACY

APPENDIX A. *EXPLANATORY COMMENTS*

A1. Root Mean Square Error

The "root mean square" (rms) error is defined to be the square root of the average of the squared discrepancies. In this case, the discrepancies are the differences in coordinate or elevation values as derived from the map and as determined by an independent survey of higher accuracy (check survey). For example, the rms error in the X coordinate direction can be computed as:

$rms_x = \sqrt{(D^2/n)}$

where:

$D^2 = d_1^2 + d_2^2 + \text{--------} + d_n^2$

d = discrepancy in the X coordinate direction
$= X_{map} - X_{check}$

n = total number of points checked on the map in the X coordinate direction

A2. Well-defined Points

The term "well-defined points" pertains to features that can be sharply identified as discrete points. Points which are not well-defined (that is poorly-defined) are excluded from the map accuracy test. In the case of poorly-defined image points, these may be of features that do not have a well-defined center such as roads that intersect at shallow angles [U.S. National Map Accuracy Standards, 1941]. In the case of poorly defined ground points, these may be such features as soil boundaries or timber boundaries. As indicated in the ASPRS Standard, the selection of well-defined points is made through agreement by the contracting parties.

A3. Relationship to U.S. National Map Accuracy Standards

Planimetric accuracy in terms of the "limiting rms error" can be related to the United States National Map Accuracy Standards (NMAS) provided the following assumptions are made:

- the discrepancies are normally distributed about a zero mean
- the standard deviations in the X and Y coordinate directions are equal
- sufficient check points are used to accurately estimate the variances

To compute the "circular map accuracy standard" (CMAS) which corresponds to the 90% circular map error defined in the NMAS [ACIC, 1962, p. 26, p. 41]:

$CMAS = 2.146\ \sigma_x$ or; $CMAS = 2.146\ \sigma_y$

Given these relationships and assumptions, the limiting rms errors correspond approximately to the CMAS of 1/47th of an inch for all errors and related scales indicated in Table 1E. For the metric case indicated in Table 1M, the CMAS is 0.54 mm for all rms errors and corresponding scales. It is emphasized that for the ASPRS Standard, spatial accuracies are stated and evaluated at *full or ground scale*. The measures in terms of equivalent CMAS are only approximate and are offered only to provide a comparison to the National Map Accuracy Standard of CMAS of 1/30th inch at map scale.

A4. Check Survey

Both the vertical and horizontal (planimetric) check surveys are designed based on the National standards of accuracy and field specifications for control surveys established by the Federal Geodetic Control Committee (FGCC). These standards and specifications [FGCC, 1984] are intended to establish procedures which produce accuracies in terms of relative errors. For horizontal surveys, the proportional accuracies for the various orders and classes of survey are stated in Table 2.1 of the FGCC document and for elevation accuracy in Table 2.2. These tables along with their explanations are reproduced here. From FGCC [1984]:

"2.1 HORIZONTAL CONTROL NETWORK STANDARDS

When a horizontal control is classified with a particular order and class, NGS certifies that the geodetic latitude and longitude of that control point bear a relation of specific accuracy to the coordinates of all other points in the horizontal control network. This relationship is expressed as a distance accuracy, 1:a. A distance accuracy is the ratio of relative positional error of a pair of control points to the horizontal separation of those points.

TABLE 2.1 — DISTANCE ACCURACY STANDARDS

Classification	Minimum distance accuracy
First-order.....	1:100,000
Second-order, class I	1: 50,000
Second-order, class II....	1: 20,000
Third-order, class I.....	1: 10,000
Third-order, class II	1: 5,000

" A distance accuracy, 1:a, is computed from a minimally constrained, correctly weighted, least squares adjustment by

$$a = d/s$$

where

a = distance accuracy denominator

s = propagated standard deviation of distance between survey points obtained from the least squares adjustment

d = distance between survey points"

[5]see Appendix A., Section A5.

ADOT MAP SPEC.S

PHOTOGRAMMETRY & MAPPING STANDARD SPECIFICATIONS

Arizona Department of Transportation
1986

Where the profile gradient is 2 percent or less, spot elevations shall be shown at intervals not greater than 2 inches at final map scale, along the center of lakes, roads, ditches, and railroads. Spot elevations shall be shown at all sags and crests regardless of gradient.

Spot elevations shall be shown at intervals not exceeding 2 inches at final map scale, along the boundary of the area to be mapped at locations where the nearest contour is over 1 inch from the boundary.

Where interpolation of the contours will not show correct elevations, such as summits, depressions, saddles, and road intersections, spot elevations shall be shown.

5-1.76 In the event that discrepancies should occur between information furnished by the Contracting Engineer and information obtained by the Consultant in performance of his work, the Consultant shall immediately notify the Engineer. The Engineer will investigate the facts, and advise the Consultant in writing, on how to resolve the discrepancy. The instructions issued by the Contracting Engineering shall be final and conclusive.

5-1.80 Planimetric Features.--

5-1.81 All planimetric features which are visible or identifiable on or are interpretable from the aerial photography shall be shown. Features which are to be included on the plan sheet entitled, "Drafting Standards and Standard Symbols", shall be shown and labeled. Particular attention shall be given to include utility and drainage features, fences, walls, and other indications of property lines or lines of occupation.

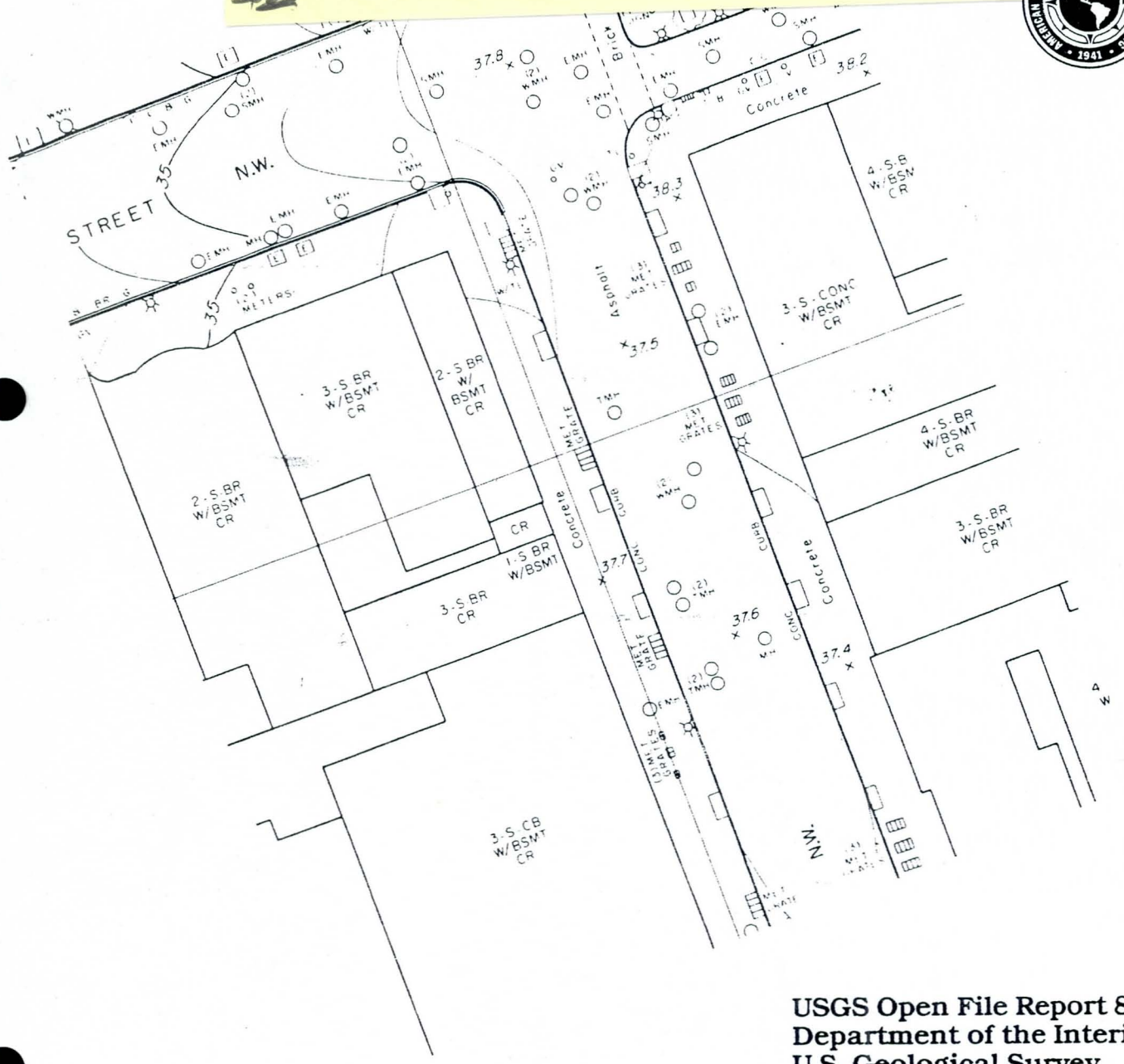
The maps shall show all roads, railroads, bridges, canals, streams, dams, fence lines, wells, power and telephone poles, and billboards which are visible on the aerial photographs. They shall also show boundaries of timber and brush areas, slide and slip out areas, orchards, vineyards, and any other improvements or distinguishing features which are visible on the aerial photographs.

Orchards planted in regular rows may be symbolized by a dot for each tree, except for the outer rows which shall be shown by appropriate symbol. Free standing trees having a crown diameter of 15 feet or more shall be shown.

JAN:

HERE ARE SOME DIFFERENT MAPPING SPECIFICATIONS THAT RICHARD COOK GAVE TO PEDRO. THIS SET IS FOR YOUR USE. ALSO ATTACHED IS A WORDPERFECT TEMPLATE FOR YOUR USE.

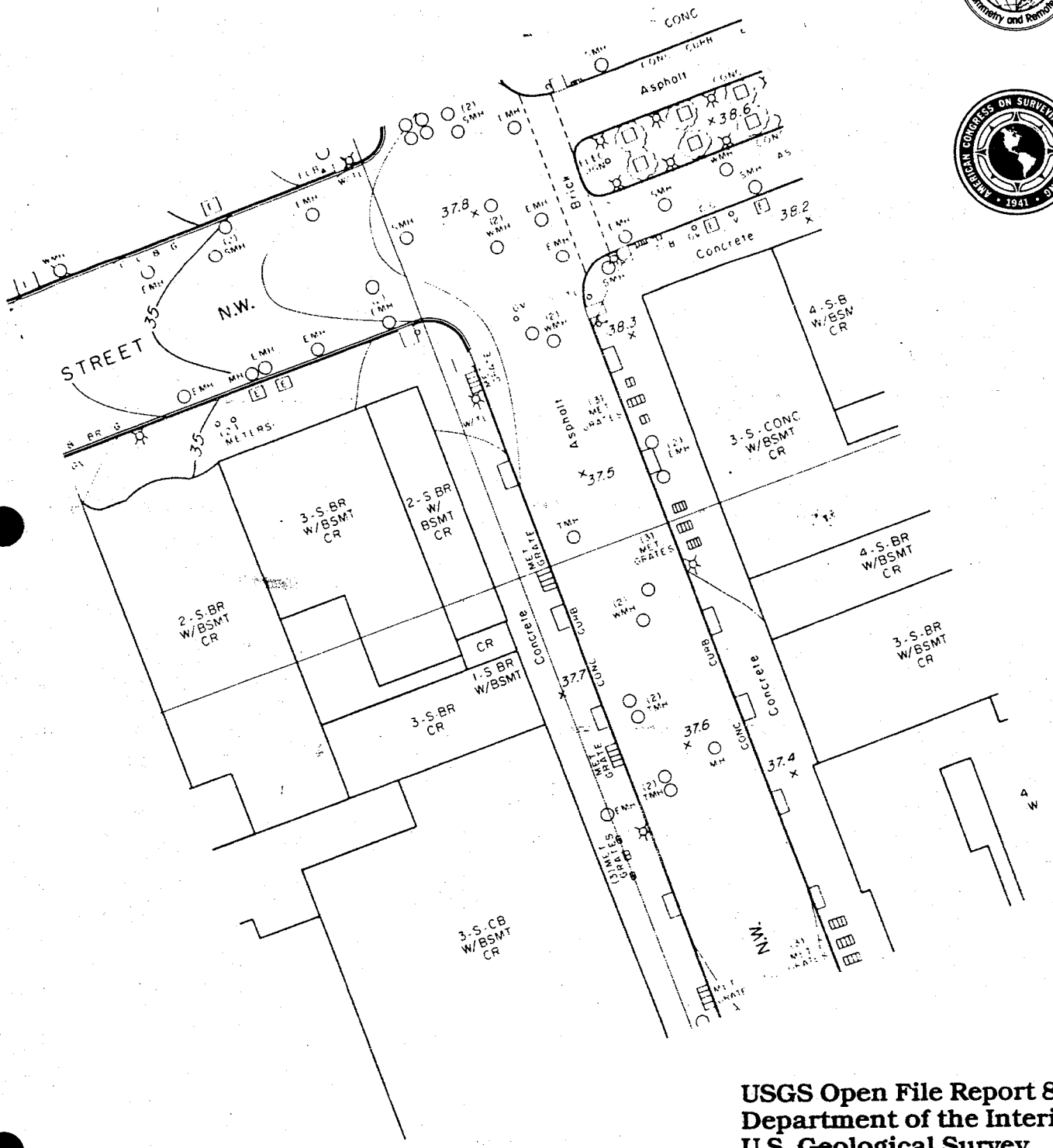
TIM



USGS Open File Report 86-005
Department of the Interior
U.S. Geological Survey
National Mapping Division

Published by
American Society for Photogrammetry and Remote Sensing
and the American Congress on Surveying and Mapping

Large-Scale Mapping Guidelines



USGS Open File Report 86-005
Department of the Interior
U.S. Geological Survey
National Mapping Division

Published by
American Society for Photogrammetry and Remote Sensing
and the American Congress on Surveying and Mapping

Sample Specifications	Comments
Monumented horizontal control stations and bench marks used in making the maps shall be shown. In addition, other permanent control marks recovered during the course of the project shall also be shown, the objective being to present an even distribution of control on the published maps.	
All mapped information shall be shown in accordance with the symbols, style, and lineweights shown in the Appendix, exhibit 4.	
d. Contours and spot elevations	
Contours shall be shown at a vertical interval of ____ feet, and every fifth contour line (or the fourth contour line in the case of, for example, a 2.5-meter contour interval which makes the 10-meter contour line the logical index contour) shall be an index contour and shall be shown with a lineweight heavier than that of the intermediate contours. (See symbol chart for contour lineweights.) Contours shall be shown as solid lines except in areas where the ground is completely obscured by heavy brush or tree cover; in such areas, the contours shall be shown as dashed lines and shall be plotted as accurately as possible from the stereoscopic model, with particular reference to spot elevations measured photogrammetrically in places where the ground is visible.	Dashed contours may not meet standard accuracy. Therefore, the dashed-contour provision may be omitted from the specifications if standard accuracy must be met, regardless of ground conditions, as is often the case when detailed designs for construction work are to be based on maps. But before omitting, consideration should be given to the high cost difference between actual field contouring and photogrammetric contouring.
Spot elevations determined photogrammetrically shall be shown on the maps in proper position at water level on lakes, reservoirs, and ponds; on hilltops; in saddles; at bottoms of depressions; at intersections of principal streets and highways; and at ends of bridges. In areas where the contours are more than 2 inches apart, additional spot elevations shall be plotted to provide additional topographic information; and the horizontal distance between elevations or	

Sample Specifications	Comments
c. Map reproductions are usually specified as one of the following forms: Reproducible copies of stable polyester with a minimum thickness of 0.004 inch Paper reproductions (either blue- or black-line positives).	As insurance against loss or damage, at least one extra set of polyester reproducibles should be obtained from the contractor and stored at a location different from the place where the original or master set is stored and used. It may be advantageous for the contractor to make and retain an extra set of reproducibles and furnish paper prints, as needed, at prices fixed by agreement. If the contractor is not conveniently located, a similar arrangement could be made with a local reproduction firm. Because paper prints are the usual work medium, it is important that a supplier be readily available.
7. Manuscripts Map manuscripts shall be drawn on stable polyester with a minimum thickness of 0.004 inch at a scale equal to or larger than the final map scale. If the compilation scale is larger than the publication scale, the manuscript shall be reduced photographically and printed on 0.004-inch polyester material for subsequent contact printing of the final bases.	
8. Map accuracy a. Coordinate grid lines and horizontal control points shall be plotted within 1/100 inch of true position. b. At least 90 percent of all well-defined planimetric features shall be plotted within 1/40 inch of true position, and the remaining features shall be plotted within 1/20 inch of true position.	The accuracy requirements are from the Reference Guide Outline – Specifications for Aerial Surveys and Mapping by Photogrammetric Methods for Highways prepared by the American Society of Photogrammetry and published by the U.S. Department of Transportation in 1968 except that the RGO specifications call for grid lines and horizontal control points to be plotted within 1/100-inch of true position rather than 1/200-inch. Another widely referenced set of accuracy standards, usually used for smaller scale mapping, is the United States National Map Accuracy Standards,

Sample Specifications	Comments
	U.S. Bureau of the Budget, issued June 10, 1941, revised April 26, 1943 and June 17, 1947. These standards specify horizontally, not more than 10 percent of all points tested shall be in error by more than 1/30-inch on maps published at scales larger than 1:20,000 or 1/50-inch on maps published at scales of 1:20,000 and smaller. Vertically, the standards specify that not more than 10 percent of the elevations tested shall be in error more than one-half the contour interval.
c. At least 90 percent of all elevations determined from solid-line contours shall be accurate within one-half the contour interval, and the remaining 10 percent shall be accurate within one contour interval. Any contour that could be brought within this accuracy tolerance by shifting its location 1/40 inch (the allowable horizontal error) will be considered to be acceptable.	
d. At least 90 percent of spot elevations shown on the maps shall be accurate within one-fourth the contour interval, and the remaining 10 percent shall be accurate within one-half the contour interval.	
9. Aerotriangulation	
Analytical aerotriangulation or semi-analytical aerotriangulation may be used to establish supplemental horizontal and vertical control for stereoscopic models, provided that the procedures and equipment (both the aerial camera, the comparator, and the stereoplotter) are approved in advance by the technical officer for the contract.	

scribing - Removal of portions of a photographically opaque coating from a transparent base with engraving tools.

section - Unit of subdivision of a township; normally a quadrangle 1 mile square with boundaries conforming to meridians and parallels within established limits, and containing 640 acres as nearly as practicable.

sidelap - See overlap.

spot elevation - Point on a map or chart whose height above a specified datum is noted, usually by a dot or a small sawbuck and elevation value. Elevations are shown, on a selective basis, for road forks and intersections, grade crossings, summits of hills, mountains and mountain passes, water surfaces of lakes and ponds, stream forks, bottom elevations in depressions, and large flat areas.

state plane coordinate systems - Rectangular coordinate systems established beginning in the 1930's by the U.S. Coast and Geodetic Survey, providing one or more zones for each State based on a specific map projection and origin for each zone.

stereocompilation - Production of a map or chart manuscript from aerial photographs and geodetic control data by means of photogrammetric instruments.

stereoplotter - Instrument for plotting a map by observation of stereomodels formed by pairs of photographs.

stereoscopic - Pertaining to the use of binocular vision for observation of a pair of overlapping photographs or other perspective views, giving the impression of depth.

target - The distinctive marking or instrumentation of a ground point to aid in its identification on a photograph. A target is so arranged and placed as to form a distinctive image over a geodetic or other control-point marker, on a property corner or line, or at the position of an identifying point above an underground facility or feature.

thematic map - See map, thematic.

topographic map - See map, topographic.

topography - Configuration (relief) of the land surface; the graphic delineation or portrayal of that configuration in map form, as by contour lines; in oceanography the term is applied to a surface such as the sea bottom or a surface of given characteristics within the water mass.

township - Unit of survey of the public lands of the United States, normally a square area approximately 6 miles on a side with boundaries conforming to meridians and parallels within established limits, containing 36 sections. Also, in certain parts of the country, the term designates a minor governmental subdivision.

traverse - Sequence of lengths and directions of lines connecting a series of stations, obtained from field measurements, and used in determining positions of the stations.

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APPENDIX "B"

General specifications for Photogrammetry

1. DEFINITIONS AND TERMS:

Whenever in these general specifications, or in any documents, agreements or instruments where these specifications govern, the following terms are used, the meaning shall be interpreted as follows:

a. Specifications. - The directions, provisions and requirements contained herein and as supplemented by the Job Description pertaining to method and manner of performing the work or to the quantities or qualities of materials to be furnished under the (contract/(Supplemental Agreement).

b. Job Description. - The specific clauses setting forth conditions of requirements peculiar to the project and covering the work required.

c. Work and Services. - All services, material and equipment required for the flying, photography, ground paneling, field control, preparation and finishing of all contact prints, photo indices, topographic and/or planimetric maps and related work as hereinafter described.

NOTE: In the event of any ambiguity between these general specifications and the Job Description, the Contractor-Engineer shall be guided by the Job Description.

2. PHOTOGRAPHY:

a. Camera. - A single lens precision-type aerial camera with a distortion free-type lens which has the accuracy and photographic characteristics as determined by tests made by the National Bureau of Standards or other competent testing laboratories, which prove it to be adequate for the fulfillment of all contract requirements in the specifications shall be used on all vertical photography for photogrammetric mapping. The focal length shall be specified in the Job Description. The camera shall contain eight (8) fiducial marks.

b. Requirements. - All vertical photography for photogrammetric mapping shall conform to the following:

(1) Tilt. - Negatives made with the optical axis of the aerial camera in a vertical position are desired. Tilt (departure of the aerial camera axis from a vertical line at time of exposure) of any negative by more than three (3) degrees, an average tilt of more than one (1) degree for the entire project or tilt between any two (2) successive negatives of more than four (4) degrees may be cause for rejection.

bridges, trestles, tunnels, piers, dams, power pipelines, plants, transformer and other substations, transportation terminals and airfields, oil, water and other storage tanks, and the like shall be shown. A chart showing the standard symbols and line weights is appended hereto.

(6) Topography. - Every fifth contour shall be accentuated and labeled in tiers on general slopes at intervals not to exceed ten (10) inches. Labeling of contours should be so placed so that the elevation of any contour is readily discernable. This may entail the labeling of intermediate contours in areas of low relief. Intermediate contours may be omitted on even slopes when lines fall closer than fifteen (15) contours per inch. Index contours shall always be shown.

(7) Spot Elevations. - Spot elevations, determined photogrammetrically, shall be shown at points in areas of low relief which are more than two (2) inches from regular contours; at all tops, saddles, depressions, ponds, lakes, bridges, street intersections, and wherever interpolation of contours would incorrectly represent the land form. The position of the spot elevation shall be determined by the decimal point.

(8) Labeling. - The exterior of all maps shall contain a title block, north arrow, graphic scale bar, and coordinate grid values. The interior of the maps shall contain labeling of all main topographic and planimetric features. All lettering on the manuscripts shall be hand-lettered or done with a mechanical lettering device in a neat manner. All lettering on the finished maps shall be done with a mechanical lettering device or "stickup."

(9) Draftsmanship. - Professional standards of draftsmanship shall be maintained throughout the inking or scribing of all finished maps. The inked or scribed symbols, lines, letters and numbers shall be clear and legible and conform within five (5) per cent to the weights and gauges of all lines and symbols shown on the manuscripts shall conform within twenty (20) per cent of those shown on the symbol sheet.

4. MOSAICS:

a. Area, Scale and Material. - The area and scale will be specified in the Job Description. The final mosaics shall be reproduced on double weight, semi-matte photographic paper or cronapaque (or equal) as specified in the Job Description.

b. Labeling. - Each mosaic sheet and copy negative shall show a title, bar scale and north arrow. When the mosaic requires more than one sheet for the area involved, a miniature index map shall be shown indicating each specific sheet. The interior of the mosaic shall contain names of important topographic and planimetric features.

Roger Honberger Associates, Inc.
Government Information Service
Washington, D.C.

June 2, 1992

TO: Irene Rasmussen

Attached from the Federal Register of June 2, 1992 is a FEMA notice, effective June 2, 1992, which includes the Financial Assistance/Subsidy Arrangement for 1992-93 governing the duties of insurers participating in the Write Your Own Program of the NFIP. This information may be important to whoever oversees this program for the County.

RFH:jfm

Attachment

FEDERAL EMERGENCY MANAGEMENT AGENCY

Offer To Assist Insurers in Underwriting Flood Insurance Using the Standard Flood Insurance Policy

AGENCY: Federal Insurance Administration, FEMA.

ACTION: Notice.

SUMMARY: The Federal Insurance Administration is republishing for public information and convenience the Financial Assistance/Subsidy Arrangement for 1992–1993 governing the duties and obligations of insurers participating in the Write Your Own Program (WYO) of the National Flood Insurance Program (NFIP). The Financial Assistance/Subsidy Arrangement sets forth the responsibilities of the Government to provide financial and technical assistance to the insurers.

DATES: The offer is effective June 2, 1992. The Financial Assistance/Subsidy Arrangement is effective with respect to flood insurance policies written under the Arrangement with an effective date of October 1, 1992, and later.

SUPPLEMENTARY INFORMATION: By way of background, the Federal Insurance Administration (FIA), working with insurance company executives, FEMA's Comptroller's Office and FEMA's Office of the Inspector General, addressed the operating and financial control procedures for the Write Your Own Program. The Statistical Plan (now the Transaction Record Reporting and Processing Plan), Accounting Procedures, and the Financial Control Plan were specifically referenced in the final rule, as amended, and, in addition, procedural manuals have been issued by the FIA in aid of implementation by the WYO companies of the procedures published in the final rule, as amended, such as the Flood Insurance Manual, Flood Insurance Adjuster's Manual, and FEMA Letter of Credit Procedures, all of which comprise the operating framework for the WYO Program.

The purposes of this Notice are:

(1) To offer, publicly, financial assistance to protect against underwriting losses resulting from floods on Standard Flood Insurance Policies written by private sector insurers;

(2) To provide a method by which the offer may be accepted; and

(3) To provide notice of the duties and obligations under the Financial Assistance/Subsidy Arrangement for the Arrangement year 1992–93.

Method of Acceptance of Offer

1. Acceptance of this offer shall be by telegraphed or mailed notice of acceptance or signed Arrangement to the Administrator prior to midnight e.d.t. September 30, 1992.

2. The telegraphed or mailed notice of acceptance to the Administrator must be authorized by an official of the insurance company who has the authority to enter into such arrangements.

3. A duly signed original copy of the Notice of Acceptance must be on file with the Administrator by November 16, 1992.

4. If 1., 2., or 3. above are not satisfied, the acceptance will be considered by the Administrator as conditional and the commitment of NFIP resources to fulfill the "Undertaking of the Government" under Article IV of the Arrangement will take a lower priority than those needed to fulfill the requirement of the other participating insurance companies.

5. Send all acceptances of this offer to: Federal Emergency Management Agency, Attn: Federal Insurance Administrator, WYO Program, Washington, DC 20472.

Offer To Provide Financial Assistance

Pursuant to the provision of the National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4001 et seq., Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329, and Executive Order 12127 of March 31, 1979, 44 FR 19367, 3 CFR, 1979 Comp., p. 376, Federal Emergency Management Agency, subject to all regulations promulgated thereunder, including the final rule published at 53 FR 15208, April 28, 1988, and to the duties, obligations and rights set forth in the Financial Assistance/Subsidy Arrangement as printed below, the Federal Insurance Administrator, herein the "Administrator," offers to enter into the Financial Assistance/Subsidy Arrangement with any individual private sector property insurance company. This offer is effective only in a State in which such private sector insurance company is licensed to engage in the business of property insurance.

Federal Emergency Management Agency, Federal Insurance Administration, Financial Assistance/Subsidy Arrangement

Purpose: To assist the company in underwriting flood insurance using the Standard Flood Insurance Policy.

Accounting Data: Pursuant to section 1310 of the Act, a Letter of Credit shall be issued for payment as provided for herein from the National Flood Insurance Fund.

Effective Date: October 1, 1992.

Issued By: Federal Emergency Management Agency, Federal Insurance Administration, Washington, DC 20472.

Article I—Findings, Purpose, and Authority

Whereas, the Congress is its "Finding and Declaration of Purpose" in the National Flood Insurance Act of 1968, as amended, ("the Act") recognized the benefit of having the National Flood Insurance Program (the Program) "carried out to the maximum extent practicable by the private insurance industry"; and

Whereas, the Federal Insurance Administration (FIA) recognizes this Arrangement as coming under the provisions of section 1345 of the Act; and

Whereas, the goal of the FIA is to develop a program with the insurance industry where, over time, some risk-bearing role for the industry will evolve as intended by the Congress (section 1304 of the Act); and

Whereas, the Program, as presently constituted and implemented, is subsidized, and the insurer (hereinafter the "Company") under this Arrangement shall charge rates established by the FIA; and

Whereas, this Arrangement will subsidize all flood policy losses by the Company; and

Whereas, this Financial Assistance/Subsidy Arrangement has been developed to involve individual Companies in the Program, the initial step of which is to explore ways in which any interested insurer may be able to write flood insurance under its own name; and

Whereas, one of the primary objectives of the Program is to provide coverage to the maximum number of structures at risk and because the insurance industry has marketing access through its existing facilities not directly available to the FIA, it has been concluded that coverage will be extended to those who would otherwise not be insured under the Program; and

Whereas, flood insurance policies issued subject to this Arrangement shall be only that insurance written by the Company in its own name pursuant to the Act; and

Whereas, over time, the Program is designed to increase industry participation, and, accordingly, reduce or eliminate Government as the principal vehicle for delivering flood insurance to the public; and

Whereas, the direct beneficiaries of this Arrangement will be those Company policyholders and applicants for flood insurance who otherwise would not be covered against the peril of flood.

Now, therefore, the parties hereto mutually undertake the following:

Article II—Undertakings of the Company

A. In order to be eligible for assistance under this Arrangement the Company shall be responsible for:

1.0 Policy Administrator, including
1.1 Community Eligibility/Rating Criteria
1.2 Policyholder Eligibility Determination
1.3 Policy Issuance
1.4 Policy Endorsements
1.5 Policy Cancellations
1.6 Policy Correspondence
1.7 Payment of Agents Commissions

The receipt, recording, control, timely deposit and disbursement of funds in connection with all the foregoing, and correspondence relating to the above in accordance with the Financial Control Plan requirements.

2.0 Claims processing in accordance with general Company standards and the Financial Control Plan. The Write Your Own Claims Manual, the Federal Emergency Management Agency Adjuster Manual, the FIA National Flood Insurance Program Policy Issuance Handbook, the Write Your Own Operational Overview, and other instructional material also provide guidance to the Company.

3.0 Reports.

3.1 Monthly Financial Reporting and Statistical Transaction Reporting shall be in accordance with the requirements of National Flood Insurance Program Transaction Record Reporting and Processing Plan for the Write Your Own (WYO) Program and the Financial Control Plan for business written under the WYO Program. These data shall be validated/edited/audited in detail and shall be compared and balanced against Company financial reports.

3.2 Monthly financial reporting shall be prepared in accordance with the WYO Accounting Procedures.

3.3 The Company shall establish a program of self audit acceptable to the FIA or comply with the self audit program contained in the Financial Control Plan for business written under the WYO Program. The Company shall report the results of this self-audit to the FIA annually.

B. The Company shall use the following time standards of performance as a guide:

1.0 Application Processing—15 days

(Note: If the policy cannot be mailed due to insufficient or erroneous information or insufficient funds, a request for correction or added monies shall be mailed within 10 days):

1.1 Renewal Processing—7 days;
1.2 Endorsement Processing—7 days;
1.3 Cancellation Processing—15 days;
1.4 Correspondence, Simple and/or Status Inquiries—7 days;
1.5 Correspondence, Complex Inquiries—20 days;
1.6 Supply, Materials, and Manual Requests—7 days;
1.7 Claims Draft Processing—7 days from completion of file examination;
1.8 Claims Adjustment—45 days average from receipt of Notice of Loss (or equivalent) through completion of examination.
1.9 For the elements of work enumerated above, the elapsed time shown is from date of receipt through date of mail out. Days means working, *not* calendar days.

In addition to the standards for timely performance set forth above, all functions performed by the Company shall be in accordance with the highest reasonably attainable quality standards generally utilized in the insurance and date processing industries.

These standards are for guidance. Although no immediate remedy for failure to meet them is provided under this Arrangement, nevertheless, performance under these standards can be a factor considered by the Federal Insurance Administrator (the Administrator) in determining the continuing participation of the Company in the Program or other action, e.g., limiting the Company's authority to write new business.

C. The Company shall coordinate activities and provide information to the FIA or its designee on those occasions when a Flood Insurance Catastrophe Office is established.

D. Policy Issuance.

1.0 The flood insurance subject to this Arrangement shall be only that insurance written by the Company in its own name pursuant to the Act.

2.0 The Company shall issue policies under the regulations prescribed by the Administrator in accordance with the Act;

3.0 All such policies of insurance shall conform to the regulations prescribed by the Administrator pursuant to the Act, and be issued on a form approved by the Administrator;

4.0 All policies shall be issued in consideration of such premiums and upon such terms and conditions and in such States or areas or subdivisions thereof as may be designated by the Administrator and only where the Company is licensed by State law to engage in the property insurance business;

5.0 The Administrator may require the Company to immediately discontinue issuing policies subject to this Arrangement in the event Congressional authorization or appropriation for the National Flood Insurance Program is withdrawn.

E. The Company shall establish a bank account, separate and apart from all other Company accounts, as a bank of its choosing for the collection, retention and disbursement of funds relating to its obligation under this Arrangement, less the Company's expenses as set forth in Article III, and the operation of the Letter of Credit established pursuant to Article IV. All funds not required to meet current expenditures shall be remitted to the United States Treasury, in accordance with the provisions of the WYO Accounting Procedures Manual.

F. The Company shall investigate, adjust, settle and defend all claims or losses arising from policies issued under this Arrangement. Payment of flood insurance claims by the Company shall be binding upon the FIA.

G. The Company may market flood insurance policies in any manner consistent with its customary method of operation, provided that there is adherence to Program statutes, regulations and explicit guidelines, e.g., for the Mortgage Portfolio Protection Program.

Article III—Loss Costs, Expenses, Expense Reimbursement, and Premium Refunds

A. The Company shall be liable for operating, administrative and production expenses, including any taxes, dividends, agent's commissions or any board, exchange or bureau assessments, or any other expense of whatever nature incurred by the Company in the performance of its obligations under this Arrangement.

B. The Company shall be entitled to withhold as operating and administrative expenses, other than agents or brokers commissions, an amount from the Company's written premium on the policies covered by this Arrangement in reimbursement of all of the Company's marketing, operating and administrative expenses, except for allocated and unallocated loss adjustment expenses described in C. of this Article, which amount shall equal the average of industry expense ratios

for "Other Acq." "Gen. Exp." and "Taxes" as published in the latest available (as of March 15 of the prior Arrangement year) "Best's" Aggregates and Averages Property Casualty, Industry Underwriting—by Lines for Fire, Allied Lines, Farmowners Multiple Peril, Homeowners Multiple Peril, and Commercial Multiple Peril Combined (weighted average using premiums earned as weights) calculated and promulgated by the Administrator. Premium income net of reimbursement (net premium income) shall be deposited in a special account for the payment of losses and loss adjustment expenses (see article II, section E).

The Company shall be entitled to 15% of the Company's written premium on the policies covered by this Arrangement as the commission allowance to meet commissions and/or salaries of their insurance agents, brokers, or other entities producing qualified flood insurance applications and other related expenses.

The Company, with the consent of the Administrator as to terms and costs, shall be entitled to utilize the services of a national rating organization, licensed under state law, to assist the FIA in undertaking and carrying out such studies and investigations on a community or individual risk basis, and in determining more equitable and accurate estimates of flood insurance risk premium rates as authorized under the National Flood Insurance Act of 1968, as amended. The Company shall be reimbursed in accordance with the provisions of the WYO Accounting Procedures Manual for the charges or fees for such services.

C. Loss Adjustment Expenses shall be reimbursed as follows:

1. Unallocated loss adjustment shall be an expense reimbursement of 3.3% of the incurred loss (except that it does not include "incurred but not reported").

2. Allocated loss adjustment expense shall be reimbursed to the Company pursuant to Exhibit A, entitled "Fee Schedule."

3. Special allocated loss expenses shall be reimbursed to the Company for only those expenses the Company has obtained prior approval of the Administrator to incur.

D.1. Loss payments under policies of flood insurance shall be made by the Company from funds retained in the bank account established under article II, section E and, if such funds are depleted, from funds derived by drawing against the Letter of Credit established pursuant to article IV.

2. Loss payments will include payments as a result of awards or judgments for damages arising under the scope of this Arrangement, policies of flood insurance issued pursuant to this Arrangement, and the claims processing standards and guides set forth at article II, section A, 2.0 of this Arrangement. Prompt notice of any claim for damages as to claims processing or other matters arising outside the scope of this section (D)(2) shall be sent to the Assistant Administrator of the FIA's Office of Insurance Policy Analysis and Technical Services (OIPATS), along with a copy of any material pertinent to the claim for damages arising outside of the scope of the matters set forth in this section (D)(2).

Following receipt of notice of such claims, the General Counsel (OGC), FEMA shall review the cause and make a recommendation to FIA as to whether the claim is grounded in actions by the Company which are significantly outside the provisions of this section (D)(2). After reviewing the General Counsel's recommendation, the Administrator will make his decision and the Company will be notified, in writing, within thirty (30) days of the General Counsel's recommendation, if the decision is that any award or judgment for damages arising out of such actions will not be recognized under article III of this Arrangement as a reimbursable loss cost, expense or expense reimbursement. In the event that the Company wishes to petition for reconsideration of the notification that it will not be reimbursed for the award or judgment made under the above circumstances, it may do so by mailing, within thirty days of the notice declining to recognize any such award or judgment as reimbursable under article III, a written petition to the Chairman of the WYO Standards Committee established under the Financial Control Plan. The WYO Standards Committee will, then, consider the petition at its next regularly scheduled meeting or at a special meeting called for that purpose by the Chairman and issue a written recommendation to the Administrator, within thirty days of the meeting. The Administrator's final determination will be made, in writing, to the Company within thirty days of the recommendation made by the WYO Standards Committee.

E. Premium refunds to applicants and policyholders required pursuant to rules contained in the National Flood Insurance Program (NFIP) "Flood Insurance Manual" shall be made by the Company from funds retained in the bank account established under article II, section E and, if such funds are depleted, from funds derived by drawing against the Letter of Credit established pursuant to article IV.

Article IV—Undertakings of the Government

A. Letter(s) of Credit shall be established by the Federal Emergency Management Agency (FEMA) against which the Company may withdraw funds, daily, if needed, pursuant to prescribed procedure as implemented by FEMA. The amount of the authorizations will be increased as necessary to meet the obligations of the Company under article III, sections (C), (D), and (E). Request for funds shall be made only when net premium income has been depleted. The timing and amount of cash advances shall be as close as is administratively feasible to the actual disbursements by the recipient organization for allowable Letter of Credit expenses.

Request for payment on Letters of Credit shall not ordinarily be drawn more frequently than daily nor in amounts less than $5,000, and in no case more than $5,000,000 unless so stated on the Letter or Credit. This Letter of Credit may be drawn by the Company for any of the following reasons:

1. Payment of claim as described in article III, section D; and

2. Refunds to applicants and policyholders for insurance premium overpayment, or if the application for insurance is rejected or when cancellation or endorsement of a policy results in a premium refunds as described in article III, section E; and

3. Allocated and unallocated Loss Adjustment Expenses as described in article III, section C.

b. The FIA shall provide technical assistance to the Company as follows:

1. The FIA's policy and history concerning underwriting and claims handling.

2. A mechanism to assist in clarification of coverage and claims questions.

3. Other assistance as needed.

Article V—Commencement and Termination

A. Upon signature of authorized officials for both the Company and the FIA, this Arrangement shall be effective for the period October 1 through September 30. The FIA shall provide financial assistance only for policy applications and endorsements accepted by the Company during this period pursuant to the Program's effective date, underwriting and eligibility rules.

B. By June 1, of each year, the FIA shall publish in the Federal Register and make available to the Company the terms for the re-subscription of this Financial Assistance/Subsidy

Arrangement. In the event the Company chooses not to resubscribe, it shall notify the FIA to that effect by the following July 1.

C. In the event the Company elects not to participate in the Program in any subsequent fiscal year, or the FIA chooses not to renew the Company's participation, the FIA, at its option, may require (1) the continued performance of this entire Arrangement for one (1) year following the effective expiration date only for those policies issued during the original term of this Arrangement, or any renewal thereof, or (2) the transfer to the FIA of:

a. All data received, produced and maintained through the life of the Company's participation in the Program, including certain data, as determined by FIA, in a standard format and medium; and

b. A plan for the orderly transfer to the FIA of any continuing responsibilities in administering the policies issued by the Company under the program including provisions for coordination assistance; and

c. All claims and policy files, including those pertaining to receipts and disbursements which have occurred during the life of each policy. In the event of a transfer of the services provided, the Company shall provide the FIA with a report showing, on a policy basis, any amounts due from or payable to insureds, agents, brokers, and others as of the transition date.

D. Financial assistance under this Arrangement may be cancelled by the FIA in its entirety upon 30 days written notice to the Company by certified mail stating one of the following reasons for such cancellation: (1) Fraud or misrepresentation by the Company subsequent to the inception of the contract, or (2) non payment to the FIA of any amount due the FIA. Under these very specific conditions, FIA may require the transfer of data as shown in section C., above. If transfer is required, the unearned expenses retained by the Company shall be remitted to the FIA.

E. In the event the Act is amended, or repealed, or expires, or if the FIA is otherwise without authority to continue the Program, financial assistance under this Arrangement may be cancelled for any new or renewal business, but the Arrangement shall continue for policies in forces which shall be allowed to run their term under the Arrangement.

F. In the event that the Company is unable to, or otherwise fails to, carry out its obligations under this Arrangement by reason of any order or directive duly issued by the Department of Insurance of any jurisdiction to which the Company is subject, the Company agrees to transfer, and the Government will accept, any and all WYO policies issued by the Company and in force as of the date of such inability or failure to perform. In such event the Government will assume all obligations and liabilities owed to policyholders under such policies arising before and after the date of transfer and the Company will immediately transfer to the Government all funds in its possession with respect to all such policies transferred and the unearned portion of the Company expenses for operating, administrative and loss adjustment on all such policies.

Article VI—Information and Annual Statements

The Company shall furnish to the FIA such summaries and analyses of information in its records as may be necessary to carry out the purposes of the National Flood Insurance Act of 1968, as amended, in such form as the FIA, in cooperation with the Company, shall prescribe. The Company shall be a property/casualty insurer domiciled in a State or territory of the United States. Upon request, the Company shall file with the FIA a true and correct copy of the Company's Fire and Casualty Annual Statement, and Insurance Expense Exhibit or amendments thereof, as filed with the State Insurance Authority of the Company's domiciliary State.

Article VII—Cash Management and Accounting

A. The FEMA shall make available to the Company during the entire term of this Arrangement and any continuation period required by FIA pursuant to article V, section C., the Letter of Credit provided for in article IV drawn on a repository bank within the Federal Reserve System upon which the Company may draw for reimbursement of its expenses as set forth in article IV which exceed net written premium collected by the Company from the effective date of this Arrangement or continuation period to the date of the draw.

B. The Company shall remit all funds not required to meet current expenditures to the United States Treasury, in accordance with the provisions of the WYO Accounting Procedures Manual.

C. In the event the Company elects not to participate in the Program in any subsequent fiscal year, the Company and FIA shall make a provisional settlement of all amounts due or owing within three months of the termination of this Arrangement. This settlement shall include net premiums collected, funds drawn on the Letter of Credit, and reserves for outstanding claims. The Company and FIA agree to make a final settlement of accounts for all obligations arising from this Arrangement within 18 months of its expiration or termination, except for contingent liabilities which shall be listed by the Company. At the time of final settlement, the balance, if any, due the FIA or the Company shall be remitted by the other immediately and the operating year under this Arrangement shall be closed.

Article VIII—Arbitration

A. If any misunderstanding or dispute arises between the Company and the FIA with reference to any factual issue under any provisions of this Arrangement or with respect to the FIA's non-renewal of the Company's participation, other than as to legal liability under or interpretation of the standard flood insurance policy, such misunderstanding or dispute may be submitted to arbitration for a determination which shall be binding upon approval by the FIA. The Company and the FIA may agree on and appoint an arbitrator who shall investigate the subject of the misunderstanding or dispute and make a determination. If the company and the FIA cannot agree on the appointment of an arbitrator, then two arbitrators shall be appointed, one to be chosen by the Company and one by the FIA.

The two arbitrators so chosen, if they are unable to reach an agreement, shall select a third arbitrator who shall act as umpire, and such umpire's determination shall become final only upon approval by the FIA.

The Company and the FIA shall bear in equal shares all expenses of the arbitration. Findings, proposed awards, and determinations resulting from arbitration proceedings carried out under this section, upon objection by FIA or the Company, shall be inadmissible as evidence in any subsequent proceedings in any court of competent jurisdiction.

This Article shall indefinitely succeed the term of this Arrangement.

Article IX—Errors and Omissions

The parties shall not be liable to each other for damages caused by ordinary negligence arising out of any transaction or other performance under this Arrangement, nor for any inadvertent delay, error, or omission made in connection with any transaction under this Arrangement, provided that such delay, error, or omission is rectified by the responsible party as soon as possible after discovery.

However, in the event that the Company has made a claim payment to an insured without including a mortgagee (or trustee) of which the Company had actual notice prior to making payment, and subsequently determines that the mortgagee (or trustee) is also entitled to any part of said claim payment, any additional payment shall not be paid by the Company from any portion of the premium and any funds derived from any Federal Letter of Credit deposited in the bank account described in article II, section E. In addition, the Company agrees to hold the Federal Government harmless against any claim asserted against the Federal Government by any such mortgagee (or trustee), as described in the preceding sentence, by reason of any claim payment made to any insured under the circumstances described above.

Article X—Officials Not to Benefit

No Member or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this Arrangement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this Arrangement if made with a corporation for its general benefit.

Article XI—Offset

At the settlement of accounts the Company and the FIA shall have, and may exercise, the right to offset any balance or balances, whether on account of premiums, commissions, losses, loss adjustment expenses, salvage, or otherwise due one party to the other, it successors or assigns, hereunder or under any other Arrangements heretofore or hereafter entered into between the Company and the FIA. This right of offset shall not be affected or diminished because of insolvency of the Company.

All debts or credits of the same class, whether liquidated or unliquidated, in favor of or against either party to this Arrangement on the date of entry, or any order of conservation, receivership, or liquidation, shall be deemed to be mutual debts and credits and shall be offset with the balance only to be allowed or paid. No offset shall be allowed where a conservator, receiver, or liquidator has been appointed and where an obligation was purchased by or transferred to a party hereunder to be used as an offset. Although a claim on the part of either party against the other may be unliquidated or undetermined in amount on the date of entry of the order, such claim will be regarded as being in existence as of the date of such order and any credits or claims of the same class then in existence and held by the other party may be offset against it.

Article XII—Equal Opportunity

The Company shall not discriminate against any applicant for insurance because of race, color, religion, sex, age, handicap, marital status, or national origin.

Article XIII—Restriction on Other Flood Insurance

As a condition of entering into this Arrangement, the Company agrees that in any area in which the Administrator authorizes the purchase of flood insurance pursuant to the Program, all flood insurance offered and sold by the Company to persons eligible to buy pursuant to the Program for coverages available under the Program shall be written pursuant to this Arrangement.

However, this restriction applies solely to policies providing only flood insurance: It does not apply to policies provided by the Company of which flood is one of the several perils covered, or where the flood insurance coverage amount is over and above the limits of liability available to the insured under the Program.

Article XIV—Access to Books and Records

The FIA and the Comptroller General of the United States, or their duly authorized representatives, for the purpose of investigation, audit, and examination shall have access to any books, documents, papers and records of the Company that are pertinent to this Arrangement. The Company shall keep records which fully disclose all matters pertinent to this Arrangement, including premiums and claims paid or payable under policies issued pursuant to this Agreement. Records of accounts and records relating to financial assistance shall be retained and available for three (3) years after final settlement of accounts, and to financial assistance, three (3) years after final adjustment of such claims. The FIA shall have access to policyholder and claim records at all times for purposes of the review, defense, examination, adjustment, or investigation of any claim under a flood insurance policy subject to this Arrangement.

Article XV—Compliance With Act and Regulations

This Arrangement and all policies of insurance issued pursuant thereto shall be subject to the provisions of the National Flood Insurance Act of 1968, as amended, the Flood Disaster Protection Act of 1973, as amended, and Regulations issued pursuant thereto and all Regulations affecting the work that are issued pursuant thereto, during the term hereof.

Article XVI—Relationship Between the Parties (Federal Government and Company) and the Insured

Inasmuch as the Federal Government is a guarantor hereunder, the primary relationship between the Company and the Federal Government is one of a fiduciary nature, i.e., to assure that any taxpayer funds are accounted for and appropriately expended.

The Company is not the agent of the Federal Government. The Company is solely responsible for its obligations to its insured under any flood policy issued pursuant hereto.

In witness whereof, the parties hereto have accepted this Arrangement on this _____ day of _____, 1992.

Company
by _____
(Title) _____
The United States of America
Federal Emergency Management Agency
by _____
(Title) _____

EXHIBIT A—FEE SCHEDULE

Range (by covered loss)	Fee
Erroneous Assignment	$40
Closed Without Payment	125
Minimum for Upton-Jones Claims	800
$0.01 to $600.00	150
$600.01 to $1,000.00	175
$1,000.01 to $2,000.00	225
$2,000.01 to $3,500.00	275
$3,500.01 to $5,000.00	350
$5,000.01 to $7,000.00	425
$7,000.01 to $10,000.00	500
$10,000.01 to $15,000.00	550
$15,000.01 to $25,000.00	600
$25,000.01 to $35,000.00	675
$35,000.01 to $50,000.00	750
$50,000.01 to $100,000.00	1,000
$100,000.01 to $150,000.00	1,300
$150,000.01 to $200,000.00	1,600
$200,000.01 to limits	2,000

Allocated fee schedule entry value is the covered loss under the policy based on the standard deductibles ($500 and $500) and limited to the amount of insurance purchased.

Notice of Acceptance for Federal Emergency Management Agency; Federal Insurance Administration; Financial Assistance/Subsidy Arrangement (Arrangement)

Whereas, in 1992, there was published a Notice of Offer by the Federal Emergency Management Agency to enter into a Financial Assistance/Subsidy Arrangement (hereafter the Arrangement).

Whereas, the above cited Arrangement, as published in and reprinted from the Federal Register, does not provide sufficient space to type in the name of the Company.

Whereas, the Arrangement may include several individual companies within a Company Group and the Arrangement as published in and reprinted from the Federal Register does not provide sufficient space to type in a list of companies.

Therefore, the parties hereby agree that this Notice of Acceptance form is incorporated into and is an integral part of the entire Arrangement and is substituted in place of the signature block contained in the Federal Register under article XVI of the Arrangement. The above mentioned Arrangement is effective in the States in which the insurance company (ies) listed below is (are) duly licensed to engage in the business of property insurance:

_____

_____

_____

_____

_____

In witness whereof, the parties hereto have accepted this Arrangement on this _____ day of _____, _____.

By: _____

Title: _____

The United States of America
Federal Emergency Management Agency

By: _____

Title: Federal Insurance Administrator

Dated: May 22, 1992.

C.M. "Bud" Schauerte,

Administrator, Federal Insurance Administration.

[FR Doc. 92-12713 Filed 6-1-92; 8:45 am]

BILLING CODE 6718-05-M

FEDERAL MARITIME COMMISSION

[Docket No. 92-24]

Frata Shipping PTE, Ltd. v. U.S. Eurasia Lines; Filing of Complaint and Assignment

Notice is given that a complaint filed by Frata Shipping PTE, Ltd. ("Complainant") against U.S. Eurasia Lines ("Respondent") was served May 27, 1992. Complainant alleges that Respondent engaged in violations of section 10(d)(1) of the Shipping Act of 1984, 46 U.S.C. app. 1709(d)(1), by failing to remit Complainant's property, namely specific and identifiable sums of money to Complainant as promised. Complainant requests shorteded procedure pursuant to Commission Rule 181, 46 CFR 502.181.

This proceeding has been assigned to Administrative Law Judge Frederick K. Dolan ("Presiding Officer"). Hearing in this matter, if any is held, shall commence within the time limitations prescribed in 46 CFR 502.61. The hearing shall include oral testimony and cross-examination in the discretion of the Presiding Officer only upon proper showing that there are genuine issues of material fact that cannot be resolved on the basis of sworn statements, affidavits, depositions, or other documents or that the nature of the matter in issue is such that an oral hearing and cross-examination are necessary for the development of an adequate record. Pursuant to the further terms of 46 CFR 502.61, the initial decision of the Presiding Officer in this proceeding shall be issued by May 27, 1993, and the final decision of the Commission shall be issued by September 24, 1993.

Joseph C. Polking,

Secretary.

[FR Doc. 92-12784 Filed 6-1-92; 8:45 am]

BILLING CODE 6730-01-M

FEDERAL RESERVE SYSTEM

[Docket No. 7100-0128]

Bank Holding Company Reporting Requirements

AGENCY: Board of Governors of the Federal Reserve System.

ACTION: Final approval of agency forms.

SUMMARY: Under the Bank Holding Company Act of 1956, as amended, the Board is responsible for the supervision and regulation of all bank holding companies. Notice is hereby given of final approval by the Board of Governors of the Federal Reserve System of revisions to the Consolidated Financial Statements for Bank Holding Companies With Total Consolidated Assets of $150 Million or More or With More Than One Subsidiary Bank (FR Y-9C; OMB No. 7100-0128), under delegated authority from the Office of Management and Budget (OMB), as per 5 CFR 1320.9 (OMB Regulations on Controlling Paperwork Burdens on the Public), to parallel changes made to the commercial bank Reports of Condition and Income for the March 1992, reporting date.[1] The Board gave approval, on an interim basis, to these revisions on March 26, 1992. The notice of the new reporting requirements was published in the Federal Register on April 8, 1992 (57 FR 11952 April 8, 1992). The Board received no public comments and has determined that the changes as proposed should become final.

These revisions are consistent with the Board's policy to maintain, to the extent possible, agreement between the bank holding company reports and the commercial bank reports. Bank holding companies have reported, in prior quarters, that the impact on reporting burden is lessened when parallel changes are made concurrently to the FR Y-9C bank holding company report and the Reports of Condition and Income.

On March 26, 1992, the Board also gave final approval to changes in the FR Y-9C that were the result of modifications to the components of risk-based capital adopted by the Board in October 1991 and January 1992. In addition, the Board also gave final approval to changes to the FR Y-9C relating to issues of credit availability. Those revisions also were published in the Federal Register on April 8, 1992.

All changes to the reporting requirements for bank holding companies were effective with the March 31, 1992, reporting date.

Revisions Approved under OMB Delegated Authority—the Approval of the Collection of the Following Report:

Report Title: Consolidated Financial Statements for Bank Holding Companies with Total Consolidated Assets of $150 Million or More, or With More Than One Subsidiary Bank.

This report is to be filed by all bank holding companies that have total consolidated assets of $150 million or more *and* by all multibank holding companies regardless of size. The following bank holding companies are exempt from filing the FR Y-9C, unless the Board specifically requires an exempt company to file the report: bank holding companies that are subsidiaries of another bank holding company *and* have total consolidated assets of less than $1 billion; bank holding companies that have been granted a hardship exemption by the Board under section 4(d) of the Bank Holding Company Act; and foreign banking organizations as defined by § 211.23(b) of Regulation K. The revised report is to be implemented on a quarterly basis as of March 31, 1992, with a submission date of 45 days after the "as of" date.

Agency Form Number: FR Y-9C

OMB Docket Number: 7100-0128

[1] One of the proposed items parallels an item that was added to the Report of Condition and Income at an earlier date.

THE NATIONAL FLOOD INSURANCE PROGRAM: Agency and Insurer Perspectives

Insurance Research Council
July 1990

This study, *The National Flood Insurance Program: Agency And Insurer Perspectives*, is available from the Insurance Research Council, 1200 Harger Road, Suite 310, Oak Brook, IL 60521. In the U.S. and Canada, a single copy is free and additional copies are $4 each postpaid. All copies to other countries are $5 each postpaid. A list of other Insurance Research Council reports is provided in **Appendix 3**.

ACKNOWLEDGEMENTS

This study reflects the guidance and input of the Insurance Research Council's Flood Insurance Committee. The group helped to define the scope of the research, participated extensively in development of the four surveys, and reviewed the findings and draft report.

Many others made contributions that helped to shape this work. J. Wesley Ooms of State Farm and Al Moore of Aetna Life and Casualty were two early members of the Committee who made valuable contributions in the design of the study and surveys. F. Dean Hildebrandt of Dean Hildebrandt and Associates conducted a series of background interviews with insurers, agents, and others involved with flood insurance which were useful in identifying and fine-tuning questions for the surveys. Six individuals deserve recognition for the assistance they provided in drawing samples of insurance agents from their respective organizations for the agency survey. They include Todd Muller of the Independent Insurance Agents of America, Lydia Astorga of the National Association of Professional Insurance Agents, Ed Clark of Allstate Insurance Company, Robert DeChant of State Farm Fire and Casualty Company, Tom Dunlap of Nationwide Insurance Companies, and Ted Johnson of Omaha Property and Casualty Company. Their hard work and followup resulted in an agency survey response rate that was excellent for mailed surveys of this size and scope. The Alliance of American Insurers handled the mailing of approximately 1,800 agency and insurer survey forms. We also appreciate the insurers and agencies who took the time to complete and return the flood surveys. Without their participation this study would not have been possible.

David Unnewehr of the Insurance Research Council staff and Gerald Shkarovsky of NAII conducted the data analysis of the four surveys. *The National Flood Insurance Program: Agency and Insurer Perspectives* was written by David Unnewehr.

To all of these individuals and organizations, the Insurance Research Council extends its thanks and appreciation.

Gregory Heidrich, Chairman
Flood Insurance Committee

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CHAPTER 1
EXECUTIVE SUMMARY

Since 1983, the Federal Government and property-liability insurers have worked together to provide U.S. property owners with needed flood insurance in a public-private partnership known as the Write-Your-Own (WYO) Flood Insurance Program. During the fall of 1989, the Insurance Research Council conducted a series of surveys to review the organization, operation, challenges, and achievements of the National Flood Insurance Program (NFIP) and WYO from the perspectives of insurance companies and insurance agents. Prior to June 1990, the Insurance Research Council was known as the All-Industry Research Advisory Council (AIRAC).

One of the purposes of this research was to examine whether WYO and the NFIP are structured to maintain and increase the involvement of insurers and agents in selling flood insurance. Of equal concern was the issue of whether the flood programs are designed to attract and enable property owners who need flood coverage to buy it. The surveys analyzed the flood insurance program from the perspectives of both agents and insurers actively writing flood insurance and those not participating in the flood insurance program. A total of 104 insurers responded to surveys on WYO and the National Flood Insurance Program. Participating insurers represented 63% of 1988 total industry property insurance premium volume. Flood insurance surveys were completed by 478 insurance agencies doing business in the 11 largest states for flood insurance policies.

Major findings from the surveys and additional interviews with agents and company officials familiar with the flood insurance program were as follows:

1. The desire to be a full service agency and the fact that clients were required by lenders to have flood insurance were the reasons most frequently cited by insurance agencies for their involvement in selling flood insurance. Insurers also most often chose wanting to be a full service company as a very important factor influencing their decisions to write flood insurance through the WYO program. The perception that the flood policy offers necessary coverage sought by policyholders and a belief that the WYO program enabled better service to policyholders than the Direct Program were also important influences on insurers deciding to write flood insurance.

2. The principal reason given by insurers and agents for not writing flood insurance was that anticipated demand for flood policies would not justify startup costs for equipping offices and training personnel to offer the product.

3. When asked whether in their opinion flood insurance was a "hard sell" for most insurance prospects, 85% of the responding insurers agreed that flood insurance was a hard sell compared to 45% of the insurance agencies. A majority of agencies (55%) indicated that flood insurance was not a hard sell compared to 15% of the insurers. The large difference between insurers and agencies may have been a reflection of varying perspectives. The agency survey was targeted heavily to 11 states where about 80% of all flood policies are written in the nation. Many of the responding agents wrote policies in coastal states such as Florida, Texas, and Louisiana where there is greater awareness of the risk of severe flooding from hurricanes. Insurers may have approached the issue from a national viewpoint. The number of flood insurance policies sold outside the concentration in coastal areas is relatively low despite the presence of Special Flood Hazard Areas in every state.

4. Insurers and agencies saying that they believed flood insurance was a "hard sell" were asked to evaluate a list of reasons why this might be so. The three reasons cited most frequently were that: (1) people just don't think they will experience significant flood damage, (2) people think flood insurance is too expensive compared to their property insurance premium, and (3) people believe they are already covered for flood damage.

5. Insurers and agents again differed on opinions regarding which groups involved with the National Flood Insurance Program should take on primary responsibility for promotion to potential policyholders. A plurality of insurers (46%) said that the Federal Insurance Administration (FIA) should have primary responsibility for promoting flood insurance, 22% said local insurance agents should take primary responsibility and 17% indicated that WYO companies should have the lead role for promotion.

Meanwhile, 42% of agents said that agents themselves should take on the primary responsibility for promoting flood insurance, with 39% saying the FIA should take primary responsibility and only 10% saying WYO companies should do so. Fifteen percent of the insurers and 10% of the agencies said other groups or a combination of groups should work together to promote flood insurance. Besides the FIA, WYO companies, and insurance agents, some of the respondents said that lenders or real estate agents should assume partial or even primary responsibility.

6. About nine in ten (88%) of both agents and insurers expressed some agreement with the statement that a more extensive public campaign to raise awareness about the flood hazard and the availability of insurance would be effective in increasing the number of flood insurance policies. Agents were more enthusiastic about the concept as 47% said they strongly agreed with the desirability of an extensive public campaign compared to 33% of the insurers.

7. There is wide agreement among insurers, agents, government officials, environmental, floodplain, and land use organizations that mortgage lenders hold one of the keys to increasing the number of flood policies through better compliance with the Federal mandatory purchase guidelines for flood insurance. The Flood Disaster Protection Act of 1973 mandates purchase of flood insurance by inhabitants of Special Flood Hazard Areas in order to qualify for a federally backed mortgage. Compliance with this mandate on the part of lenders ranges from very good in parts of Florida and other coastal states vulnerable to storm surge flooding to very spotty in other areas of the country, according to agents and insurers responding to the Insurance Research Council surveys.

8. The number of flood insurance policies in force nationwide has increased 23% since insurers again became active in the flood insurance program, rising from 1.83 million policies in 1984 to 2.26 million policies in March, 1990. Estimates vary on the size of the national market for flood insurance policies due to the difficulties of counting properties within Special Flood Hazard Areas (SFHA's). It is agreed that there are significant numbers of property owners within these areas who need or require flood insurance, but have not purchased it. Insurers active in the flood insurance program feel that the rate of growth in policies has been restricted by a doubling of average flood insurance premiums between 1981 and 1988, reductions in coverage, several years of drought and minimal flooding, and uneven enforcement of the mandatory requirement for flood insurance connected with mortgage loans in flood hazard areas.

9. Agents and insurers made numerous positive comments about the WYO program. A number of agents stated in written comments that the WYO program had greatly improved overall service to agents and policyholders. Several agents said that policies were issued and claims were settled more quickly and efficiently than before and that it was helpful to have WYO company people with insurance expertise to contact for help in working with flood policies. Regarding problem areas, both insurers and agents named the process of obtaining elevation certificates as the biggest stumbling block faced by consumers when buying flood insurance.

CHAPTER 2
A BRIEF HISTORY AND CURRENT ISSUES AFFECTING THE NATIONAL FLOOD INSURANCE PROGRAM

Background

The National Flood Insurance Program (NFIP) was created by federal legislation in 1968 to address a peril that had proved difficult to manage for the federal government, states, local communities, and the insurance industry. It is estimated that 70-80 percent of all natural disasters involve flooding. Before enactment of the National Flood Insurance Program, the Federal response to flood mitigation was two-fold. The first effort was intended to be preventive and involved channeling and the construction of dams, seawalls, levees, and other structures. The second response came in the form of disaster relief after a major flood event. It became increasingly apparent that the disaster relief response, rather than providing incentives for limiting flood and erosion damage, encouraged unwise development in flood prone areas, and did not encourage communities and states to develop their own flood hazard mitigation programs. Flood losses and relief costs increased along with the burden on the taxpayers for providing preventive measures.[1]

Historically, the insurance industry had perceived flood as an uninsurable peril because of the problem of adverse selection, the lack of a geographic spread of risk, and the catastrophic nature of severe flooding. Underwriters concluded that a rate reflecting anticipated losses would be too costly to make coverage affordable and marketable.[2] Beginning in the 1950's with the Truman and Eisenhower administrations, there were several attempts to implement a national flood insurance program. In 1956, Congress passed the Federal Flood Indemnity Act which included a $2.9 billion flood insurance program. Under this program Federal and State governments would have jointly subsidized 40% of the premium rate and private insurers would have sold and serviced the policies. However, Congress never authorized the funds for the flood program and it fell by the wayside. Both the government and the insurance industry continued to study various approaches to the national flood problem during the 1960's.[3] Interest waned in years with little flooding, while impetus for action rose whenever there was a severe hurricane with catastrophic coastal flooding. Hurricane Betsy in 1965 sparked a Federal feasibility study which explored ways of implementing two important objectives: (1) to provide financial assistance for victims of flood disaster with a minimum of taxpayer subsidy and (2) to help prevent the unwise use of land where flood damages would mount steadily and rapidly. The report suggested that flood insurance was a mechanism which could keep the objectives of assistance and mitigation in balance, without either outweighing the other.

In August 1968 the Housing and Urban Development Act was passed. The legislation included the National Flood Insurance Act which created the National Flood Insurance Program. The Flood Insurance Act brought a completely new approach of tying flood insurance availability to community development of land use and control measures aimed at reducing and preventing flood losses. A flood insurance program was authorized that would make insurance available nationally through the shared efforts of the federal government and the private insurance industry. Included were provisions to encourage state and local governments to institute changes in land use to better regulate and constrict the development of land exposed to flooding. The Federal Insurance Administration was established within the Department of Housing and Urban Development to administer the program and to encourage creation of a pool of private insurers to help implement the flood insurance operation. The National Flood Insurers Association was formed to meet the insurance industry's commitment to the Flood Program.

The First Decade: Slow Growth in Community Participation and Flood Policies

The first flood insurance policies were written in Louisiana and Alaska during 1969, but growth during the first several years was extremely slow. Under the initial program, Federal flood insurance was not available until detailed flood hazard zones and elevation mapping studies had been completed. These studies were necessary to establish rates that were actuarially

1. Simmons, Malcom, *The Evolving National Flood Insurance Program*, Congressional Research Service, Library of Congress, October 1988.

2. Ooms, J. Wesley, CPCU, CLU, and Weese, Samuel H. "The National Flood Insurance Program—Did the Insurance Industry Drop Out"?, *CPCU Journal*, December 1978.

3. Ibid

sound and to specify elevations at which new construction would be reasonably safe from flooding. Because of the time-consuming nature of these studies, it soon became apparent that the requirement drastically slowed down the entrance of new communities into the program. Following Hurricane Camille in 1969, Congress amended the act to provide an "emergency" phase to the program. Under the emergency phase, the government could quickly provide a limited amount of flood insurance in a community before the detailed flood insurance rate maps were completed. During the emergency phase, flood insurance boundary maps, with limited detail and without elevation data, were typically issued. Flood insurance was made available at subsidized rates, but for lower maximum coverage.[4] Policyholders would have the opportunity for higher amounts of coverage and more appropriate rates when technical mapping studies had been completed and communities entered the regular phase of the flood program. The emergency phase has been extended repeatedly as the mapmaking process has continued, and in mid-1989 still applied to about 2% of the policyholders.[5] Special Flood Hazard Area mapping and the emergency program are expected to be completed in mid-1991. Although most policyholders are now in the "regular" phase, many still pay subsidized prices because the program allowed the option of paying subsidized prices if their structures were built before a certain date. So many policyholders are paying subsidized rates, it has been estimated that the program lost an average of $65.2 million in premiums per year in the 10 years ending with 1987.

Although the emergency phase resulted in increased community participation and the number of policies began to rise, growth was still slow. Hurricane Agnes in 1972 brought some of the most devastating and widespread floods in the nation's history to the southeast and mid-Atlantic states. Congress was disturbed to learn that the flood insurance program seemed to have very little impact in providing compensation for flood losses. So few property owners had bought flood insurance in the affected areas, that it was estimated that flood insurance paid about 1% of the flood losses. This realization led to passage of the Flood Disaster Protection Act of 1973 which made it virtually impossible for communities with Special Flood Hazard Areas (SFHA) to remain out of the program. The Act mandated purchase of flood insurance by inhabitants in areas identified by HUD as SFHA's, prior to receiving any form of federal financial assistance for acquisition or construction purposes. One of the crucial effects of this legislation was to deny federally-related financing by private lending institutions unless the property owner in a SFHA obtained flood insurance. Since a large amount of private lending activity fell into the domain of federal regulation, borrowers now had to purchase flood insurance to get a mortgage. Flood prone communities were expected to enter the National Flood Insurance Program by July 1, 1975, or within one year after receiving notification of having flood-prone areas within the community. A flood prone community not joining the program would not have federal disaster loans or grants available for rehabilitation after a catastrophe. The number of eligible communities and the number of flood insurance policies increased dramatically during the period 1974-77. Insurance executives involved with the National Flood Insurers Association believed that the 1973 Amendment provided the necessary ingredients for a sound insurance plan. The program already had integrated a loss prevention plan into the insurance concept. The 1973 changes created an opportunity for the necessary geographic spread of risk by mandating flood insurance coverage prior to mortgage money availability for properties located in Special Flood Hazard Areas.[6]

Insurer-Federal Government Partnership: On and Off; Then On Again With WYO

During the first 10 years of the National Flood Insurance Program (NFIP), flood insurance was serviced by private property-liability insurance companies under a cooperative venture with the government. In 1978, the NFIP became an operation involving direct federal flood insurance and participation by private insurers ceased. The temporary end to insurance industry participation came after several years of conflicts over philosophical and management issues related to the role each party in the public-private partnership would play. In 1979, the Federal Insurance Administration and the NFIP were reorganized from HUD into the Federal Emergency Management Agency (FEMA).

In 1981 with a change in administration, efforts began to reinvolve the private sector in the NFIP.

4. Simmons, Malcom, *The Evolving National Flood Insurance Program*, Congressional Research Services, Library of Congress, October 1988.

5. The Journal of Commerce, "The National Flood Insurance Program," June 16, 1989, New York, New York.

6. Ooms, J. Wesley, CPCU, CLU and Weese, Samuel H., "The National Flood Insurance Program—Did the Insurance Industry Drop Out?," *CPCU Journal*, December 1978.

Federal Insurance Administrator Jeffrey Bragg, working with insurance industry executives, started an 18-month effort which led to introduction of the Write-Your-Own (WYO) flood insurance program as the method for insurers to re-enter the NFIP. Both the federal government and insurers felt that the industry's reinvolvement would result in improved marketing of flood coverages. In August 1983, FEMA extended an invitation to all licensed property-casualty insurers to participate in the WYO program for fiscal year 1984. In the first sign-up period, 48 companies signed the financial assistance/subsidy arrangement to write flood insurance. By October 1989, 186 companies had signed this arrangement and the 80 insurers actively writing flood insurance also represented an additional 40 corporately related companies.

How the Write Your Own (WYO) Program Works

The purpose of the WYO program is to enable private enterprise businesses to replace government as the primary method of delivering flood insurance to the public. Under the program, the government is still responsible for (1) determining rates, coverage limitations and eligibility, (2) establishing floodplain management guidelines, and (3) providing the financial backup for the program.[7]

Since 1983, the FIA Administrator, under the authority of the 1968 National Flood Insurance Act, has, in addition to issuing flood policies directly, authorized private insurance companies to issue flood policies. Insurers issue identical policies at identical premiums. Companies are permitted to retain approximately 30% of the premiums for their administrative costs. The balance of the premium is deposited into a separate bank account from which it is swept weekly (except for a minimum balance of $5,000) into the United States treasury. When claims arise, under a Federal Letter of Credit mechanism, Federal Funds are deposited into that account for the drawing of timely claim checks. Under the arrangement between the Federal government and the private insurance companies, the Federal government is committed to payment of all claims on policies written by the companies in the event that any company is unable to remain in the business of insurance. Thus, in all respects, all flood insurance policies, direct and those written through the companies, are written under the authority of National Flood Insurance Act of 1968.[8]

The goals of the WYO Program are: (1) to increase the flood insurance base as well as the geographic distribution of policyholders, (2) to improve service to policyholders and insurance agents through the infusion of existing insurance company communication and service capabilities that have been designed to meet their clients' service needs, and (3) to provide insurance companies with operating experience under the NFIP in a way that greatly increases the program's ability to settle claims in a post-flood catastrophe situation. Still another goal which is mentioned in some reports about WYO is reduction of the federal government's role as the primary marketing agent of flood insurance. Based on results from the Insurance Research Council surveys, substantial progress has been made on goals two and three. Insurance agencies and companies in written comments have emphasized the improved service to agents and policyholders brought about by the WYO program. They are convinced that the WYO program has made policy issuance, rating, marketing, and claims handling much more timely and efficient. Over the long run, this improved service and claims handling should have a payoff in increased sales of new policies and higher renewal rates for existing policies. However, in the first six years of the WYO program, the policy base and the geographic distribution of policyholders have not increased as rapidly as expected.

The Market For Flood Insurance

Because flood insurance is required in order to obtain a federally-backed mortgage for properties located in SFHA's, FEMA/FIA has estimated that the "built-in" market for flood insurance may be in the range of 8 to 11 million policies.[9] Special Flood Hazard Areas are determined with reference to a "100-year" flood standard or "base flood," which is defined as the flood having a one percent probability of being equalled or exceeded in any given year. The risk of experiencing a flood of this magnitude increases with the length of time considered. Over the life of a 30-year mortgage, a property located in a special flood hazard

7. Federal Insurance Administration, Federal Emergency Management Agency, *The National Flood Insurance "Write Your Own Program": Executive Prospectus*, Washington D.C., 1987

8. Rose, James Jr., Executive Assistant to the FIA Administrator, letter to Sarah Haynie, General Counsel, Texas State Board of Insurance clarifying the role of the Direct and WYO flood programs under the NFIP, FEMA, Washington D.C., April 6, 1990.

9. Federal Insurance Administration, National Flood Insurance Program, "The Number of Households/Structures Located in Special Flood Hazard Areas: The History and Background of Such Estimates," Federal Emergency Management Agency, February 15, 1988. Also See: *Flood Report*, July 1988.

area would have a 26% chance of being flooded, according to a FEMA probability analysis. By contrast, during the term of a 30-year mortgage, there is only a 1 percent chance of suffering a fire loss.[10] For properties that are located in floodplains, the much higher probability of a flood loss is a key factor in the cost of flood insurance.

Special Flood Hazard Areas relate to the highly irregular courses of streams, rivers, and coastlines and don't pay any attention to municipal boundaries or census tracts. Thus it is very difficult to calculate the true number of SFHA properties. A more precise estimate would be helpful in determining how close the nation is to achieving the goal of having flood insurance for all properties in the SFHA's. In March, 1989, nearly 2.3 million flood insurance policies were in force. There is not an exact matchup between policies in force and estimates of homes and businesses in SFHA's because about one-third of NFIP policies are sold outside of the Special Flood Hazard Areas. Even more of these policies will be sold in the future with the advent of a new "preferred risk" flood policy at a greatly reduced premium marketed to homeowners outside of SFHA's.

One consideration in reconciling estimates for how many flood insurance policies *should* be in force with consumer behavior is to understand that the risk of flood damage is not uniform within Special Flood Hazard Areas. Owners of homes on barrier islands in South Carolina or along the Florida coast, facing the potential of 20-foot storm surges from severe hurricanes, have stronger incentives to buy flood insurance than homeowners situated near the outer edge of a wide floodplain on a midwestern river. For the South Carolina or Florida homeowner the risk of a total loss clearly must be considered; while for some midwesterners the perceived risk might be a foot of water in a basement once every 50-100 years. Consumers do evaluate risk against the cost of insuring for that peril, but not always correctly or with full information. Agents and insurers selling flood insurance have noted that sales suffered in many parts of the country that experienced drought during the late 1980's. These are examples of factors that can affect consumer perceptions of risk and the market for flood insurance.

Mandatory Purchase Requirements

Beyond consumer knowledge and behavior, there is a wide consensus among insurers, agents, FIA officials, other federal agencies, environmental, floodplain, and land use organizations, that the key to increasing the number of flood policies and persistency is better *compliance with the Federal mandatory purchase requirements by mortgage lenders*. In interviews with agents, insurance company representatives and flood program vendors, conducted by Dean Hildebrandt & Associates for this study, participants noted that compliance ranged from very good in some areas to spotty at best in other areas. Some of the insurance agents interviewed took pride in personally calling on local lenders and realtors to remind them of the mandatory purchase requirements. Most agreed that compliance is a complex issue that does not lend itself to any one solution. Several interviewees noted the importance of the increased role of the FIA in working with banking regulators. Two stressed the need for better lender education about compliance requirements and potential liability consequences to lenders if they were sued by a property owner who suffered an uninsured flood loss. Lenders, who are usually so careful to ensure that a mortgage loan is secured by fire and windstorm insurance, also need to realize the risk to their portfolios of uninsured flood losses. Several others mentioned various problems that make compliance difficult, such as the following:

1. There have been no specific regulatory penalties for noncompliance.
2. Five different federal agencies regulate various types of mortgage lenders; their requirements for compliance differ.
3. Competitive pressures make it difficult for a lender to require flood insurance when its competitors do not.
4. The mortgage servicer may be in a different part of the country and not knowledgeable about flood hazard conditions in the property's location, especially if the flood maps do not agree with other information or do not show a complete or current street grid.
5. Computer system restrictions make it difficult for mortgage servicers to follow up on flood insurance nonrenewal, particularly on mortgages that were originated before the mandatory purchase requirements were instituted.
6. Lenders often delegate compliance to the lowest employee level, where employee turnover and possible lack of training reduce compliance effectiveness.

10. Federal Emergency Management Agency, *Mandatory Purchase of Flood Insurance Guidelines*, October 1989.

Acknowledging these problems, the FIA has been working with responsible Federal agencies and instrumentalities and the Congress to promote more aggressive enforcement of the requirement and legislation has been introduced. In October 1989, new guidelines were issued for lenders and federal regulatory institutions on the Mandatory Purchase of Flood Insurance. These guidelines describe the purpose and history of the program, spell out lender responsibilities, and attempt to clear up questions that had arisen among lenders and regulators about how to interpret the regulations. The issue of lender compliance has received a great deal of attention from FEMA/FIA, insurers, Congress, lenders and financial regulators, and others with an interest in the flood insurance program over the last year. It is reasonable to suppose that the attention being focused may begin to have a positive effect on the number of new flood insurance policies and renewals of existing policies. Compliance is also addressed in depth in the insurer and agency surveys analyzed in this report (See Chapter 4).

The Effect of Pricing on the Market For Flood Insurance

During the first several years of the program, there was dramatic growth in WYO policies as the Direct federal government-written policies were rolled over into WYO policies. At the same time there was slow growth in the overall number of flood policies, as shown by the following table:

TABLE 1
NATIONAL FLOOD INSURANCE POLICIES IN FORCE

Year	Direct Program	WYO Program	Total Flood Policies
1984	1,651,000	181,000	1,832,000
1985	1,435,000	520,000	1,955,000
1986	1,060,000	1,016,000	2,076,000
1987	750,000	1,330,000	2,080,000
1988	521,539	1,578,000	2,099,000
1989	413,500	1,803,900	2,217,400
1990 (March)	384,700	1,875,300	2,260,000

SOURCE: The *Flood Report* July 1988; FIA and Computer Sciences Corporation (CSC)

The total number of flood policies has grown by approximately 23% since 1984, the first full year of operation for the WYO program. Representatives of WYO companies in general believe that the slow growth in the total number of policies has been commendable in light of dramatic increases in the average flood insurance premium charged to policyholders and significant coverage restrictions introduced during the 1980's. A major goal of the FIA during the Reagan Administration was to make the NFIP self-supporting (actuarially sound) for an average loss year, as reflected in past experience since the inception of the program. This goal was met by 1988-89 using three techniques, including (1) restricting insurance coverage in basements, (2) increasing deductibles on building contents, and (3) most significantly, raising flood insurance premiums. Average flood insurance premiums rose 111% from $134 at the beginning of 1981 to $283 by October 1, 1988 in a steady progression of premium increases. As average flood premiums more than doubled during this period, insurers and agents saw rising resistance to the product as the price of flood coverage alone began to approach the cost of an average homeowner's policy, which covers numerous perils. The price increases no doubt had an effect on renewal rates. Recent price stability, coupled with more stringent enforcement of the mandatory flood insurance requirements for mortgages issued in Special Flood Hazard Areas, could mean that the program is poised for more significant growth during the 1990's. As always, weather patterns are a wildcard influence on consumer awareness of the flooding peril. Hurricane Hugo resulted in over 10,000 flood claims and $312 million in flood insurance losses in South Carolina alone. Hugo and severe flooding in Ohio, Texas and the lower Mississippi Valley during the Spring of 1990 have again raised awareness about the flood peril following the drought years of the late 1980's.

Other Issues Affecting WYO and the NFIP: Hazard Mitigation and Floodplain Management

The National Flood Insurance Program is a multifaceted and complex public policy program that impacts many different constituencies and interest groups. At Congressional Hearings conducted during May 1989, organizations presenting testimony ranged from environmental groups such as the National Wildlife Federation, the Coastal Alliance, and the Association of State Flood Plain Managers to numerous insurance and banking trade groups.

To enable residents to qualify for mortgages and flood insurance, 18,000 communities nationwide have joined the NFIP and adopted floodplain management ordinances designed to regulate land use in flood haz-

ard areas. Protection and preservation of floodplains offers numerous benefits to water supply, recreational opportunities, wildlife, and overall mitigation of flooding potential. The Flood Insurance Program has helped to spur the development and adoption of building and construction standards designed to withstand flood forces. Progress has also been made on techniques to retrofit, raise, or move existing structures to make them much less vulnerable to flooding.

A recent evaluation of floodplain management activities in 10 communities in various regions of the U.S. indicates that these activities have significantly reduced average annual flood damages over what they would have been in absence of floodplain management.[11] The authors of the study, published by the University of Colorado, estimate that average annual flood damages (in 1975 dollars) increased by 4% in the ten communities from $18.047 million to $18.85 million. However, in the absence of floodplain land use management programs in place it is estimated that average annual flood damages would have increased by 65% to 29.84 million by 1985. Floodplain land use management thus produced a net savings of almost $11 million per year in potential average annual flood losses. The ten communities covered in the study included Savannah, Georgia; Cape Girardeau, Missouri; Toledo, Ohio; Tulsa, Oklahoma; Omaha, Nebraska; Wayne, New Jersey; Armada, Colorado; Fargo, North Dakota; Scottsdale, Arizona; and Palatine, Illinois. Data compiled by the FIA provides further evidence of the effect of floodplain and construction regulations on flood losses. Insured buildings with construction dates after communities adopted floodplain management standards had a claim frequency per 1,000 flood policies 78% lower than insured structures that were built prior to adoption of the standards during the period 1978-1988.[12]

An interesting new program that ties into both the insurance and mitigation aspects of the National Flood Insurance Program is the Community Rating System (CRS). The CRS is a system that rates and rewards communities with insurance premium reductions for having exemplary floodplain management programs. The CRS is modeled after the fire insurance public protection classes given to communities. Experience since the turn of the century has shown that the fire insurance public protection class given to a community has been a very strong incentive for local officials to maintain or improve their fire protection programs. It is hoped that the Community Rating System for flood mitigation efforts will stimulate a similar desire to make improvements and protect flood plains. CRS was developed by the FIA, in conjunction with insurers, the Insurance Services Office (ISO), and the Association of State Floodplain Managers. Congressman Doug Bereuter of Nebraska described efforts in Beatrice, Nebraska as one example of floodplain management activities that the new CRS program will address. Beatrice has purchased or relocated over 100 flood damaged homes and created Chautaqua Park, a greenway recreational area in the floodplain of the Big Blue River. Several city blocks where homes were once severely damaged have been converted to more compatible floodplain uses such as ball fields, and facilities for hiking and camping.[13] The CRS program is scheduled for implementation in October 1991.

11. Burby, Raymond J., et. al., *Cities Under Water*; Monograph #47, Program on Environmental and Behavioral Science, University of Colorado, Boulder, Colorado, 1988, p. 71.

12. Reilly, Frank, "1978-1988 NFIP Flood Policy and Claim Experience," Panel on *Insurance as a Mitigation Tool: How Effective Is It?*, 1989 Natural Hazards Center Workshop, Boulder, Colorado.

13. Representative Doug Bereuter, Nebraska, "Keynote Address," National Flood Insurance Program Biennial Conference, November 28, 1989.

CHAPTER 3
METHODOLOGY FOR AIRAC SURVEYS ON FLOOD INSURANCE

After extensive discussions on how to approach the issue of whether the National Flood Insurance Program is set up to attract further acceptance among insurers, agents, and the public, the Council's Flood Insurance Committee decided to survey insurance industry participants and nonparticipants in the flood insurance program. The committee identified five groups from within the property-liability insurance industry that might be expected to offer varying perspectives on the Write-Your-Own (WYO) flood insurance program. These included:

1. Insurance agents actively writing flood insurance, both through the WYO and Direct Programs,

2. Agencies not writing flood insurance,

3. Active WYO insurance companies,

4. Insurance companies which have signed the WYO arrangement, but which do not actively write flood insurance, and

5. Insurance companies that have *not* signed the WYO arrangement and which do not write flood insurance.

Commercial vendors handling statistical reporting, accounting, policy issuance and other services on behalf of WYO insurers form a sixth group associated with the flood program and the insurance industry. Vendor perspectives on the flood insurance program were sampled in background interviews.

To provide a basis for written questionnaires that would be directed to the five groups listed above, selected insurers, insurance agencies, and vendors were interviewed in person or by telephone by Dean Hildebrandt & Associates, an independent consulting firm.

The interviews included representatives of 12 insurers participating in the Write-Your-Own program, including 10 of the 11 largest writers of flood insurance; four insurers that do not participate in the WYO Program; and three service vendors presently providing a variety of operating services for active insurers. On the agency/producer side, the consultant interviewed six insurance agencies, including four agencies represented on the Flood Insurers Producers National Committee. The interviews were confidential and not attributed to individual interviewees. Interviews covered three main topics: the size of the market for flood insurance and policy count growth factors, the WYO Program, and the flood insurance product itself.

The background interviews proved to be extremely useful in identifying major issues to be covered in four questionnaires developed. Those interviewed also were able to offer comments on the reasons for the difference between estimates of potential flood insurance policies based on properties in Special Flood Hazard Areas and the actual number of flood policies.

Three Flood Insurance Surveys For Insurers

Insurer and agent experiences with the National Flood Insurance Program were explored in surveys conducted by the Insurance Research Council during the fall of 1989. A survey for insurance agents on the flood insurance program went to insurance agencies located in the 11 top states for flood insurance premium volume. Property insurers writing at least $20 million of property insurance premium volume in the U.S. according to A.M. Best Company data, received one of three insurer questionnaires. The three insurer surveys varied according to current status with regard to writing flood insurance. Companies actively writing flood insurance received a detailed survey for "signed and writing" participants in the Write-Your-Own (WYO) program. Another group of property insurers have signed the Write-Your-Own arrangement, paving the way for participation in the flood program, but have not yet written any policies. This set of companies received a survey tailored to their special situation. A smaller survey went to property insurers not involved in the flood insurance program in any way.

Flood surveys were mailed to 72 property insurance companies or groups that had signed the WYO arrangement and were actively writing flood insurance. The list of active and signed companies was prepared by the Computer Sciences Corporation, the federal servicing agent for the NFIP. The Federal Insurance Administration (FIA) sometimes lists as many as 200 WYO companies. This count includes insurers that are part of a fleet or group of companies. In the flood insurance program, usually one company among the group will take the lead role in writing flood insurance

although in a technical sense all signed companies would have the ability to actively write flood insurance. These alternate ways of counting help to explain differences between FIA totals, figures supplied by CSC, and the number actually contacted by the survey. Responses were returned by 41 of the 72 active writers for a response rate of 57%. Twenty-three companies that had signed the WYO arrangement, but which were not actively writing flood insurance at the time, received the survey by mail. Responses were received from 13 insurers in this category, also a 57% response. A mail survey also was sent to 140 non-writers of flood insurance, seeking reasons why each company had decided against participation in the flood insurance program. From this group came 47 useable survey responses. Three additional companies sent letters acknowledging that they did not write flood insurance, commenting briefly as to why they did not write the coverage. Summarizing, there were 104 total responses from the three insurer surveys for an overall response rate of 44%. From the standpoint of shares of the industry's total property insurance premium volume, responding insurers accounted for 63% of that premium volume in 1988, according to A.M. Best data.

Agency Survey

The insurance agency survey was mailed to a sample of 1,600 agencies in the 11 top states for flood insurance policies and flood premium volume. The Insurance Research Council Flood Insurance Committee decided to target the survey to states where there were concentrations of flood insurance policies and premium, rather than conducting a random national sample. A major reason for this strategy was to ensure that the mailing would be received by agents familiar with the flood insurance program and that a majority would be active writers. Within the 11 states, the sample was drawn according to the share of flood insurance policies written in each state as a percentage of all eleven states. Table 2 in Chapter 4 shows the share of flood insurance policies written in each state as a percentage of all 11 states and the agency survey response rate by state. The flood insurance program has a strong geographic concentration. The 11 states of Florida, Louisiana, Texas, California, New Jersey, New York, Pennsylvania, South Carolina, North Carolina, Virginia, and Mississippi accounted for about 80% of the flood insurance policies in force nationally during October 1989. Florida, Louisiana, and Texas alone account for well over half the flood policies written nationally.

Four large writers of flood insurance and two independent agency trade associations provided assistance by supplying a sample of their agencies drawn randomly according to the share of flood insurance policies written in the 11 states. The samples were drawn statewide and there was no attempt to target special geographic areas such as the coastline. The six organizations, representing about an equal mix of exclusive and independent agents, included State Farm Fire and Casualty Company, Allstate Insurance Company, Nationwide Insurance Companies, Omaha Property and Casualty Company, the Professional Insurance Agents of America (PIA), and the Independent Insurance Agents of America (IIAA). Each organization drew the number of agencies for the sample that roughly corresponded with their shares of the flood insurance business. Agents representing these organizations write a substantial majority of the nation's flood insurance policies.

The agency survey was mailed during October, 1989. A total of 478 or about 30 percent of the 1,600 insurance agencies contacted responded to the survey, an above average response for a mailed survey of this size.

CHAPTER 4
EXPERIENCES OF INSURERS AND AGENCIES ACTIVELY WRITING FLOOD INSURANCE

Chapter 4 analyzes perceptions and experiences of insurance companies and agents actively writing flood insurance as reported in the surveys on flood insurance. This chapter covers the reasons why insurers and agents choose to write flood and participate in the WYO program, perceptions about the distribution and marketing of flood insurance, program administration, perceptions about compliance with mortgage requirements, problems consumers encounter in purchasing flood insurance and overall comments on the WYO program. Opinions on whether flood insurance is a "hard sell" and which group should have primary responsibility for public promotion of flood insurance are addressed in the section on marketing and distribution. This chapter focuses on insurers and agencies that write flood insurance, while reasons why insurers and agencies choose not participate in the WYO flood insurance program are discussed in Chapter 5.

Table 2 shows where responding agencies wrote property insurance. The survey was targeted to agencies in the top 11 states in proportion to flood insurance policies generated by the 11 states. For example, Florida accounts for 35% of national flood insurance policies and 44% of the policies among the 11 largest states which were part of the survey. Table 2 indicates that the responses were generally in line with the number of survey forms sent to each state. For example, agents writing in Florida accounted for approximately 44% of the surveys and for 44.8% of the survey responses received.

TABLE 2
RESPONDING AGENCIES AND FLOOD INSURANCE POLICIES BY STATE

	Survey Respondents		Flood Policies (Oct. 1989)	
State	Numbers	Percent	% of Largest 11	% of U.S.
Florida	214	44.8%	44%	35%
Louisiana	60	12.6	14	11
Texas	48	10.0	12	10
New Jersey	33	6.9	7	5
California	27	5.6	7	6
Pennsylvania	27	5.6	3	2
New York	27	5.6	4	3
North Carolina	25	5.2	2	2
Mississippi	21	4.4	2	1
South Carolina	21	4.4	3	2
Virginia	16	3.3	2	2
Other States	36	7.5	-	20
Respondents	478	100.0%	Total Policies 1,780,300	2,210,772

NOTES: Responses add to more than the total number of respondents (478) because some agencies write insurance in more than one state. For the same reason, percent totals add to more than 100%. Policy counts for the national total do not add exactly to 100% due to rounding. SOURCE: NFIP, October 1989 report on Policy Count, and the Insurance Research Council survey.

It was not known prior to the survey which of the insurance agencies actually wrote flood insurance. Thus one of the early questions in the agency survey dealt with the status of the agency with regard to the flood insurance program (Table 3). The WYO program allows insurance agents to write flood insurance through the insurer or insurers they represent. Under the direct program, agencies place flood business through a government contractor on behalf of the Federal Insurance Administration (FIA).

TABLE 3
INVOLVEMENT OF INSURANCE AGENCIES WITH THE FLOOD INSURANCE PROGRAM

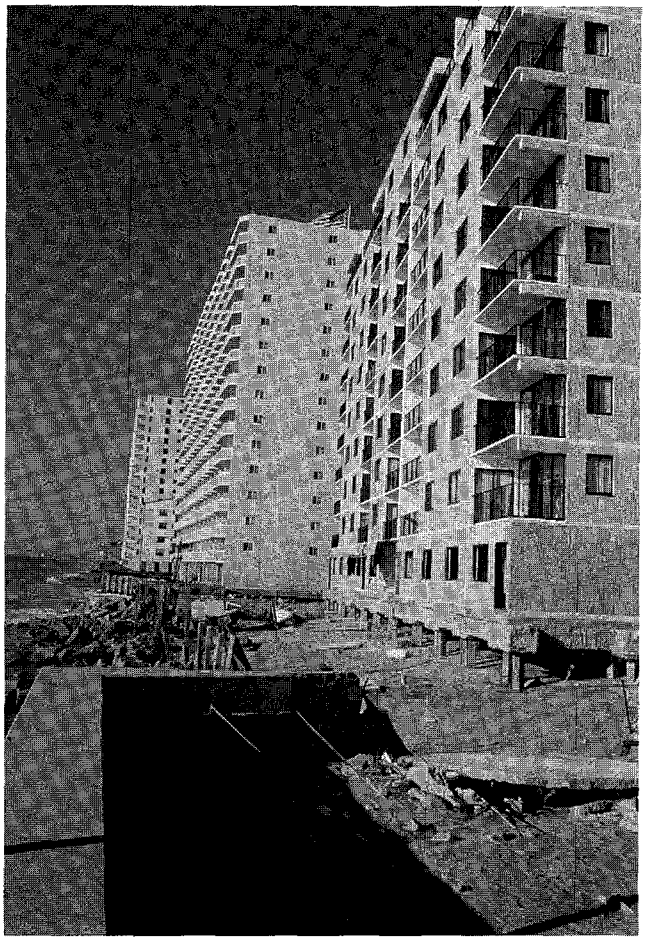
Q. Does Your Agency Write Flood Insurance?

Involvement and Status	Number of Agencies	Percent
We Write Through the WYO Program Only	318	67%
Write Through Both the WYO and Direct Program	47	10
Write Through the Direct Program Only	68	14
We Don't Write Flood Insurance	41	9
Total Responses	474	100%

Over nine in ten (91%) of the responding agencies wrote flood insurance through either the direct or the WYO program. Over three-fourths (77%) wrote some or all of their flood insurance through the WYO program while 14% wrote flood insurance exclusively through the direct program. Two-thirds (67%) wrote flood insurance exclusively through the WYO program while 10% used both the WYO and the Direct programs to write flood insurance. Fewer than one in ten (9%) of the agencies responding to this survey did not sell flood insurance policies at all. Reasons these agencies gave for not participating in the flood insurance program are shown in Table 34, Chapter 5. It is likely that agencies writing flood insurance accounted for a larger share of responses relative to their true shares in the states sampled and that nonwriting agencies are somewhat under-represented in the survey responses. This is because it is reasonable to suppose that flood writers had more interest in the survey and were more likely to respond than were agencies with no involvement with flood insurance.

Why Insurance Agents and Companies Participate in the WYO Flood Program

Both insurance agencies and property insurers were asked a similar question about the importance of various factors influencing decisions to participate in the WYO flood program. Because the questions are similar, results for both surveys are shown to allow comparisons of agent and insurer perceptions. Table 4 has detailed results for insurance agencies, and Table 5 covers similar ground for insurers writing flood insurance.



Flood damage to seawalls and high rise construction caused by Hurricane Hugo near Myrtle Beach, South Carolina. A large percentage of the nation's flood insurance policies are sold in Southern states vulnerable to hurricanes. Photo by S.M. Rogers Jr., UNC Sea Grant Program.

Tables 4 and 5 show that some factors influencing decisions to participate in the flood insurance program are relevant only to insurance agencies and others are applicable to insurers only. For example, the opportunity to eliminate the exclusion for flood in the homeowners policy was perceived as somewhat or very important by 56% of the insurers, but is not a factor for agents. A somewhat related issue which is unique to agencies would be the concern about errors and omissions liabilities. Agents are concerned about informing clients about any perils that may exist and possible ways that the perils can be insured. In Table 4, nearly seven in ten (68%) of the agencies assigned some or great importance to errors and omission liabilities as a reason for offering the flood product to clients who might need it.

TABLE 4
FACTORS INFLUENCING INSURANCE AGENCIES TO WRITE FLOOD INSURANCE THROUGH WYO

Q. Please rate the following factors for their influence on your agency's decision to participate in the WYO program, using a scale of 1-5:

	Level of Importance					
Factor	Very	Somewhat	Slight	Little/None	DK	n
We View Our Agency As Full Service Provider	72%	20%	6%	2%	*	337
Our Clients Required By Lenders To Have Flood	69	18	7	4	2	345
Wanted to Offer Our Service In Providing This Product	63	23	9	3	2	336
We Believed Our Clients Needed Flood Coverage	61	17	8	11	3	331
Our Property Insurance Business Includes Areas Affected By Flood	60	14	14	11	2	345
We Believed Errors And Omission Liabilities Required Offer Of Flood Coverage	52	16	10	17	5	333
Wanted A Way Of Staying Informed About WYO	30	20	19	27	3	325
Clients Wanted This Product Though Not Required By Lenders	20	25	24	28	3	331
We Thought Providing Flood Insurance Might Create New Business	12	13	26	43	6	328

* = Less Than 0.5%

Notes: There were 365 survey respondents writing flood insurance through the WYO program eligible to answer this question. As shown in the "n" column the actual number of respondents varied slightly with each choice. DK refers to the choice of don't know or no opinion.

The factor ranked most highly for its role in influencing agencies to write flood insurance was that "we view our agency as a full service provider of insurance to our clients and felt it was important to offer this product." The full service factor was ranked very important by 72%. Nearly seven in ten (69%) said a very important factor was that mortgage lenders required their clients to purchase flood insurance to get a mortgage. Viewed by at least six in ten agents as "very important" factors were "we wanted to offer our service in providing this product" (63%)," "we believed our clients needed the coverage (61%)," and "our property insurance business includes areas affected by flood" (60%). Very few agencies saw providing flood insurance as a way of creating new business in other lines as significant in their decision to write through WYO.

Insurers were asked to rank a similar but not identical set of factors, as shown in Table 5. Several of the factors were unique to insurance company operations and were not applicable to situations faced by agencies.

TABLE 5
FACTORS INFLUENCING INSURERS TO WRITE FLOOD INSURANCE THROUGH WYO

Q. Please rate the following factors for their influence on your company's decision to sign the WYO agreement.

Factor	Level of Importance				Don't Know
	Very	Somewhat	Slight	Little/None	
We View Our Company As A Full Service Insurer; It Was Important to Offer This Product	56%	20%	10%	2%	12%
Believed Flood Policy Offers Important And Necessary Coverage Sought By Policyholders	42	34	12	7	5
The WYO Program Enabled Better Service To Policyholders Than Received Under the Direct Program	46	24	22	0	7
Expected A Volume Of Flood Business Sufficient To Justify Startup Costs	46	20	22	5	7
Our Property Insurance Business Includes Areas Affected By Flood	25	40	18	8	10
Our Producers Writing In Flood-Prone Areas Wanted Us To Offer Flood Insurance To Their Clients	34	24	20	7	14
The Absence Of Insurance Risk-Bearing By Insurers Made The Coverage A Viable Product	32	27	24	17	0
Wanted To Eliminate A Major Exclusion in the Homeowners Insurance Policy	29	27	20	10	15
Saw Flood Insurance As An Opportunity to Make Money	27	27	29	12	5
Private Industry Should Remain Involved in Providing Flood, If Only on a Non-Risk Bearing Basis	24	27	32	7	10
We Wanted To Work With Federal Government On Catastrophe Programs	27	22	32	10	10
We Thought Providing Flood Insurance Might Create New Business	24	17	37	17	5
We Wanted To Have A Good Means of Staying Informed About WYO	2	5	39	39	15

Responding Insurers
Writing Flood Insurance = 41

Insurers had additional influences on their decision-making for the flood program. Some 59% noted that the absence of risk-bearing on flood losses was a somewhat or very important factor in the decision to participate. Nearly half (48.2%) wanted to cooperate with the federal government on catastrophe programs, and 51% believed it was somewhat or very important for private sector insurers to remain involved.

The two tables, based on questions from the agency and insurer surveys for WYO writing companies, contain several choices of statements that are nearly identical, allowing comparisons of agent and insurer perceptions. Table 6 summarizes and ranks factors common to both surveys which insurers and agents considered "somewhat important" or "very important" in making a decision to write flood insurance.

There is substantial agreement among agents and insurers on the three most highly ranked factors. Both insurers and agencies writing flood insurance were inclined to view the opportunity and responsibility of being "full service providers" an important consideration in their decision to write flood insurance. A substantial majority of both agencies and insurers wanted to provide this service to policyholders and believed it was a necessary coverage sought by policyholders. Seven in ten (73%) of the agencies and 65% of the insurers indicated that their property book of business included a large number of areas affected by flood. On two other choices that may have influenced agencies and insurers in writing flood insurance there were differences. Agencies were much more inclined to view "staying informed about the WYO program" as an important influence on the decision to participate (44%) than were insurers (7%). Insurers were also somewhat more optimistic that offering flood insurance might be a way of attracting new customers (42%) than were insurance agencies (25%).

Although relatively small numbers are involved, 13 insurers that have signed the WYO arrangement, but had not yet written flood insurance at the time of the survey, also were asked about factors that influenced them to sign the WYO arrangement. A few of these insurers were about to begin writing flood insurance. Others have decided not to write flood insurance at present for one or more reasons, but have reserved the right to begin writing in the future. Table 7 indicates factors that influenced this group of insurers to sign the Write-Your-Own (WYO) arrangement. The number of respondents is shown for each response so that the reader may be aware of the small sample size. Because of the small numbers percentages are not as meaningful as is the case for the other surveys.

TABLE 6
COMPARISON OF INSURER AND AGENCY PERCEPTIONS REGARDING REASONS FOR WRITING FLOOD INSURANCE

Factor	Factor Very or Somewhat Important	
	Agencies	Insurance Companies
View Our Agency/Company As Full Service Provider	92%	76%
Wanted To Offer Our Services In Providing This Product/Believed the Coverage Offers Important, Necessary Coverage Sought By Policyholders	85	76
Our Property Insurance Business Includes A Number of Areas Affected By Flood	73	63
Wanted to Stay Informed About The WYO Program	50	7
We Thought Providing Flood Might Provide New Clients/Policyholders	25	42
Number	365*	41

Note: On the agency survey, there were 365 agencies who said they wrote through the WYO program and were eligible to answer this question. The actual number of responses varied slightly for each choice listed above. Percentages are based on the actual number of responses for each choice.

TABLE 7
FACTORS INFLUENCING NON-WRITING INSURERS TO SIGN THE WYO ARRANGEMENT

Q. Please rate the following factors for their influence on your company's decision to sign the WYO agreement.*

Factor Influencing Decision	Factor Was Somewhat or Very Important	
	Number	Percent
Believed Flood Was An Important And Necessary Coverage Sought By Policyholders	10	77%
Our Producers Wanted Us To Write Flood	10	77
View Ourselves As Full Service Insurer	9	69
Our Property Business Includes A Number Of Areas Affected By Flood	8	62
We Believed That The WYO Program Would Give Customers Better Service Than The Direct Program	8	62
Thought There Was A Chance That Providing Flood Would Introduce Our Company To New Clients	7	54
Wanted to Work With the Federal Government On Catastrophe Programs	6	46
The Absence of Flood-Insurance Risk-Bearing By Participating Insurers Made Coverage Viable	6	46
We Expected Sufficient Volume To Justify Start-Up Costs	5	39
We Wanted to Stay Informed About the WYO Program	5	39
We Wanted to See Private Insurers Remain Involved, If Only On A Non-Risk Bearing Basis.	5	39
We Saw the WYO Program As A Good Business Opportunity, A Chance to Make Money	5	39
We Saw the WYO Program as an Opportunity to Eliminate a Major Exclusion In Homeowners Policy	4	31
Number of Responding Companies (Signed Arrangement But Do Not Write)	13	100%

* NOTE: The wording of the questionnaire used the informal term "WYO agreement." More accurate terminology that should have been in the survey is "WYO arrangement." To become a participating WYO Company insurers sign a document with the FIA of the Federal Emergency Management Agency known as the Financial Assistance/Subsidy Arrangement. Excepting the wording in Table 7 above which comes from the questionnaire, WYO arrangement is used in the report to describe the signatory process.

The thirteen companies that had signed the WYO arrangement but were not writing flood insurance tended to have perceptions similar to those writing policies on the importance of various factors for getting involved with flood insurance. One noticeable difference is that 39% of the signed, but non-writing companies said "staying informed about the WYO program" was a somewhat or very important influence, compared with only 7% of the companies actively writing flood insurance.

Distribution and Marketing of Flood Insurance

Insurance agencies and insurers actively writing flood insurance were asked a series of questions on the distribution and marketing of flood insurance. Because the national flood insurance program is a cooperative effort involving the federal government, one might expect marketing and distribution to be somewhat different than regular insurance company and agency marketing. Table 8 shows principal methods used by insurers to distribute flood insurance.

TABLE 8
PRINCIPAL METHODS USED BY INSURERS TO DISTRIBUTE FLOOD INSURANCE

Q. What is Your Principal Method for Distributing the Flood Insurance Product? (Select All That Apply)

Distribution Method	Number	Percent
Sold Through Any of Our Agents Who Wish To Provide The Coverage	34	83%
Sold Primarily Through Agents Who Have Become Familiar With the Program Requirements and Procedures	15	37
Sold by Direct Mail or Telephone to Potential Policyholders	5	12

Number = 41
Responses add to more than 100% due to Multiple Responses.

Most of the 41 insurers (83%) sell flood insurance through any of the company's agents who wish to provide the coverage to their clients. In more practical terms, however, 15 or 37% of the insurers indicated that flood insurance is sold primarily through agents who have become familiar with the program requirements and procedures. Five insurers or 12% sell flood insurance using direct mail or telephone marketing.

Insurers and agencies were asked a nearly identical question about the kinds of efforts made to get information on flood insurance to customers, lenders, producers, the general public and others with an interest in the program (Table 9). Some of the choices shown in the question were unique to either insurers or agencies, so where no comparison can be made there is a N.A. (not asked, not applicable).

TABLE 9
SOURCES OF INFORMATION ABOUT THE FLOOD INSURANCE PROGRAM PROVIDED BY INSURERS AND AGENCIES

Q. What Sources of Information About the Flood Program Do Your Provide? Select *all* that apply.

Information Sources	Insurers	Agencies
Information on the Rate Applicable To Individual Policyholder	73%	69%
Provide Brochures Describing Flood Program	73	64
Provide Price Quotes To Clients (Agencies)	N.A.	87
Provide a Computer Rating System To All Producers To Give Accurate Policyholder Quotes (Insurers)	37	N.A.
Information On Steps Necessary To Obtain Elevation Certificates	54	51
Information On Flood Hazard Zone Applicable To The Property	39	48
Information To Local Lending Institutions Regarding Program Requirements And Features	20	25
Target Mailings Of Brochures	29	13
Support Of Producer Advertising By Insurers In Flood-Prone Area	22	N.A.
Advertising In Local Media In Flood Prone Areas	15	10
Other Information Provided	39	6
Number	41	433

Information on the rate for flood coverage applicable to the individual policyholder and brochures describing the flood program were the two types of information most frequently provided by insurers. Nearly three-fourths (73%) of insurers provided each of these sources of information. Providing quotes to clients (87%) was the type of information about flood insurance most frequently given by insurance agencies followed by information on the rate applicable to the individual policyholder (69%) and brochures describing the flood program (64%). With the exception of the five responding insurers that market flood insurance by direct mail or telephone, most insurers provide quotes to clients through their agents instead of directly. Some 37% of the insurers provide a computer rating system to all producers to assist them in giving accurate quotes. Just over half of both responding insurers (54%) and agencies (51%) provide information on the steps necessary to obtain a flood elevation certificate. This document certifies the elevation of the structure under consideration for flood insurance relative to flood zones and is essential in determining the correct rate for flood insurance. On a related issue, the survey showed that 48% of the agencies and 39% of the insurers provide information on the flood hazard zone applicable to the property. Flood hazard zone information helps the prospective flood insurance client determine the degree of hazard and has a direct bearing on rates.

The National Flood Insurance Program has a mandatory purchase requirement for properties located in Special Flood Hazard Areas when federally-backed mortgages are involved. Because of this requirement, knowledge of program requirements on the part of the lenders is very important. One-fourth (25%) of the agencies and 20% of the insurers indicated that they provide information to local lending institutions regarding the flood insurance program and requirements. Insurers were more likely to engage in target mailing of brochures to prospective customers in flood-prone areas (29%) than were insurance agencies (13%). Table 9 also indicates that relatively low numbers of insurers and agencies use local media advertising in flood-prone areas. In other comments, six agents said that they talk to local real estate agents and brokers about the flood insurance program. "We explain flood insurance to real estate agents and brokers as a sales tool they can use for the future sale of houses in flood hazard areas," wrote one agent.

TABLE 10
WHERE DOES PRIMARY RESPONSIBILITY LIE FOR PROMOTION OF THE FLOOD INSURANCE PROGRAM?

Q. In your opinion, where does the primary responsibility lie for promoting the Flood Insurance program to potential policyholders? Please select the *single* answer which most agrees with your view.

Should Have Primary Responsibility	Insurers	Agencies
Local Agency	22%	42%
Federal Insurance Administration (FIA)	46	39
Write-Your-Own Companies	17	10
Other	15	10
Number	41	403

On the question of which entity should have the prime responsibility for promoting flood insurance, insurers have a decidedly different point of view from insurance agents, as shown in Table 10. A plurality of insurers (46%) said they thought that the Federal Insurance Administration (FIA) should take the lead role in promoting flood insurance policies. In contrast, the largest share of agents (42%) said the local agency should take major responsibility for flood insurance promotion, followed by the Federal Insurance Administration (39%). Insurers were much less likely (22%) to have viewed local agencies as having prime promotion responsibility than were the agents.

The perception on the part of many agents that they should have prime responsibility for promotion might result from the fact that agents are the closest link to the property owner in the market for flood insurance. Agents take the lead role in analyzing insurance needs and making recommendations on other lines of insurance purchased by the consumer.[14] Flood insurance fits into this customer service context. The close link to the consumer would be particularly true in the 11 largest states for flood insurance which were targeted for the agency survey on flood insurance. Nearly 60% of the responding agents wrote insurance in Florida, Louisiana, and Texas—states subjected to coastal flooding where an agent would likely discuss the need for flood insurance in a comprehensive discussion about insurance requirements. Agents also might be expected to have better knowledge of specific flood hazards in a local community than would the FIA or a WYO company.

14. AIRAC, *Patterns of Shopping Behavior in Auto Insurance, 1985*.

Relatively small numbers of both insurers (17%) and agencies (10%) indicated that they thought the Write-Your-Own companies should take the lead role in promoting the sale of flood insurance. Fifteen percent of the insurers and 10% of the agencies indicated that others besides the FIA, local agency, or WYO companies should bear prime responsibility for promotion of flood insurance. A majority of those citing "other" indicated in written comments that responsibility for promotion of policies needed to be a shared responsibility and that they did not feel comfortable in singling out one group. A number of agencies and several companies specifically mentioned that lenders should join one or more of the other entities such as the local agent in taking prime responsibility for promoting flood insurance. "The agency is usually the secondary contact for providing insurance, the first contact is usually the lending institution. I think together with the local agency, banks and mortgage companies share in this responsibility," wrote one agent. Other agents mentioned that state and local governments need to help promote flood insurance along with lending institutions. One company wrote that federal regulatory agencies need to become more involved in promoting flood insurance, presumably from the standpoint of stronger enforcement of provisions requiring flood insurance for federally-backed mortgages in Special Flood Hazard Areas.

In agencies where flood insurance contributes a sizeable amount of premium volume, respondents were much more likely to believe that agents should take the lead role in promoting flood insurance (Table 11). The share of agencies having the opinion that agents should take the lead role increased steadily as flood premium volume rose. Agencies with smaller flood volume tended to believe that the FIA should take the lead role. For example, 30% of the agencies with flood premium volume of $100-$5,000 a year indicated that agencies should take the lead role compared to 60% of the agencies with $100,001 or more in flood premium volume.

TABLE 11
PRIMARY RESPONSIBILITY FOR PROMOTION OF FLOOD INSURANCE BY SIZE OF AGENCY FLOOD PREMIUM VOLUME

	Opinion on Primary Responsibility				
Flood Premium Volume	FIA	WYO Insurers	Agencies	Other	Number
$100-$5,000	47%	17%	30%	7%	120
$5,001-$25,000	40	8	43	10	91
$25,001-$100,000	31	6	49	14	70
$100,001 and Above	24	0	60	16	50
All Agencies Citing Premium Volume	38%	9%	42%	11%	331

A major issue affecting the National Flood Insurance Program has been getting more people in flood hazard areas to buy flood insurance. Insurers and agencies had substantially different views on the question of whether or not flood insurance was a "hard sell" for most insurance prospects. An overwhelming majority (85%) of insurers said they believed flood insurance was a "hard sell" for most insurance prospects while a majority of responding agencies (55%) disagreed with this assessment (Table 12).

TABLE 12
IS FLOOD INSURANCE A "HARD SELL?"

Q. In your opinion, is flood insurance a "hard sell" for most flood insurance prospects?

	Insurers	Agencies
Yes	85%	45%
No	15	55
Number	41	425

Fewer than half (45%) of the agency respondents said they believed that flood insurance was a hard sell. This major difference between agency and insurer opinions might arise from several factors, including the difference in perspectives. Insurers view the situation from the national level where flood insurance tends to be harder to market when the hazard is not as obvious. In many of the top states for flood policies, the risk of hurricane-related flooding is well publicized, and agents likely find it easier to convince prospects of the need for the coverage. If agents are doing business in areas where lending institutions enforce the mandatory flood insurance requirement as a condition for obtaining a federally-backed mortgage, then flood insurance becomes an easier sale. As in the previous question, how involved the agency was in selling flood made a difference in whether flood insurance was perceived as a "hard sell." The greater the premium volume gener-

ated by the responding agencies, the less likely they were to have perceived flood insurance as a "hard sell" (Table 13). For agencies selling more than $100,001 annually in flood insurance premium volume, only 20% view flood insurance as a "hard sell."

TABLE 13
WHETHER FLOOD INSURANCE IS A HARD SELL BY SIZE OF AGENCY FLOOD PREMIUM

	Is Flood a Hard Sell?		
Annual Flood Premium	Yes	No	Number
$100-$25,000	56%	44%	219
$25,001-$100,000	38	62	73
$100,001-$2,500,000	20	80	51
Agencies Reporting Flood Premiums	47	53	343

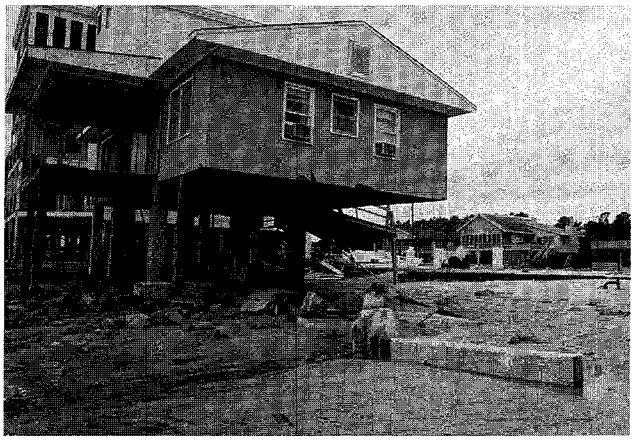
Perceptions about whether flood insurance was a hard sell varied by state, but it should be noted that only in Texas, Louisiana, and Florida are sample sizes large enough to be statistically meaningful. Florida agents were nearly evenly split on whether flood insurance was a hard sell, with 47% indicating it was difficult and 53% saying it wasn't. In Louisiana, over six in ten (62%) agents said that flood insurance was not a hard sell, about the same share as said so in Texas (60%).

TABLE 14
WHETHER FLOOD INSURANCE IS A HARD SELL VARIATIONS BY STATE WHERE AGENCIES WROTE

	Flood A Hard Sell		
State	Yes	No	Number
Florida	47%	53%	208
Louisiana	38	62	52
Texas	40	60	35
South Carolina, North Carolina, Virginia	25	75	44
All Others*	49	51	178
All Responding Agencies	45	55	425

*Includes Pennsylvania, New Jersey, New York, California, Mississippi, and small numbers of other states mostly adjacent to the 11 target states in the agency survey.

Results from North Carolina, South Carolina and Virginia, although based on a small sample size, may have been influenced by Hurricane Hugo which devastated the two states about 10 days prior to the survey. The effect may illustrate a point that many agents mentioned in written comments—hurricanes, with their high winds, storm surge and coastal flooding, raise awareness about the flood hazard and make it easier (at least temporarily) to sell flood insurance. Several agents said that pictures and videotape from Hurricane Hugo should be used in coastal areas to promote flood insurance.



Hurricane Hugo and other storms temporarily raise awareness about the need for flood insurance. This small house is on shallow concrete block that led to flood damage in numerous buildings during Hurricane Hugo. Photo by S.M. Rogers Jr., UNC Sea Grant Program.

In a follow-up question, insurers and agencies indicating that flood insurance *was* a "hard sell" were asked to evaluate a series of statements on why it might be difficult to sell flood insurance. The largest share of both insurers and agencies "strongly agreed" with the statement that "most people don't think they are likely to experience significant flood damage (Table 15)." When insurer (82%) and agency (77%) respondents indicating strong agreement are combined with those agreeing somewhat, 97% of both groups agreed to some extent that many people do not perceive a significant risk of flooding to their property. A number of agency and insurer respondents elaborated on this issue in written comments. Some noted that most people will not buy flood insurance unless forced to do so by lenders complying with the mandatory purchase requirement, or unless the peril is obvious as in the case of coastal flooding.

TABLE 15
WHY IS FLOOD INSURANCE DIFFICULT TO SELL?

Based on Respondents Indicating Flood Insurance is a "Hard Sell."

Reason	Strongly Agree	Agree Somewhat	Disagree Somewhat	Strongly Disagree	No Opinion	Number
Most People Don't Think They Will Experience Significant Flood Damage						
Agencies	77%	20%	1%	3%	0%	189
Insurers	82	15	3	0	0	34
Most People Think Flood Insurance Is Too Expensive Compared To Their Property Insurance Premium						
Agencies	64%	26%	8%	2%	0%	185
Insurers	65	27	6	0	3	34
Most People Think They Are Already Covered For Flood Damage						
Agencies	17%	43%	22%	15%	3%	184
Insurers	18	60	18	6	3	34
Property Insurance Is Generally A Hard Sell. Most People Won't Buy Unless Required.						
Agencies	25%	23%	24%	27%	1%	181
Insurers	21	24	35	21	0	34
Most People Don't Know That Flood Insurance Is Available						
Agencies	7%	37%	27%	28%	1%	179
Insurers	15	50	32	3	0	34
Most People Think That Federal Disaster Assistance Negates The Need For Coverage						
Agencies	13%	26%	18%	17%	27%	180
Insurers	38	21	17	3	21	34
Most People Don't Think the Flood Insurance Policy Provides Enough Coverage Or They Think Deductibles Are Too High						
Agencies	15%	29%	31%	10%	16%	178
Most People Don't Think the Flood Insurance Policy Provides Enough Coverage						
Insurers	12%	32%	29%	12%	15%	34
Most People Think The Flood Insurance Deductibles Are Too High						
Insurers	3%	29%	38%	12%	17%	34

Another statement which drew a high level of agreement on the part of both insurers and agencies was that "most people think that flood insurance is too expensive compared to their property insurance." Over nine in ten of both agency and insurer respondents either strongly agreed or agreed somewhat with this statement and 65% of the insurers and 64% of the agencies expressed strong agreement. Over the last decade, one goal of the National Flood Insurance Program has been to make the program actuarially sound. In the Federal Insurance Administration's context, this means that premiums collected would be sufficient to pay all flood claims in an average loss year. To meet this objective premiums rose significantly during 1985-88 and average flood insurance premiums are now over $280. This amount is about 71% of the amount homeowners typically pay for property insurance covering a whole variety of perils such as fire, liability, theft, vandalism, and windstorm.[15]

Doubts about the risk of significant flood damage and the cost of flood insurance compared to homeowners premiums clearly stand out as the most important reasons why people don't buy flood insurance, according to responding agents and insurers. None of the other issues ranked as high in the share of agency and insurer respondents indicating strong agreement with a reason for not purchasing flood insurance. However, 60% of the insurers and 80% of the agencies indicated that people thinking that they are already covered for flood was a very or somewhat important reason why people don't buy flood insurance. Public attitude surveys conducted by the Insurance Research Council show that a significant and growing segment of the public is confused about whether their homeowner's policy includes flood coverage.[16] In the 1983 and 1989 surveys, homeowners were asked which in a series of different causes of property loss would be covered by their homeowner's or renter's policy. In 1983, 37% of the public said they believed flood would be covered by their homeowner's policy, 59% correctly answered that flood would not be covered, and 4% said they didn't know. The level of knowledge about flood insurance appears to have deteriorated during the 1980's because when the question was asked again in 1989, 43% said flood would be paid for by the homeowner's policy, 42% said it would not be paid for, and 15% said they did not know. In the 1989 study, there were only minor variations based on education levels of respondents in perceptions about whether flood was covered in the standard homeowner's policy.

Half the insurers (50%) and 37% of the agencies "agreed somewhat" that most people don't know that flood insurance is available. Nearly four in ten insurers (38%) strongly agreed that federal disaster assistance lulled people into believing that they would not need flood insurance, but agency respondents did not think this was a significant reason. The level of coverage available and size of deductibles were not considered important reasons why people did not buy flood insurance.

Because insurance agents interact directly with potential clients, agencies alone were asked a question about why prospective customers for flood insurance typically decide not to purchase the product. Results are shown in Table 16. Agents working with potential clients directly usually get a better feel for why customers choose to buy or not to buy insurance products. The price of the flood insurance policy relative to the protection provided was the reason cited most often by agents as a very or somewhat important reason why clients do not buy flood insurance. More that half (51%) mentioned the high price of a policy relative to protection provided as a very important reason and 28% indicated that this issue was somewhat important.

Nearly seven in ten (69%) attributed importance to the cost and complexities of obtaining an elevation certificate, including 42% who considered this reason very important and 27% who ranked it somewhat important. The difficulties in obtaining elevation certificates drew more written comments than any other subject later in the survey when agents were asked about special problems faced by consumers trying to buy flood insurance.

15. Alliance of American Insurers, *Household Insurance Expenditure Study*, indicates the average homeowners insurance premium was $394 a year as of 1989.

16. All-Industry Research Advisory Council, *PAM 89: A Survey of Public Attitudes on Auto Insurance Rates, Seat Belts, Attorney Advertising, Homeowner's Insurance, and Insurance Claim Fraud*, December 1989.

TABLE 16
WHY CLIENTS DECIDE NOT TO PURCHASE FLOOD INSURANCE

Q. In your opinion, how important are the following items to those of your clients who decided not to purchase flood insurance?

Reason	Level of Importance Given Item By Agents					
	Very	Somewhat	Slight	None	Don't Know	Number
Price Of The Policy Relative To The Protection Provided	51%	28%	12%	7%	2%	393
Cost And "Red Tape" Necessary To Obtain An Elevation Certificate	42	27	14	13	4	390
The Level Of Limits Offered Under The Policy	12	22	22	39	5	384
Separate $500 Deductibles On Buildings and Contents Under The Policy	12	19	23	41	5	385
Lack Of Basement Coverage	8	12	8	52	20	376
Other Reasons (36 Listed)						

Smaller numbers of agents saw the other items as important reasons why clients don't buy flood insurance. Regarding the level of limits offered under the policy, 61% of the agencies said available limits were of slight or no importance in decisions not to buy flood insurance. Agents assigned similarly low levels of importance to the issue of separate $500 deductibles on both buildings and contents under the policy, with 64% indicating that separate deductibles were of slight (23%) or no importance (41%). The lack of basement coverage was perceived a very important or somewhat important reason by 20% of the agents, while 8% said it had slight importance and 52% indicated the basement coverage had no importance. Twenty percent indicated that they did not know or had no opinion. The large share of agents who saw the lack of basement coverage as not important or who had no opinion could in part reflect the nature of the agency sample. Although the sample included a few northern states such as Pennsylvania, New Jersey, and New York, the southeastern coastal states, particularly Florida, were heavily represented in the survey. Basements are rare in many of these Southern states.

Agents citing "other reasons" generally made comments about the listed choices such as "there are no basements in our area," or one agent who noted that "there are many high valued homes on the coastal waterway and $185,000 of coverage is inadequate." Several agents commented that it is a drawback for some clients that many flood insurance coverages are written on an actual cash value basis rather than a replacement cost basis.[17] One noted that consumers are becoming used to replacement cost coverage in other lines of insurance and therefore see actual cash value as somewhat inferior coverage. Another agent said that people do not like paying annual premiums in advance and that it should be possible to break flood premiums up into several installments. Other agents wrote that in their service area, people only bought flood insurance if required to do so by lenders.

Companies and agents were asked for their opinions on whether an extensive publicity campaign would be effective in raising awareness about the flood hazard and increasing the policy count. Both groups generally expressed optimism that a public campaign would raise awareness and increase policy counts. Agents were somewhat more enthusiastic in their support for a public campaign. Among agents, nearly half (47%) strongly agreed and 41% somewhat agreed that an extensive public campaign would raise awareness about flooding and increase the number of policy counts (Table 17). This compares with one-third (33%) of the insurers strongly agreeing and half (50%) somewhat agreeing.

17. Note: Replacement cost coverage is available for single-family *principal* residences up to a coverage limit of $185,000. Flood coverages on contents and other types of structures are written on an actual cash value basis.

TABLE 17
EFFECTIVENESS OF PUBLICITY CAMPAIGN IN RAISING AWARENESS ABOUT THE FLOOD HAZARD AND INCREASING POLICY COUNTS

Q. Please indicate your levels of agreements or disagreement with the following statement. A more extensive public campaign to raise awareness about the flood hazard and the availability of insurance would be effective in increasing the number of insurance policies. Please check the single response which most agrees with your view.

	Agencies	Insurers
Strongly Agree	47%	33%
Somewhat Agree	41	50
Somewhat Disagree	6	18
Strongly Disagree	3	0
Don't Know/No Opinion	3	0
Number of Responses	430	40

Combining the two levels of agreement shown in Table 17, 88% of the agencies and 83% of the insurers expressed some or strong agreement that a public campaign would raise awareness about the flood hazard and increase the number of policies.

Agencies with larger amounts of flood premium volume were more inclined to strongly agree that a public campaign on flood insurance would raise awareness about the flood hazard and increase the number of policies (Table 18). About one- third (34%) of agencies with $100-$5,000 of annual flood premium strongly agreed with the statement compared to 57% of those generating from $100,001-$2,500,000 in volume.

TABLE 18
VIEWPOINT ON EFFECTIVENESS OF A PUBLIC CAMPAIGN BY SIZE OF AGENCY FLOOD PREMIUM VOLUME

Flood Premium Volume	Strongly Agreed That Campaign Would Increase Flood Policies	Number of Responses
$100-$5,000	34%	125
$5,001-$25,000	51	51
$25,001-$100,000	55	76
$100,001-2,500,000	57	51

Both insurers and agencies were asked in an open-ended question to briefly explain their responses to the question on the potential effectiveness of a public campaign to raise awareness. The agents made a variety of comments supporting the concept of a public campaign to raise awareness and increase the sale of flood policies. A theme expressed most frequently in written comments by agents was that many people aren't aware of the flood risk or don't believe it could happen to them. At least 20 agents wrote comments expressing this viewpoint directly, and many others wrote comments that approached the same theme indirectly. One agent wrote that there was a special problem in reaching people who might be at risk from rivers and low-lying areas. "People tend to think that flooding is a beach or coastal problem only," the agent wrote. Eight agents wrote that a public campaign in the wake of a natural disaster like Hurricane Hugo would be very effective in pointing out the need for flood insurance. Another group of agents wrote that a public campaign and media coverage about the need for flood insurance would bring credibility to the effort. "Otherwise people just think their agent is trying to sell them more insurance," and "when the agency or insurance companies explain flood insurance, the customer believes it is only profit-motivated," are examples of the written comments along this line. Somewhat related to this theme was the comment that when more sources of information on a subject are available, the consumers can make more informed decisions. Another written comment that came from at least six agents was that people still tend to believe that flood will be covered by their homeowners policy or federal disaster assistance payments. "Despite our best efforts, some people still think that flood damage is covered by other hazard policies," one agent wrote. Other agents wrote that public service advertising would be a good investment because "advertising works," and that any increase in the number of policies would benefit the program and taxpayers. "The more flood insurance sold, the more sound the program becomes and the lesser the need for Federal disaster assistance. This would benefit all taxpayers."

Among the few agencies (9%) indicating disagreement with the statement on a public campaign, five agents wrote that a public campaign would not be particularly effective because most people in their areas who need flood insurance already know about and/or buy it.

A majority of insurers indicating strong or some agreement with the statement about a public campaign explained in written comments that they believed people needed to be made more aware about the availability of flood coverage and the flood hazards they faced. "Until our company became involved in flood insurance in 1984, I was unaware it was available. Flood insurance needs more prime time national attention," wrote one insurer. "The overall public knowledge of

flood insurance appears to be poor," wrote another. "Each flood insurance sale is an individual transaction. Better public awareness of the need for and availability of flood insurance would make it easier to sell each policy," is another example of a comment made by an insurer expressing some agreement with the idea of a public campaign.

Respondents expressing some disagreement with the idea of a more intense public campaign to promote flood insurance were concerned that the cost of flood insurance would still deter purchases or that a broad public campaign would not be cost effective. "A public campaign is too broad. Must attack through communities, lenders, etc. and reduce cost (of flood insurance)," wrote one insurer. "By itself, no amount of publicity is going to overcome the high lapse ratio that occurs whenever flooding fails to occur for an extended period of time," wrote another.

To further assess the marketing of flood insurance, respondents participating in the agency survey were asked about the extent to which agents/brokers in their area currently offered flood insurance to their clients. Seven of ten (70%) indicated most insurance agents and brokers in their area have learned about the product and offer the coverage to any of their clients who need it (Table 19).

TABLE 19
HOW OFTEN DO AREA AGENTS OFFER FLOOD INSURANCE?

Q. What is your impression of the extent to which agents/brokers in your area currently offer flood insurance to their clients. Please check the *single* response which best describes your view:

	Percent of Agency Responses
Most Agents/Brokers in the Area Have Learned About the Product and Offer The Coverage To Any Of Their Clients Who Need It	70%
A Few Agents/Brokers In Our Area Have Become Experts In The Program And To Whom Most Local Flood Business Is Referred	28
No Agents/Brokers In Our Area Offer Flood Insurance	2
Number of Responses	422

Most of the remaining respondents (28%) said that there were a few local agents who had become experts in the flood program and to whom most local business was referred. Only a few (2%) said it was their impression that no agents or brokers in the area offered flood insurance. It should be remembered that the agency survey was targeted to the 11 top states for flood insurance and may not be reflective of the extent agents and brokers offer flood insurance nationally.

Mortgage Requirements For Flood Insurance

The Flood Disaster Protection Act of 1973 made the purchase of flood insurance mandatory as a condition for obtaining a mortgage in areas identified by the government as being in Special Flood Hazard Areas. Even though the mandatory purchase requirement has existed for over 16 years, two criticisms of the flood program are that lenders are lax in requiring homeowners to purchase and renew flood coverage and that the requirement has not been enforced. Insurers and agencies were asked about their impressions of the effectiveness of the mandatory purchase requirement for flood insurance, both with respect to initial purchase and renewal of coverage. Agencies were asked to comment on the situation in their local market areas while insurers answered the question from a general perspective (Table 20).

TABLE 20
EFFECTIVENESS OF MANDATORY PURCHASE REQUIREMENT FOR FLOOD INSURANCE WHEN MORTGAGE IS ISSUED

Q. Based on your experience, how effective is the mandatory purchase requirement that flood insurance be obtained as a condition for issuing a federally backed mortgage on properties built within Special Flood Hazard (A,V zones) Areas? Please rate the effectiveness of the requirement with respect to an *Initial Purchase* of the coverage when the mortgage is issued. Choose the *single* item that best matches your view.

Level of Effectiveness	Agencies	Insurers
Virtually All Lenders Require the Coverage	56%	13%
Many Lenders Require the Coverage	19	40
Few Lenders Require the Coverage	16	37
Virtually No Lenders Require the Coverage	5	0
Don't Know/No Opinion	4	11
Number of Responses	422	38

Note: For the Agency survey each choice included the phrase "in our area." E.g., "Virtually all lenders in our area require the coverage."

Table 20 shows a substantial difference among insurers and agencies in the share of respondents indicating that nearly all lenders require flood coverage for prop-

erties in Special Flood Hazard Areas. Over half (56%) of the agencies said that virtually all lenders in the area require flood coverage when called for, compared to 13% for insurers. The large differences could be a matter of perspective: agencies were looking at the issue from the standpoint of the local area served while insurers were responding from a broader, perhaps national perspective. The targeting of the agency survey to the 11 largest states for flood insurance may have also influenced results. Many of the 11 are coastal states subject to catastrophic flooding from hurricanes. The flood hazard is more obvious in these states, the flood program is more established, and lenders may be more aware of their responsibilities for enforcing mandatory purchase requirements. Finally, the differences are tempered somewhat by the fact that 40% of the insurers indicated that "many lenders require the coverage" compared to 19% for agencies. Combining the categories, 75% of the agencies said either that "virtually all" or "many" lenders require the coverage. This compares with 53% for insurers.

Despite the differences between agency and insurer perceptions, both groups acknowledged gaps in the effectiveness of the mandatory purchase requirements. Thirty-seven percent of insurers indicated that few lenders require flood coverage and 11% did not know or had no opinion on the effectiveness of the requirement. For agencies, 16% said that few lenders (in our area) require the coverage and 5% said virtually no lenders require the coverage. Thus even within the largest states for flood policies, about two in every ten agents perceive a significant problem with the effectiveness of the mandatory purchase requirement.

Next, both groups were asked about the effectiveness of the mandatory purchase requirement in regard to subsequent renewals of coverage. A problem with the flood program reported by companies and agents is that policyholders living in Special Flood Hazard Areas buy flood insurance when the mortgage is issued to comply with lender requirements, but later let the coverage lapse. Because mortgages are so frequently sold among lenders, responsibility for monitoring for flood insurance can be lost in the shuffle.

TABLE 21

EFFECTIVENESS OF MANDATORY PURCHASE REQUIREMENT FOR FLOOD INSURANCE ON SUBSEQUENT RENEWALS OF THE COVERAGE

Q. Now please rate the effectiveness of the requirement for mandatory purchase with respect to subsequent renewals of the coverage when the mortgage is issued. Choose the single item that best matches your view.

Level of Effectiveness At Renewal	Agencies	Insurers
Virtually All Lenders Require the Coverage	51%	11%
Many Lenders Require the Coverage	21	29
Few Lenders Require the Coverage	16	34
Virtually No Lenders Require the Coverage	5	3
Don't Know/No Opinion	7	24
Number of Responses	421	38

Note: For the Agency survey each choice included the phrase "in our area." E.g. "Virtually all lenders in our area require the coverage."

Regarding renewals of flood insurance coverage, about seven in ten (72%) of the agencies said that "virtually all" (51%) or "many" (21%) lenders require subsequent renewals of coverage. Again, insurers were less inclined to think that lenders were enforcing mandatory purchase requirements. Only 11% indicated that virtually all lenders require flood coverage renewals and 29% said that many lenders require the coverage. About one-third (34%) said that few lenders require the coverage and 24% did not know or had no opinion.

Both groups were asked to comment on the importance of factors that might hinder compliance with the mandatory purchase requirements for flood insurance. Insurers had stronger opinions on possible factors that might hinder compliance than did agencies as measured by the shares of respondents who said that certain issues were key or contributing factors (Table 22). This could relate to findings that agents perceive higher compliance with the mandatory purchase requirement in the states and local areas where they are doing business. As shown in Tables 20 and 21 over half of the agents indicated that "virtually all lenders in our local area require the coverage." Since this group did not view noncompliance in their local area as a problem, they were not inclined to rank possible hindering factors very high. "As far as I know, lenders in our area do comply. My answers above were based on this observation," wrote one agent in a followup question to deter-

business. As shown in Tables 20 and 21 over half of the agents indicated that "virtually all lenders in our local area require the coverage." Since this group did not view noncompliance in their local area as a problem, they were not inclined to rank possible hindering factors very high. "As far as I know, lenders in our area do comply. My answers above were based on this observation," wrote one agent in a followup question to determine what could be done to increase compliance. "In our area there is 100% compliance with the flood requirement. Perhaps this is because we are in Florida where the need for flood insurance is more obvious than in some areas," wrote another agent. Because insurers usually do business in many states, their perspective is based in part on conditions in states that have low volumes of flood insurance.

TABLE 22

PRINCIPAL FACTORS HINDERING COMPLIANCE WITH MANDATORY PURCHASE REQUIREMENTS FOR FLOOD INSURANCE

Q. In your opinion, what are the principal factors hindering higher compliance with the mandatory purchase requirements for flood insurance? Please rate each possible factor, using the following scale: 1 = Key Factor 2 = Contributing Factor 3 = Not a Significant Factor and 4 = Don't Know/No Opinion

Factors	Key Factor	Contributing Factor	Not Significant	Don't Know No Opinion	"N"
No Effective Regulatory Penalties For Noncompliance					
Insurers	54%	32%	3%	11%	37
Agencies	19	25	24	33	349
The Cost of Flood Insurance and the Lack of General Compliance Creates a Disadvantage For Lenders Which Enforce Requirement					
Insurers	22%	57%	16%	5%	37
Agencies	11	19	43	27	351
Difficult to Reach Homeowners With Mortgages Issued Prior To Purchase Requirement Even Though Their Properties May Lie in Flood Area					
Insurers	27%	35%	30%	8%	37
Agencies	28	25	22	26	354
Rapid Turnover of Mortgages in the Secondary Market Makes Monitoring of Flood Purchases Difficult					
Insurers	30%	43%	14%	14%	37
Agencies	14	34	36	17	355
Many Lenders Are Unaware of the Mandatory Purchase Requirement For Properties in the Special Flood Hazard Area					
Insurers	8%	43%	38%	11%	37
Agencies	8	14	57	20	369

Insurers chose the lack of effective regulatory penalties for noncompliance most often as the key (54%) or contributing (32%) factor hindering compliance with mandatory purchase requirements for flood coverage. Although the mandatory purchase requirement for flood insurance was enacted in 1973, some observers feel progress toward compliance has been slow because lenders have not faced any sanctions. Monitoring to determine which mortgages should have flood insurance is difficult and time-consuming. Special Flood Hazard Area maps must be consulted and matched with addresses of mortgages. A large majority (86%) of insurers saw the issue of regulatory penalties for noncompliance as a key or contributing factor. Insurance agencies apparently did not view the lack of regulatory penalties for noncompliance as a major problem. Fewer than half (44%) said the issue was a key factor or contributing factor. However, as with many of the other choices, a relatively large share (in this case 33%) of the respondents indicated that they did not know or had no opinion on the subject.

Another issue that a large share (79%) of insurers viewed as a key or contributing factor has to do with the cost of flood insurance, noncompliance, and the competitive disadvantage this might create for lenders enforcing the mandatory purchase requirement. With all other components held equal, closing costs and annual mortgage payments are higher for customers obtaining a mortgage loan through a lender which does enforce the requirement than they would be from noncomplying lenders. Over half (57%) of the insurers saw this as a contributing factor while 22% said it was a key factor. Based on their local experience, insurance agencies did not rate competitive disadvantage for lenders as a critical issue in their areas. Some 30% ranked it as either a key (11%) or contributing (19%) factor while 43% said the factor was not significant.

The issue agencies were most likely to see as a key or contributing factor was that it is difficult to reach homeowners whose mortgages were issued prior to the enactment of the mandatory purchase requirement, even though their properties may lie in a Special Flood Hazard Area. These are property owners who need flood insurance because of location, but are technically not required to have it, because their mortgages predate the purchase requirement. The FIA believes that the number of such properties is relatively small since the "mandatory purchase requirement" includes those instances in which lenders "make, increase, extend, or renew" loans or provide second mortgages or equity loans. Thus, properties with mortgages that otherwise predate the mandatory purchases requirement are ultimately likely to be affected. A more prevalent problem may be that some 20-25% of mortgage loans are privately made and are not subject to any purchase requirement. Over half (53%) of the agencies said that difficulties in contacting properties with older mortgages was either a key or contributing factor, while 22% said it wasn't significant. A majority of insurers (62%) also saw this issue as a key or contributing factor hindering compliance.

Nearly three-fourths (73%) of insurers indicated that the rapid turnover of mortgages in the secondary market was a key or contributing factor for hindering compliance. It is very common for lending institutions to sell and resell mortgages, which can make the monitoring of flood purchases difficult. The original servicing lender for the mortgage may be completely out of the picture. About half of the agency respondents saw the rapid turnover in mortgages as either a key or a contributing factor, but 36% said it was not a significant factor.

Insurers and agencies seemed to agree that lack of awareness on the part of lenders about the mandatory purchase requirement for properties in flood hazard areas was not a critical factor hindering compliance. Only eight percent of both groups saw the lack of awareness as a key factor. However, 43% of insurers saw unawareness as a contributing factor compared to 14% for agencies. Nearly six in 10 (57%) of the agencies said lack of awareness on the part of lenders about flood insurance requirements was not a factor.

Insurers and agents were asked an open-ended question about what changes or actions could be taken to increase the effectiveness of compliance with the mandatory purchase requirements. Twelve insurers suggested implementing penalties and fines for lenders that do not comply, while eight suggested a campaign to increase public and lender awareness about the flood insurance requirements. Wrote one company respondent, "Let's develop a campaign directed to lenders to show them how the coverage works to protect their interest in the building." Seven companies mentioned increased monitoring of lenders, conducting audits, and further encouragement of lenders to comply. Five companies mentioned that compliance would improve if identification of homes and other properties in flood hazard areas could be simplified: "A simplified zone determination or another easier method locating the risk and rate for flood prone areas," wrote an insurer.

Regarding agents, 15 specifically mentioned that lenders in their areas were doing a good job and had a "good grasp" of the requirements. For those seeing the need for improvement, the education of lenders and the general public about the requirement was mentioned by more than a dozen agents. Four wrote that lenders who

don't comply with the mandatory purchase requirement should receive penalties. Several mentioned that federal bank examiners should conduct compliance audits for flood insurance. Others had a variety of suggestions designed to get the lenders involved and improve the process. Several agents thought that better knowledge on the part of real estate people and title companies that handle closings could help alert people when flood insurance is required. Mandatory escrow accounts, with direct billing of policies to the mortgagee as the designated payor would ease the financial burden on consumers and ensure renewals, wrote several agents. Other agents thought that agents and FEMA/FIA could make target mailings to lenders in areas where compliance is a problem, to aid in identifying flood hazard areas and urging compliance.

Renewal Rates

Because of the relatively high cost of flood insurance and problems lenders have had in enforcing mandatory purchase requirements, there has been concern about the high rate of nonrenewals of flood coverage. The premium for flood insurance frequently matches and sometimes exceeds that of the basic homeowners policy which covers multiple perils. To get a handle on the rate of flood insurance renewals experienced by survey participants, both groups were asked about the flood policy renewal rate experienced by the agency or company on its book of business during 1988.

TABLE 23
POLICY RENEWAL RATE EXPERIENCED ON FLOOD INSURANCE BUSINESS

Q. What is the policy renewal rate that your agency (your company) has experienced on its book of flood insurance during 1988?

Flood Policy Renewal Rate	Agencies	Insurers
0-50%	7%	3%
51%-70%	7	6
71%-80%	11	27
81%-90%	29	47
91%-100%	46	18
Number of Responses	402	34

Insurance agencies participating in the survey had slightly higher rates of policy renewal than did insurers. Close to half (46%) of the agencies had renewal rates on flood policies of between 91% and 100%, compared to 18% for the insurers. Nearly half (47%) the insurers had policy renewal rates from 81%-90% compared with 29% for the agencies. One-fourth (25%) of the agencies and 36% of the insurers had policy renewal rates below 80%.

On an overall basis, insurer and agency renewal rates are closer than they appear. If the midpoints for each of the renewal ranges shown in Table 23 are used, a weighted average can be computed for the agencies and insurers. This estimating procedure would yield a rough renewal average of about 83% for insurance agencies, and 82% for insurers. These estimated flood policy renewal rates are lower than what insurers and agencies typically experience in the homeowners line of insurance.

Flood policy renewal rates experienced by agencies tended to be higher in agencies that were more heavily involved in selling flood insurance (Table 24). For example, 88% of the agencies generating more that $100,000 in flood premiums have policy renewal rates of 80% or more. This compared with 82% of the agencies with $25,001-$100,000 in flood premiums and 72% for agencies with $100-$25,000 in flood premiums.

TABLE 24
POLICY RENEWAL RATE EXPERIENCED BY AGENCIES BY SIZE OF FLOOD PREMIUMS

	Size of Agency Flood Premium		
Renewal Rate	$100-$25,000	$25,001-$100,000	$100,001-$2,500,000
0-50%	5%	7%	0%
51%-70%	9	3	2
71%-80%	14	9	10
81%-90%	27	45	33
91%-100%	45	37	55
Number	206	76	51

Problems Encountered By Consumers

At the end of both surveys, agencies and insurers were asked to comment on any special problems that consumers encountered in attempting to purchase flood insurance coverage. The cost, hassle, and delay of obtaining an elevation certificate for a client applying for flood insurance was by a large margin the consumer problem most frequently mentioned by both insurers and agencies. Eighty-five agents submitted written comments on the difficulties of obtaining flood elevation certificates. "Elevation certificates are costly and create a backup of application processing—if the federal government or local insurance companies could help, it would reduce hassle," is an example of one of the written comments from agents. Some of the survey participants complaining about elevation certificates had suggestions on how the process could be improved. "The elevation certificate is always lost. I recommend that all elevation certificates be filed as a public record with the deed information so that all future owners of the property can obtain this information easily," one agent wrote. It should be noted here that the new Community Rating System (CRS) discussed in Chapter 2 will make a community's retention and furnishing of elevation certificates a creditable activity. Such credits contribute to the percentage premium reduction for which the community may ultimately may qualify thus providing an incentive to communities.

"Consumers need a better system with less expense to obtain the elevation certificate," wrote one agent. Another agent said that elevation certificates are usually on file with city building departments and the departments should be required to furnish the certificates to insurance companies and agents "without a hassle." Commenting on the need to simplify rating and the process of obtaining an elevation certificate, one insurer wrote that "agents and potential policyholders need a more user-friendly approach." In a related problem, 23 agents noted that real estate agents and lenders often wait to tell consumers at the last minute before closing that flood insurance is required. This causes much anguish and scrambling for elevation certificates and money to meet flood premiums. Over 30 agents made general comments about the cost of elevation certificates and premiums being a problem for consumers.

The importance of proper elevation of a home above expected flood or storm surge levels is well-illustrated by the large home in the foreground. Wave heights exceeded the floor elevations in the house on the left and it received severe damage while others even further from the coast were totally destroyed. The house on the right was elevated several feet higher and had little or no damage. Photo by S.M. Rogers Jr., UNC Sea Grant Program.

Twenty-four agents wrote about problems in interpreting flood hazard maps. "Flood maps should be in atlas form with more distinct boundary lines following streets, rivers, and bays which are more definitive in nature. More definitive maps would remove some of the mystery about who is required to carry flood insurance," wrote one agent. In response to such concerns, the FIA has undertaken initiatives to make Flood Insurance Rate Maps easier to use, including the addition of street indexes. The agency is also pursuing the digitization of maps and their use in automated Geographic Information Systems, to facilitate flood risk determinations.

Twenty-three agents mentioned that the consumer's lack of awareness about the need for flood insurance is a problem, and 18 wrote that agents themselves need more training and information on how to sell flood insurance. Some need to take more of an interest in flood insurance, said one agent. "We are very involved with flood. Many agents call us for information and help. We are disgusted with the lackadaisical attitude of the majority of agents in this highly flood prone area," the agent wrote.

A few agents mentioned the separate deductibles on buildings and contents and limitations on coverage as issues that bothered some consumers. And as was mentioned earlier in the discussion on the role of lenders, several agents mentioned that flood insurance would be more affordable for the consumer if lenders were more amenable to making payments for flood insurance out of an escrow account. "This would give the consumer a payment plan of sorts," wrote one agent. It should be noted that there are many areas of

the country where flood insurance premiums can be escrowed by lending institutions, but where this is not the case, payments are more of a burden to clients needing the coverage.

Overall Comments About the WYO Program

The last question on the agency survey asked agents to add any comments they might have on the WYO or the Direct Flood Programs. In addition, they were asked whether there were ideas or concepts already in use which they thought should be expanded or implemented further. Fifty-three agents made positive comments about the WYO program, many of them noting major improvements that had taken place in service, policy issuance, and claims handling when compared with the Direct program. Following is a sampling of some of these comments about the WYO program and companies:

1. "Our WYO carrier has made writing flood insurance a pleasure."

2. "The WYO Flood program gives much better service to the agent and policyholder."

3. "Better and easier to work with than in the past, but still room for improvement on maps, certificates, and educating the consumer and all sales people involved."

4. "We have a very good flood insurance department and find them to be prompt, professional and knowledgeable. I feel we should do a better job of advertising the need for flood insurance."

5. "The WYO program appears to have corrected the many administrative problems experienced with the Direct Flood Program."

6. "WYO is a winner!"

7. "WYO was the best thing the government did as now I can call someone for an answer."

8. "The WYO program has been most beneficial. Routine matters run more smoothly when dealing with people that have an insurance background. The workshops sponsored by both WYO and NFIP have been informative and favorable."

9. "WYO answers first call; no delay; policies issued within 30 days."

10. "Our WYO company does a great job. Far superior to the Direct Program."

11. "I love the WYO program. The ability to talk to our company underwriters is great."

12. From an agent representing a company not in the WYO program and writing Direct, "We would prefer a more personal approach from the NFIP when we are in need of their services. We would like our company to offer this coverage, so that we do not have to deal with NFIP."

A number of agents mentioned their WYO companies by name and how helpful it was to be able to develop knowledgeable home office contacts who were dependable and accessible. Several agents mentioned that they were pleased with the new preferred risk flood policy. This allows consumers not living in special flood hazard areas to pick up a basic flood policy for $75 which means the product is much more affordable.

Some had suggestions for areas where the WYO program could be improved:

—"WYO companies should get more involved in educating their agents. Use of videotapes may be an answer. NFIP seminars are good, but poorly attended," wrote one agent.

—"WYO might be more successful if the companies writing it publicized the fact and acted as though they want the business."

—"Additional education of agents is needed with regard to reading flood zone maps, elevation requirements, and compliance regulations."

Most of the remaining overall comments related to issues covered in earlier questions such as the need to improve the readability of the flood hazard maps, the need to push lenders to work harder on compliance with mandatory purchase, and to streamline and lower the cost of obtaining flood elevation certificates. One agent managed to hit on a variety of these issues in brief written comments:

—"Flood rate maps are poor, hard to read and vague. Penalize lenders for non-compliance! Establish escrow accounts for flood premiums. Encourage agents to produce by increased commissions or bonuses. Lower flood rates, make it easier to deal with the flood elevation certificate requirement."

Write-Your-Own (WYO) Program Administration

To open this section, insurers were first asked if the company used the services of a commercial vendor to handle any flood insurance services or whether all such functions were handled internally. Over eight in ten (83%) of the responding insurers used commercial vendors to handle one or more flood insurance services, while 17% handled all functions internally. This latter group of companies handle their own policy rating, issue flood policies, train agents, develop marketing brochures and advertising, do statistical and financial reporting, and settle flood claims.

TABLE 25
DOES YOUR COMPANY USE A COMMERCIAL VENDOR FOR ANY FLOOD INSURANCE SERVICES?

Q. Does your company use the services of a commercial vendor for any flood insurance services or do you handle these functions internally?

Yes, We Do Use the Services of a Commercial Vendor	83%
No, All Program Functions Are Handled Internally	17%
Number	41

Companies that do use commercial vendor services were asked which flood insurance services were performed by the vendor and which were performed by the company (Table 26). It is readily apparent that the commercial vendors are heavily involved in taking care of many of the mechanics connected with operating the flood insurance program. Statistical and financial reporting to the Computer Sciences Corporation (CSC) was the service performed most frequently by a commercial vendor. Over nine in 10 (94%) of the insurers using vendors for some purpose farmed out the task of statistical and financial reporting. CSC compiles statistics and does accounting for the National Flood Insurance Program. About nine in ten also utilized commercial vendors for policy issuance.

TABLE 26
WHICH SERVICES ARE PERFORMED BY A VENDOR AND WHICH ARE PERFORMED BY YOUR COMPANY?

Service	Performed By Vendor	Performed By our Company
Statistical and Financial Reporting to CSC	94%	6%
Policy Issuance	91	9
Policy Rating	74	29
Claims Settlement	65	50
Training of Agents	35	50
Other Marketing Efforts Including Information Brochures For Potential Policyholders	18	65
Advertising in Flood-Prone Areas	9	53
Other Services	6	18
Number	34	34

Vendors also handled policy rating for about three-fourths of the companies, and they performed or shared in claims settlement for 65% of the companies. Half of the companies also did some claims settlements. The total for claims settlement is 115%, indicating that some insurers shared claim settlement activities between their company and a commercial vendor. For policy rating a few insurers also used both a vendor and company involvement as the total is 104%.

Half of the insurers performed training on flood insurance for their agents while 35% relied on commercial vendors for agent training. The total for agent training is 85%, indicating that several insurers are not undertaking agent training. Insurers were even more involved with preparation of other marketing efforts, including information brochures for potential policyholders (65%) and advertising in flood prone areas where 53% were taking initiatives in this area. Commercial vendors took on some marketing efforts, including preparation of brochures for 18% of the companies. Nine percent of the companies used vendors to assist in advertising flood insurance in flood-prone areas. Totals for advertising and other marketing activities add to less than 100% meaning that not all insurers engage in these activities. Several insurers listed other services and tasks performed by commercial vendors, including tracking of flood policies to ensure renewal, flood zone determination, assistance in obtaining elevation certificates, and training for company representatives. Preparation of flood forms was a task several companies mentioned doing in-house.

WYO companies were asked about the type of training provided their personnel on the flood insurance program. Sixty-one percent of respondents said that the company used the National Flood Insurance Program manual for basic training in the flood program (Table 27). About the same share (59%) indicated that they notify personnel of all flood program changes pertinent to their areas of responsibility, and 44% provide an introductory course about the flood program. Over one-third (37%) have developed a special manual for use in administering the program.

TABLE 27
TYPES OF TRAINING PROVIDED FOR COMPANY PERSONNEL

Q. In managing the WYO Program within your company, what types of training do your provide for your personnel?

Type of Training	Percent
We Use the NFIP Manual For Basic Training of Our Personnel	61%
We Notify Our Personnel of All Program Changes Pertinent to Their Area of Responsibility	59
We Provide An Introductory Course Describing the Program and Its Operation	44
We Have Developed A Special Manual For Flood	37
We Provide Refresher Courses Periodically To Reacquaint Our Personnel With the Program	32
Other Methods of Training Mentioned	32
Number	41

Other types of training mentioned by respondents included National Flood Insurance Program classes conducted by FEMA and FIA, in-house classes, cross-training, and on-the-job (OJT) training, and using a vendor as a resource to answer all questions that come up about the program and its operations.

Nearly half (49%) of the insurers had developed their own in-house material for training and program administration while just over half (51%) did not.

TABLE 28
IN-HOUSE MATERIALS FOR TRAINING AND ADMINISTRATION

Q. Have you developed your own in-house material for training and program administration?

Yes	49%
No	51%
Number	37

Insurers that had developed their own in-house materials were asked to describe them. Two companies indicated they had created their own flood manual while four companies published guidelines and procedures. "We do maintain a mini-master file of critical rating information which is updated as needed," wrote one respondent. Three other companies maintained examples of completed forms while two companies used slides, tapes, and workbooks for training and informational purposes. Several companies indicated that they used a combination of company-produced and NFIP materials.

Next, insurers writing flood insurance were asked about human resources devoted to administering the WYO program. Table 29 shows the distribution in the number of employees for 38 responding flood writers in terms of part-time, full-time, and total employees (sum of part-time and full-time) having responsibility for flood insurance.

TABLE 29
NUMBER OF EMPLOYEES ADMINISTERING THE WYO PROGRAM

Number of Employees	Part-Time	Full-Time	Total (Part and Full-Time)
None	18%	50%	3%
One	16	16	21
2-5	32	13	42
6-10	18	5	11
11-25	10	13	10
More Than 25	5	3	13
Number of Companies	38	38	38

As shown in Table 29, half (50%) of the companies had no full-time employees, 18% had no part-time employees, and only 3% (one company) had no full or part-time employees administering the program. At the other end of the spectrum, two companies (5%) had more than 25 part-time employees, one (3%) had more than 25 full-time employees and five companies (13%) had 25 or more full and part-time employees. Companies with large numbers of employees tended to be those that did most or all of WYO program and administrative functions in-house and wrote large volumes of flood insurance. For each of the categories of part-time, full-time, and total employees, a large number of WYO insurers fell into the 1-5 employee range.

Agency Premium Volume And Other Agency Characteristics

At the beginning of the flood survey for insurance agencies, respondents were asked about the type of insurance agency and several questions to measure their level of involvement in property and flood insurance. Level of premium volume for flood insurance gives a means of assessing level of agency involvement as did the employment figures for insurers in the previous section. Regarding type of agency, 55% of the agencies were independent agencies writing for more than one insurer, 40% were exclusive agents writing for one company, and 5% were other types of producers such as brokers.

TABLE 30
TYPE OF PRODUCER

	Percent
Independent Agency	55%
Exclusive Agency	40
Other	5
Number	471

Agents were next asked about total 1988 Property Insurance premium produced by the agency. Table 31 shows the distribution of total property premiums for several dollar ranges. Over one-third (35%) of the agencies had annual *property* premiums of over $1,000,000 and 5% had property premiums of more than $5,000,000. The largest agency had property premiums of $70,000,000. For all of the agencies able to provide information on premium volumes, property premiums totaled $608.1 million.

TABLE 31
1988 AGENCY PREMIUM VOLUME FOR PROPERTY INSURANCE

1988 Annual Property Premium Volume	Percent of Respondents
0- $100,000	15%
$100,001-$500,000	29
$500,001-$1,000,000	20
$1,000,001-$5,000,000	30
Over $5,000,000	6
Number	366

The median annual property premium volume among the 366 agencies was $700,000 while the average was $1,661,484.

Then agencies were asked about 1988 *flood* insurance premium volume. As mentioned earlier in the chapter, about 10% of the responding agencies did not write any flood insurance and others did not want to reveal property or flood premium volumes. Table 32 shows the percent of responding agencies that fell into each range of flood insurance premium volume.

TABLE 32
1988 AGENCY PREMIUM VOLUME FOR FLOOD INSURANCE

1988 Flood Premium Volume	Percent of Agency Respondents
$100-$1,000	12%
$1,001-$5,000	25
$5,001-$25,000	27
$25,001-$100,000	22
Over $100,000	15
Number	351

Flood premiums generated by the 351 responding agencies totaled $23,631,763. One agency wrote flood premiums of $2,180,000 and three had flood premiums over $1,000,000. The median flood premium for the 351 agencies was $12,250 while the mean was $67,327. Fifteen percent of the agencies wrote over $100,000 in annual flood premiums and an additional 22% wrote from $25,001-$100,000. Another way of measuring the impact of flood insurance on the respondent agencies is to calculate the percentage of property premium generated by flood insurance (Table 33). For over half (54%) of the respondents, flood insurance premiums accounted for two percent or less of the agency's property insurance premiums. However, for about one-quarter of the respondents (24%), flood insurance accounted for over five percent of the agency's property premium volume. At ten agencies, flood insurance accounted for 20% or more of property premium volume.

TABLE 33
FLOOD PREMIUMS AS A SHARE OF PROPERTY INSURANCE PREMIUMS

Flood As a Percent of Property Premiums	Percent of Respondents
0-0.5%	26%
0.6-1.0%	12
1.1-2.0%	16
2.1-5.0%	23
5.1-10.0%	17
Over 10%	7
Number	303

CHAPTER 5
ATTITUDES OF NON-PARTICIPANTS

This chapter covers findings from surveys of insurers and agencies on why they have decided not to write flood insurance through the WYO program. Separate surveys were sent to two groups of insurers not currently involved in writing flood insurance. One group has signed the Write-Your-Own (WYO) arrangement with the Federal Insurance Administration (FIA) and could exercise the option to write flood insurance in the future. In the past, some of the signed, nonwriting companies have become active writers of flood insurance. The other group includes insurers that have not signed the WYO arrangement.

Reasons for Non-Participation in the WYO Program

A question in the agency survey asked about status of the agency with regard to flood insurance (see Table 3, Chapter 4). Nine percent of 474 respondents to the agency survey indicated that the agency did not write flood insurance. An additional 14% indicated that they only wrote flood insurance through NFIP's "Direct" program and that they did not participate in the WYO program. In a followup question, agencies not writing any flood insurance and those writing only through the Direct program were asked to rate factors that influenced the decision not to write flood through the WYO program. In Table 34, results are shown separately for the non-writers, agencies writing through the Direct program, and for both groups combined. The most important reason for not participating in the WYO program given by agencies not writing *any* flood insurance was that their property insurance book of business includes relatively few areas affected by potential or actual flooding. Six in ten (60%) of the nonwriting agencies rated this item very important and 9% said it was somewhat important. The agencies not writing flood at all also cited small volume of flood insurance business anticipated not justifying startup costs as a very (43%) or somewhat important (17%) reason. In written comments, several agents mentioned that they had not become familiar with the flood insurance program yet, but would like to learn more about it.

TABLE 34

WHY AGENCIES CHOSE NOT TO WRITE FLOOD INSURANCE THROUGH THE WYO PROGRAM

Q. Please rate the following factors for their influence on your agency's decision not to write flood insurance through the WYO program using a scale of 1-5:

	Level of Importance				Don't	
Factor	Very	Somewhat	Slight	Little/None	Know	"N"
Our Property Insurance Business Includes Few Areas Affected By Potential Or Active Flood						
Write direct only	40%	32%	6%	15%	6%	47
Do not write flood	60	9	6	12	12	33
Both groups	49	23	6	14	9	80
The Volume of Flood Insurance Business We Expected To Write Was Too Small To Justify the Anticipated Start-Up Costs						
Write direct only	55	11%	9%	21%	4%	47
Do not write flood	43	17	10	10	20	30
Both groups	51	13	9	17	10	77

None Of Our Companies For Property Insurance Offers The WYO Coverage						
Write direct only	50%	6%	4%	21%	19%	52
Do not write flood	25	11	4	36	25	28
Both groups	41	8	4	26	21	80
Administrative Requirements To Sell The Coverage Appeared To Too Complex To Justify Our Participation						
Write direct only	19%	4%	21%	26%	30%	47
Do not write flood	29	21	11	21	18	28
Both groups	23	11	17	24	25	75
Flood Policy Does Not Offer The Type Or Extent Of Coverage Sought By Our Clients						
Write direct only	10%	3%	5%	60%	23%	40
Do not write flood	2	0	15	31	42	26
both groups	11	1	9	49	30	66
The Commission Offered On The Business Is Inadequate To Cover Our Cost of Selling the Product						
Write direct only	18%	14%	18%	30%	20%	50
Do not write flood	7	17	14	28	35	29
Both groups	14	15	17	29	25	79
We Have Been Happy With The Direct Program And See No Need To Change To WYO						
Write direct only	42%	24%	12%	10%	2%	50
Do not write flood	0	0	0	23	77	26
Both groups	28	16	8	21	28	76
We Refer Business To Another Local Agent Who Specialized In Writing Flood Insurance						
Write direct only	0%	0%	0%	69%	31%	39
Do not write flood	4	4	4	48	39	23
Both groups	2	2	2	61	34	62
Agency Has Never Reviewed The Question Of Whether To Write Flood Insurance						
Write direct only	5%	0%	2%	63%	29%	38
Do not write flood	16	28	8	28	20	25
Both groups	10	11	5	49	25	63

For agencies writing some flood insurance through the direct program, there were several reasons rated "very important" as reasons for not participating in the WYO program. Over half (55%) of this group stated that the volume of flood insurance expected was too small to justify incurring the anticipated startup costs for the WYO program. This would imply that many agencies in this group write a small amount of flood insurance through the direct program. Having grown somewhat comfortable with that arrangement, there isn't a strong incentive to learn a new set of procedures for the WYO program.

In fact, nearly two-thirds (64%) of the agencies writing through the direct program said a very or somewhat important reason for not participating in WYO was that "We have been happy with the service we've been able to provide our clients through the NFIP direct program and see no need to change to WYO." Another "very important" reason for not writing flood through the WYO program given by those writing through the direct program was that "none of our companies for property insurance offer the WYO coverage."

Why Insurers Signing the Arrangement Have Not Written Flood Insurance

Thirteen insurers responding to the Insurance Research Council flood survey had a "middle ground" status in that the company signed the WYO arrangement to participate in the program, but hadn't yet written flood policies. Table 7 in Chapter 4 has details on why these companies decided to sign the WYO arrangement leaving open the option to write flood insurance at a future time. Leading reasons given by the 13 insurers for signing the arrangement included "flood coverage is sought by our policyholders," "our producers wanted us to offer flood insurance," and "we view ourselves as a full-service insurer." Next these companies were asked to rate a series of factors regarding the company's decision *not to write* WYO flood insurance policies. Only eight of the 13 respondents answered this portion of the survey. Table 35 shows reasons for deciding not to write flood insurance according to the numbers of respondents that ranked an item "very" or "somewhat" important.

TABLE 35
FACTORS INFLUENCING DECISION NOT TO WRITE FLOOD INSURANCE:
INSURERS THAT HAVE SIGNED THE WYO ARRANGEMENT

Q. Please rate the following factors for their influence on your company's decision *not to write* WYO Flood Insurance policies.

Factors	Factor Was "Very or Somewhat" Important	
	Number of Responses	Percent
We Found The Startup Costs Of Training And Equipping Our Home Office Staff And Producers To Be Too High	7	88%
The Volume of Flood Insurance We Expect To Write Is Too Small To Justify Start-up Costs	7	88
Most Of Our Producers Who Would Offer This Product Are Currently Writing It For Another WYO Company Or Through the Direct Plan	6	75
We Found The Administrative Requirements To Be Too Complex To Justify Our Participation	4	50
We Believe The Expense Reimbursement Allowed By The WYO Program Is Inadequate To Cover Our Administrative Costs	3	38
Our Property Book Of Business Includes Relatively Few Areas Affected By Potential Or Actual Flooding	2	25
Future Changes In the Program Are Likely To Result in Flood Insurance Risk-Bearing By Participating Insurers And We Do Not Want To Be Involved In That Aspect of This Coverage	2	25
We Think There is Little Chance That Providing Flood Insurance Will Bring Us New Policyholders For Other Types of Coverage	2	25
We Wish To Avoid Any Direct Relationship With the Federal Government In The Provision Of Insurance	1	13
Number of Respondents	8	100%

High startup costs for training and equipping home office staff and producers for flood insurance is the issue which deterred the majority of respondents from starting to write. Four insurers ranked this as very important in addition to three which indicated it was somewhat important. Closely related and also highly ranked was the statement "the volume of flood insurance business we would expect to write is too small to justify incurring the necessary start-up costs." Other reasons given in written comments by respondents not listed in Table 35 pertained to "uncertain risks" of the program and not being able to forge an agreement with a commercial vendor to service the company's flood business.

Next the 13 companies were asked if they would consider writing WYO premiums now, and if not, what changes in the program would be necessary to induce the company to begin writing. Out of 10 companies answering the question, four (40%) said they would consider writing flood insurance through the WYO program.

TABLE 36
WOULD YOUR COMPANY CONSIDER WRITING FLOOD INSURANCE NOW?

	Number	Percent
Yes	4	40%
No	6	60
Number	10	100%

One company that said it planned to become active very shortly in writing flood insurance and that the desire to become a "full-service" insurer was the primary motivation. Another company said that the WYO program looked good, but the company had not received enough demand yet from its producers to initiate the program. Two companies not considering writing flood insurance at this time wrote that demand for the product would have to increase for them to begin writing. Another company said it was looking for an improvement in its own financial position before tackling a new program like flood insurance. One company was in the process of entering into an agreement with another insurer to allow its agents to place flood business with the insurer that is already established as a flood writer. Another company said it had concerns relative to the government attempting to overregulate the WYO program, including reduction in commissions when premium volume does not increase by 10%, triennial audits, and penalty fees for failure to meet federal standards on error ratios.

Forty-seven non-writers of flood insurance completed a survey for companies that have not signed the WYO agreement while three companies sent letters acknowledging that they were not writers and provided brief reasons why. Respondents were asked to rate a series of factors that influenced their company's decision not to participate in the WYO Flood Insurance Program. The reason this group cited most frequently for non-participation was "that the volume of flood insurance business we would expect to write is too small to justify startup costs." Nearly six in ten (59%) of the respondents ranked this reason as "very important," while 26% indicated it was "somewhat important." About half (49%) said startup costs of training and equipping home office staff and producers to administer the program appeared too high was a very important reason for not participating, and 19% said this reason was somewhat important.

TABLE 37
REASONS WHY NON-SIGNATORY INSURERS DECIDED NOT TO WRITE FLOOD INSURANCE

Q. Please rate the following factors for their influence on your company's decision *not to participate* in the WYO Flood Insurance Program. Please assign a rating of 1-5 to each item.

Factor	Very	Somewhat	Slight	Little/None	Don't Know	"N"
The Volume of Flood Business We Would Expect To Write Is Too Small To Justify Startup Costs	59%	26%	7%	7%	2%	46
The Startup Costs of Training and Equipping Our Home Office Staff and Producers To Administer The Program Appeared Too High	49	19	16	7	9	43
The Administrative Requirements for the Program, Such As Statistical and Financial Reporting, Appeared Too Complex To Justify Our Participation	36	21	19	14	10	42
Most of Our Producers Who Would Offer This Product Are Currently Writing It For Another WYO Company Or With the Direct Plan	30	30	11	13	15	46
Our Property Insurance Book of Business Includes Relatively Few Areas Affected By Potential Or Actual Flooding	30	26	21	15	9	47
We Believe the Expense Reimbursement Allowed By the Program Is Inadequate To Cover Administrative Costs	19	19	26	19	19	43
We Believe the Private Vendor Services We Would Require to Administer Various Aspects Of This Program Cost Too Much	18	23	18	28	15	40
We Did Not Believe the WYO Program Would Enable Our Customers to Obtain Better Service Than Under Direct Program	15	20	15	28	23	40
We Believe That Future Changes In Program Are Likely To Result In Flood Insurance Risk-Bearing By Participating Insurers; Do Not Want to Be Involved	14	16	16	32	23	44
Our Company Has Never Reviewed the WYO Program For Possible Participation	15	10	5	7	63	41
Although We Write Business In Areas Affected By Flooding, The Flood Policy Does Not Offer The Type Or Extent Of Coverage Sought By Policyholders	5	5	5	48	39	44
We Think the Price of This Product Is Too High, Relative To The Cost of Homeowners Insurance To Attract Many Of Our Policyholders	2	2	21	49	26	43
We Wish To Avoid Any Direct Relationship With the Federal Government In The Provision Of Insurance	0	14	16	46	25	44

Three other reasons were considered very or somewhat important in the decision not to write WYO flood insurance by more than half of the companies. These included administrative requirements that appeared too complex to justify participation, and the fact that the company's property insurance book of business had relatively few areas affected by potential or actual flooding. Finally, a majority of companies indicated that most of their producers who would offer this product were currently writing it for another WYO company or with the direct plan. Other such options available through a company's producers would tend to provide assurance that their customers would have a place to obtain flood insurance if needed.

A number of companies made additional comments elaborating on their reasons for nonparticipation. Three companies noted that they had not received sufficient interest from producers to indicate an adequate demand for flood insurance.

Another company wrote that it felt reluctant to turn its name and reputation for quality service over to a vendor "even though using a vendor was the only way to make writing flood insurance cost effective." Several noted they were not sufficiently familiar with the program and one company respondent noted that it lacked the trained personnel needed to get involved with the program.

The nonwriting companies were asked if their company would consider becoming active in the WYO program, and if not, what factors or changes in the program would be necessary for them to decide to participate. Forty of 43 companies (93%) said that they would not consider becoming active in the flood insurance program now while three companies said they would consider becoming involved (Table 38).

TABLE 38
WOULD YOUR COMPANY CONSIDER BECOMING ACTIVE IN WYO NOW?

Yes	7%
No	93%
Number	43

Six companies indicating that they would not consider participating now said that more evidence of demand for flood insurance from policyholders and interest from producers would have to be shown before the company would consider becoming active in WYO. "We would re-evaluate participation if our producers and agents consistently felt this product would enable us to better serve their needs and those of their clients," one company wrote. "Our agents and policyholders would have to request coverage more often to make it cost effective," added another company in written comments. Two companies stated that simplified statistical accounting and reporting requirements would be necessary to consider participation and two companies said they were looking for lower startup costs or improved reimbursement for WYO operating expenses. Several companies mentioned that they were struggling to maintain profitability in their traditional lines and didn't think the company had the resources to take on a new program. Two companies noted that they were primarily commercial lines carriers with little business in homeowners insurance where the primary market for flood insurance is found.

Regarding the three companies saying they would consider becoming active in the WYO program, one company noted it would consider becoming involved if the reporting requirements became simpler. Another company which indicated some interest in becoming active, noted that its agency force was primarily life-insurance oriented and that there had not been significant interest expressed on the part of agents.

Asked for additional comments on the flood insurance and the WYO program, many nonwriters again emphasized the lack of interest they had experienced from agents and policyholders. "If our agents would have a need for this program, we would consider providing the coverage. (The insured may need the coverage, but if our agents do not want to sell it, we would not try to make a market.) This is a good idea and we support the industry effort to use the WYO program. The market for our insureds has been low so we are not in it. It would be a service, not a profit center," wrote one of the companies.

APPENDIX 1
INSURER PARTICIPANTS IN THE FLOOD INSURANCE SURVEYS

Aetna Life & Casualty Group
Agway Insurance Company
Alliance Insurance Companies Group
Allianz Insurance Group
Allied Group
Allstate Insurance Group
American Mutual Fire Group
American Modern Home Group
American International Group
American Universal Group
American Family Insurance Group
American Bankers Group
American Financial Insurance Group
American Hardware Mutual Insurance Co.
Amica Mutual Insurance Company
Andover Group
Argonaut Group
Auto-Owners Group
Automobile Club Insurance Company
Automobile Club of Michigan Group
Baldwin Mutual Insurance Company
Berkshire Hathaway Inc. Group
Brotherhood Mutual Insurance Company
Capital Assurance Group
Casualty Indemnity Exchange
Central Insurance
CIGNA Group
Columbia Insurance Group
Continental Insurance Companies
Cotton States Group
Country Companies
Crum & Forster Insurance Companies
Delta Lloyds Insurance Company
Dependable Insurance Company
Durham Insurance Group
Employers Mutual Companies
Erie Insurance Group
Farmers Insurance Group
Farmers Home Group
Federated Mutual Group
Fireman's Fund Insurance Companies
Foremost Corporation Group
Fremont Mutual Group
Germania Mutual Group
Grange Insurance Group
Grinnell Mutual Group
Hastings Mutual Insurance Company
Hochheim Prairie Group
Holyoke Mutual Insurance Company
Independent Life & Accident Group
Indiana Farm Bureau Group
Island Insurance Group
Kemper Group
Kentucky Farm Bureau Group
Liberty Mutual Insurance Companies
Lincoln National Group
Michigan Millers Mutual Insurance Company
Milwaukee Insurance Group
Motorists Insurance Group
Mountain States Insurance Company
Mutual Service Insurance Group
National Farmers Union Casualty Group
Nationwide Group
New Jersey Manufacturers Group
New York Central Mutual Fire Insurance Company
North Carolina Farm Bureau Mutual Insurance Company
North Star Mutual Insurance Company
Northwestern National Insurance Group
Old Guard Mutual Group
Old Republic Group
Patrons Mutual Group of Connecticut
Pekin Insurance Group
Penn Mutual Insurance Company
Pennsylvania National Mutual Casualty Insurance Company
Pioneer Insurance Company
Preferred Mutual Insurance Company
Preferred Risk Group
Progressive Insurance Group
Providence Washington Group
Public Service Mutual Group
Regency Insurance Company
RLI Group
SAFECO Insurance Companies
Secura Insurance Mutual Company
Security Mutual Insurance Company
Seibels Bruce Insurance Group
Selective Insurance Group
Shelby Group
Shelter Insurance Companies
Sierra Pacific Insurance Company
Southern Farm Bureau Casualty Group
State Farm Fire and Casualty Company

State Auto Insurance Companies
The PMA Group
The Royal Insurance Group
The Hanover Insurance Companies
Travelers Group
United Fire & Casualty Group
USAA Group
Vermont Mutual Group
West Bend Mutual Insurance Company
Western National Mutual Group
White Hall Mutual Insurance Company
Winterthur Swiss Group

APPENDIX 2
FLOOD INSURANCE SURVEYS

AGENCY SURVEY ON THE NATIONAL FLOOD INSURANCE PROGRAM

Respondent Information

1. Name:_____ (1-4) **Record Number** — — — —
(Office Use Only)

2. Position:_____

3. Telephone No.: (_____) _____ - _____

4. Agency/Brokerage Name:_____

5. Please put a checkmark by the state or states in which your agency does business. Please check all which apply.

(5)_____ California
(6)_____ Florida
(7)_____ Louisiana
(8)_____ Mississippi
(9)_____ New Jersey
(10)_____ New York
(11)_____ North Carolina
(12)_____ Pennsylvania
(13)_____ South Carolina
(14)_____ Texas
(15)_____ Virginia
(16)_____ Other

(17)**6.** Type of Producer:

1._____ Independent Agency
2._____ Exclusive Agency
3._____ Other

(18-26)**7.** 1988 Approximate total Property Insurance premium volume produced by your agency. $_____

(27-35)**8.** How much of this is flood business? $_____

Decision to Participate in the Write-Your-Own Program

Note: The Write-Your-Own (WYO) program allows agents to write flood insurance through the insurer or insurers they represent. Under the direct program, agencies place flood business through a government contractor, the Computer Sciences Corporation, on behalf of the Federal Insurance Administration (FIA).

(36)**9.** Does your agency write flood insurance?

1._____ We write flood insurance through the Write-Your-Own (WYO) program **only**. [PLEASE PROCEED TO QUESTION 11]

2._____ We write flood insurance through **both** the WYO and the Direct programs. [PLEASE PROCEED TO QUESTION 11]

3._____ We write flood insurance through the Direct program **only**. [PLEASE ANSWER QUESTION 10, THEN PROCEED TO QUESTION 12]

4._____ We don't write flood insurance at all. [PLEASE ANSWER QUESTION 10, AND THEN RETURN THE SURVEY TO AIRAC]

10. Please rate the following factors for their influence on your agency's decision **not to write** flood insurance through the WYO program, using a scale of 1–5:

1=Very Important
2=Somewhat Important
3=Slight Importance
4=Little or No Importance
5=No Opinion/Don't Know

(37)_____ Our property insurance book of business includes relatively few areas affected by potential or actual flooding.

(38)_____ The volume of flood insurance business we expected to write was too small to justify incurring the anticipated startup costs.

(39)_____ None of our companies for property insurance offer the WYO coverage.

(40)_____ The administrative requirements to sell the coverage appeared to be too complex to justify our participation.

(41)_____ Although we do write significant business in areas affected by actual or potential flooding, the flood policy does not offer the type or extent of coverage sought by our clients.

(42)_____ We think the commission offered on the business is inadequate to cover our costs of selling the product.

(43)_____ We have been happy with the service we've been able to provide our clients through the NFIP "direct program" and see no need to change to WYO.

(44)_____ We refer business to another local agent who specializes in writing flood insurance.

(45)_____ Our agency has never reviewed the question of whether to write flood insurance at all.

(46)_____ Other (please explain):

IF YOU ANSWERED QUESTION 10, AND YOU WRITE FLOOD INSURANCE UNDER THE DIRECT PROGRAM ONLY, PLEASE SKIP TO QUESTION 12 AND COMPLETE THE SURVEY.

IF YOU ANSWERED QUESTION 10, AND YOU DO NOT WRITE FLOOD INSURANCE AT ALL, YOU HAVE NOW COMPLETED THE FLOOD INSURANCE PROGRAM SURVEY FORM. PLEASE RETURN THE COMPLETED FORM IN THE SELF-ADDRESSED STAMPED ENVELOPE TO THE ALL-INDUSTRY RESEARCH ADVISORY COUNCIL AT 1200 HARGER ROAD, SUITE 310, OAK BROOK, ILLINOIS 60521. THANK YOU FOR YOUR HELP ON THIS IMPORTANT PROJECT.

11. Please rate the following factors for their influence on your agency's decision **to participate** in the WYO program, using a scale of 1–5:

1=Very Important
2=Somewhat Important
3=Slight Importance
4=Little or No Importance
5=No Opinion/Don't Know

(47)_____ Our property insurance book of business includes a number of areas affected by potential or actual flooding.

11. (Continued)

(48)_____ Our clients were required by mortgage lenders to have flood insurance.

(49)_____ Our clients indicated a desire to have this product, even though not required by a lender to buy it.

(50)_____ We believed that our E & O liabilities dictated that we offer this coverage to our clients.

(51)_____ We wanted to offer our agency's services in providing this product to our clients who might want the product.

(52)_____ Given that we write a significant amount of property insurance business in areas affected by actual or potential flooding, we believed that the flood policy offers important and necessary coverage sought by our clients.

(53)_____ We thought there was a good chance that providing flood insurance would be an effective way of introducing our agency to potential new clients.

(54)_____ We wanted to have a good means of staying informed about changes in the WYO program.

(55)_____ We view our agency as a full-service provider of insurance to our clients and felt it was important to offer this product.

(56)_____ Other (please explain):

The Marketing of Flood Insurance

12. What sources of information about the flood program do you provide? Select **all** which apply.

(57)_____ Provide brochures describing the program features to those who request them.

(58)_____ Target mailings of brochures.

(59)_____ Advertising in local media in flood-prone areas.

(60)_____ Information on the flood hazard zone applicable to the property.

(61)_____ Information on the steps necessary to obtain elevation certificates.

(62)_____ The rate applicable to an individual policyholder.

(63)_____ Information to local lending institutions regarding the program requirements and features.

(64)_____ Price quotes to clients.

(65)_____ Other (please explain):

_____

_____

_____

_____

(66)**13.** In your opinion, where does the primary responsibility lie for promoting the flood insurance program to potential policyholders? Please select the single answer which most agrees with your view:

1._____ Primary responsibility for promotion lies with the Federal Insurance Administration (FIA).

2._____ Primary responsibility for promotion lies with the individual WYO company.

3._____ Primary responsibility for promotion lies with the local agency.

4._____ Other (please explain):

_____

_____

_____

_____

(67)**14.** In your opinion, is flood insurance a "hard sell" for most flood insurance prospects?

1._____ Yes [IF YOU ANSWERED "YES", PLEASE ANSWER QUESTION 15]

2._____ No [IF YOU ANSWERED "NO", PLEASE PROCEED TO QUESTION 16]

15. Why do you think flood insurance is difficult to sell? Please rate each of the following possible factors, using a scale of 1–5:

1=Strongly agree

2=Agree Somewhat

3=Disagree Somewhat

4=Strongly disagree

5=No Opinion/Don't Know

(68)_____ Property insurance generally is a hard sell. Most people won't buy it unless they're required to and flood insurance is no different.

(69)_____ Most people don't know that flood insurance is available.

(70)_____ Most people don't think they are likely to experience significant flood damage to their property.

(71)_____ Most people think flood insurance is too expensive compared to their property insurance premium.

(72)_____ Most people think they're already covered for flood damage under their existing property insurance policy.

(73)_____ Most people don't think the flood insurance policy provides enough coverage, or they think the deductibles are too high.

(74)_____ Most people think federal disaster insurance negates the need for flood insurance.

16. In your opinion, how important are the following items to those of your clients who decide **not** to purchase flood insurance? Please assign a rating to each, using a scale of 1-5:

1=Very Important
2=Somewhat Important
3=Slight Importance
4=Little or No Importance
5=Don't Know/No Opinion

(75)_____ Separate $500 deductibles on buildings and contents under the policy.

(76)_____ The level of limits offered under the policy.

(77)_____ The price of the policy, relative to the protection provided.

(78)_____ The cost and/or "redtape" necessary to obtain an elevation certificate.

(79)_____ Lack of full basement contents coverage.

(80)_____ Other. (please explain):

_____

_____

_____

_____

(81)17. Please indicate your level of agreement or disagreement with the following statement: "A more extensive public campaign to raise awareness about the flood hazard and the availability of flood insurance would be effective in increasing the number of flood insurance policies." Please check the **single** response which best describes your view:

1._____ Strongly Agree

2._____ Somewhat Agree

3._____ Somewhat Disagree

4._____ Strongly Disagree

5._____ Don't Know/No Opinion

18. (a). Please explain briefly the reasons for your response to Question 17:

_____

_____

_____

_____

(b). Please take a few moments to add any other brief thoughts you may have on steps which could be taken to improve the marketing of flood insurance:

_____

_____

_____

_____

(82)**19.** What is your impression of the extent to which agents/brokers in your area currently offer flood insurance to their clients? Please check the **single** response which best describes your view:

1._____ Most agents/brokers in the area have learned about the product and offer the coverage to any of their clients who need it;

2._____ There are a few agents/brokers in our area who have become experts in the program requirements and procedures and to whom most of the local business is referred.

3._____ No agents/brokers in our area offer flood insurance.

Write-Your-Own Program Administration

20. Based on your experience, how effective is the mandatory purchase requirement that flood insurance be obtained as a condition for issuing a federally-backed mortgage on properties built within Special Flood Hazard (A,V zones) Areas?

A. Please rate the effectiveness of the requirement with respect to **an Initial Purchase** of the coverage when the mortgage is issued. Choose the **single** item that best matches your view.

(83)**Initial Purchase**

1._____ Virtually all lenders in our area require the coverage.

2._____ Many lenders in our area require the coverage.

3._____ Few lenders in our area require the coverage.

4._____ Virtually no lenders in our area require the coverage.

5._____ Don't Know/No Opinion

B. Now please rate the effectiveness of the requirement for mandatory purchase with respect to **Subsequent Renewals** of the coverage. Choose the single item that best matches your view.

(84)**Subsequent Renewals**

1._____ Virtually all lenders in our area require the coverage.

2._____ Many lenders in our area require the coverage.

3._____ Few lenders in our area require the coverage.

4._____ Virtually no lenders in our area require the coverage.

5._____ Don't Know/No Opinion

21. In your opinion, what are the principal factors hindering higher compliance with the mandatory purchase requirements for flood insurance? Please rate each possible factor, using the following scale:

1=Key Factor 3=Not a Significant Factor

2=Contributing Factor 4=Don't Know/No Opinion

(85)_____ Many lenders in our area are unaware of the mandatory flood insurance purchase requirement for properties in Special Flood Hazard areas.

21. (Continued)

(86)_____ Rapid turnover of mortgages in today's secondary mortgage market make monitoring of flood insurance purchases difficult.

(87)_____ There are no effective regulatory penalties for noncompliance with the mandatory purchase requirements.

(88)_____ The cost of flood insurance to clients and the lack of general compliance creates a significant competitive disadvantage for any lender which actually enforces the requirement.

(89)_____ There is no simple or effective way to reach homeowners whose mortgages were issued prior to the enactment of the mandatory purchase requirement, even though their properties may lie within a Special Flood Hazard Area.

22. What changes or actions can you suggest which could increase compliance with the mandatory purchase requirements?

_____

_____

_____

_____

(90) 23. What is the policy renewal rate that your agency has experienced on its book of flood insurance business during 1988?

1._____ 0–50%

2._____ 51–70%

3._____ 71–80%

4._____ 81–90%

5._____ 91–100%

Other Issues

24. Have you noted special problems frequently encountered by consumers in attempting to purchase the flood insurance coverage? If so, what are they and how might they be corrected?

_____

_____

_____

_____

25. Please take a few minutes to add any comments you may have on the the WYO or the Direct Flood programs. Are there areas in which you believe the programs have been particularly successful? Are there ideas or concepts already in use which you think should be expanded or implemented further?

_____

_____

_____

_____

SURVEY ON THE WRITE-YOUR-OWN (WYO) FLOOD INSURANCE PROGRAM
For Signed and Writing Participants in the Program

Respondent Information

1. Name:_____
2. Position:_____
3. Telephone No.: (_____)_____-_____
4. Company Name:_____
5. Member of Insurer Group: _____Yes _____No
6. Group Name:_____

NOTE: THE ABOVE RESPONDENT AND INSURER INFORMATION IS REQUESTED FOR RECORDKEEPING PURPOSES ONLY. THERE WILL BE NO DISCLOSURE BY AIRAC OF ANY RESPONDENT OR INSURER-SPECIFIC INFORMATION.

Decision to Participate in the Write-Your-Own Program

7. Please rate the following factors for their influence on your company's decision **to sign** the WYO agreement. Please assign a rating of 1-5 to each item, using a scale of:

1=Very Important
2=Somewhat Important
3=Slight Importance
4=No Importance
5=Not Applicable

_____Our property insurance book of business includes a number of areas affected by potential or actual flooding.

_____We expected to write a volume of flood insurance business sufficient to justify incurring the necessary startup costs.

_____Our producers writing in flood-prone areas were interested in having us offer this product to their clients.

_____We believed that the flood policy offers important and necessary coverage sought by our policyholders.

_____We saw the WYO program as an opportunity to eliminate a major exclusion (flood) in the homeowners insurance policy.

_____We saw the WYO program as a good business opportunity, a chance to make money.

_____We were interested in cooperating with the federal government on catastrophe programs.

_____We thought there was a good chance that providing flood insurance would be an effective way of introducing our company to potential new policyholders.

_____We wanted to have a means of staying informed about the WYO Program.

_____The absence of flood insurance risk-bearing by participating insurers made the coverage a viable product for us to offer.

_____We view our company as a "full-services" insurer, which made it important for us to offer this additional product to our insureds.

7. (Continued)

_____We wanted to see the private insurance industry remain involved in providing this coverage, if only on a non-risk sharing basis.

_____The WYO program enabled us to give our customers better service than they could obtain under the direct program.

_____Other (please explain):

_____

_____

_____

_____

The Distribution and Marketing of Flood Insurance

8. What is your principal method for distributing the flood insurance product? Select all which apply.

_____Sold through any of our agents who wish to provide the coverage to their clients;

_____Sold primarily through agents who have become familiar with the program requirements and procedures;

_____Sold by direct mail or telephone to potential policyholders.

9. Please explain briefly the advantages you have found in the distribution method you have chosen:

_____

_____

_____

_____

10. What sources of information about the flood insurance program do you provide? Select all which apply.

_____Brochures describing the program features to those who request them.

_____Target mailings of brochures.

_____Advertising (as a company) in local media in flood-prone areas.

_____Support of producer advertising in local media in flood-prone areas.

_____Information on the flood hazard zone applicable to the property.

_____Information on the steps necessary to obtain elevation certificates.

_____The rate applicable to an individual policyholder.

_____Information to local lending institutions regarding the program requirements and features.

_____We provide a computer rating system to allow our producers to give accurate quotes to policyholders.

_____Other (please explain):

_____

_____

_____

_____

11. In your opinion, where does the primary responsibility lie for promoting the flood insurance program potential policyholders? Please select the **single** answer which most agrees with your view:

_____Primary responsibility for promotion lies with the Federal Insurance Administration (FIA).

_____Primary responsibility for promotion lies with the individual WYO company.

_____Primary responsibility for promotion lies with the local agency

_____Other (please explain):

_____

_____

_____

_____

12. In your opinion, is flood insurance a "hard sell" for most flood insurance prospects?

_____Yes [IF YOU ANSWERED "YES," PLEASE ANSWER QUESTION 13.]

_____No [IF YOU ANSWERED "NO," PLEASE PROCEED DIRECTLY TO QUESTION 14.]

13. Why do you think flood insurance is difficult to sell? Please rate each of the following possible factc according to the following assessments:

1=Strongly agree

2=Agree Somewhat

3=Disagree Somewhat

4=Strongly disagree

5=No Opinion/Don't Know

_____Property insurance generally is a hard sell. Most people won't buy it unless they're required to ar flood insurance is no different.

_____Most people don't know that flood insurance is available.

_____Most people don't think they are likely to experience significant flood damage to their property.

_____Most people think flood insurance is too expensive compared to their property insurance.

_____Most people think they're already covered for flood damage under their existing property insuranc policy.

_____Most people don't think the flood insurance policy provides enough coverage.

_____Most people think the flood insurance policy deductibles are too high.

_____Most people believe that government disaster assistance negates the need for flood insurance coverag

14. Please indicate your level of agreement or disagreement with the following statement: A more extensiv public campaign to raise awareness about the flood hazard and the availability of flood insurance would b effective in increasing the number of flood insurance policies. Check the **single** response which be describes your view:

___Strongly Agree

___Somewhat Agree

___Somewhat Disagree

___Strongly Disagree

___Don't Know/No Opinion

15 (a). Please explain briefly the reasons for your response to Question 14:

_____

_____

_____

_____

(b). Please take a few moments to add any other brief thoughts you may have on steps which could be taken to improve the marketing of flood insurance:

_____

_____

_____

_____

Write-Your-Own Program Administration

16. Does your company use the services of a commercial vendor for any flood insurance services or do you handle these functions internally?

_____Yes, we do use services of a commercial vendor [IF YOU ANSWERED "YES," PLEASE ANSWER QUESTION 17.]

_____No, all program functions are handled internally [IF YOU ANSWERED "NO," PLEASE PROCEED DIRECTLY TO QUESTION 18.]

17. Identify which of the following program services or tasks are performed by your company and which are performed by the commercial vendor.

Performed by Commercial Vendor	**Performed by Our Company**	
_____	_____	Advertising in flood-prone areas
_____	_____	Preparation of other marketing effort, including information brochures for potential policyholders
_____	_____	Policy rating
_____	_____	Policy issuance
_____	_____	Claims settlement
_____	_____	Statistical/financial reporting to CSC
_____	_____	Training of agents
_____	_____	Other (please explain):_____

_____

_____

_____

_____

18. In managing the WYO Program within your company, what types of training do you provide for your personnel? Check all responses which apply.

_____We provide an introductory course describing the program and its operation.

_____We provide "refresher" courses on the program to reacquaint our personnel with the program periodically.

_____We notify our personnel of all program changes pertinent to their areas of responsibility.

_____We have developed a special manual for use in administering the program.

_____We use the NFIP manual for basic training of our personnel.

_____Other (please explain):_____

_____

_____

_____

_____

19. Have you developed your own in-house material for training and program administration?

_____Yes _____No

If yes, please describe:

_____

_____

_____

_____

20. How many employees has your company devoted to administering the WYO program? Please exclude from these counts claim adjusters who may be involved only when a flood occurs.

_____Number with full-time responsibility for flood insurance.

_____Number with part-time responsibility for flood insurance.

Mortgage Requirements

21. Based on your experience with the WYO program, how effective is the mandatory purchase requirement that flood insurance be obtained as a condition for issuing a federally-backed mortgage on properties built within special flood hazard (A,V zones) areas?

a. Please rate the effectiveness of the requirement with respect to a **first-time purchase** of the coverage when the mortgage is issued. Please check the single answer which best describes your general experience:

_____Virtually all lenders require the coverage.

_____Many lenders require the coverage.

_____Few lenders require the coverage.

_____Virtually no lenders require the coverage.

_____Don't know.

b. Please rate the effectiveness of the requirement with respect to **subsequent renewals** of the coverage. Please check the single answer which best describes your general experience:

____Virtually all lenders require the coverage.

____Many lenders require the coverage.

____Few lenders require the coverage.

____Virtually no lenders require the coverage.

____Don't know.

22. In your opinion, what are the principal factors hindering higher compliance with the mandatory purchase requirements for flood insurance? Please rate each possible factor, using the following scale:

1=Key Factor
2=Contributing Factor
3=Not A Significant Factor
4=Don't Know/No Opinion

_____Many lenders are unaware of the mandatory flood insurance purchase requirement for properties in special flood hazard areas.

_____Rapid turnover of mortgages in today's secondary mortgage market makes monitoring of flood insurance purchases difficult.

_____There are no effective regulatory penalties for noncompliance with the mandatory purchase requirements.

_____The cost of flood insurance to policyholders and the lack of general compliance creates a significant competitive disadvantage for any lender which actually enforces the requirement.

_____There is no simple or effective way to reach homeowners whose mortgages were issued prior to the enactment of the mandatory purchase requirement, even though their properties may lie within a special flood hazard zone.

_____Other (Please Specify)_____

_____

_____

_____

_____

23. What changes or actions can you suggest which could increase the effectiveness of compliance with the mandatory purchase requirements?

_____

_____

_____

_____

24. What is the policy renewal rate that your company has experienced on its book of flood insurance business during 1988?

_____0-50%

_____51-70%

_____71-80%

_____81-90%

_____91-100%

Other Issues

25. Have you noted special problems frequently encountered by **consumers** in attempting to purchase the flood insurance coverage? If so, what are they and how might they be corrected?

_____

_____

_____

_____

26. Please take a few minutes to add any brief comments you may have on the WYO program. Are there areas in which you believe the program has been particularly successful? Are there ideas or concepts already in use which you think should be expanded or implemented further?_____

_____

_____

_____

SURVEY ON THE WRITE-YOUR-OWN (WYO) FLOOD INSURANCE PROGRAM
For Signed, but Non-Writing Participants in the Program

Respondent Information

1. Name:_____
2. Position:_____
3. Telephone No.: (_____)_____-_____
4. Company Name:_____
5. Member of Insurer Group: _____Yes _____No
6. Group Name:_____

NOTE: THE ABOVE RESPONDENT AND INSURER INFORMATION IS REQUESTED FOR RECORDKEEPING PURPOSES ONLY. THERE WILL BE NO DISCLOSURE BY AIRAC OF ANY RESPONDENT OR INSURER-SPECIFIC INFORMATION.

7. Please rate the following factors for their influence on your company's decision to sign the WYO agreement. Please assign a rating of 1-5 to each item, using a scale of:

1=Very Important
2=Somewhat Important
3=Slight Importance
4=Little or No Importance
5=Not Applicable

_____Our property insurance book of business includes a number of areas affected by potential or actual flooding.

_____We expected to write a volume of flood insurance business sufficient to justify incurring the necessary startup costs.

_____Our producers writing in flood-prone areas were interested in having us offer this product to their clients.

_____We believed that the flood policy offers important and necessary coverage sought by our policyholders.

_____We saw the WYO program as an opportunity to eliminate a major exclusion (flood) in the homeowners insurance policy.

_____We saw the WYO program as a good business opportunity, a chance to make money.

_____We were interested in cooperating with the federal government on catastrophe programs.

_____We thought there was a good chance that providing flood insurance would be an effective way of introducing our company to potential new policyholders.

_____We wanted to have a means of staying informed about the WYO Program.

_____We believed that the absence of flood insurance risk-bearing by participating insurers made the coverage a viable product for us to offer.

_____We view our company as a "full-services" insurer, which made it important for us to offer this additional product to our insureds.

7. (Continued)

_____We wanted to see the private insurance industry remain involved in providing this coverage, if only on a non-risk sharing basis.

_____We believed that the WYO program would enable us to give our customers better service than they could obtain under the direct program.

_____Other (please explain):_____

_____

_____

_____

_____

8. Please rate the following factors for their influence on your company's decision **not to write** WYO Flood Insurance premiums. Please assign a rating of 1-5, using a scale of:

1=Very Important

2=Somewhat Important

3=Slight Importance

4=Little or No Importance

5=Not Applicable

_____Our property insurance book of business includes relatively few areas affected by potential or actual flooding.

_____The volume of flood insurance business we would expect to write is too small to justify incurring the necessary startup costs.

_____Most of our producers who would offer this product are currently writing it for another WYO company, or through the direct plan.

_____We found the startup costs of training and equipping our home office staff and producers to be too high.

_____We found the administrative requirements for the program to be too complex to justify our participation.

_____Although we do write significant business in areas affected by actual or potential flooding, the flood policy does not offer the type or extent of coverage sought by our policyholders.

_____We think there is little chance that providing flood insurance will bring us new policyholders for other types of coverage.

_____We wish to avoid any direct relationship with the federal government in the provision of insurance.

_____We believe the expense reimbursement allowed by the WYO program is inadequate to cover our administrative costs.

_____We believe that future changes in the program are likely to result in flood insurance risk-bearing by participating insurers and we do not want to be involved in that aspect of this coverage.

_____Other (please explain):_____

_____

_____

_____

_____

9. Would your company consider writing WYO premiums now?

_____Yes

_____No. If no, what changes in the program would be necessary to induce you to begin writing?

_____

_____

_____

10. Do you have any further comments on the Write-Your-Own Flood Insurance Program?

_____

_____

_____

SURVEY ON THE WRITE-YOUR-OWN (WYO) FLOOD INSURANCE PROGRAM
For Non-Signatory Companies

Respondent Information

1. Name:_____
2. Position:_____
3. Telephone No.: (_____)_____-_____
4. Company Name:_____
5. Member of Insurer Group: _____Yes No _____
6. Group Name:_____

NOTE: THE ABOVE RESPONDENT AND INSURER INFORMATION IS REQUESTED FOR RECORDKEEPING PURPOSES ONLY. THERE WILL BE NO DISCLOSURE BY AIRAC OF ANY RESPONDENT OR INSURER-SPECIFIC INFORMATION.

7. Please rate the following factors for their influence on your company's decision **not to participate** in the WYO Flood Insurance program. Please assign a rating of 1-5 to each item, using a scale of:

1=Very Important
2=Somewhat Important
3=Slight Importance
4=Little or No Importance
5=Not Applicable

_____Our property insurance book of business includes relatively few areas affected by potential or actual flooding.

_____The volume of flood insurance business we would expect to write is too small to justify incurring the necessary startup costs.

_____Most of our producers who would offer this product are currently writing it for another WYO company, or with the direct plan.

_____The startup costs of training and equipping our home office staff and producers to administer this program appeared to be too high.

_____The administrative requirements for the program, such as statistical and financial reporting, appeared to be too complex to justify our participation.

_____Although we do write significant business in areas affected by actual or potential flooding, the flood policy does not offer the type or extent of coverage sought by our policyholders.

_____We think the price of this product is too high, relative to the cost of homeowners insurance, to attract many of our policyholders.

_____We wish to avoid any direct relationship with the federal government in the provision of insurance.

_____We believe the expense reimbursement allowed by the program is inadequate to cover our costs of administering it.

_____We believe that future changes in the program are likely to result in flood insurance risk-bearing by participating insurers and we do not want to be involved in that aspect of this coverage.

7. (Continued)

_____We believe the private vendor services we would require to administer various aspects of this program cost too much.

_____Our company has never reviewed the WYO Program for possible participation.

_____We did not believe the WYO program would enable our customers to obtain better service than they could get under the direct program.

_____Other (please explain):_____

_____

_____

_____

_____

8. Would your company consider becoming active in the WYO program now?

_____Yes

_____No. If no, what changes in the program, or other factors would be necessary to obtain your participation?

_____

_____

_____

_____

9. Do you have any further comments on the Write-Your-Own Flood Insurance program?

_____

_____

_____

_____

APPENDIX 3
LIST OF PUBLICATIONS

Recent Publications

All publications listed here are available from the Insurance Research Council, 1200 Harger Road, Suite 310, Oak Brook, Illinois 60521. Unless otherwise indicated, a single copy is free in the U.S. and Canada and additional copies are $4 each, postpaid. All copies to other countries are $5 each, postpaid. Please make checks payable to the Insurance Research Council in U.S. dollars.

The National Flood Insurance Program: Agency and Insurer Perspectives. July 1990, pages.

This study reports results from four surveys of insurers and agents on the National Flood Insurance and Write-Your-Own Programs. Reasons why insurers and agents choose whether or not to write flood insurance are examined, as are consumer decisions about purchasing flood insurance. The study also explores the role of lenders in the sale of flood insurance, which groups should take responsibility for promotion, growth in the number of policies, and many other topics.

Public Attitude Monitor 1989. December 1989, 31 pages.

This survey of 1,484 households reports on public attitudes towards the cost of auto insurance and ideas to reduce the cost, laws on seat belt usage, attorney advertising and its effect on the number of liability claims and the cost of auto insurance, coverage under a standard homeowner's policy, incidence of insurance claim fraud, and other topics.

Surviving the Storm: Building Codes, Compliance, and the Mitigation of Hurricane Damage. December 1989, 71 pages.

This study examines evidence that sound building codes and enforcement have made a big difference in the amount of property damage caused by hurricanes. It analyzes wide variations in codes and code compliance with respect to wind resistance in states located along the Gulf and Atlantic coasts. The study also contains information on the insured value of property exposed to hurricanes and includes a special study on the added costs of building more hurricane-resistant homes.

Uninsured Motorists. October 1989, 63 pages.

This study examines the extent of the uninsured motorist problem in the United States, the types of laws in effect to encourage financial responsibility, the effectiveness of these laws, and the provisions of Uninsured Motorist and Underinsured Motorist insurance coverages that affect the amount of insurance available to insureds.

Claimant Satisfaction in Auto Accident Cases. June 1989, 36 pages.

This countrywide survey of more than 2,800 households focuses on the respondents' recent experience with auto accidents. The study reports on satisfaction with the overall handling and settlement of claims as well as particular aspects of the claims process.

Catastrophic No-Fault Auto Injury Claims. May 1989, 26 pages.

Over 5,000 currently open serious PIP claims with total expected payments of $100,000 or more are identified in Michigan, New Jersey, and Pennsylvania in a survey of 22 insurers. This study also provides update information on claim status, payment amounts and claimant condition for a group of 420 claimants first identified by the Council in 1978.

Business Attitude Monitor. April 1989, 47 pages.

This study reports findings from a nationwide survey of 1,200 small businesses conducted during November 1988 regarding use and availability of property-liability insurance. The survey explores property-liability insurance coverages purchased by small businesses, availability and cost of coverages, the incidence of insurance claims and satisfaction with claims settlements. Also covered by the survey are small business perceptions about reasons for increased liability insurance costs, claim handling when insurers go broke and how insurance ranks with other expense items as a business concern.

Compensation For Automobile Injuries in the United States. March, 1989.

This book reports results of a countrywide survey of 46,694 auto injury claims paid by 34 major auto insurance companies in 1987. The analysis shows characteristics of the accidents and of those injured, trends in losses incurred and payments received, incidence of attorney involvement in the claims process and its effect on claim costs, and state by state variations in all of these factors. Comparisons are made between the 1987 data and a similar study conducted in 1977 (see section on Automobile Insurance). Copies are $15 postpaid in the U.S.; $15 plus shipping costs elsewhere. Magnetic tapes containing the data base may be purchased by contacting the Council at (708) 572-1177.

Attorney Involvement in Auto Injury Claims. December 1988, 54 pages.

A countrywide survey of 3,375 families with recent auto injury experience indicates that 35% hired an attorney to handle their claims in 1986, up from 22% in a similar study in 1977. The study reports information about the accidents, injuries, sources and amounts of reimbursement and experience with attorneys, including degree of satisfaction with attorneys and the settlements they negotiated.

Other Insurance Research Council Publications

PROPERTY INSURANCE

Fire Following Earthquake: Estimates of the Conflagration Risk to Insured Properties in Greater Los Angeles and San Francisco. March 1987, 83 pages.

This study indicates that major earthquakes in the Los Angeles Basin and the San Francisco Bay area would be likely to cause major conflagrations and generate insured fire damage of $4 to $17 billion, depending on quake location and on wind conditions. The report displays estimated "burn rates" on a community-by-community basis.

Earthquake Losses Under Workers Compensation and General Liability. October 1988, 80 pages.

Insured earthquake losses under workers compensation and general liability insurance policies are estimated at about $14.6 billion for a "worst case" M7.5 event on the Newport-Inglewood Fault, Los Angeles.

Catastrophic Losses: How The Insurance System Would Handle Two $7 Billion Hurricanes. November 1986, 73 pages.

This study started with two hypothetical hurricanes causing $7 billion each in insured property losses, and tracked those losses through the insurance system to find out where they would fall. In addition, the study contains financial analyses of the impact two such catastrophic losses would have on primary companies and reinsurers, as a group, in the U.S. and abroad. As an adjunct to the study, the Council also collected information on actual hurricane losses for 1983 and 1985, resulting in a substantial upward revision of earlier loss estimates for those storms.

Crime Losses in Property-Casualty Insurance. July 1984, 46 pages.

This study measures, for the first time, the overall impact of crime-related insurance claims on the various kinds of policies sold by property-casualty insurers. Results are stated in terms of crime losses as a percentage of all losses, countrywide and by state, for various personal and commercial lines of insurance and for various types of criminal activity. The report also estimates annual dollar costs per household and per employee.

Arson Incidence Claim Study. March, 1982, 29 pages.

A survey of 13,418 insurance company claim files was conducted to determine the incidence of suspected arson in fire claims for homes and businesses. The report also discusses probable motives for the suspected arson fires, to the extent that motives could be determined.

Availability and Use of Business Insurance by Urban Small Businesses: A Survey. May 1982, 67 pages.

This research involved a survey of 1,845 owners of small mercantile and service business in Atlanta, Boston, Brooklyn, Chicago, Cleveland, Detroit, Los Angeles and Philadelphia. It explores their perceptions regarding the availability and affordability of business insurance and reports on their experiences in purchasing insurance.

The Availability of Homeowners Insurance in Six Major Cities: Consumer Experience and Attitudes. May 1981, 40 pages.

This survey measures the experience and attitudes of home owners regarding their purchase of residential insurance in Chicago, Cleveland, Atlanta, Philadelphia, Los Angeles and the borough of Brooklyn, New York City.

PUBLIC ATTITUDE MONITOR SURVEYS

Public Attitude Monitor 1988. November 1988, 46 pages.

This household survey focuses on public attitudes about the cost of auto insurance, higher speed limits, drinking and driving behavior, the collision damage waiver in car rental contracts, and proposals to subsidize liability insurance premiums. It also continues the Council's tracking of households with uninsured vehicles, steps people take to shop for auto insurance, and other topics.

Public Attitude Monitor 1987. November 1987, 37 pages.

This survey of public attitudes explores gender-based auto insurance rates, safety standards for minivans and pickup trucks, personal injury lawsuits, repair parts for automobiles and insurance industry regulation issues. The study also reports on uninsured vehicles and attitudes about the cost of auto insurance.

Public Attitude Monitor 1986. November 1986, 45 pages.

Civil justice issues explored in this survey include public perceptions about the frequency and cost of personal injury lawsuits, the fairness of the lawsuit system, possible consequences of lawsuits on our society, and steps that might be taken to reduce their cost. The survey also asks about drinking and driving behavior, penalties for drunk driving, and the liability of hosts for intoxicated guests. Questions on uninsured vehicles and the cost of auto insurance are repeated for trend purposes.

Public Attitude Monitor 1985. November 1985, 48 pages. This sixth annual study of public attitudes toward the property and casualty insurance industry has a major focus on attitudes regarding trends in the civil justice system. Findings include the public's perception of fairness in lawsuits involving personal injuries and reasons why people are suing for personal injuries more frequently. PAM 85 also explores drinking and driving behavior and whether the national movement against drunken driving has had any effect on driving behavior. It also repeats for trend purposes questions on uninsured motorists, the cost of auto insurance, and attitudes regarding the elimination of gender-based rating for auto insurance.

Public Attitude Monitor 1984. January 1985, 44 pages. This countrywide survey of U.S. households probes public attitudes toward the sale of insurance by various kinds of financial institutions, and toward measures that should be taken to help make sure that customers are protected when various kinds of financial institutions fail. It also includes some of the same questions used in a separate survey on Patterns of Shopping Behavior for Auto Insurance.

Public Attitude Monitor 1983. October 1983, 40 pages.

In addition to covering many of the auto-related topics probed in the three previous PAM surveys, the 1983 study introduces a number of new topics including public perceptions of homeowner's insurance policy coverages, attitudes about seatbelts, smoke alarms, and the medical malpractice issue. Also examined for the first time are public attitudes toward changes that would result from a law prohibiting auto insurance rating based on gender. The section exploring strategies for combating the drunk driving problem has been expanded.

Public Attitude Monitor 1982. January 1983, 48 pages.

This is the third in a series of reports on interviews with 1,300 families representative of U.S. households. Topics explored include the cost of owning and operating a car, perceptions about the cost of auto insurance, factors influencing the choice of new cars, attitudes toward auto insurance rating factors, degree of support for various possible countermeasures for drunk driving, extent of accident reporting and other topics related to auto insurance.

Public Attitude Monitor 1981. December 1981, 27 pages.

In addition to covering many of the auto-related topics listed for the 1982 survey, the 1981 study explores public attitudes toward claim fraud and provides information on consumer experience with and attitudes toward insurance for homeowners and renters.

Public Attitude Monitor 1980. March 1981, 26 pages.

This initial survey focuses on ownership of vehicles and of auto insurance, attitudes toward the cost of auto-related expenses, any problems experienced in obtaining auto insurance, extent of consumer information about auto insurance coverages, attitudes toward auto insurance selection and rating factors, and attitudes toward government regulation and competition.

AUTOMOBILE INSURANCE

Unisex Auto Insurance Rating. October 1987, 20 pages.

Following passage of unisex insurance rating legislation in Montana, the Council conducted a study of how auto insurance premiums changed when gender and marital status were eliminated as rating variables. The study measures the increases and decreases in auto insurance premiums experienced by youthful female and male drivers.

Patterns of Shopping Behavior in Auto Insurance. January 1985, 60 pages.

This report contains the findings of three related surveys to determine how vehicle owners shop for auto insurance and types of information available to them. The studies found that consumers engage in a large amount of comparison shopping, and report little difficulty in obtaining the information they need for buying auto insurance.

Evaluation of Motor Vehicle Records. April 1984, 96 pages.

The study evaluates state motor vehicle records as a source of information on individual driver accidents and convictions, in the 37 states that made available such information as of 1983. The study shows great variability among states in the amount of accident and conviction information found on publicly available state records, and provides explanations for these state differences.

Uninsured Motorist Facts & Figures. January 1984, 56 pages.

This report pulls together available statistics on uninsured and hit and run motorists, by state and countrywide. It includes information on the historical development of the uninsured motorists coverage, characteristics of uninsured motorists, estimates of the size of the uninsured motorist problem by state, and on state law pertaining to uninsured and underinsured motorists.

The Cost of Auto Insurance: How Consumer Choices and Characteristics Affect the Premiums People Pay. December 1980, 52 pages.

Research for this study was based on an examination of 3.8 million auto insurance policies insuring nearly 5.8 million vehicles. The study shows how average premiums vary according to such factors as the number of cars insured, the age and the value of the car, urban vs. rural locations, age and sex of principal drivers and prior accident records.

Automobile Injuries and Their Compensation in the United States, Vol. I and II. March 1979, 254 pages plus 409 pages of tables in Vol. II.

Three related studies examine the characteristics of injury producing automobile crashes and the compensation received by crash victims. Includes a countrywide survey of 42,204 injury-producing crashes involving 53,164 paid auto insurance claims; a survey of 420 serious injury claims involving expected ultimate payment of $100,000 or more each; and a consumer panel survey of auto injuries for 60,000 U.S. households. The study is priced at $15 for the two-volume set. Magnetic tapes containing data from the insurer study of closed claims and the consumer panel survey may be purchased by contacting the Council at (708) 572-1177.

Insurer Study of PIP Serious Injury Claims—Follow-Up 1982. December 1982, 44 pages.

This report monitors the progress of 420 seriously injured crash victims whose files were initially surveyed as part of **Automobile Injuries and Their Compensation in the United States.** This is the second follow-up survey of the survivors. In addition to tracking survival rates and updating expected costs, the study includes a new count of large-loss claims open as of year- end 1981 in the three surveyed states (Michigan, Pennsylvania, New Jersey).

Insurer Study of PIP Serious Injury Claims—1980 Follow-Up Survey. December 1982, 44 pages.

This is the first follow-up on the 420 seriously injured crash victims included in the study described above. The survey, conducted in 1980, recorded changes in their condition since 1978 and updated statistics on current and future expected costs.

LIABILITY INSURANCE

Surveys on Liability Insurance for Government Entities. November 1986, 66 pages.

Survey responses from 66 liability insurers and 679 government entities (municipalities, counties, school districts, etc.) provide the basis for this study, which explores problems in obtaining liability insurance, the reasons for those problems, and steps that might be taken to alleviate them. Specific questions were asked about cancellations and nonrenewals, premium increases, loss control measures, and favorable and unfavorable states.

Pollution Liability: The Evolution of a Difficult Insurance Market. September 1985, 50 pages.

Due to a number of complex and inter-related factors, insurers have had major difficulties in developing a broad market for pollution liability insurance. This study explores some of the forces that have hampered development of a market. These include trends in the civil justice system that make it difficult to assess risk, Superfund legislation and regulations, adverse selection and the lack of a broad base of demand for the product. The report also contains the results and an analysis of underwriting procedures and practices of property-casualty insurers writing pollution liability insurance during late 1984 and early 1985.

Risk Assessment For Pollution Liability: A Survey of Insurers and Environmental Consultants. December 1985, 36 pages.

This report describes how insurance companies assess the physical hazards involved in handling substances that can pollute the environment and generate liability insurance claims. Findings are based on a survey of 14 insurance companies writing pollution liability coverage and nine environmental consultants active in providing risk assessments for insurance purposes. The survey explores guidelines and procedures used by insurers and consultants to conduct pollution liability risk assessment, the technical skills and backgrounds of staff risk assessors, and the types of information that are most critical for completing a risk assessment.

Pollution Liability Claims Administration. July, 1986, 20 pages.

The report describes how insurers have organized their claims operations for handling pollution liability claims, based on responses from 13 companies. Contains information on the number of types of pollution claims filed in 1984.

Municipal Liability Insurance: Survey of Municipalities and Insurance Companies. May 1980, 71 pages plus 284 pages of tables in appendices.

Municipal Liability Insurance: Underwriting Results. December 1980, 80 pages.

These two related studies of municipal liability involved a survey of selected municipalities and of insurers writing municipal liability coverages, plus the collection of premium and loss experience on the cities responding to the survey. The survey explores availability of coverage, cost of coverage, and actions needed to control rising liability losses. Responses were received from 83 insurance companies and 853 municipalities.

GENERAL

Special Investigative Units: Survey on Insurance Company Use of SIU's for Fraud Investigations. November 1984, 36 pages.

The concept of using special investigative units to combat insurance fraud has received increasing attention in the property-casualty insurance industry in recent years. This report summarizes findings from several Council surveys on Special Investigative Units. Included is a study tracking the costs and savings from denial of fraudulent claims experienced by 19 companies with SIUs. In addition to analysis of SIU cost-effectiveness, the study also contains information on types of insurance fraud investigated, organization of SIUs, training of personnel, legal implications, and information on how many insurers have SIUs or may establish them in the future.

Structured Settlements: Use and Characteristics of Structured Settlements in the Property-Casualty Insurance Industry. October 1983, 52 pages.

Insurance companies are making increasing use of annuities and other forms of "structured" settlements in lieu of lump-sum payments to disabled or seriously injured liability claimants. This report contains findings of a survey involving 54 major property-casualty insurers concerning their use of the technique, criteria used for making structured settlement offers, funding arrangements and other aspects.

Insurance Research Council

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(708) 572-1177

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FEMA SUBMITTAL

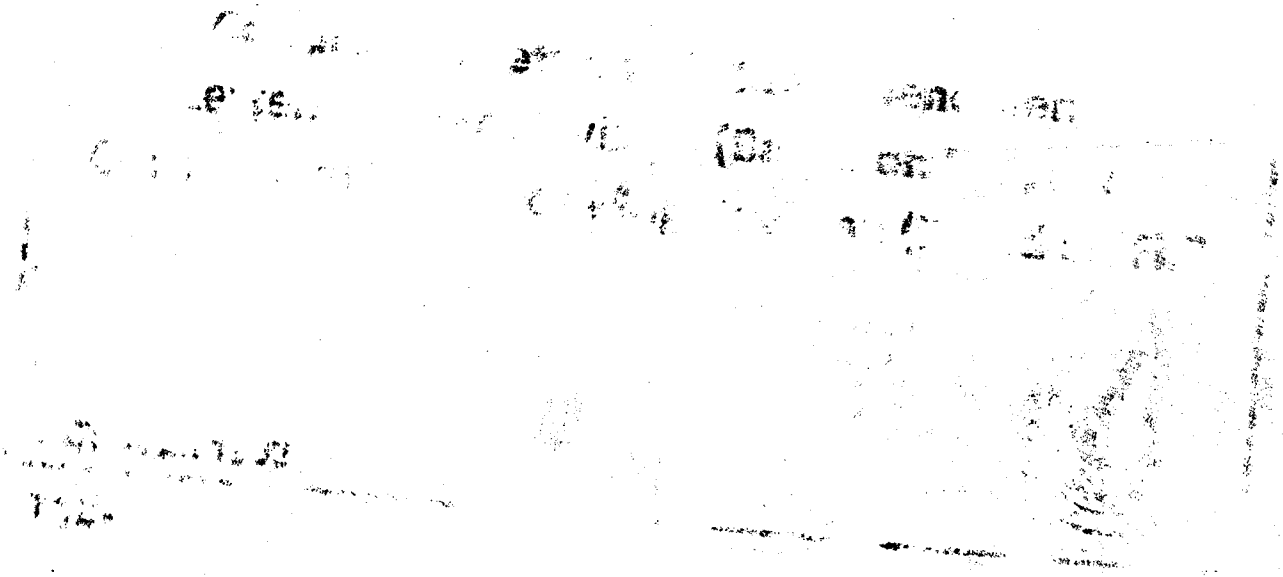
1. FEMA kick off letter to FEMA Region IX, Washington D.C., Jim Morris ADWR. Noting study area.

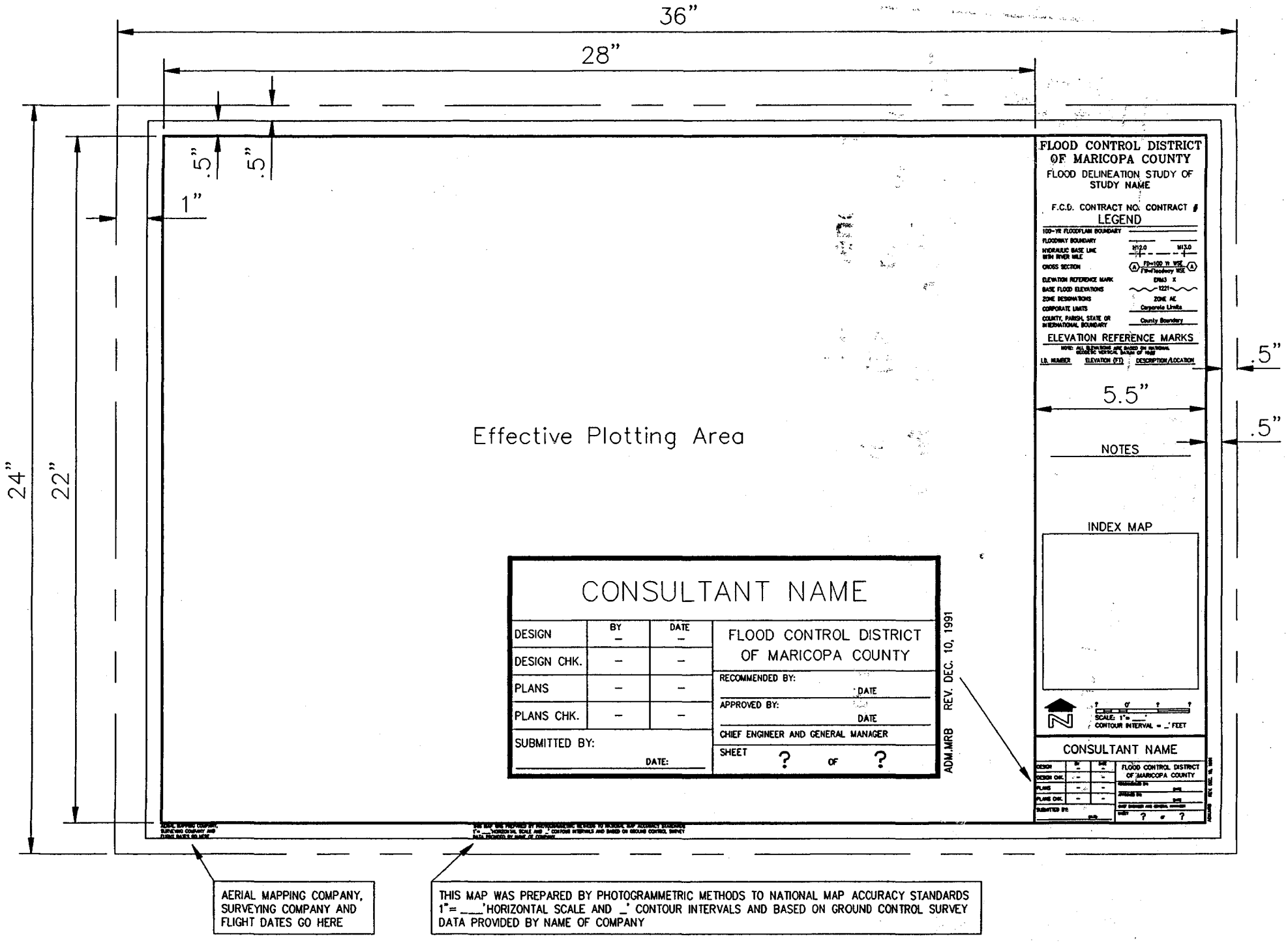
2. Letter to city/town officials. Need to get letter of concurrence from city/town acknowledging the study.

3. Kick off meeting:

   Go over the scope.
   Clarification of deliverable
   News add in AZ Republic --- must get the original "cut out" add with affidative of publication from paper. Add should include the study limits and date of completion.
   Review schedule
   Need monthly update -- substantiate billing with a brief narrative of tasks completed
   Review Substantial Completion

4. Log in all activities.





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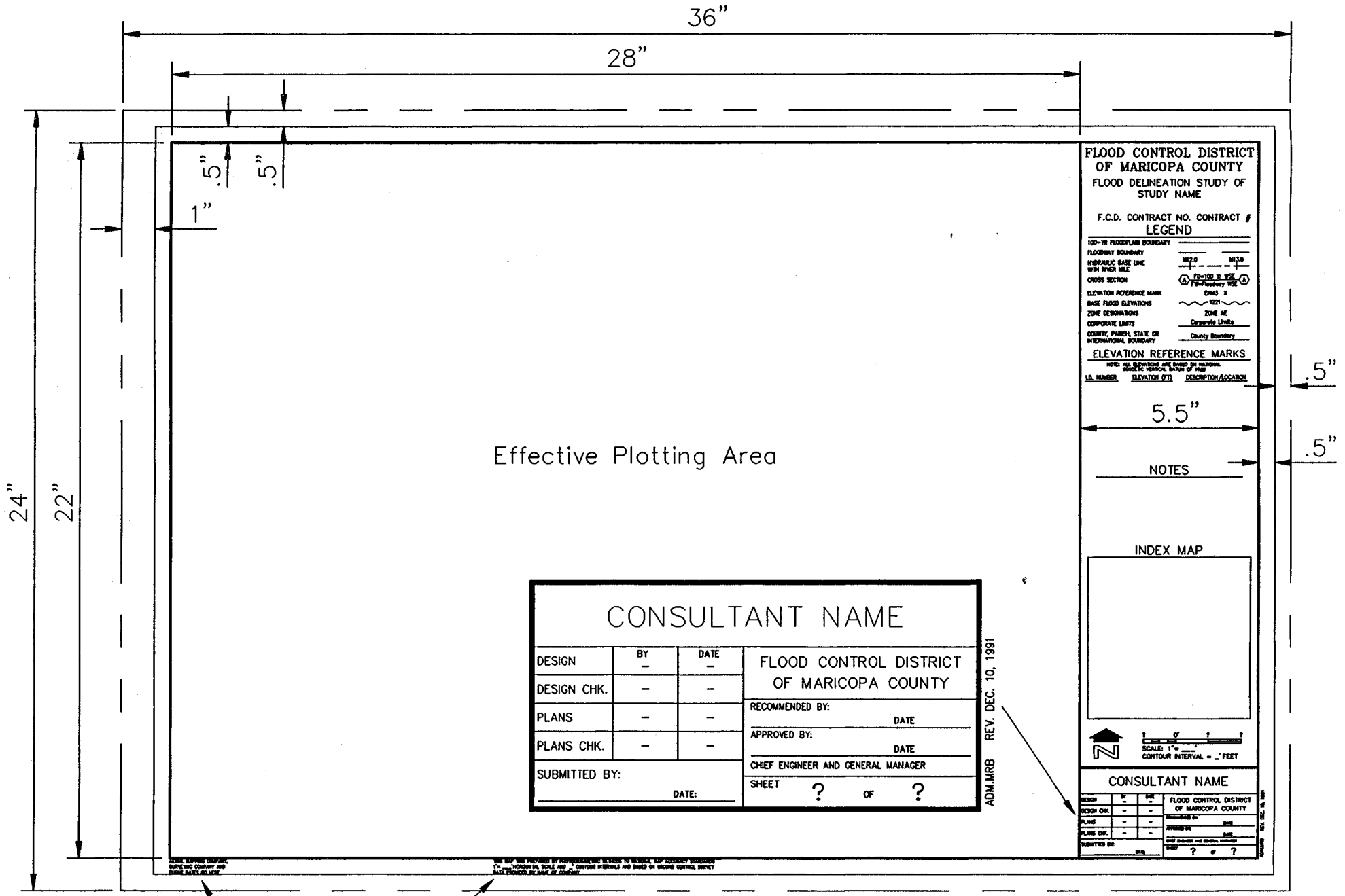

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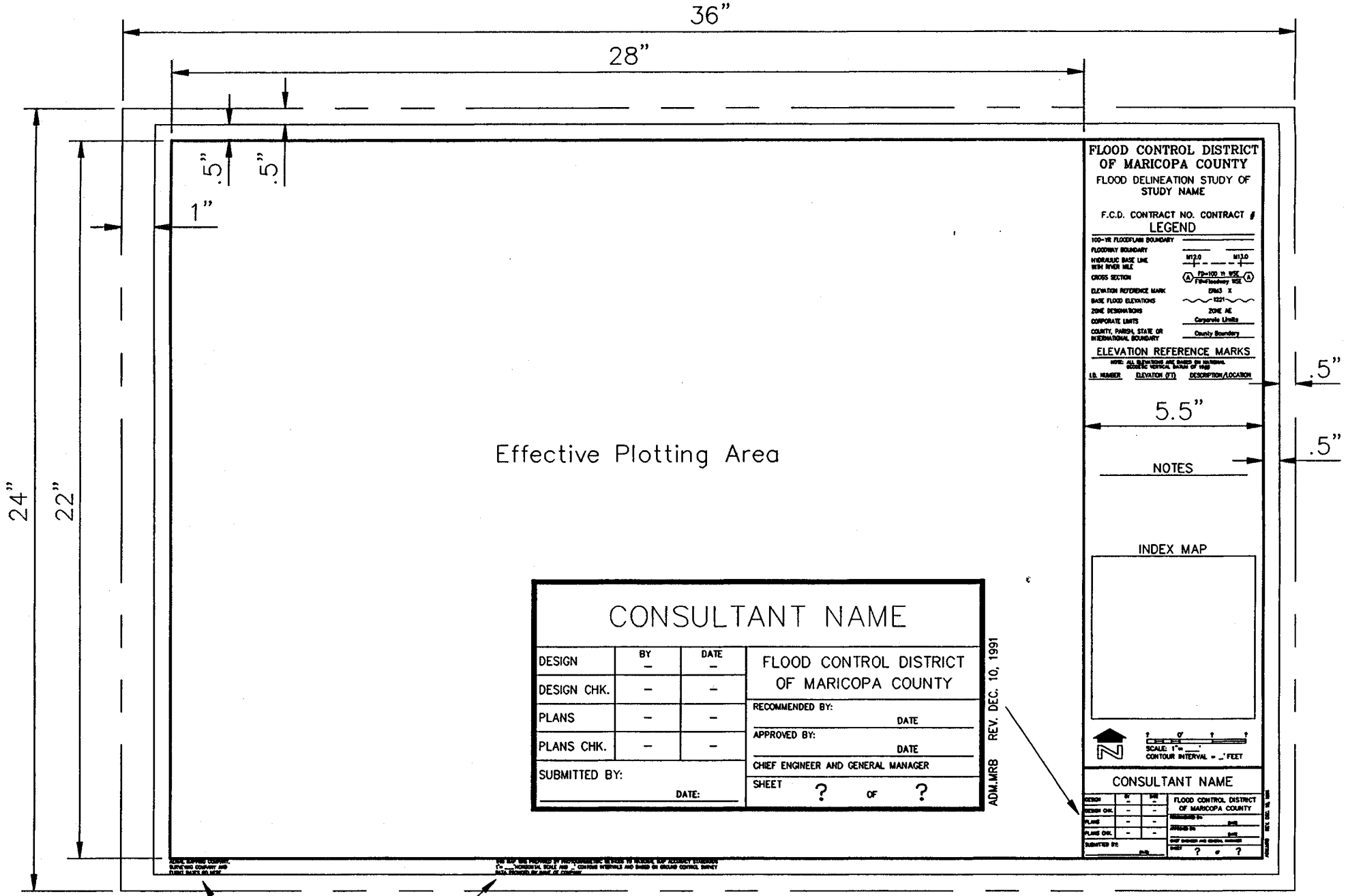

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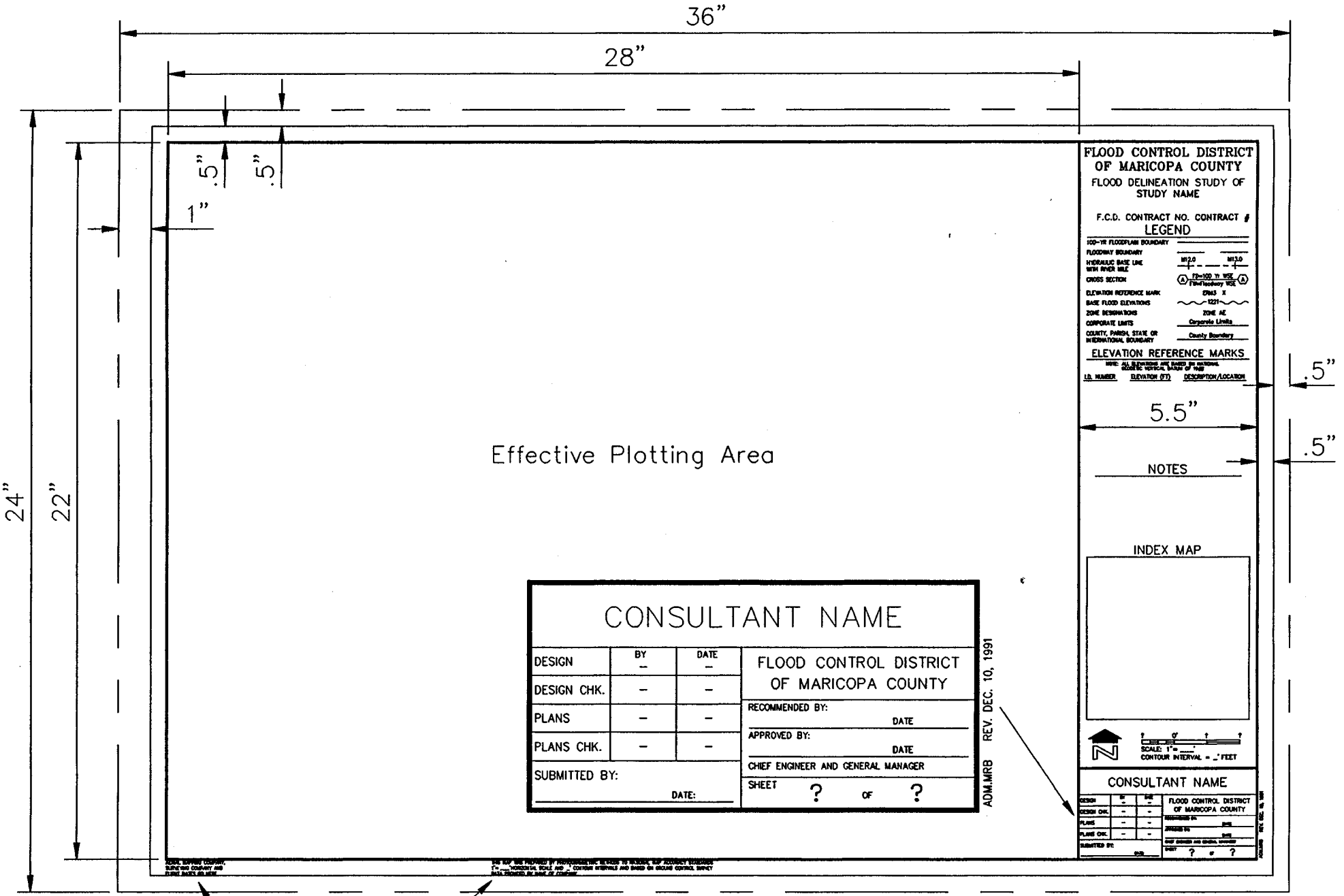
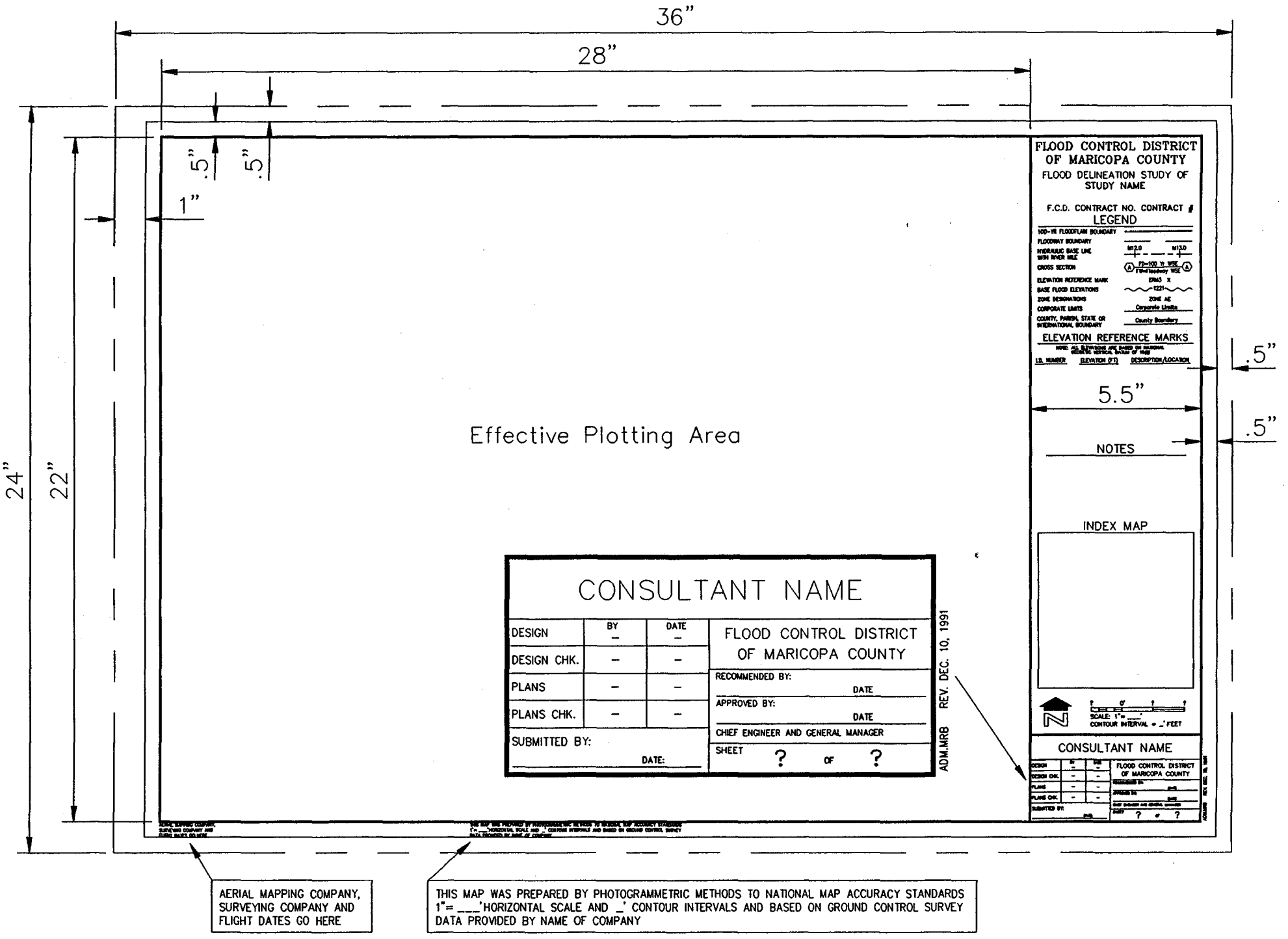

36"
28"
.5"
.5"
1"
24"
22"
Effective Plotting Area
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOOD DELINEATION STUDY OF STUDY NAME
F.C.D. CONTRACT NO. CONTRACT #
LEGEND
100-YR FLOODPLAIN BOUNDARY
FLOODWAY BOUNDARY
HYDRAULIC BASE LINE WITH RIVER MILE
CROSS SECTION
ELEVATION REFERENCE MARK
BASE FLOOD ELEVATIONS
ZONE DESIGNATIONS
CORPORATE LIMITS
COUNTY, PARISH, STATE OR INTERNATIONAL BOUNDARY
ELEVATION REFERENCE MARKS
I.D. NUMBER
ELEVATION (FT)
DESCRIPTION/LOCATION
.5"
5.5"
.5"
NOTES
INDEX MAP
SCALE: 1"= ___'
CONTOUR INTERVAL = _' FEET
CONSULTANT NAME
CONSULTANT NAME
DESIGN
DESIGN CHK.
PLANS
PLANS CHK.
SUBMITTED BY:
DATE:
BY
DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
RECOMMENDED BY:
DATE
APPROVED BY:
DATE
CHIEF ENGINEER AND GENERAL MANAGER
SHEET ? OF ?
ADM.MRB REV. DEC. 10, 1991
AERIAL MAPPING COMPANY, SURVEYING COMPANY AND FLIGHT DATES GO HERE
THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS 1"= ___'HORIZONTAL SCALE AND _' CONTOUR INTERVALS AND BASED ON GROUND CONTROL SURVEY DATA PROVIDED BY NAME OF COMPANY
GIS-BMAP.DWG ADM.MRB 09-14-92



GIS-BMAP.DWG ADM,MRB 09-14-92

FLOODPLAIN REVIEW CHECKLIST

PROJECT: _____

FCD CONTRACT #: _____

LEGEND:
- ✓ Acceptable
- NA Not Applicable - provide explanation
- NC Not Checked - provide explanation

HYDRAULICS

A. PLAN VIEW

_____1. Cross sections oriented perpendicular to 100 YR flows.
_____2. Cross sections extend the full width of inundation.
_____3. Cross section labeling agrees with the HEC-2.
_____4. The following information is provided at each cross section:
- _____a. Floodplain Elevation.
- _____b. Floodway Elevation.
- _____c. 100 YR discharge (Q).

_____5. Stated water surface elevations agree with:
- _____a. the HEC-2 output:
  - _____1. Floodplain elevations.
  - _____2. Floodway elevations.
- _____b. Floodway Data Tables
  - _____1. Floodplain elevations.
  - _____2. Floodway elevations.

_____6. Plotted starting station (SSTA) and ending station (ENDST) match the HEC-2 output:
- _____a. Floodplain Run.
- _____b. Floodway Run.

_____7. Plotted water surface elevations for the floodplain model agree with the topographic mapping.
_____8. Base flood elevations (BFE's) extend to the expected ground elevation.
_____9. Descriptions/elevations of elevation reference marks (ERM's) agree with those listed in the technical data notebook (TDN).
_____10. Each sheet contains a minimum of two (2), approximated or surveyed, reference points in the form of section, half-section, or quarter-section corners.

FCD CONTRACT #: _____

B. HEC-2

_____1. Comment cards provided in the HEC-2 to identify/explain:
- _____a. Starting water surface elevation (WSEL).
- _____b. Bridge/culvert sections.
- _____c. Road alignments.
- _____d. Change in flow (Q).
- _____e. Special problem areas.

_____2. Discharge Q's changed at appropriate cross sections.
_____3. Starting and ending stations examined to ensure no encroachment into the designated channel.
_____4. Assigned 'n' values consistent with the 'n' value report.
_____5. HEC-2 composited 'n' values are reasonable (for those sections utilizing NH cards).
_____6. Coefficients of expansion and contraction adjusted at appropriate cross sections.
_____7. Special Culvert Routine used to model culverts.
_____8. Appropriate bridge model used.
_____9. No extended cross section messages.

Checked By: _____ **Date:** _____

FLOODPLAIN REVIEW CHECKLIST

PROJECT: _____

FCD CONTRACT #: _____

LEGEND:

✓	Acceptable
NA	Not Applicable - provide explanation
NC	Not Checked - provide explanation

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_____8. Appropriate bridge model used.
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Checked By: _____ **Date:** _____

FLOODPLAIN REVIEW CHECKLIST

PROJECT: _____

FCD CONTRACT #: _____

LEGEND:
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- NA Not Applicable - provide explanation
- NC Not Checked - provide explanation

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_____9. No extended cross section messages.

Checked By: _____ **Date:** _____

*** NEWS RELEASE ***

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 western Maricopa County as follows:

> Jackrabbit Wash from Vulture Mine Road to the CAP Canal; an unnamed tributary to Jackrabbit Wash from Vulture Mine Road to it's mouth in Section 6, T.3N., R.5W.; Star Wash from the electric power line crossing to it's mouth; and adjacent ponding areas along the CAP Canal.

The study is being performed for the Flood Control District by Burgess & Niple, Inc., Engineers & Architects, of Phoenix, Arizona.

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 furnished to Mr. Pedro Calza or Mr. Joe Tram, Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, AZ 85009, telephone (602) 262-1501 for Burgess & Niple's use in performing the study.

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 assistant 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
x~~The Phoenix Gazette~~x

~~AUGUST 16, 1990~~

Joan Lohr

Sworn to before me this

20TH day of

AUGUST A.D. 19 90

OFFICIAL SEAL
MARY LEE MEASEL
NOTARY PUBLIC STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1991

Marylee Measel
Notary Public

ANNOUNCEMENT OF FLOOD HAZARD STUDY **INVOICE NO. 05601**

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 western Maricopa County as follows: Jackrabbit Wash from Vulture Mine Road to the CAP Canal; an unnamed tributary to Jackrabbit Wash from Vulture Mine Road to it's mouth in Section 6, T.3N., R.5W.; Star Wash from the electric power line crossing to it's mouth; and adjacent ponding areas along the CAP Canal.

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Published: Arizona Republic, August 16, 1990.

#10310

DRJ JMO

FLOOD CONTROL DISTRICT
of
MARICOPA COUNTY

Interoffice Memorandum

DATE: December 8, 1993

TO: Neil S. Erwin, P.E., Chief Engineer and General Manager
Division Chiefs
Gwen Loving

FROM: David A. Brozovsky, CPM, Administrator

SUBJECT: ADA Accommodation Notice

Attached to this memo is the "official" version of the notice that is required to be included in all notices that announce public meetings. This notice has been approved by the County Attorney's Office and the ADA Office. Please add a last sentence to the notice that reads: "Please contact David A. Brozovsky, Flood Control District ADA Coordinator, at 506-1501 if any of these services are required." You may also note reference to "FM or Infra-Red Listening Devices" in the official notice. I can procure/borrow these devices from the ADA Office. The systems basically consist of a transmitter (requires power) and a battery operated receiver to be worn by the disabled person.

In planning a public meeting, barriers to access by disabled persons should be identified and evaluated. In other words, ensure that entry and exit routes can be used by disabled people, (e.g. no head knockers or tripping hazards for seeing disabled or narrow corridors for those needing wheelchairs or walkers). Also ensure that there is a reasonable place to locate people that require the use of a wheelchair in the meeting area (e.g. potential problem in areas that have fixed/permanent seating). Don't forget to evaluate the rest room facilities as well. Remember, under ADA guidelines, we are responsible for providing access to public sector programs.

If you have any questions about the notice or any of my comments, please give me a call at 4702.

David A. Brozovsky

David A. Brozovsky, CPM
Enclosure

Dave Brosovsky

TO BE INCLUDED WITH ALL PUBLIC MEETINGS NOTICES:

"A sign language interpreter will be made available upon request with 72 hours' notice. Alternative format materials or FM or Infra-Red Listening Devices are also available upon request with 72 hours' notice. Additional reasonable accommodations will be made available to the extent possible within the time frame of the request."

From Dan Damien -
This language just received
from County attorney (Shaw
Dan)

MARICOPA COUNTY PERFORMANCE MANAGEMENT EVALUATION FORM

SECTION 1a WORKSHEET (CONTINUED)

Full Name	Social Security #	Division #
	Evaluation Period	
Class Title	From:	To:
	PERFORMANCE STANDARDS & MEASURES: "How"(Quality, quantity, time frame,etc.)	
Position Duties "Do"(action verb) + "What" (immediate object)	"Full Performance":	"Exceptional Performance":
I.		
J.		
K.		
L.		
M.		
N.		
O.		
P.		

Section 2: Mapping & Survey Information

**ADWR-TDN Form on mapping*

2.1 Description of mapping, map control and any other survey information used in study. Narrative description of mapping and survey information used in study.

2.2 Index of maps.

2.3 Survey field notes

Identify datum (horizontal and vertical), when survey was done, who is the professional responsible for field work.

***Under separate cover; clear and concise survey notes with sketches, notations should meet requirements of State Technical Board.*

**Professional certification on survey notes*
**Datum, date of topography, scale, contour intervals.*
**Index map of the work maps-8 1/2" x 11"*
**Location map with ERMs identified*
**Flight map*

**General Watershed map of the study area no larger than 11" x 17", to scale.*
**General flood plain map of the study area no larger than 11" x 17", to scale.*
***These are to be presented as an overview exhibit of the study boundaries, total basin, and flood plains. The consultant may combine the two maps displaying both basin divisions and flood plains or present individual maps.*

Section 3: Hydrology Analysis

**ADWR-TDN Hydrology Form.*
**General watershed map of the study area on larger that 11" x 17" - to scale, showing subbasin distribution and concentration points.*

3.1 Method description.

Narrative description of hydrologic method or model, include model name, date, and source with watersheds analyzed by computer programs.

3.2 Parameter estimation.

This section and its subsections should include all calculations used to develop the hydrology.

3.2.1 Drainage area Boundaries

3.2.2 Physical parameters

Sheets for all other physical hydrologic parameters, time of concentration, lag, hydro CN number, channel, percolation loss estimation, N values used in hydro studies, transect, etc.

3.2.3 Statistical parameters

Narrative discussion of data record and information available on precipitation, runoff and discharge for region and watershed used for assessment of adequacy and applicability of record under WRS Bulletin 17B, (March 1982), Discuss factors that effect the reasonableness of frequency analysis.

3.2.4 Precipitation

Narrative discussion with supporting data analyzing historic precipitation records in or adjacent to watershed in relation to watershed size, historic flooding, type of storm, extent, duration and distribution pattern. Relate hypothetical model design precipitation and distribution from stated reference source to historic record and statistical parameters.

3.2.5 Gage Data

Identify and discuss locations of any NWS, USGS or other agency gage stations in or adjacent to the region and watershed in relation to historic precipitation, watershed runoff and statistical parameters.

3.3 Calibration.
Narrative discussion should describe what calibration was accomplished or attempted.

3.4 Special problems/solutions.
Narrative discussion of any *special problems during the study and alternatives/final solutions.*

3.5 Final results/computer runs.
Include output discharge volumes, times, water surface elevations and peak flows. Results are to be presented in tabular form as well as discussed in narrative text. Full input and output listings of all models should be included.

3.6 Final input files on diskette(s).

* *Soil tables, Watershed work maps,*

Section 4: Hydraulic Analysis

**ADWR-TDN Form for hydraulics*
**General overview map of study area with flood plain delineations identified, no larger 11" x 17" - to scale.*

4.1 Method description.
Narrative of the detail water profile model used as well as an explanation of how the starting WSEL was determined.

4.2 Parameter estimation.

4.2.1 Manning's N-value

Sufficient documentation of the source or method in determining N value including photo of appropriate stream reaches.
***A draft copy must be delivered prior to finalizing the computer modeling. A final copy included in the TDN.*

4.2.1.1 Expansion and contraction coefficients: Sufficient documentation of the source or method used to determine expansion and contraction coefficients.

4.2.3 Hydraulic jump/drop analysis.

4.3 Cross-section description.
Narrative discussion on the placement of cross-sections, orientation, how many.

4.4 Calibration
Narrative description of calibration procedure attempted or accomplished.

4.5 Special problems/solutions.
Narrative discussion of any special problems identified during the study and alternatives/final solution.

4.6 Floodway modeling
Narrative discussion of the floodway methods used to determine encroachments.

4.7 Final results/computer output listings.

4.7.1 FIS Report

4.7.5.1 Table of Contents

4.7.5.2 The FIS Report Shall included at niminum

Table of discharges.
Plotted profiles.
Floodway data table (s), FEMA format.

4.7.2 Input and output listings. To be bound under a separate notebook.

4.7.3 11" x 17" reduced work maps.

4.7.4 Plotted cross-sections (where appropriate, such as hydraulic structures, significate bends/crurves in the river reach, ect.) identifying channel & overbank, bridge or constriction, grade control structures, n values, channel stations, encroachment/ineffective areas, (include legend of parameters shown for cross-section plots).

4.7.5 "As Builts" and bridge drawings (identify low cord, top of road, side slope, area of bridge opening, and invert).

4.8 Final input modeling and output results on diskette(s).

Section 5: Erosion/sediment transport

Recommend this section to be dropped from the flood insurance studies (FIS). It is not our practice to provide this information due to the cost which makes the information unfeasible for a FIS. If a specific area is to be studied or a structure, this portion of the contract would come under a separate contract , negotiated outside of the FIS contract. Such as in Pima County, erision/sediment transport analysis is requested in the "River Management Study" but not in their "Flood Insruance Studies".

Section 6: Reference materials

6.1 *Data collection summary:*
includes list of previous studies, other applicable studies, published/unpublished historical flood information, research contacts.

6.2 Referenced technical papers/documents pertaining to methodology used in study. All technical methodology should be documented if there is any question of the reviewing agency having the referenced papers or documents.

Section 7: Cross-referencing and labeling information

Recommend this section to be dropped. Cross-section references are completed at the time FEMA draws the studied area on the FIRMs. Their mappers select the cross-sections to be placed on the maps. EPA Reach identifier are not required for floodplain mapping.

Section 8: Draft FIS Report

Included with section 4.

DRAFT AGENDA INFORMATION FORM

1. **BRIEF DESCRIPTION OF PROPOSAL AND REQUESTED BOARD ACTION:**

It is requested that the Board of Directors award Contract FCD 93-07 to McLaughlin Kmetty Engineers, Ltd. for Phases I and II of the Rio Verde South Floodplain Delineation Study. Phase I of the study consists of the development of approximately 18 square miles of watershed hydrology and the development of 5.3 river miles of floodplain and floodway delineation for those washes identified of FIRM Panel #04013C1300E as Washes 9, 10, and 11. Phase II will utilize the results of the Phase I hydrology to develop up to 4.0 additional river miles of floodplain and floodway delineation. The washes to be delineated an Phase II will be determined upon the finalization of the Phase I hydrologic Study.

The Flood Control Advisory Board recommended that the Board of Directors approve this request to perform the subject floodplain delineation study during its meeting of January 20, 1993.

2. **Compliance with Maricopa County Procurement Code _____, Paragraph _____**

Sole Source Justification_____

5. **MOTION:**

It is moved that the Flood control District of Maricopa County Board of Directors award Contract FCD 93-07 to McLaughlin Kmetty Engineers, Ltd. for Phase I and Phase II of the Rio Verde South Floodplain Delineation Study. Phase I will be for a lump sum of $182,021.00. Phase II will be paid on a per mile of delineation basis for a maximum sum not to exceed $19,700.00.

Revised April 30, 1993

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

BACKGROUND INFORMATION

AGENDA ITEM TARGET DATE: December 15,1993

AGENDA ITEM NO.:

SUBJECT: FCD 93-07 Rio Verde South Floodplain Delineation Study

The hydrologic study area for the proposed study consists of approximately 18 square miles of watershed lying approximately within the limits of Rio Verde Drive on the north, the Happy Valley Road alignment on the south, the 124th Street alignment on the west, and the Verde River on the east. Three washes, known as Washes 9, 10, and 11, are identified as flood hazard zone 'A' on the FIRMs. The proposed study will determine discharges for these three washes and provide a detailed study of water surface elevations to replace the 'A' zone designation. If practical, floodways will be developed along these reaches. Both the hydrology and the detailed delineation of Washes 9, 10, and 11 will be performed under Phase I.

Phase II will consist of a maximum of 4.0 additional river miles of delineation. The actual wash(es) to be delineated will depend on the results of the hydrologic study. Washes with the greatest flows will be delineated first until the 4.0 maximum miles is reached or until the flow is less than 500 cfs.

The benefits and floodplain management tools to be derived from this study are:

1. A detailed analysis of water surface elevations in an area which has, to date, not been studied in great detail.

2. A delineation of conveyance corridors for the watercourse whereby the continuity of flow can be maintained through the floodplain management program.

3. A hydrologic model which will be useful in watershed management programs to monitor and address drainage issues.

4. Identification of appropriate flood hazard designations for incorporation into and revision of the Flood Insurance Rate Maps (FIRMs).

5. HIS data that will be useful in planning, designing, implementing projects, and administering the floodplain management program.

The Flood Control Advisory Board recommended that the Board of Directors approve this request to perform the subject floodplain delineation study during its meeting of January 20, 1993.

COST/FUNDING: The cost of the Rio Verde South Floodplain Delineation Study Phase I is a lump sum of $182,021.00. The cost of Phase II will be paid on a per mile of delineation basis for a maximum sum not to exceed $19,700.00.

Neil S. Erwin, P.E.
Chief Engineer and General Manager

OFFICE OF THE MARICOPA COUNTY ATTORNEY
RICHARD M. ROMLEY
COUNTY ATTORNEY

MEMORANDUM

TO: Jim Phipps, Public Information Coordinator

FROM: Christina P. Sargeant, Deputy County Counsel

DATE: December 13, 1993

RE: **PUBLIC NOTIFICATION**

==========

As you noted in your October 19, 1993 memo, adoption or amendment of floodplain regulations are entirely different from amendment of floodplain delineations. Accordingly, we agree with you that the notice requirements set forth in A.R.S. § 48-3609(E) do not control with respect to adoption of floodplain delineations.

Regulations and statutes applicable to notice of delineations are as follows:

First, FEMA regulations apply. Section 65.07, requiring submission to FEMA of a copy of "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." Use of the disjunctive "or" means that alternatives exist. Notice to each individual property owner, whether or not there is a structure on the property is thus, under FEMA requirements, only an alternative and is not mandatory. Public notice such as you have described (public meeting, news releases, postings in the study area, and mailings to property owners having structures in the area) meet the requirement set by the first alternative. In instances in which the numbers of property owners within the study area are more manageable or identifiable, the District may elect to provide the more individualized notice process envisioned by the second alternative. The District could develop guidelines to be used to determine when notice shall be provided to every property owner individually, but certainly under FEMA there is no present requirement that the District do so.

As you noted the floodplain regulation itself may be a bit vague on what public notice requirements it imposes independent of FEMA, saying only that the required "public notice and public hearing process shall be followed." (Section 704, Floodplain Regulation for Maricopa County).

Section 48-3604 A.R.S. sets forth the notice requirements applicable when the Board is dividing the district into zones. The section, again, has no direct application to the delineation process, however, but may be looked to as providing guidance on the sorts of notice which are viewed to be adequate in other, but similar circumstances.

Section 48-3604 requires:

- before altering boundaries that the board fix a date for a hearing 21-40 days from the date of the resolution;
- that notice of the hearing be published once a week for 3 consecutive weeks in a newspaper of general circulation;
- that the zone be posted in not less than 30 public places in the zone, beginning not less than 3 weeks before the date of the hearing;
- that upon adoption the board adopt a resolution establishing the zone and file with the county recorder, county assessor and department of revenue, a certified copy of the resolution and map;
- that the Board publish a copy of the resolution once a week for 3 consecutive weeks; and
- that the Board cause a copy of the resolution to be posted in not less than 30 public places in the zone.

Watercourse master plans, as defined in Section 48-3609.01, also have separate statutory notice requirements which may be looked to for guidance. Subsection B of Section 48-3609.01 requires public notice to record owners of real property in and immediately contiguous to the watercourse. In other words, personal mailings to every owner regardless of whether there are structures on the property, is required. It is my understanding that the Apache Wash Study is not a Watercourse Master Study within the meaning of this statute.

In conclusion, it is the opinion of this office that the notice requirements mandated by law are those set forth in the FEMA regulation requiring notice to the community through a public notice distributed in the community. Any notice beyond that is not required but may be provided. Such additional notice should be given not on an ad hoc basis but pursuant to a policy or practice to be followed in all like cases.

CPS:dh

FEDERAL EMERGENCY MANAGEMENT AGENCY
FEDERAL INSURANCE ADMINISTRATION

AMENDMENTS AND REVISIONS TO NATIONAL FLOOD INSURANCE PROGRAM MAPS

Application/Certification Forms and Instructions for

Letters of Map Amendment, Conditional Letters of Map Amendment, Letters of Map Revision (Based on Fill), and Conditional Letters of Map Revision (Based on Fill)

OCTOBER 1992

TOD-1

CERTIFICATION/APPLICATION FORMS FOR LETTERS OF MAP AMENDMENT/REVISION BASED ON FILL

In 1968, the U.S. Congress passed the National Flood Insurance Act, which created the National Flood Insurance Program (NFIP). The NFIP was designed to reduce future flood losses through local floodplain management and to provide protection for property owners against potential losses through an insurance mechanism that allows a premium to be paid for the protection by those most in need of it. Creation of the NFIP represented a major shift in Federal strategy from previous structural flood-control and disaster relief programs.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt floodplain management ordinances containing certain minimum requirements intended to reduce future flood losses. Therefore, the community official or agency responsible for floodplain management may be able to provide information which would be of use to a requester. This official or agency is usually also responsible for engineering, public works, flood control, or planning.

These certification forms are designed to assist requesters in gathering the information that the Federal Emergency Management Agency (FEMA) needs to determine whether a certain property is likely to be flooded during the flood event that has a 1-percent chance of being equaled or exceeded in any given year (base flood). Lands at risk from the base flood are called Special Flood Hazard Areas (SFHAs).

- The Property Information form may be completed by the property owner.
- The Elevation Information form must be completed by a registered professional engineer or licensed land surveyor.
- The Summary of Elevations—Individual Lot Breakdown form, if applicable, must be completed by a registered professional engineer or licensed land surveyor.
- The Community Acknowledgement form, if applicable, must be completed by the official responsible for floodplain management in the community.
- The Certification of Fill Compaction form, if applicable, must be completed by a registered professional engineer or soils engineer, or the community's NFIP permit official.

These forms shall be used to request Letters of Map Amendment (LOMAs), Conditional Letters of Map Amendment (CLOMAs), Letters of Map Revision Based on Fill (LOMRs-F), and Conditional Letters of Map Revision Based on Fill (CLOMRs-F), as defined on page 7 of these instructions. They shall not be used for requests involving changes in base (100-year) flood elevations (BFEs), floodway designations, coastal high hazard areas (V zones), and alluvial fan areas. In addition, these forms shall not be used for requests involving property and/or structures that have been elevated by fill placed within a regulatory floodway. Such requests must be submitted to FEMA by the community in accordance with the NFIP regulations, published under Title 44 of the Code of Federal Regulations, Chapter I, Part 65.

In accordance with the NFIP regulations, FEMA will use the information provided by these certification forms to make a determination on whether to remove a parcel of property or a structure from a designated SFHA. In certain instances, additional data that are not referenced on these forms may be required. A FEMA representative will notify the requester of any additional requirements.

Please submit all forms and data to support a request involving a single structure or lot to the appropriate FEMA Regional Office (see inside back cover). Requests for multiple lots or structures and requests involving proposed projects should be submitted to FEMA's Headquarters Office:

Federal Emergency Management Agency
Federal Insurance Administration
Office of Risk Assessment
Technical Operations Division
500 C Street, SW.
Washington, DC 20472

(202) 646-2764

October 1992

INSTRUCTIONS FOR COMPLETING THE PROPERTY INFORMATION FORM

Before completing the Property Information form, request the following documentation from the County Clerk or Recorder for the community:

- A copy of the Plat Map of the area, showing the recordation information (e.g., Book/Volume and Page numbers or Document/Instrument number)

OR

- A copy of the Deed for the property, showing the recordation information (e.g., Book/Volume and Page numbers or Document/Instrument number), accompanied a tax assessor's or other suitable map showing the surveyed location of the property

It will also be necessary to obtain a photocopy of the Flood Insurance Rate Map (FIRM) panel (including the Title Block) that shows the area in which the property is located. To determine which panel shows the property, consult the FIRM Index, which shows the outline of the mapped community and the numbers and layout of the individual FIRM panels. After locating the general area of the property by referring to major streets and streams in the vicinity, read the corresponding FIRM panel number from the Index. The FIRM should be available at the community map repository or from the community official or agency responsible for floodplain management. However, FIRM panels may be ordered from the Flood Map Distribution Center for a minimal fee by calling 1-800-358-9616. Orders may also be faxed to the center at 1-800-358-9620.

Item 1

The Community Name/State, Community Number, Panel or Map Number, and Effective Date appear in the Title Block of the FIRM panel, as shown in Figure 1 (for maps depicting a single community) and Figure 2 (for maps covering an entire county, including all incorporated communities).

Item 2

Enter the street address if there is one. For requests involving multiple lots, a range of street addresses will be sufficient.

Item 3

If a street address cannot be provided, describe the property by referring to the Deed or Plat Map. The description may consist of a lot number and subdivision name, a parcel number, a tract number, or any other information provided in a Deed to identify the property. However, it is not necessary to reproduce a lengthy description of the property as it appears in the Deed.

Item 4

Choose (a) if the entire legally defined property shown on the Plat Map or described in the Deed is to be removed from the SFHA.

Choose (b) if the request is not for the entire piece of property described in the Deed or shown on the Plat Map, but only for a portion of that property. In this case, a registered professional engineer or licensed land surveyor must write and certify a metes and bounds description of the subject portion. The description must be accompanied by a map showing the accurately plotted metes and bounds of that portion.

Choose (c) if only the structure(s) on the property, not the entire property itself, is to be removed from the SFHA.

Item 5

Choose (a) if the request is for a single residential structure or lot.

Choose (b) if the request is for a single commercial structure or lot.

Choose (c) if the request is for more than one structure or lot.

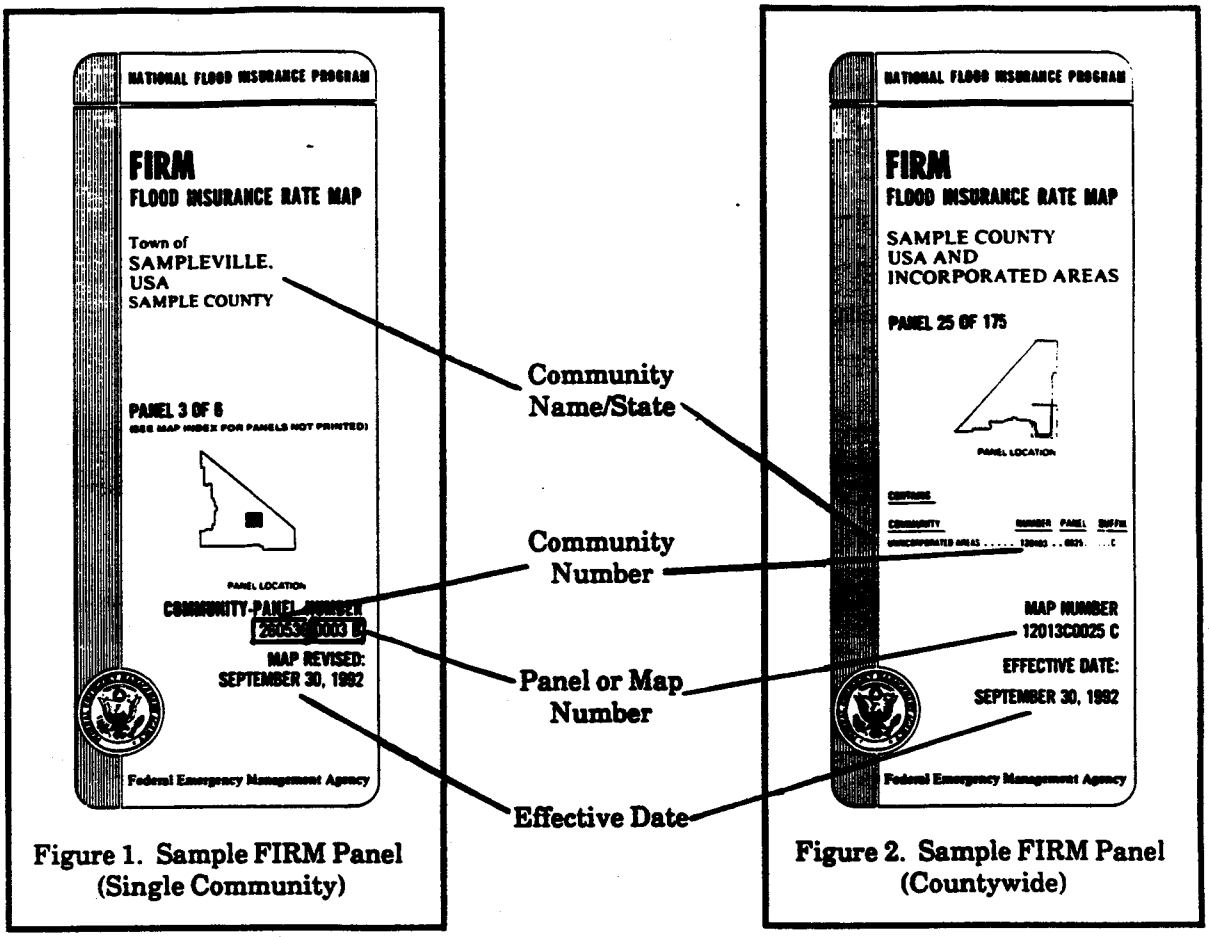

Figure 1. Sample FIRM Panel (Single Community)

Figure 2. Sample FIRM Panel (Countywide)

Item 6

Choose (a) if the request involves structures for which construction is complete ("as-built") or on-grade slabs have been poured, or parcels of land for which the locations have been recorded.

Choose (b) if the request involves planned placement of fill, planned construction of insurable buildings, planned improvements costing 50 percent or more of the market value of the structure before the start of construction of the improvement, and planned subdivisions for which lot locations have not yet been recorded.

Item 7

Fill is defined as material placed to raise the ground to or above the BFE. The common construction practice of removing unsuitable existing material (topsoil) and backfilling with select structural material is not considered the placement of fill if the practice does not alter the existing elevation, which is at or above the BFE. Also, fill placed before the first NFIP map was produced for the area is considered natural ground.

Item 8

If fill has not already been placed on the property to elevate it or a structure above the elevation of the base flood, indicate whether any fill is anticipated.

Item 9

Any available information regarding previous requests will be useful to FEMA. In particular, if the request concerns a proposed project that was submitted to FEMA for comment and is now complete, please indicate that here. It is not necessary, however, to research previous requests.

Item 10

The documents to be enclosed with each request will vary, depending on the nature of the request. Not all forms are required for every request.

a.,b. Property description documentation must be enclosed and will consist of either the Plat Map or the Deed and tax assessor's map. It is important that the recordation data (e.g., Book, Volume, Page, Reel, Date) be evident on the copies of these documents so that FEMA may describe the property in a legal sense. In addition, FEMA must be able to identify the property exactly. If the property is not recorded on a Plat Map, a copy of a tax assessor's map or other suitable map is required to aid FEMA in locating the property.

c. A photocopy of the FIRM panel must be annotated to show where the property is located. For requests involving more than one structure or lot, the locations of the structures or lots must be certified by a registered professional engineer or licensed land surveyor to be accurate representations. The panel number and effective date of the FIRM must appear on the copy submitted. The actual map or a photographic copy must be used. A reproduction from a photocopy is unacceptable due to possible distortion.

d. A map (certified by a registered professional engineer or licensed land surveyor) may be required to relate the ground elevations and locations of structures or lots. The map should be labeled to indicate whether it reflects "as-built" or "proposed" conditions.

e. A metes and bounds description is required only if a request is made that an area less than the entire property be removed from the SFHA. (This does not apply to requests involving only structures.) The metes and bounds description will cover the specific area to be removed, be tied to an identifiable starting point, and be certified by a registered professional engineer or licensed land surveyor. The narrative description must be accompanied by a certified map showing the area described. Note that no portion of the area described by the metes and bounds may be below the 100-year flood elevation.

f. The Elevation Information form must be included UNLESS the request is for a determination that the FIRM already shows the property or structure to be outside the SFHA. This form must be completed by a registered professional engineer or licensed land surveyor.

g. The Community Acknowledgement form must be included for all requests involving the placement of fill in the SFHA to elevate the structure or property. It requires the Chief Executive Officer (CEO) of the community or an official designated by the CEO to acknowledge activities affecting the community's floodplain and floodway management responsibilities.

h. The Certification of Fill Compaction form is required for requests involving the preparation of fill pads designed to support the foundations of residential or commercial structures. It must be completed by a registered professional engineer, an accredited soils scientist, or the community's NFIP permit official. This certification is NOT required for a single residential structure or lot.

i. The initial fee is required for requests involving proposed projects (see instructions for Item 6) and for requests involving more than one lot that has been elevated by the placement of fill. No fee is required to obtain a determination based on existing conditions as long as no fill has been placed or the project involves only one lot .

j. Attach other information as necessary.

Item 11

Complete the last part of the form to certify the accuracy of the information provided.

INSTRUCTIONS FOR COMPLETING THE ELEVATION INFORMATION FORM

For a registered professional engineer or licensed land surveyor to complete this form it will be necessary to obtain the FIRM panel, Flood Boundary and Floodway Map (FBFM) panel, and Flood Insurance Study (FIS) report that cover the area in which the property is located. These can be obtained from the community map repository or can be ordered from the Flood Map Distribution Center by calling 1-800-358-9616.

Item 1

The community name appears in the Title Block of the FIRM panel that shows the area in which the property is located.

Item 2

Include lot /block numbers and subdivision name, street address, or tract/parcel number.

Item 3

Name the source of the flooding (i.e., give the name of the stream, river, lake, bay, or ocean) or note whether there is ponding or shallow flooding.

Item 4

List all flood zones that affect the property (e.g., A, AE, A1-A30, A99, VE, V1-V30, B, C, X, D).

Item 5

The regulatory floodway is the channel of a river or other watercourse that must be reserved to carry the floodwaters efficiently. If a floodway has been adopted by the community it will be shown on the FBFM or FIRM. No fill may be placed in a regulatory floodway.

Item 6

In areas of subsidence or uplift, the elevations shown on this document must be based on the most recent releveling of a National Geodetic Survey or other acceptable benchmark.

Items 7 and 8

After listing the BFE, identify the datum to which the elevation is referenced (e.g., MSL, NGVD, NAVD). If the datum identified differs from the datum used in the FIS report/FIRM, provide a conversion equation to relate the two. Typically, preliminary data produced while an FIS is underway cannot be used to support a request for a LOMA or LOMR-F.

Detailed Analysis

A determination shall be made using the BFE or depth presented in the FIS report (in the Summary of Elevations table or on the Flood Profiles), or the one that is shown on the FIRM. Requests based on flood elevations or depths that are different from those shown on the FIRM or in the FIS report will be processed under other administrative procedures.

Zone AE or A1-A30 (riverine flooding sources): After locating the property on the FBFM or FIRM, use the nearest lettered cross section or physical feature to locate the property and the corresponding BFE on the Flood Profile in the FIS report.

Zone AE or A1-A30 (coastal flooding sources): Read the BFE from the FIRM panel and compare it to the corresponding value presented in the Summary of Stillwater Elevations table in the FIS report. If the table value is within 0.4 foot of the BFE on the FIRM (i.e., no wave runup), use the table value; if the BFE on the FIRM is more than 0.5 foot greater than the table value (i.e., includes wave runup), use the BFE on the FIRM.

Zone AH or A1-A30: Obtain the BFE from the FIRM panel or FIS report.

Zone AO: Read the depth from the FIRM panel.

Zone VE or V1-V30: Revisions in these zones are handled under other procedures.

Approximate Analysis

If FEMA has not specified BFEs for the area, data may be provided to substantiate a 100-year flood elevation. These data may be obtained from an authoritative source, such as the U.S. Army Corps of Engineers, U. S. Geological Survey, U.S. Soil Conservation Service, or a State or local water resource department. Alternatively, data prepared and certified by a registered professional engineer may be submitted. Sufficient technical information should be provided to support the elevation.

Item 9

Complete this item only for requests to remove the SFHA designation from a parcel(s) of land (whether defined by a metes and bounds description, described in a Deed, or shown on a Plat Map). After listing the elevation, identify the datum to which the elevation is referenced, providing a conversion equation as necessary.

Item 10

Complete this item only for requests to remove the SFHA designation from a structure(s). The elevation requested is that of the lowest ground touching the structure. For structures built on piers, provide the lowest ground touching the piers. After listing the elevation, identify the datum to which the elevation is referenced, providing a conversion equation as necessary.

Item 11

Complete this item only for requests involving fill placed within an identified SFHA to elevate a structure(s) since the date of the first NFIP map. If the structure has a basement, the elevation requested is that of the basement floor. After listing the elevation, identify the datum to which the elevation is referenced, providing a conversion equation as necessary.

Item 12

Complete the last part of the form to certify the accuracy of the information provided. If FEMA has specified a BFE for the area in which the property is located or the 100-year flood elevation was obtained from an authoritative source such as the U.S. Army Corps of Engineers, the U.S. Geological Survey, the U.S. Soil Conservation Service, or a State or local water resource department, the form may be certified by either a registered professional engineer or a licensed land surveyor. If FEMA has not specified a BFE for the area, and a registered professional engineer has determined the 100-year flood elevation based on alternative data, Items 7 and 8 must be certified by a registered professional engineer, but the form may be certified by either a registered professional engineer or a licensed land surveyor.

ADDITIONAL INFORMATION

Types of Requests

These forms shall be used to request one of the following responses from FEMA:

LOMA	A letter from FEMA stating that an existing structure or parcel of land that has not been elevated by fill would not be inundated by the 100-year flood
CLOMA	A letter from FEMA stating that a proposed structure that is not to be elevated by fill would not be inundated by the 100-year flood if built as proposed
LOMR-F	A letter from FEMA stating that an existing structure or parcel of land that has been elevated by fill would not be inundated by the 100-year flood
CLOMR-F	A letter from FEMA stating that a parcel of land or proposed structure that is to be elevated by fill would not be inundated by the 100-year flood if fill is placed on the parcel as proposed or the structure is built as proposed

Applicable Regulations

The regulations pertaining to LOMAs and LOMRs-F are presented in the NFIP regulations under Title 44, Chapter I, Parts 65 and 70, Code of Federal Regulations (CFR). The purpose of Part 70 is to provide an administrative procedure whereby FEMA will review information submitted by an owner or lessee of property who believes that his or her property has been inadvertently included in a designated SFHA. The necessity of Part 70 is due in part to the technical difficulty of accurately delineating the SFHA boundary on an NFIP map. Part 70 procedures shall not apply if the topography has been altered since the effective date of the first NFIP map (i.e., a FIRM or Flood Hazard Boundary Map) showing the property to be within the SFHA. Requests involving changes in topography (such as the placement of fill) are handled under the procedures described in Part 65.

Part 72 of the NFIP regulations, published at 44 CFR 72, presents information regarding the reimbursement procedure that FEMA has initiated to allow for the recovery of costs associated with the review of requests for CLOMAs, CLOMRs-F, and LOMRs-F involving more than one lot, thereby reducing the expense to the general taxpayer. The initial, minimum fees for FEMA's review and processing of such requests are as follows:

• Single-lot CLOMA or CLOMR-F	$175
• Multiple-lot CLOMA or CLOMR-F	$245
• Multiple-lot LOMR-F that follows a CLOMR-F, provided that the as-built conditions are the same as the proposed conditions upon which FEMA based the CLOMR-F	$200
• Multiple-lot LOMR-F, not following a CLOMR-F	$445

Before a determination is issued, the requester will be billed for any actual costs incurred during the review that exceed the initial fee. In addition, if a multiple-lot LOMR-F results in a change that can be shown on the NFIP map when the map is next revised, a fee of $560 per panel will be charged for cartographic preparation and processing. If the total cost will exceed $700, FEMA will advise the requester and obtain approval in writing before costs in excess of $700 are incurred.

The following types of requests are exempt from fees under Section 72.5 of the NFIP regulations:

- Requests for LOMAs or LOMRs to correct map errors or to include the effects of natural (not manmade) changes to the SFHA
- Requests for LOMRs-F to remove single residential lots or structures from the SFHA

Basis of Determination

FEMA's determination as to whether a structure(s) may be removed from the SFHA will be based upon a comparison of the BFE with the elevation of the lowest adjacent grade to the structure and, if fill has been placed, with the elevation of the lowest floor (including basement). For a legally defined property that does not have a structure on it to be removed from the SFHA, the elevation of the lowest ground on the property must be at or above the BFE.

Please note the following special considerations that may affect FEMA's determination:

- In areas of sheetflow flooding (AO Zones), the elevation of the lowest adjacent grade and the elevation of the lowest floor (including basement) must be above the elevation of the highest surrounding ground by at least the amount of the depth specified on the FIRM. In addition, adequate drainage paths must be maintained to guide floodwaters around and away from the structure(s).

- If the lowest floor of a building has been elevated on posts, piers, or pilings above the BFE in the SFHA and any portion of the structure (i.e., posts or piers) is still below the BFE, the building will not be removed from the SFHA.

Response

In accordance with Part 70 procedures, the requester will be notified in writing of the determination within 60 days of the date of receipt of all required data. Under Part 65 procedures, the community will be notified in writing of the determination within 90 days of the date of receipt of all requested data.

Effect on Insurance Purchase Requirements

Although FEMA may issue a LOMA or LOMR-F removing a structure(s) from the SFHA, it is the lending institution's prerogative to require flood insurance if it deems such action appropriate. If, however, the lending institution agrees to waive the flood insurance purchase requirement for a structure that has not been elevated by fill, the property owner is eligible for a full refund of the premium paid for the current policy year, provided that no claim is pending or has been paid on the policy in question during the same policy year. If the property owner has been required to renew his or her policy during a period when a revised map was being printed, the premium will be refunded for an additional year. To initiate processing of the refund, the property owner should provide the LOMA and evidence of the waiver of the flood insurance requirement from the lending institution to the insurance agent or broker who sold the policy.

Conditional Determinations

To qualify for a CLOMA or CLOMR-F, the proposed project must meet the same criteria as those required for a LOMA or LOMR-F. After construction is completed or fill is placed, certified as-built information must be submitted to FEMA in order for a LOMA or LOMR-F to be issued.

Property owners and developers should note that a CLOMA or CLOMR-F merely provides comment on the proposed plan and does not amend the map. It also does not relieve Federal agencies of the need to comply in carrying out their responsibilities for providing federally undertaken, financed, or assisted construction and improvements or in their regulating and licensing activities, in accordance with the provisions of Executive Order 11988.

FEMA USE ONLY

PROPERTY INFORMATION

This form may be completed by the property owner.

1. **Community Name:** _____ **State:** _____

   Community Number: _____ **Panel or Map Number:** _____

   Effective Date: _____

2. **Street Address of Property:** _____

   _____

3. **Description of Property (if a street address cannot be provided):** _____

   _____

   _____

4. **Are you requesting that the SFHA designation be removed from (a) all of the land within the bounds of the property, (b) a portion of land within the bounds of the property (metes and bounds description is required), or (c) the structure(s) on the property? (Answer "a," "b," or "c")**

   _____

5. Is this request for (a) a single residential structure or lot, (b) a single commercial structure or lot, or (c) multiple structures or lots? (Answer "a," "b," or "c") _____

6. Is this request for (a) existing conditions or (b) a <u>proposed</u> project? (Answer "a" or "b")

   _____

7. Has fill been placed in an identified SFHA? _____ If yes, when? _____

8. For <u>proposed</u> projects, will fill be placed to elevate this land or structure(s)? _____

9. Do you know of previous requests that have been submitted to FEMA for this property or adjacent properties? _____

   If yes, what was the date of FEMA's response letter? _____

10. I have enclosed the following documents in support of this request:

_____ a. Copy of the Plat Map (with recordation data)

OR

_____ b. Copy of the Deed (with recordation data), accompanied by a tax assessor's or other suitable map showing the surveyed location of the property

_____ c. Copy of the effective FIRM panel on which the property location has been accurately plotted (If the request is for more than one lot/structure, this location must be certified by a registered professional engineer or licensed land surveyor)

_____ d. A map showing the locations of any structures existing on or proposed for the property (certified by a registered professional engineer or licensed land surveyor)

_____ e. Metes and bounds description and accompanying map (only if the request is for a portion of land within the bounds of the property, not structure(s) only)

_____ f. Elevation Information form

_____ g. Community Acknowledgment form (only if fill has been/will be placed)

_____ h. Certification of Fill Compaction form (only if fill has been/will be placed and the request is not for a single residential structure)

Initial fee (if applicable, see page 7 of instructions)

_____ i. _____ $_____
(type of request) (amount enclosed)

_____ j. Additional information: _____
(please specify)

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

Applicant's Name: _____
(please print or type)

Mailing Address: _____

_____
(please print or type)

Daytime Telephone Number: _____

_____ _____
Date Signature of Applicant

FEMA USE ONLY

ELEVATION INFORMATION

This form must be completed by a registered professional engineer or licensed land surveyor. (See page 6 of instructions for details.)

1. Community Name: _____

2. Legal Description of Property: _____

   _____

3. Flooding Source: _____

4. Based on the FIRM, this property is located in Zone(s) _____

5. Is any portion of this property located in the adopted regulatory floodway? _____
   Are any structures (existing or proposed) located in the regulatory floodway? _____

6. Is this area subject to land subsidence or uplift? _____ If yes, what is the date of the current releveling? _____

7. What is the BFE for this property? (Provide elevation to nearest tenth of a foot and datum)*

   _____

8. How was the BFE determined (attach a copy of the Flood Profile or table from the FIS report, if appropriate, or other necessary supporting information)? _____

   _____

   _____

   _____

   _____

   _____

   _____

*For multiple lots/structures, complete the Summary of Elevations—Individual Lot Breakdown form, identifying the elevation for each lot/structure .

9. If this request is to remove the SFHA designation from a parcel of land or lot(s), what is the existing or proposed elevation of the lowest grade; that is, the lowest ground on the property? (Provide elevation to nearest tenth of a foot and datum)* _____

10. If this request is to remove the SFHA designation from a structure(s), what is the elevation of the existing or proposed lowest adjacent grade; that is, the lowest ground touching the structure? (Provide elevation to nearest tenth of a foot and datum)* _____

11. If fill has been/will be placed to elevate the structure(s) on this property, what is the existing or proposed elevation of the lowest floor, including basement? (Provide elevation to nearest tenth of a foot and datum)* _____

*For multiple lots/structures, complete the appropriate column(s) of the Summary of Elevations—Individual Lot Breakdown form, identifying the elevation for each lot/structure.

12. 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: _____
(please print or type)

Title: _____
(please print or type)

Registration No. _____ Expiration Date: _____

State _____

_____
Signature

_____ _____
Date Seal (Optional)

FEMA USE ONLY

CERTIFICATION OF FILL COMPACTION

Community Name

Property Name or Address

I hereby certify that fill placed on the property to raise the ground surface to or above the base (100-year) flood elevation in order to gain exclusion from a Special Flood Hazard Area (100-year floodplain) meets the criteria of Title 44 of the Code of Federal Regulations, Paragraph 65.5(a)(6), listed below. For proposed fill, I hereby certify that it is designed in accordance with these criteria.

1. That the fill has been compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test method or an acceptable equivalent method for (check one of the following)

   _____ a. Fill pads prepared for the foundations of residential or commercial structures

   _____ b. Entire legally defined parcel (Note: If the location of fill pads has not been determined, the fill over the entire legally defined parcel must be compacted to the above criteria).

2. That fill slopes for granular materials are not steeper than one vertical on one-and-one-half horizontal (steeper slopes must be justified); and

3. That adequate erosion protection is 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 permanent 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 appropriately designed stone, rock, concrete, or other durable products).

Signature

Date

Community Official's Title or
Engineer's Seal/Registration Number

FEMA USE ONLY

COMMUNITY ACKNOWLEDGMENT OF REQUESTS INVOLVING FILL

Community Name _____ Property Name or Address _____

We hereby acknowledge receipt and review of this Letter of Map Revision request and have found that the completed or proposed project meets or is designed to meet all of the community's applicable floodplain management regulations, including the requirement that no fill be placed in the adopted regulatory floodway. We understand that this request is being forwarded to FEMA for a possible map revision. For proposed projects, we understand that FEMA is being asked to provide comments on the potential effects of this project on the flood hazards of our community.

Community comments on the proposed project: _____

_____

_____

_____

_____

_____

Community Official's Name: _____
(please print or type)

Address: _____

_____
(please print or type)

Daytime Telephone Number: _____

_____ _____
Community Official's Signature Date

_____
Community Official's Title

FEMA USE ONLY

SUMMARY OF ELEVATIONS— INDIVIDUAL LOT BREAKDOWN

Community Name _____ Property Name or Address _____

LOT NUMBER	BLOCK NUMBER	LOWEST LOT ELEVATION[1]	LOWEST FLOOR ELEVATION[2] (INCLUDING BASEMENT)	LOWEST ADJACENT GRADE TO STRUCTURE[3]	100-YEAR FLOOD ELEVATION	SOURCE OF 100-YEAR FLOOD ELEVATION	FOR FEMA USE ONLY

[1]For requests that an entire parcel of land be removed from the SFHA; if the request involves an area described by metes and bounds, provide the lowest elevation within that area

[2]For requests that a structure that has been elevated by fill be removed from the SFHA

[3]For requests that a structure be removed from the SFHA

FEMA REGIONAL OFFICES

REGION I

(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont)

Federal Emergency Management Agency
Natural and Technological Hazards Division
J.W. McCormack Post Office and Courthouse Building, Room 462
Boston, Massachusetts 02109-4595

(617) 223-9559

REGION II

(New York, Puerto Rico, New Jersey, and Virgin Islands)

Federal Emergency Management Agency
Natural and Technological Hazards Division
26 Federal Plaza, Room 1337
New York, New York 10278-0002

(212) 225-7200

REGION III

(Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia)

Federal Emergency Management Agency
Natural and Technological Hazards Division
Liberty Square Building
(Second Floor)
105 South Seventh Street
Philadelphia, Pennsylvania 19106-3316

(215) 931-5750

Region IV

(Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee)

Federal Emergency Management Agency
Natural and Technological Hazards Division
1371 Peachtree Street, Northeast
Suite 700
Atlanta, Georgia 30309-3108

(404) 853-4418

REGION V

(Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin)

Federal Emergency Management Agency
Natural and Technological Hazards Division
175 West Jackson Boulevard
(Fourth Floor)
Chicago, Illinois 60604-2698

(312) 408-5533

REGION VI

(Arkansas, Louisiana, New Mexico, Oklahoma, and Texas)

Federal Emergency Management Agency
Natural Hazards Branch
Federal Regional Center
800 North Loop 288
Denton, Texas 76201-3698

(817) 898-5127

REGION VII

(Iowa, Kansas, Missouri, and Nebraska)

Federal Emergency Management Agency
Natural and Technological Hazards Division
Federal Office Building
911 Walnut Street, Room 200
Kansas City, Missouri 64106-2085

(816) 283-7021

REGION VIII

(Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming)

Federal Emergency Management Agency
Natural and Technological Hazards Division
Denver Federal Center, Building 710
Box 25267
Denver, Colorado 80225-0267

(303) 235-4830

REGION IX

(Arizona, California, Guam, Hawaii, and Nevada)

Federal Emergency Management Agency
Natural and Technological Hazards Division
Building 105
Presidio of San Francisco
San Francisco, California 94129-1250

(415) 923-7177

REGION X

(Alaska, Idaho, Oregon, and Washington)

Federal Emergency Management Agency
Natural and Technological Hazards Division
Federal Regional Center
130 228th Street, SW.
Bothell, Washington 98021-9796

(206) 487-4682

FEDERAL EMERGENCY MANAGEMENT AGENCY
FEDERAL INSURANCE ADMINISTRATION

REVISIONS TO NATIONAL FLOOD INSURANCE PROGRAM MAPS

Application/Certification Forms and Instructions for Conditional Letters of Map Revision, Letters of Map Revision, and Physical Map Revisions

NOVEMBER 1992

RSD-1

INSTRUCTIONS FOR COMPLETING THE APPLICATION/CERTIFICATION FORMS FOR CONDITIONAL LETTERS OF MAP REVISION, LETTERS OF MAP REVISION, AND PHYSICAL MAP REVISIONS

GENERAL

In 1968, the U.S. Congress passed the National Flood Insurance Act, which created the National Flood Insurance Program (NFIP). The NFIP was designed to reduce future flood losses through local floodplain management and to provide protection for property owners against potential losses through flood insurance.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt floodplain management ordinances containing certain minimum requirements intended to reduce future flood losses. The community is also responsible for submitting data to the Federal Emergency Management Agency (FEMA) reflecting revised flood hazard information so that NFIP maps can be revised as appropriate. This will allow risk premium rates and floodplain management requirements to be based on current data.

Submissions to FEMA for revisions to effective Flood Insurance Studies (FISs) by individual and community requestors will require the signing of application/certification forms. These forms will provide FEMA with assurance that all pertinent data relating to the revision is included in the submittal. They will also assure that: (a) the data and methodology are based on current conditions; (b) qualified professionals have assembled data and performed all necessary computations; and (c) all individuals and organizations impacted by proposed changes are aware of the changes and will have an opportunity to comment on them. The circumstances for which this package is applicable are as follows:

Conditional Letter of Map Revision (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).
Letter of Map Revision (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.)
Physical Map Revision (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.)

Please note that for the following circumstances, this package is not applicable. Instead, the package entitled Amendments and Revisions to National Flood Insurance Program Maps, Application/ Certification Forms and Instructions for Conditional Letters of Map Amendment, Letters of Map Amendment, Conditional Letters of Map Revision (Based on Fill), and Letters of Map Revision (Based on Fill) is appropriate.

Letter of Map Amendment (LOMA)	A letter from FEMA removing an existing structure or a legally defined parcel of land unaltered by fill from an SFHA (see 44 CFR Ch. I, Part 70).
Conditional Letter of Map Amendment (CLOMA)	A letter from FEMA conditionally removing a proposed structure or a legally defined parcel of land unaltered by fill from an SFHA (see 44 CFR Ch. I, Parts 70 and 72).
Letter of Map Revision Based on Fill (LOMR-BOF)	A letter from FEMA removing an existing structure or a legally defined parcel of land elevated by the placement of fill from an SFHA (see 44 CFR Ch. I, Section 65.5).
Conditional Letter of Map Revision Based on Fill (CLOMR-BOF)	A letter from FEMA conditionally removing a proposed structure or a legally defined parcel of land to be elevated by the placement of fill from an SFHA (see 44 CFR Ch. I, Section 65.5 and Part 72).

NFIP regulation, CFR Ch.I, specifies the requirements regarding the submittal of revision requests to FEMA. A document entitled Appeals, Revisions, and Amendments to Flood Insurance Maps, A Guide for Community Officials, dated January 1990, provides background on the NFIP and an expanded explanation of these requirements.

NFIP Regulation, 44 CFR Ch. I, Part 59, contain general provisions of the NFIP with which all requestors and community officials involved in revision requests should be familiar.

NFIP Regulation, 44 CFR Ch. I, Section 65.2, contain definitions relative to certification of data, analyses, and structural works. This information is important to all professionals certifying technical information contained with revision requests and should be carefully reviewed prior to signing the application/certification forms.

Part 72 of the NFIP regulations, published at 44 CFR 72, presents information regarding the reimbursement procedure that FEMA has initiated to allow for the recovery of costs associated with the review of requests for Conditional LOMRs, LOMRs, or Physical Map Revisions, thereby reducing the expense to the general taxpayer. The initial, minimum fees for FEMA's review and processing of CLOMRs, LOMRs, and Physical Map Revisions requests are as follows:

	CLOMR	LOMR	PMR
• Bridge or culvert only	$490	$690	$690
• Channel modification only	$560	$760	$760
• Channel modification and new bridge or culvert	$735	$935	$935
• Levees, berms, or other structural modifications	$945	$1,145	$1,145
• Structural measures on alluvial fan	$2,800	$3,000	$3,000
• Review of revised hydrology	$245	---	---
• "As-Built" request for previous CLOMR	---	$200	$200

Before a determination is issued, the requestor will be billed for any actual costs incurred during the review that exceed the initial fee. If the total cost will exceed $1,500, FEMA will advise the requestor and obtain approval in writing before costs in excess of $1,500 are incurred, except for requests involving levees and/or berms, or structural measures on alluvial fan. For those requests, the requestor will be notified if costs will exceed $2,500 and $5,000, respectively.

If the revision requests results in either a LOMR or a Physical Map Revision, the requestor will be charged a fee of $560 per revised panel to cover the costs of cartographic preparation. Please note that any initial fee already submitted will be applied to this request only if all of the required data are received within 90 days of the receipt of the original request by FEMA. Check or money orders should be made payable to The National Flood Insurance Program.

Exempt from these reimbursement procedures for either proposed or "as-built" conditions are requests for projects that are for public benefit and are intended to reduce the flood hazard to existing development in identified flood hazard areas as opposed to planned floodplain development. Also exempt are requests based solely on the submission of more detailed information and requests to correct NFIP map errors.

A request for a revision to the effective FIS information (FIRM, FBFM, and /or FIS report) is usually a request that FEMA replace the effective floodplain boundaries, flood profiles, floodway boundaries, etc., with those determined by the requestor. Before FEMA will replace the effective FIS information with the revised, the requestor must: (a) provide all of the data used in determining the revised floodplain boundaries, flood profiles, floodway boundaries, etc. (b) provide all data necessary to demonstrate that the physical modifications to the floodplain have been adequately designed to withstand the impacts of the 100-year flood event and will be adequately maintained (c) demonstrate that the revised information (e.g., hydrologic and hydraulic analyses and the resulting floodplain and floodway boundaries) are consistent with the effective FIS information.

Completed application/certification forms should be neatly packaged in order, with the appropriate enclosure following each form submitted. A notebook-style format is ideal. The complete package should be submitted to the appropriate FEMA Regional Office. The addresses and telephone numbers of the ten Regional Offices, as well as information regarding which areas they support, are provided inside the back cover of this document. The address and telephone number of the Headquarters office in Washington, DC, are also provided.

Additional information is contained on the forms. Wherever necessary, attach additional sheets required to provide the information requested on the forms.

Commonly Used Acronyms

FEMA	Federal Emergency Management Agency.
NFIP	National Flood Insurance Program.
BFE	Base Flood Elevation. It is the height of the base flood, usually in feet, in relation to the datum used, or the depth of the base flood usually in feet, above the ground surface. The base flood is the flood that has a 1 percent probability of being equaled or exceeded in any given year (also referred to as the 100-year flood).
FIS	Flood Insurance Study. An engineering study performed under contract to FEMA to identify flood-prone areas and to determine BFEs, flood insurance rate zones, and other flood risk data for a community.
FIRM	Flood Insurance Rate Map. An official map of a community, on which the Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.
FBFM	The Flood Boundary and Floodway Map. The floodplain management map issued by FEMA that depicts, on the basis of detailed analyses, the boundaries of the 100- and 500- year floodplain and the regulatory 100-year floodway.
SFHA	Special Flood Hazard Area. Areas inundated by a flood having a 1 percent probability of being equaled or exceeded in any given year (also referred to as the 100-year flood).
FHBM	The Flood Hazard Boundary Map. The initial flood insurance map issued by FEMA that identified on the basis of approximate analyses, the areas of 100-year flood hazard in a community.
CHHA	Coastal High Hazard Area. An area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources.

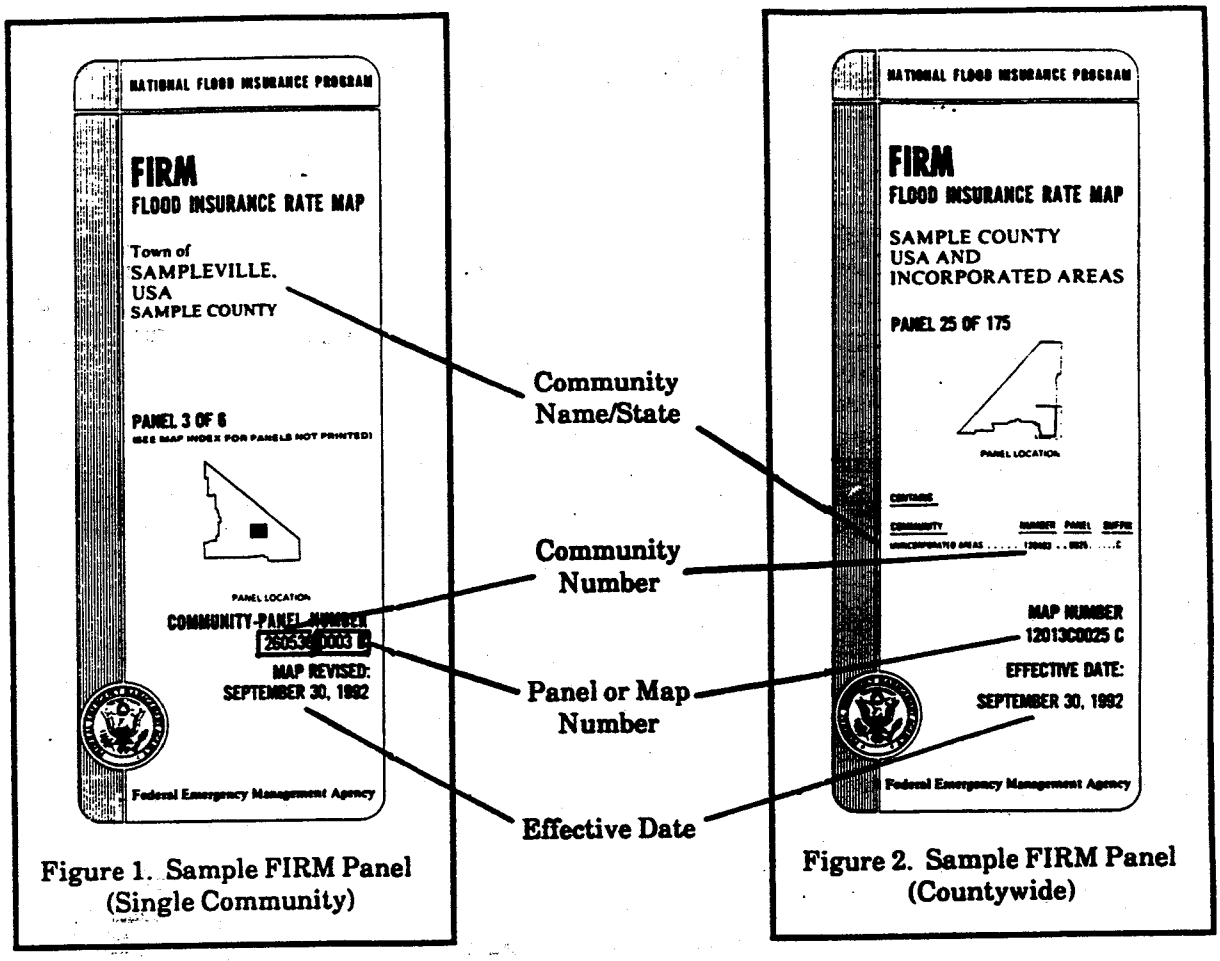

Figure 1. Sample FIRM Panel (Single Community)

Figure 2. Sample FIRM Panel (Countywide)

Signature and Title of Revision Requestor

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

Signature and Title of Community Officials

The person signing this certification should be the CEO for the community involved in this revision request or a legally designated official by the CEO. If more than one community is affected by the change, the community official from the community that is most affected should sign the form and letters from the other affected communities should be enclosed.

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

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

Physical changes include watershed development, flood control structures, etc. Note that fees will be assessed for FEMA's review of proposed and "as-built" projects, as outlined in NFIP regulation 44 CFR Ch. I, Part 72. Improved methodology may be a different technique (model) or adjustments to models used in the effective FIS. Improved data include revised as well as new data. Floodway modifications involve any shift in the FEMA-designated floodway boundaries, regardless of whether the shift is mappable.

Flooding source refers to a specific lake, stream, ocean, etc. This should match the flooding source name shown on the FIRM, if it has been labeled. (Examples: Lake Michigan, Duck Pond, or Big Hollow Creek.) Project Name/Identifier can be the name of a flood control project or other pertinent structure having an impact on the effective FIS, the name of a subdivision or area, or some other identifying phrase.

The map number, panel number, community number and effective date can be obtained from the FIRM title block. The sample FIRM panels (Figures 1 and 2) provide a convenient source of information to fill in item 5.

NFIP Compliance

If the community or communities disagree with the proposed revision, a signed statement should be attached to the request explaining the reasons or bases for disagreement.

The community should refer to the document entitled Appeals, Revisions and Amendments to Flood Insurance Maps: A Guide for Community Officials, dated January 1990.

Requested Response from FEMA

In order to avoid confusion between FEMA and the revision requestor, the requestor should identify the desired response from FEMA. Brief descriptions of possible responses are provided in the introduction; more detail regarding these responses and the data required to obtain each response are provided in the NFIP regulations, 44 CFR Ch. I, and in the document entitled Appeals, Revisions and Amendments to Flood Insurance Maps: A Guide for Community Officials, dated January 1990.

INSTRUCTIONS FOR COMPLETING THE PROFESSIONAL CERTIFICATION FORM (FORM 2)

The licensed professional engineer and/or land surveyor should have a current license in the State in which one of the impacted communities resides and should provide the number of years of experience in the specific area of expertise being certified, not the number of years as a licensed professional engineer and/or land surveyor. While the individual signing this form is not required to have obtained the supporting data or performed the analyses, he or she must have supervised and reviewed the work. This form must be submitted with each request.

Viewing the physical changes (Item 4) involves an on-site visit and observation of all features upon completion of the project. Examination of photographs is not a substitute for on-site visits.

If not familiar with all analyses conducted within the expertise cited on this form (Item 5) or with all construction procedures involved with the construction of the completed project (Item 6), the individual signing this form should attach a statement indicating the basis for concluding that all analyses and construction were performed in accordance with sound engineering practice. The individual signing this form should take care to identify other experts who may not be licensed engineers and their assistance regarding the assessment of analyses and construction practices.

Please note that more than one certification form may be required to include all disciplines involved in project completion.

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

INSTRUCTIONS FOR COMPLETING THE HYDROLOGIC ANALYSIS FORM (FORM 3)

This form is to be completed when discharges other than those used in FIS are proposed. Information requested is used to compare revised data to FIS data, compare revised discharges to FIS discharges, and to determine the merit of using revised methods and data over those used in the FIS.

For revisions based on alternative methodologies or improved data, an explanation as to why the alternative methodology or improved data provides better results over the FIS must be presented and supported throughout the form.

Attachment A - Statistical Analysis of Gage Records (one per gage record):

Statistical analyses of gage data are based on the guidelines set out in Bulletin 17B by the Interagency Advisory Committee on Water Data.

Systematic data refer to peak discharge data observed and recorded regularly over a period of time by a government agency or private firm. Historical data refers to peak discharge data observed outside the systematic period and recording only isolated outstanding events. Historical data should be documented whenever possible.

For data to be homogeneous, the long-term trend of the data should remain constant. In other words, the probability distribution used to describe it is independent of time. An example of non-homogeneous data would be peak discharge data at the confluence of two streams following two different flow regimes.

Adjustments made to the statistical data/record, such as the use of a second gaging station to compensate for a short record or adjustments for zero flood years.

Bulletin 17B recommends the use of the log-Pearson Type III (LP3) distribution for the statistical analysis of flood data. However, there may be situations where the LP3 distribution is inappropriate and another probability distribution must be used. Other distributions include Extreme Value (Gumbel) and log-normal (Galton). The use of alternative distributions must be justified and fully documented.

Comparison with other analyses includes comparing the analysis with another station on a hydrologically similar stream or using an alternative analysis (e.g. regression equations) to verify the reasonableness and logic of the results.

Attachment B - Regression Analysis (one per stream)

The source of the regression equations must be given along with a proper bibliographical reference. The U.S. Geological Survey (USGS), in cooperation with State agencies in charge of monitoring water data, has developed regression equations on a state-by-state basis. As these are revised regularly, FEMA will accept only the most recently published regression equation report. Other agencies also put out regression analyses reports, or a regional analyses can be performed.

Stream stations are grouped in hydrologic regions in which certain basin parameters have been found to have roughly the same influence on the peak flows as evidenced by the multiple regression analysis. It can happen that a stream watershed may encompass more than one region, in which case some proportionality of the influence of each region upon the peak discharge must be considered.

Most regression equations are developed for rural or undeveloped conditions. These results can be modified to reflect urban or developed conditions. If urbanized conditions were considered, the

methodology for developing the urban discharges must be described and/or referenced and the percentage of the watershed that is urbanized must be given.

Because regression equations are based on compilation of data from several gage stations, a certain amount of natural basin storage is inherent in the equations. However, regression equations are not designed to handle watersheds controlled by major storage features such as flood control structures. If such structures exist, a full account of how flood storage was considered must be given.

Attachment C - Precipitation/Runoff Model (One Per Model)

Baseflow is defined as the estimated flow occurring in the stream before the flood event occurs.

Because there are many different precipitation/runoff models, many with a different theoretical basis, it is very difficult, if not impossible, to prove that one model provides superior results over another. Therefore, it must be shown that the types of parameters, the theoretical basis, and source of data provide superior results.

If possible, a precipitation runoff model should be compared and calibrated to a known flood event in order to justify the values of the parameters and the assumptions made in the model. All calibration and verification runs should be described and the results discussed. Please attach copies of the calibration and verification runs.

Attachment D - Confidence Limits Evaluation

When revised discharges are not significantly different than the FIS discharges, FEMA may require a confidence limit analysis at a later date to complete the review.

INSTRUCTIONS FOR COMPLETING THE RIVERINE HYDRAULIC ANALYSIS FORM (FORM 4)

This form is to be completed when the request involves a hydraulic analysis for riverine flooding that differs from that used to develop the FIRM.

To obtain copies of the effective FIS models, either the community or FEMA Regional offices should be contacted for direction. A list of FEMA Regional offices is located at the end of the instructions. If the effective models are not available, the requestor must generate models that duplicate the FIS profiles and the elevations shown in the Floodway Data Table in the FIS report to within 0.1 foot or contact FEMA Headquarters for guidance. FEMA Headquarters should be contacted if this model cannot be produced. If an alternative hydraulic model is used, it must be shown that the use of the original model is inappropriate and the new model must be calibrated to reproduce the FIS profiles within 0.1 foot.

Only the duplicate effective and the revised or post-project conditions models are required to be submitted. The corrected effective model may be submitted to provide a more detailed analysis than the duplicate effective model at the project site or fix any technical deficiencies. The existing or pre-project models may be required to support conclusions about the actual impacts of the project associated with the revised or post-project model or to establish more up-to-date models on which to base the revised or post-project conditions model. The revised or post-project conditions model must always include the existing and post-project conditions. Additional information about these models is contained on the form.

The information requested on the Hydraulic Analysis Form are intended to document the steps taken by the requestor in the process of preparing the revised or post-project conditions hydraulic models and the resulting revised FIS information. The following guidelines should be followed when completing the form:

(a) All changes to the duplicate and subsequent models must be supported by certified topographic information, bridge plans, constructions plans, survey notes, etc.

(b) Changes to the hydraulic models should be limited to the stream reach for which the revision is being requested. Cross-sections upstream and downstream of the revised reach should be identical to those in the effective model. If this is done, water surface elevations and topwidths computed by the revised models should match those in the effective models upstream and downstream of the revised reach as required.

(c) There must be consistency between the revised hydraulic models, the revised floodplain and floodway delineations, the revised flood profiles, topographic work map, annotated FIRMs and/or FBFMs, construction plans, bridge plans, etc.

For SFHAs designated as Zone A, the existing or pre-project model and the revised or post-project model,or other hydraulic analyses for existing and revised conditions are required to determine the 100-year flood profile. The existing model or analysis is required to support conclusions about the actual impacts of the project associated with the revised or post-project model or analysis.

INSTRUCTIONS FOR COMPLETING THE RIVERINE/COASTAL MAPPING FORM (FORM 5)

This form is to be completed when mapping changes to either the FIRM or FBFM are proposed and to assure that the revised floodplain and floodway boundary information tie-into the effective information so that a consistent NFIP map is maintained. In addition, the questions asked and information required are to determine the impacts of the revision, including increases in SFHA and shifts in floodway both on and off the requestor's property.

When fill is placed in the 100-year floodplain and the request is to alter 100-year flood boundary, in order to permanently remove the filled area from the floodplain, the fill must be compacted and protected against erosion from moving flood waters.

An insurable structure is defined as a walled and roofed building, other than a gas or liquid storage tank, that is principally above ground and affixed to a permanent site, as well as a manufactured home on a permanent foundation. For the latter purpose, the term includes a building while in the course of construction, alteration or repair, but does not include building materials or supplies intended for use in such construction, alteration or repair, unless such materials or supplies are within an enclosed building on the premises.

INSTRUCTIONS FOR COMPLETING THE CHANNELIZATION FORM (FORM 6)

This form is to be completed when any portion of the stream channel is altered or relocated. When the Channelization Form is submitted, a Riverine Hydraulic Analysis Form must also be submitted.

The purpose of the Channelization Form is to assure that the channel will function properly as designed and pass the 100-year flood as determined by the hydraulic analysis. Typically, channelization increases the channel velocity above the natural channel velocity. Documentation must be provided that assures that the channel lining will withstand the velocities associated with the 100-year flood. Additional considerations are the stability of the flow regime and the affects of sediment transport.

INSTRUCTIONS FOR COMPLETING THE BRIDGE/CULVERT FORM (FORM 7)

This form is to be completed when the request involves a new bridge or culvert or a new or revised analysis of an existing bridge or culvert.

Typically a revision is not requested to reflect a new analysis of a previously studied existing structure. If this is the case, an explanation of why the new analysis was performed is required. Typically, the structure is analyzed using the same method of analysis used for the flooding source. If a different method is used for the structure, justification why the hydraulic analysis utilized for the flooding source could not analyze the structure must be enclosed.

Culvert Length or Bridge Width:	The culvert length or bridge width in direction of flow must be entered.
Culvert/Bridge Area:	If a computer model is used to analyze the structure, the calculated culvert/bridge area may be different than the total culvert/bridge area in cases of low flow.
Elevations above which flow is effective for the entire cross-section:	These elevations are needed to ensure that the flow is restricted to the effective cross-section.
Top Widths:	Top widths are the horizontal distance between stations of the floodplain boundaries, floodway boundaries, and the limits of effective and ineffective flow areas in a cross-section.

INSTRUCTIONS FOR COMPLETING THE LEVEE/FLOODWALL SYSTEM ANALYSES FORM (FORM 8)

The purpose of this form is to assure that the levee or floodwall is designed and/or constructed to provide protection from the 100-year flood, in full compliance with 44 CFR Ch. I, Section 65.10 of the National Flood Insurance Program (NFIP) regulations, before reflecting its effects on an NFIP map. A complete engineering analysis must be submitted in support of each section of this form. In addition, a vicinity map along with a complete set of flood profile sheets, plan sheets, and layout detail sheets must be submitted. These sheets must be numbered, and an index must be provided that clearly identifies those sheets specifically relating to the levee or floodwall in question.

INSTRUCTIONS FOR COMPLETING THE COASTAL ANALYSIS FORM (FORM 9)

The information requested on the Coastal Analysis Form is intended to document the steps taken by the requestor in the process of preparing the revised models or analyses and the resulting revised FIS information. The following guidelines should be followed when completing the form:

a. All changes to effective models must be supported by certified topographic information, structure plans, survey notes, storm surge data, meteorological data, etc.

b. The reanalysis of the effective study must tie-in with areas not restudied.

c. All equations or models used must be referenced.

INSTRUCTIONS FOR COMPLETING THE COASTAL STRUCTURES FORM (FORM 10)

The Coastal Structures Form is to be completed when a revision to coastal flood hazard elevations and/or areas is requested based on coastal structures being credited as providing protection from the base flood. If the coastal structure is a levee/floodwall, complete the Levee/Floodwall System Analysis Form in lieu of this form. When the Coastal Structures Form is submitted, the Coastal Analysis Form should also be submitted.

The purpose of the Coastal Structures Form is to assure that the structure is designed and constructed to provide protection from the base flood without failing or causing an increase in flood hazards to adjacent areas. Documentation must be provided that assures a coastal structure is designed and constructed to withstand the wind and wave forces associated with the base flood. Additional concerns include the impact to areas directly landward of the structure that may be subjected to overtopping and erosion along with possible failure of the structure due to undermining from the backside and the possible increase in erosion at the ends of the structure to unprotected properties. The evaluation of protection provided by sand dunes must follow the criteria outlined in 44 CFR Ch. I, Section 65.11.

INSTRUCTIONS FOR COMPLETING THE DAM FORM (FORM 11)

The Dam Form is to be filled out when there is an existing, proposed, or modified dam along a stream studied in detail. Any flood control storage to be considered in the hydrologic analysis for the dam should be totally dedicated to flood control. If the dam is not certified to safely pass the 100-year flood and the dam has a reasonable probability of failure during the 100-year flood, a dam break analysis should be submitted. The dam break analysis should provide consistent results, use empirical peak discharges from actual dam failures, require minimal input data, and perform river routing of the failure hydrograph by dynamic procedures, which includes attenuation and translation. The NFIP does not involve appraisal of dam safety adequacy; however, the FISs should include impacts of structures when subjected to 100-year flood hydrographs. Local, State, and/or Federal laws address dam safety features.

INSTRUCTIONS FOR COMPLETING THE ALLUVIAL FAN FLOODING FORM (FORM 12)

The purpose of this form is to assure that a structural flood control measure in areas subject to alluvial fan flooding is designed and/or constructed to provide protection from the 100-year flood, in compliance with 44 CFR Ch. I, Section 65.13 of the National Flood Insurance Program (NFIP) regulations, before it is recognized on a NFIP map. Please be aware that elevation of a parcel of land or a structure by fill or other means only, will not serve as a basis for removing areas subject to alluvial fan flooding from an area of special flood hazards. See Section 65.13 of the NFIP regulations. Complete engineering analyses must be submitted in support of each section of this form. In addition, it may be necessary to complete other forms relating to specific flood control measures, such as levees/floodwalls, channelization, or dams.

REGION I

(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont)

Federal Emergency Management Agency
Natural and Technological Hazards Division
J.W. McCormack Post Office and Courthouse Building, Room 462
Boston, Massachusetts 02109-4595

(617) 223-9559

REGION II

(New York, Puerto Rico, New Jersey, and Virgin Islands)

Federal Emergency Management Agency
Natural and Technological Hazards Division
26 Federal Plaza, Room 1337
New York, New York 10278-0002

(212) 225-7200

REGION III

(Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia)

Federal Emergency Management Agency
Natural and Technological Hazards Division
Liberty Square Building
(Second Floor)
105 South Seventh Street
Philadelphia, Pennsylvania 19106-3316

(215) 931-5750

Region IV

(Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee)

Federal Emergency Management Agency
Natural and Technological Hazards Division
1371 Peachtree Street, Northeast
Suite 700
Atlanta, Georgia 30309-3108

(404) 853-4418

REGION V

(Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin)

Federal Emergency Management Agency
Natural and Technological Hazards Division
175 West Jackson Boulevard
(Fourth Floor)
Chicago, Illinois 60604-2698

(312) 408-5533

REGION VI

(Arkansas, Louisiana, New Mexico, Oklahoma, and Texas)

Federal Emergency Management Agency
Natural Hazards Branch
Federal Regional Center
800 North Loop 288
Denton, Texas 76201-3698

(817) 898-5127

REGION VII

(Iowa, Kansas, Missouri, and Nebraska)

Federal Emergency Management Agency
Natural and Technological Hazards Division
Federal Office Building
911 Walnut Street, Room 200
Kansas City, Missouri 64106-2085

(816) 283-7021

REGION VIII

(Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming)

Federal Emergency Management Agency
Natural and Technological Hazards Division
Denver Federal Center, Building 710
Box 25267
Denver, Colorado 80225-0267

(303) 235-4830

REGION IX

(Arizona, California, Guam, Hawaii, and Nevada)

Federal Emergency Management Agency
Natural and Technological Hazards Division
Building 105
Presidio of San Francisco
San Francisco, California 94129-1250

(415) 923-7177

REGION X

(Alaska, Idaho, Oregon, and Washington)

Federal Emergency Management Agency
Natural and Technological Hazards Division
Federal Regional Center
130 228th Street, SW.
Bothell, Washington 98021-9796

(206) 487-4682

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Inquiries to FEMA Headquarters should be addressed to the Risk Studies Division at the following address:

Federal Emergency Management Agency
Federal Insurance Administration
Office of Risk Assessment
500 C Street, SW
Washington, D.C. 20472

(202)646-2767

ADWR-TDN
Suggested organization of information
for ADWR-TDN 9/21 Technical Documents
October 25, 1993

* *Title page - name of study and location, who prepared the documents with address, study requested by with address, FCD contract number, and professional registration seal.*

* *Table of Contents*
List of figures and tables
List of appendices

Introduction is structured to provide an overview of what is in the TDN final report.

* *Introduction*
A brief abstract to include: Purpose of study, authority for study, study approach, location of study reach, data collection, coordination, acknowledgments, summary of conclusions, other studies, previous delineations, previous hydrology analysis, historical studies, location of data (FCDMC), identification of special problems, other studies impacted.

* *Area studied*
A brief narrative description of the study area; township, range, section; map of the study area (8 1/2" x 11"); community description; historical and principal flooding problems; typical rainfall cycle; existing flood protection measures.

* *Community Rating Summary*
Community fact sheet. Community name; total area and length of the mapped flood hazard within the study area; number of habitable structures within the designated flood plain; flood zone determination.

** *ADWR general information form "study document abstract"*

Section 1: General Documentation & Correspondence

1.2 Contact (telephone) reports.
1.3 Meeting minutes or reports.
1.4 General Correspondence.
- 1.4.1 Community
- 1.4.2 State Coordination
- 1.4.3 Other Agencies
- 1.4.4 FEMA Regional Office
- 1.4.5 FEMA Washington
- 1.4.6 FEMA Technical Consultant
- 1.4.7 Copy of public notices

1.5 Contract Documents (Scope of Work, not financial documents).