Federal Emergency Management Agency

Washington, D.C. 20472

JAN 06 2004

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 03-08-0385P

Mr. Terry Harris
County Administrator
El Paso County
27 East Vermijo Avenue
Colorado Springs, CO 80903-2208

Community: El Paso County, CO
Community No.: 080059
Map Panel Affected: 08041C0575 F

116

Dear Mr. Harris:

In a Letter of Map Revision (LOMR) dated July 28, 2003, you were notified of proposed modified flood elevation determinations affecting the Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for the unincorporated areas El Paso County, Colorado. These determinations were for Unnamed Tributary to Black Squirrel Creek No. 2 –from approximately 200 feet upstream to approximately 4,300 feet upstream of Woodmen Road. The 90-day appeal period that was initiated on August 27, 2003, when the Department of Homeland Security's Federal Emergency Management Agency (FEMA) published a notice of proposed Base Flood Elevations (BFEs) in *El Paso County News*, has elapsed.

FEMA received no valid requests for changes to the modified BFEs. Therefore, the modified BFEs for your community became effective on November 26, 2003, remain valid and revise the FIRM and FIS that were in effect prior to that date.

The modifications are pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and are in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. The community number and suffix code are unaffected by this revision. The community number and appropriate suffix code as shown above will be used by the National Flood Insurance Program (NFIP) for all flood insurance policies and renewals issued for your community.

FEMA has developed criteria for floodplain management as required under the above-mentioned Acts of 1968 and 1973. To continue participation in the NFIP, your community must use the modified BFEs to carry out the floodplain management regulations for the NFIP. The modified BFEs will also be used to calculate the appropriate flood insurance premium rates for all new buildings and their contents and for the second layer of insurance on existing buildings and their contents.

If you have any questions regarding the necessary floodplain management measures for your community or the NFIP in general, please call the Director, Federal Insurance and Mitigation Division of FEMA in Denver, Colorado, at (303) 235-4830. If you have any questions regarding the LOMR, the proposed modified BFEs, or mapping issues in general, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness and Response Directorate

cc: Mr. Kevin Stilson, P.E., C.F.M.
Floodplain Administrator
Pikes Peak Regional Building Department

Mr. Richard N. Wray, P.E.
Kiowa Engineering Corporation

Federal Emergency Management Agency
Washington, D.C. 20472

---------- NOTICE TO RECIPIENTS ----------

New and Improved !

The Federal Emergency Management Agency (FEMA) is pleased to unveil the new Letter of Map Revision (LOMR) *Determination Document*. In the past the outcome of the LOMR was described in the body of the letter. This sometimes made it difficult to understand the outcome and identify the impacts. Improving the LOMR product is part of our ongoing Map Modernization efforts.

This attached LOMR utilizes the new LOMR *Determination Document.* It allows all users to quickly review and understand the outcome of the LOMR without reading through long narratives and provides for a consistent format for all LOMR determinations. In addition, this format allows FEMA to produce LOMRs more efficiently. Please be aware that even with this new product, the use of annotated Flood Insurance Rate Maps continues to be an important part of the LOMR *Determination Document*.

Like any other newly released product, we anticipate further enhancements as we receive feedback from our customers. If you have any questions, concerns, or suggestions, please direct them to Max Yuan of FEMA at (202) 646-3843, or you may submit your comments by e-mail at max.yuan@fema.gov.

Attachment

Federal Emergency Management Agency

Washington, D.C. 20472

JUL 28 2003

RECEIVED
JUL 31 2003
BY:

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Terry Harris
County Administrator
El Paso County
27 East Vermijo Avenue
Colorado Springs, CO 80903-2208

IN REPLY REFER TO:
Case No.: 03-08-0385P
Community Name: El Paso County, CO
Community No.: 080059
Effective Date of This Revision: NOV 26 2003

Dear Mr. Harris

The Flood Insurance Rate Map for your community has been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Federal Insurance and Mitigation Division of the Federal Emergency Management Agency (FEMA) in Denver, Colorado, at (303) 235-4830, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Kevin C. Long

Kevin C. Long, C.F.M., Project Engineer
Hazard Study Branch
Emergency Preparedness
and Response Directorate

For: Doug Bellomo, P.E., Acting Chief
Hazard Study Branch
Emergency Preparedness
and Response Directorate

List of Enclosures:
Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map

cc: Mr. Kevin Stilson, P.E., C.F.M.
Floodplain Administrator
Pikes Peak Regional Building Department

Mr. Richard N. Wray, P.E.
Kiowa Engineering Corporation

 | Issue Date: JUL 28 2003 | Effective Date: NOV 26 2003 | Case No.: 03-08-0385P | LOMR-APP

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	EL PASO COUNTY COLORADO (UNINCORPORATED AREAS) COMMUNITY NO.: 080059	NO PROJECT	HYDROLOGIC ANALYSIS HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA BASE MAP CHANGES
IDENTIFIER	West Tributary Falcon Basin Zone A Conversion	APPROXIMATE LATITUDE & LONGITUDE: 38.941, -104.619 SOURCE: USGS QUADRANGLE DATUM: NAD 27	
FLOODING SOURCE(S) & REVISED REACH(ES)	Unnamed Tributary to Black Squirrel Creek No. 2 – from approximately 200 feet upstream to approximately 4,300 feet upstream of Woodmen Road		

SUMMARY OF REVISIONS

Effective Flooding:	Zone A	No BFEs*
Revised Flooding:	Zone AE	BFEs*
Increases:	YES	YES
Decreases:	YES	NONE

* BFEs – Base Flood Elevations

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO: 08041C0575 F Date: March 17, 1997	PROFILE: 343P SUMMARY OF DISCHARGES TABLE

* FIRM – Flood Insurance Rate Map; ** FBFM – Flood Boundary and Floodway Map; *** FHBM – Flood Hazard Boundary Map

DETERMINATION

This document provides the determination from the Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., Acting Chief
Hazard Study Branch
Emergency Preparedness and Response Directorate

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

COMMUNITY REMINDERS

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information

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

Mr. Steve L. Olsen
Director, Federal Insurance and Mitigation Division
Federal Emergency Management Agency, Region VIII
Denver Federal Center, Building 710
P.O. Box 25267
Denver, CO 80225-0267
(303) 235-4830

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., Acting Chief
Hazard Study Branch
Emergency Preparedness and Response Directorate

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., Acting Chief
Hazard Study Branch
Emergency Preparedness and Response Directorate

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

Within 90 days of the second publication in the local newspaper, a citizen may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. Therefore, this letter will be effective only after the 90-day appeal period has elapsed and we have resolved any appeals that we receive during this appeal period. Until this LOMR is effective, the revised BFEs presented in this LOMR may be changed.

This information will be published in the *Federal Register* and your local newspaper as detailed below.

LOCAL NEWSPAPER Name: *El Paso County News*
Dates: 08/20/2003 08/27/2003

PUBLIC NOTIFICATION

FLOODING SOURCE	LOCATION OF REFERENCED ELEVATION	BFE (FEET NGVD)		MAP PANEL NUMBER(S)
		EFFECTIVE	REVISED	
Unnamed Tributary to Black Squirrel Creek No. 2	Approximately 200 feet upstream of Woodmen Road	None	6,895	08041C0575 F
	Approximately 4,300 feet upstream of Woodmen Road	None	6,967	08041C0575 F

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., Acting Chief
Hazard Study Branch
Emergency Preparedness and Response Directorate

CHANGES ARE MADE IN DETERMINATIONS OF BASE FLOOD ELEVATIONS FOR THE UNINCORPORATED AREAS OF EL PASO COUNTY, COLORADO, UNDER THE NATIONAL FLOOD INSURANCE PROGRAM

On March 17, 1997, the Federal Emergency Management Agency identified Special Flood Hazard Areas (SFHAs) in the unincorporated areas of El Paso County, Colorado, through issuance of a Flood Insurance Rate Map (FIRM). The Federal Insurance and Mitigation Administration has determined that modification of the elevations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) for certain locations in this community is appropriate. The modified Base Flood Elevations (BFEs) revise the FIRM for the community.

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

A hydraulic analysis was performed to incorporate new hydrologic and topographic data along an unnamed tributary to Black Squirrel Creek No. 2 from approximately 200 feet upstream to approximately 4,300 feet upstream of Woodmen Road. This has resulted in increases and decreases in SFHA width and establishment of BFEs for the unnamed tributary. The table below indicates existing and modified BFEs for selected locations along the affected lengths of the flooding source(s) cited above.

Location	Existing BFE (feet)*	Modified BFE (feet)*
Approximately 200 feet upstream of Woodmen Road	None	6,895
Approximately 4,300 feet upstream of Woodmen Road	None	6,967

*National Geodetic Vertical Datum, rounded to nearest whole foot

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

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

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

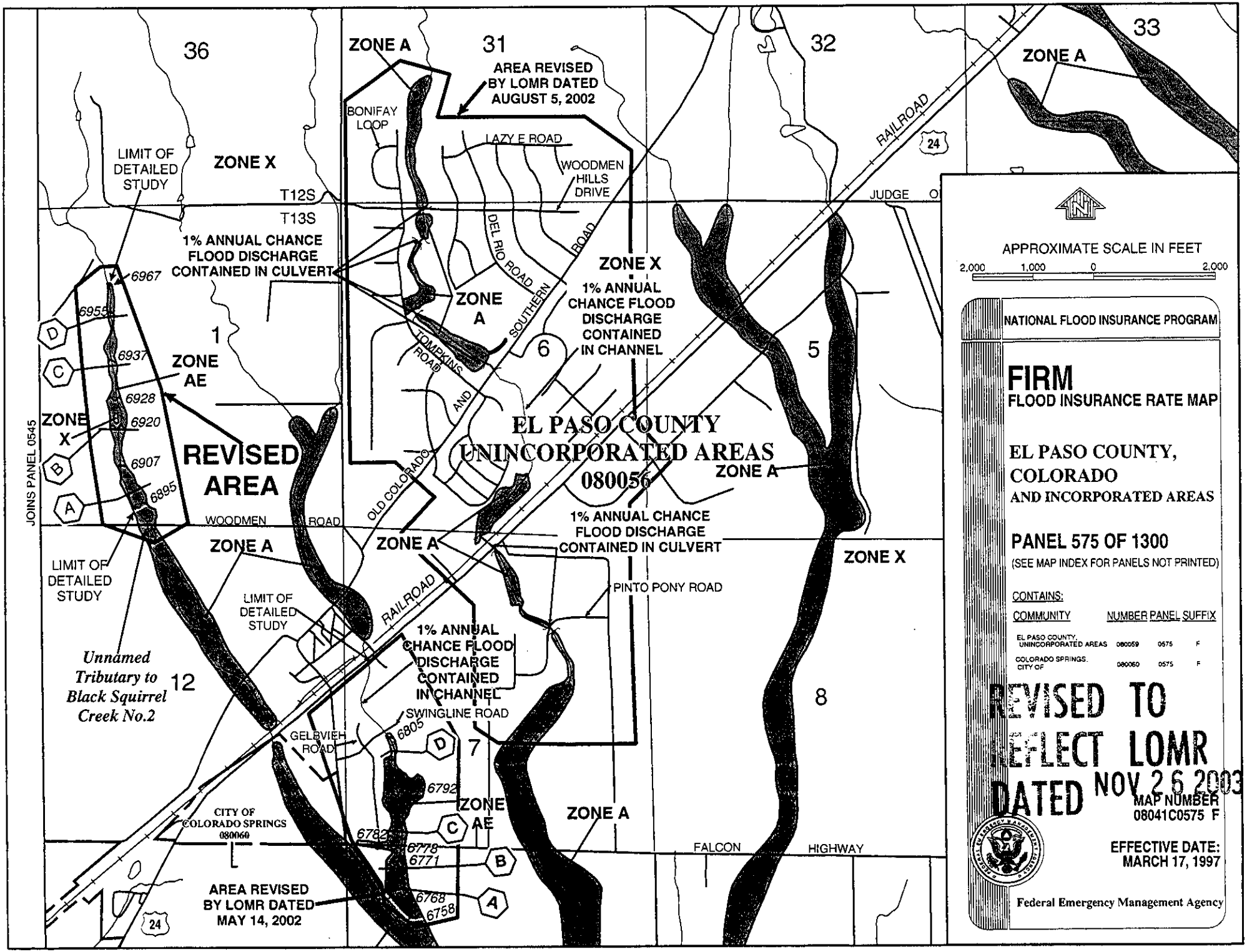
Mr. Terry Harris
County Administrator
El Paso County
27 East Vermijo Avenue
Colorado Springs, CO 80903-2208

Table 3. Summary of Discharges

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Year	50-Year	100-Year	500-Year
Unnamed Tributary to Black Squirrel Creek No. 2					
At Woodmen Road	3.23	__1	__1	1,482	__1

1Data Not Available

REVISED TO
REFLECT LOMR
DATED NOV 26 2003



APPROXIMATE SCALE IN FEET

2,000 1,000 0 2,000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 575 OF 1300

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0575	F
COLORADO SPRINGS, CITY OF	080060	0575	F

REVISED TO REFLECT LOMR DATED NOV 26 2003

MAP NUMBER
08041C0575 F

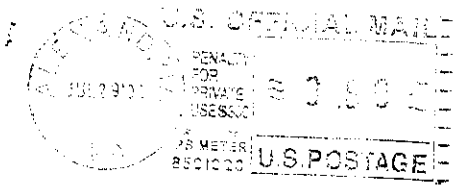
EFFECTIVE DATE:
MARCH 17, 1997

Federal Emergency Management Agency

IM-HM-HS (BAKER)

Federal Emergency Management Agency
500 C St., SW
Washington, D.C. 20472

Official Business

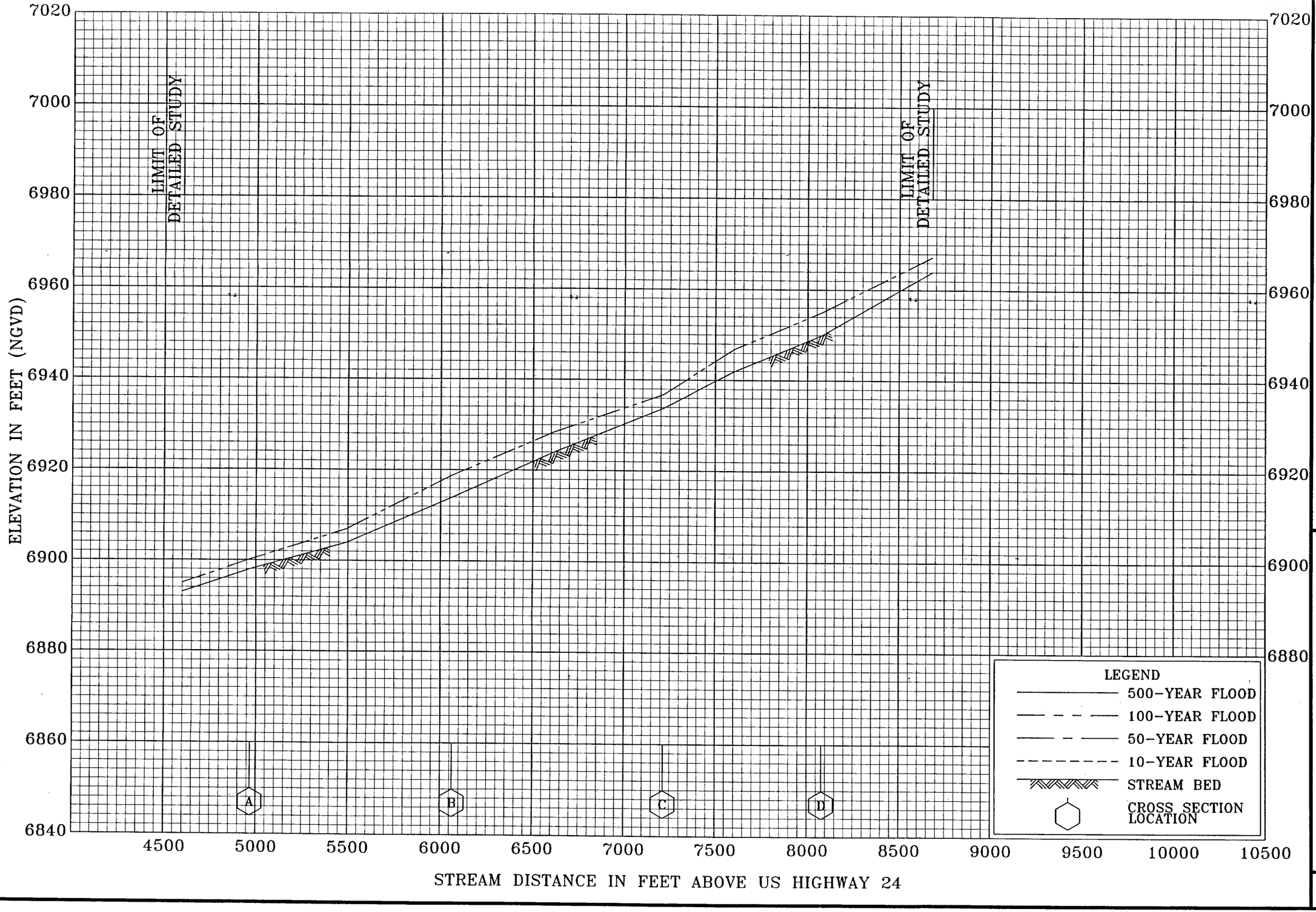


FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON, D.C. 20472

OFFICIAL BUSINESS

Mr. Kevin Stilson, P.E., C.F.M.
Floodplain Administrator
Pikes Peak Regional Building Department
101 West Costilla Street
Colorado Springs, CO 80903

Label - 6



FLOOD PROFILES

UNNAMED TRIBUTARY TO BLACK SQUIRREL CREEK NO.2

DATED NOV 26 2003

FEDERAL EMERGENCY MANAGEMENT AGENCY

EL PASO COUNTY, CO
AND INCORPORATED AREAS

NATIONAL FLOOD INSURANCE PROGRAM

FEMA MAP COORDINATION CONTRACTOR

May 1, 2003

Mr. Richard N. Wray, P.E.
Kiowa Engineering Corporation
1604 South 21st Street
Colorado Springs, CO 80904

IN REPLY REFER TO:
Case No.: 03-08-0385P
Community: El Paso County, CO
Community No.: 080059

316-ACK.FEX (RET)

Dear Mr. Wray:

This responds to your request dated April 21, 2003 that the Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) for El Paso County, Colorado and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	West Tributary Falcon Basin Zone A Conversion
Flooding Source:	Unnamed Tributary to Black Squirrel Creek
FIRM Panel(s) Affected:	08041C0575 F

As you may know, FEMA has implemented a procedure to recover costs associated with reviewing and processing requests for modifications to published flood information and maps. However, because your request based on flood hazard information meant to improve upon that shown on the flood map or within the flood study, and does not partially or wholly incorporate manmade modifications within the Special Flood Hazard Area, no fees will be assessed for our review.

With your request, you submitted a check in the amount of $4,500 to defray the cost of FEMA's review. Because no review and processing fees are required, we are returning your check with this letter.

We have completed an inventory of the items that you submitted. We have received all the data we require to begin a detailed technical review of your request. If additional data are required, we will inform you within 60 days of the date of this letter.

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

If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please call the Revisions Coordinator for your State, Kira L. Brooks, who may be reached at (703) 317-3067.

Sincerely,

Andrea L. Ryon

Andrea L. Ryon, P.E., Director
Engineering Division
Michael Baker Jr., Inc.

Enclosure

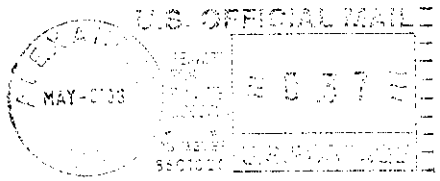
cc: Mr. Kevin Stilson, P.E.
Floodplain Administrator
Pikes Peak Regional Building Department

3601 Eisenhower Avenue, Alexandria, Virginia 22304-6425 PH: 703.960.8800 FX: 703.960.9125

MAMC-HS (BAKER)

Federal Emergency Management Agency
Washington, D.C. 20472

Official Business



Mr. Kevin Stilson, P.E.
Floodplain Administrator
Pikes Peak Regional Building Department
101 West Costilla Street
Colorado Springs, CO 80903

E-1

#0903+3801 02

Kiowa Engineering Corporation

Transmittal Letter

To: Kari Wilson, Reg. Floodplain — Date: 4/18/03

Project: Latigo Subdivision

Attention: — Kiowa Project Number: 03016

Enclosed please find:

Copies	Of
3	LOMR Submittals - West Tributary Falcon Basin.

- [x] Forwarded / [ ] Returned
- [ ] Call us for Pickup
- [ ] Prints
- [ ] Originals
- [x] Reports
- [ ] Diskette
- [ ] Reproducibles
- [ ] Specifications
- [ ] Shop Drawings
- [ ] For Approval
- [ ] As Requested
- [ ] For Your Use
- [ ] For Your Files
- [ ] For Review & Comment
- [x] Signature
- [ ] Mail
- [ ] Express Courier
- [ ] Electronic Transfer
- [x] Hand Carry
- [ ] Pick Up

Remarks:

Please return when signed & I will send to FEMA.

From: — CC:

TransmitCS.DOC

1604 South 21st Street Colorado Springs, Colorado 80904-4208
(719) 630-7342 (719) 630-0406 FAX www.kiowaengineeringcs.com

West Tributary Falcon Basin

Letter of Map Revision

Latigo Subdivision

El Paso County, Colorado

Prepared For:

Karl Andrews
Real Estate Investments and Development
102 East Pikes Peak Avenue Suite 200
Colorado Springs, CO 80903

Prepared By:

Kiowa Engineering Corporation
1604 South 21st Street
Colorado Springs, Colorado 80904

April 16, 2003
Project No. 03016

Kiowa Engineering Corporation

PROJECT DESCRIPTION

This Letter of Map Revision (LOMR) request has been prepared in conformance with Regional Floodplain Administrators Office and the Federal Emergency Management Agency (FEMA) guidelines and requirements. The flooding source is the West Tributary of the Falcon Basin. The West Tributary is currently depicted on the effective Flood Insurance Study FIRM panel as a Zone A flooding source. As such there are no base flood elevations, floodway or 500-year floodplain boundary that have been delineated. As stated in the El Paso County Subdivision Regulations as well as in the National Flood Insurance Program regulations, property that is proposed for development planning must restudy any Zone A boundary within the limits of the development using more detailed methods. It is this requirement that has resulted in the preparation of this Letter of Map Revision. The West Tributary is an unimproved natural watercourse that is presently not encroached by fill or structures. A limited detail study has been produced with this LOMR. As such only the base flood elevations, boundary and profile for the 100-year frequency was evaluated.

The portion of West Tributary of the Falcon Basin that is subject to this revision request is located north of Woodmen Road in what is known as the Falcon area of El Paso County. The location of the portion of the West Tributary is shown on Figure 1. The segment subject to this LOMR begins at the Centerline of Woodmen Road and ends at cross-section 9, approximately 4,280 feet north of Woodmen Road. This segment was studied using approximate methods by FEMA and are shown on FIRM panel 575F of the El Paso County Flood Insurance Study (FIS). The effective date of the FIS is March 17, 1997. No previous map revisions were found for this segment of the West Tributary. A limited detail hydraulic analysis was performed whereby the 100-year base flood elevations have been determined for the above described segment of the West Tributary.

Contained within this Letter of Map Revision request are the following materials:

1. Proposed effective HEC-2 model for the 100-year frequency, (Appendix A).
2. Hydrologic support information for the Falcon Basin, (Appendix B).
3. FEMA standard LOMR requestor forms, (Appendix C).
4. Proposed effective work maps at a scale of 1-inch to 100-feet and a 2-foot contour interval (Drawings PP1 and PP2, Appendix D).
5. Annotated effective FIRM panel 575F, (Exhibit 1, Appendix D)

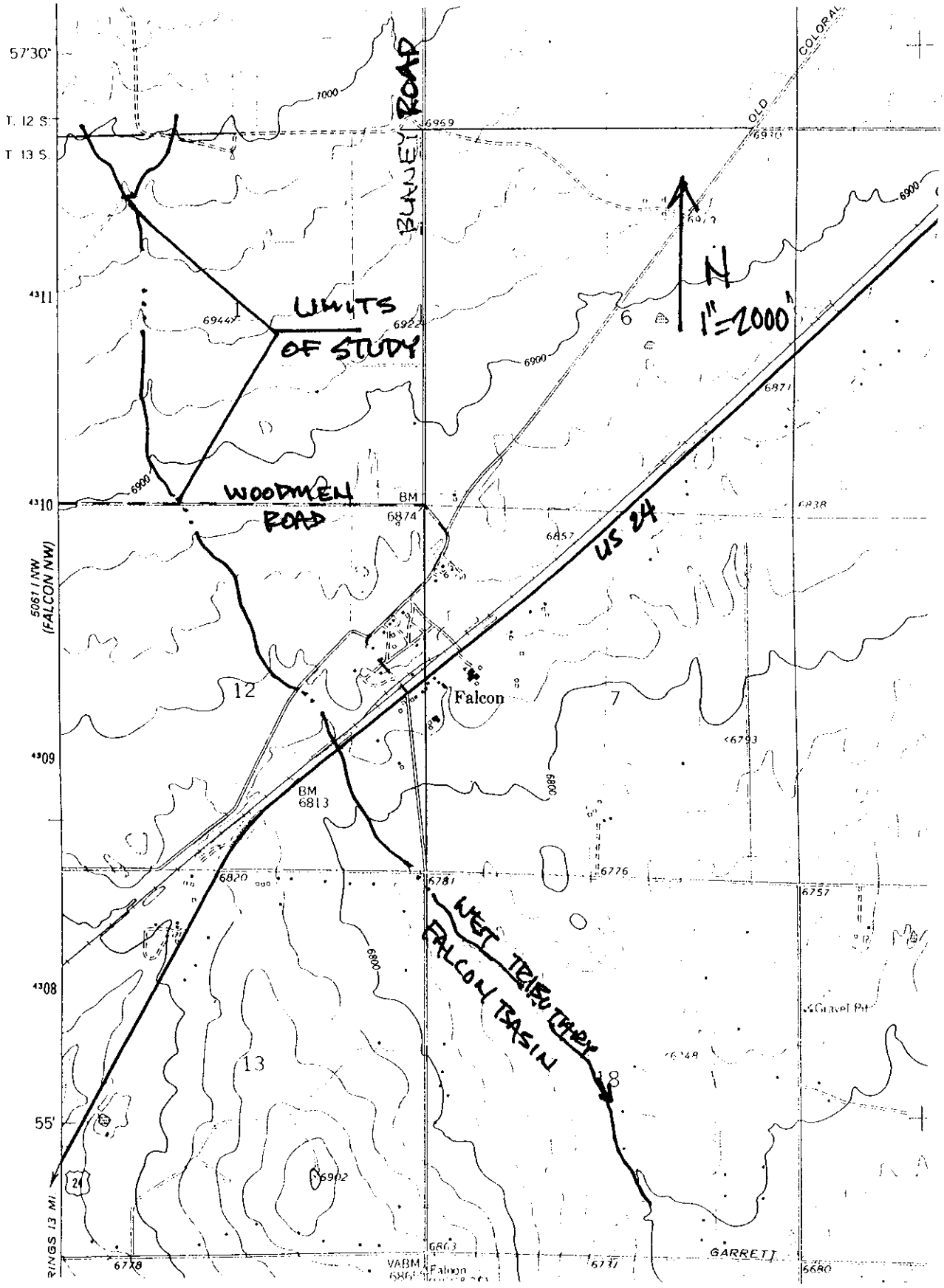


FIGURE 1: VICINITY MAP

Mapping

The work map for the West Tributary of the Falcon Basin was produced using topography that was compiled from aerial photography at a scale of one-inch to 200-feet and a contour interval of 2-feet in June 2001. There were no work maps available from FEMA for the Zone A boundary depicted on the effective FIRM panel. The topography used in the LOMR was complied using the National Geodetic Vertical Datum (NGVD) of 1929.

Hydrology

The 100-year peak discharge data used in the hydraulic analysis of the West Tributary was obtained from Falcon Basin Area Drainage Basin Planning Study (DBPS) prepared by URS, Inc. in December 2001. The DBPS was approved by El Paso County 2001 and is used in the drainage planning of areas that are anticipated to develop in the near future. The HEC-1 Flood Hydrograph package was utilized in the DBPS to determine the peak discharges have been summarized in the DBPS. At the downstream study limit of the West Tributary a 100-year peak discharge of 1,480 cubic feet per second was estimated in the DBPS. The 100-year discharge decreases to 1,450 cubic feet per second at cross-section 6 of the hydraulic analysis. The supporting information from the DBPS relevant to the hydrologic data has been incorporated into this report.

Hydraulics

The 100-year flood profile for the segment of West Tributary subject to the LOMR request was determined using the U. S. Army Corps of Engineers HEC-2 Water Surface Profile program. Cross-sectional data was obtained from the mapping described above. Roughness values were estimated using field observations in association with the City of Colorado Springs and El Paso County Storm Drainage Criteria Manual. Nine cross-sections were complied for the hydraulic analysis. The locations of the cross-sections have been shown on drawings PP1 and PP2 contained in Appendix D.

The hydraulic analysis was initialized using the slope area method. At most of the cross-sections within the hydraulic model a critical depth assumption was indicated. The assumption of critical depth was considered to yield a more conservative flood depth as compared to a super-critical depth that may be produced by recompiling the hydraulics using a super-critical model.

Floodplains

The 100-year floodplain boundaries and base flood elevations for the proposed effective condition is presented on drawings PP1 and PP2 contained within the map pockets within the report. Presented on Exhibit 1 is the Annotated FIRM panel showing the effective and proposed effective floodplain boundaries for the West Tributary above Woodmen Road.

APPENDIX A

WEST TRIBUTARY FALCON BASIN

HEC-2 WATER SURFACE PROFILE

LETTER OF MAP REVISION 100-YEAR MODEL

```
1*****************************************************
 *  WATER SURFACE PROFILES                           *
 *  VERSION OF SEPTEMBER 1988                        *
 *  ERROR: 01,02                                     *
 *  UPDATED:  4 APRIL    1989                        *
 *  RUN DATE     4/14/ 3   TIME   13: 5:15           *
 *****************************************************
```

```
*****************************************
* U.S. ARMY CORPS OF ENGINEERS          *
* THE HYDROLOGIC ENGINEERING CENTER     *
* 609 SECOND STREET, SUITE D            *
* DAVIS, CALIFORNIA 95616-4687          *
* (916) 756-1104, (916) 551-1748        *
*****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX     XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX  XXXXX               XXXXXXX
```

```
END OF BANNER
1
     4/14/ 3      13: 5:15                                                    PAGE    1
```

```
                                                    THIS RUN EXECUTED  4/14/ 3    13: 5:15

 ************************************************
   HEC2 RELEASE DATED SEP 88 UPDATED APR  1989


   ERROR CORR -  01,02
   MODIFICATION -
 ************************************************


 T1      WEST TRIBUTARY FALCON BASIN ZONE A CONVERSION
 T2      PROJECT NUMBER 03016  FILENAME WTRB100.DAT
 T3      100-YEAR FREQUENCY EX. COND XSEC L TO R FACING UPSTREAM

 J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

        0         3         0         0        .01         0         0         0      6895

 J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       1         0        -1

 JT        2        111       1482
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

```
 *PROF 1

 CCHV=      .100 CEHV=      .300
 *SECNO 1.000
      1.00      2.01  6895.01       .00  6895.00  6895.36       .35       .00       .00  6894.00
     1482.       164.      932.      386.       63.      166.      135.        0.        0.  6894.00
       .00      2.60      5.62      2.87      .050      .035      .050      .000  6893.00  1044.67
   .010134         0.        0.        0.         0         0         3       .00    358.18  1402.85
0
 *SECNO 2.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
      2.00      2.17  6900.17  6900.17       .00  6900.78       .61      3.75       .08  6900.00
     1482.          1.      1356.      125.         1.       209.       47.         2.         2.  6899.00
       .01       .67      6.50      2.65      .050      .035      .050      .000  6898.00  1070.96
   .013758       165.       367.       155.         2         8         0       .00    223.39  1294.36
0
 *SECNO 3.000
      3.00      3.00  6907.00  6906.98       .00  6907.92       .91      7.05       .09  6906.00
     1482.          2.      1467.       13.         1.       190.         6.         5.         4.  6906.00
       .03      1.99      7.71      2.14      .050      .035      .050      .000  6904.00  1108.00
   .013101       525.       525.       522.         7        11         0       .00    109.52  1217.52
0
 *SECNO 4.000
 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
      4.00      4.85  6918.85  6918.85       .00  6919.51       .66      5.35       .03  6918.00
     1482.       432.       778.       273.       161.        92.        69.         8.         6.  6916.00
       .06      2.67      8.46      3.96      .050      .035      .050      .000  6914.00  1051.59
   .008404       560.       571.       515.        20        14         0       .00    262.89  1314.48
0
 *SECNO 5.000

 3265 DIVIDED FLOW

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
1
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
5.00	4.41	6928.41	6928.41	.00	6929.39	.98	4.40	.10	6926.00
1482.	133.	1297.	52.	51.	154.	20.	12.	9.	6926.00
.08	2.60	8.45	2.52	.050	.035	.050	.000	6924.00	1043.67
.007746	535.	551.	535.	20	11	0	.00	156.96	1235.91

0
*SECNO 6.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

6.00	2.97	6936.77	6936.77	.00	6937.76	.99	6.74	.00	6936.00
1450.	2.	860.	588.	1.	100.	83.	14.	10.	6935.80
.10	2.09	8.56	7.10	.050	.035	.050	.000	6933.80	1011.32
.018718	560.	600.	565.	10	19	0	.00	100.01	1111.32

0
*SECNO 7.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

7.00	4.87	6946.87	6946.87	.00	6947.76	.89	4.35	.01	6946.00
1450.	77.	1353.	20.	52.	173.	13.	16.	12.	6946.00
.11	1.48	7.83	1.48	.050	.035	.050	.000	6942.00	1245.22
.007498	370.	390.	375.	10	14	0	.00	205.26	1450.49

0
*SECNO 8.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

8.00	5.02	6955.02	6955.02	.00	6956.13	1.11	4.10	.07	6954.00
1450.	46.	1390.	15.	24.	161.	6.	18.	13.	6954.00
.13	1.90	8.63	1.89	.050	.035	.050	.000	6950.00	1272.54
.010031	470.	470.	470.	20	8	0	.00	117.72	1390.26

0
*SECNO 9.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

9.00	3.28	6967.28	6967.28	.00	6968.43	1.15	7.05	.01	6966.00
1450.	10.	1016.	424.	4.	106.	72.	21.	15.	6964.00
.15	2.56	9.57	5.36	.050	.035	.050	.000	6964.00	1103.61
.013882	530.	600.	620.	10	14	0	.00	82.77	1186.39

0
1

****

THIS RUN EXECUTED 4/14/ 3 13: 5:15

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01,02
MODIFICATION -
****

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

100-YEAR FREQUENCY EX. C

SUMMARY PRINTOUT TABLE 150

STA

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
321	1.000	.00	.00	.00	6893.00	1482.00	6895.01	.00	6895.36	101.34	5.62	363.62	147.22
571	2.000	367.00	.00	.00	6898.00	1482.00	6900.17	6900.17	6900.78	137.58	6.50	256.72	126.35
1099	3.000	525.00	.00	.00	6904.00	1482.00	6907.00	6906.98	6907.92	131.01	7.71	197.41	129.48
1670	4.000	571.00	.00	.00	6914.00	1482.00	6918.85	6918.85	6919.51	84.04	8.46	322.19	161.66
2221	5.000	551.00	.00	.00	6924.00	1482.00	6928.41	6928.41	6929.39	77.46	8.45	225.25	168.39
2821	6.000	600.00	.00	.00	6933.80	1450.00	6936.77	6936.77	6937.76	187.18	8.56	184.32	106.09
3241	7.000	390.00	.00	.00	6942.00	1450.00	6946.87	6946.87	6947.76	74.98	7.83	238.36	167.45
3681	8.000	470.00	.00	.00	6950.00	1450.00	6955.02	6955.02	6956.13	100.31	8.63	192.84	144.78
4280	9.000	600.00	.00	.00	6964.00	1450.00	6967.28	6967.28	6968.43	138.82	9.57	182.57	123.07

1

100-YEAR FREQUENCY EX. C

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	1.000	1482.00	6895.01	.00	.00	.01	358.19	.00
*	2.000	1482.00	6900.17	.00	5.16	.00	223.39	367.00
	3.000	1482.00	6907.00	.00	6.83	.00	109.52	525.00

*	4.000	1482.00	6918.85	.00	11.85	.00	262.89	571.00
*	5.000	1482.00	6928.41	.00	9.56	.00	156.96	551.00
*	6.000	1450.00	6936.77	.00	8.35	.00	100.01	600.00
*	7.000	1450.00	6946.87	.00	10.10	.00	205.26	390.00
*	8.000	1450.00	6955.02	.00	8.15	.00	117.72	470.00
*	9.000	1450.00	6967.28	.00	12.26	.00	82.77	600.00

1

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 2.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 4.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 4.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 4.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 5.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 5.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 5.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 6.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 6.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 7.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 7.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 8.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 8.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 8.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 9.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 9.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

APPENDIX B

WEST TRIBUTARY FALCON BASIN

HEC-1 HYDROGRAPH MODEL

HYDROLOGIC ANALYSIS SUPPORT INFORMATION

FALCON AREA
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN REPORT

Prepared for:

El Paso County
Department of Transportation
3460 N. Marksheffel Road
Colorado Springs, CO 80922

Prepared By:

URS
8415 Explorer Drive
Suite 110
Colorado Springs, CO 80920

URS Project No. 67-00042284

December 15, 2000

II. STUDY AREA DESCRIPTION

The Falcon Drainage Basin is a tributary to Black Squirrel Creek, which in turn is ultimately tributary to the Arkansas River. The Falcon Basin lies in the central portion of El Paso County; its area at the downstream limit of the study is approximately 10 square miles. The basin is divided into three major sub-basins: the Falcon west, middle, and east subtributaries. Figure II-1 shows the location of the Falcon Basin.

Basin Description

The Falcon Basin covers a total of 10.3 square miles in unincorporated El Paso County, Colorado. Of this total, the West Tributary encompasses approximately 5.8 square miles, the Middle Tributary 2.0 square miles, and the East Tributary 2.5 square miles. The basin trends in generally a south to southeasterly direction. At this time, approximately 30 percent of the basin is developed. Much of this existing development consists of 5 Ac and larger agricultural parcels south of US Hwy 24. Higher density residential developments such as Paint Brush Hills and Woodmen Hills are underway in the northern portions of the east and middle tributaries.

The maximum basin elevation is approximately 7,494 feet above mean sea level, and falls to approximately 6,610 feet at the downstream limit of the study. The headwaters of the West Tributary originate in the conifer-covered areas of The Black Forest. The remainder of the basin is typified by rolling rangeland with fair to good vegetative cover associated with semi-arid climates.

Climate

This area of El Paso County can be described, in general, as high plains, with total precipitation amounts typical of a semi-arid region. Winters are generally cold and dry. Average precipitation ranges from 14 to 16 inches per year, with the majority of this precipitation occurring in spring and summer in the form of rainfall. Thunderstorms are common during the summer months, and are typified by quick-moving low-pressure cells, which draw moisture from the Gulf of Mexico into the region. Average temperature ranges from about 30°F in the winter to 75°F in the summer. The relative humidity ranges from 25 percent in the summer to 45 percent in the winter.

Soils and Geology

Soils within the Falcon Basin vary between soil types A through D, as identified by the U. S. Department of Agriculture, Soil Conservation Service, but are predominantly A and B. The predominant soil groupings are in the Truckton and Bresser soil associations. The soils consist of deep, well-drained soils that formed in alluvium and residium, derived from sedimentary rock. The soils have high to moderate infiltration rates, and are extremely susceptible to wind and water erosion where poor vegetation cover exists. In undeveloped areas, the predominance of Type A and B soils give this basin a lower runoff per unit area as compared to basins with soils dominated by Types C and D. Presented on Figure II-2 is the Hydrologic Soil distribution map for the Falcon Basin.

Property Ownership and Impervious Land Densities

Property ownership along the major drainageways within the Falcon Basin varies from public to private. Along the more recently developed reaches, drainage right-of-ways and greenbelts have been dedicated during the development of the adjacent residential and commercial land. However, there are no drainage right-of-ways or easements through most of the basin south of US Hwy 24. As mentioned above, most of this area is already developed as 5 Ac or larger residential and agricultural lots. The drainageways remain under private ownership with no delineated drainage right-of-way or easements. A drainage easement or right-of-way must be granted to the County in order for DOT to perform the recommended improvements.

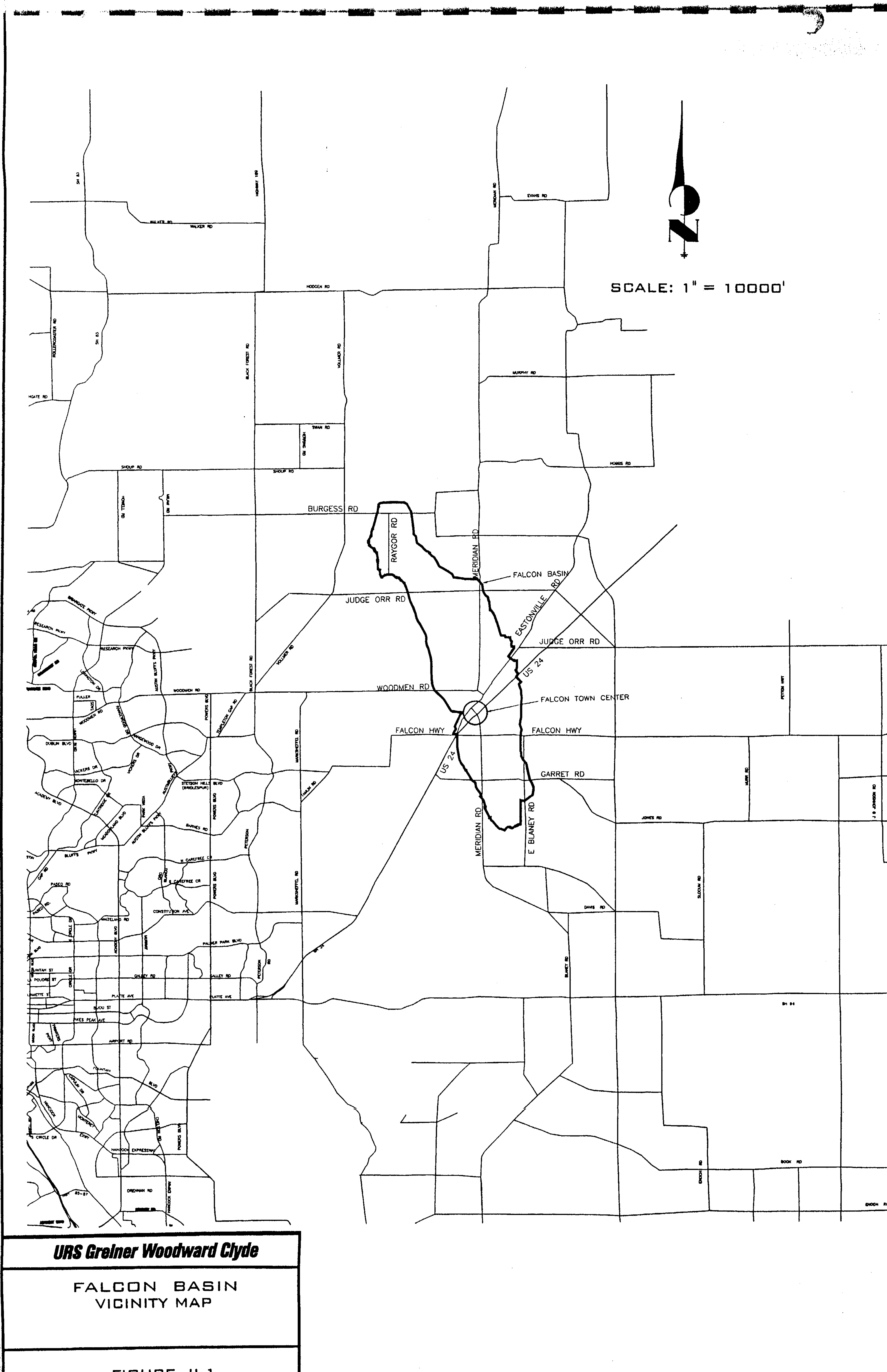
There is one County park, which abuts the Middle Tributary north of SH 24, and there is a trail system and open space allotment adjacent to the East Tributary throughout Woodmen Hills subdivision. Roadway and utility easements abutting or crossing the major drainageways occur most frequently in the developed portions of the basin.

Land use information for the existing and future conditions were reviewed with El Paso County Planning Department as part of the planning effort. This information is used in the hydrologic analysis to predict runoff rates and volumes for the purposes of facility evaluation. The identification of land uses abutting the drainageways is also useful in the identification of feasible plans for stabilization and aesthetic treatment of the creek. Presented on Figure II-3 is the proposed land use map used in the evaluation of impervious land densities discussed in the hydrologic section of this report. Figure II-3 is not intended to reflect the future zoning or land use policies of the County.

The locations of roadways were obtained from the El Paso County Major Transportation Plan dated 1988.

Park Land and Open Space

In many cases, the combination of a drainageway and adjacent parklands can be used to visually extend the limits of a park or open space. The drainageway can also act to link parks and other land uses within the basin if multiple use trails are incorporated into the channel section(s). As an example, the East Tributary of the Falcon Basin drainageway has been developed as a major trail corridor through Woodmen Hills as a private extension from the El Paso County Rock Island Trail System.



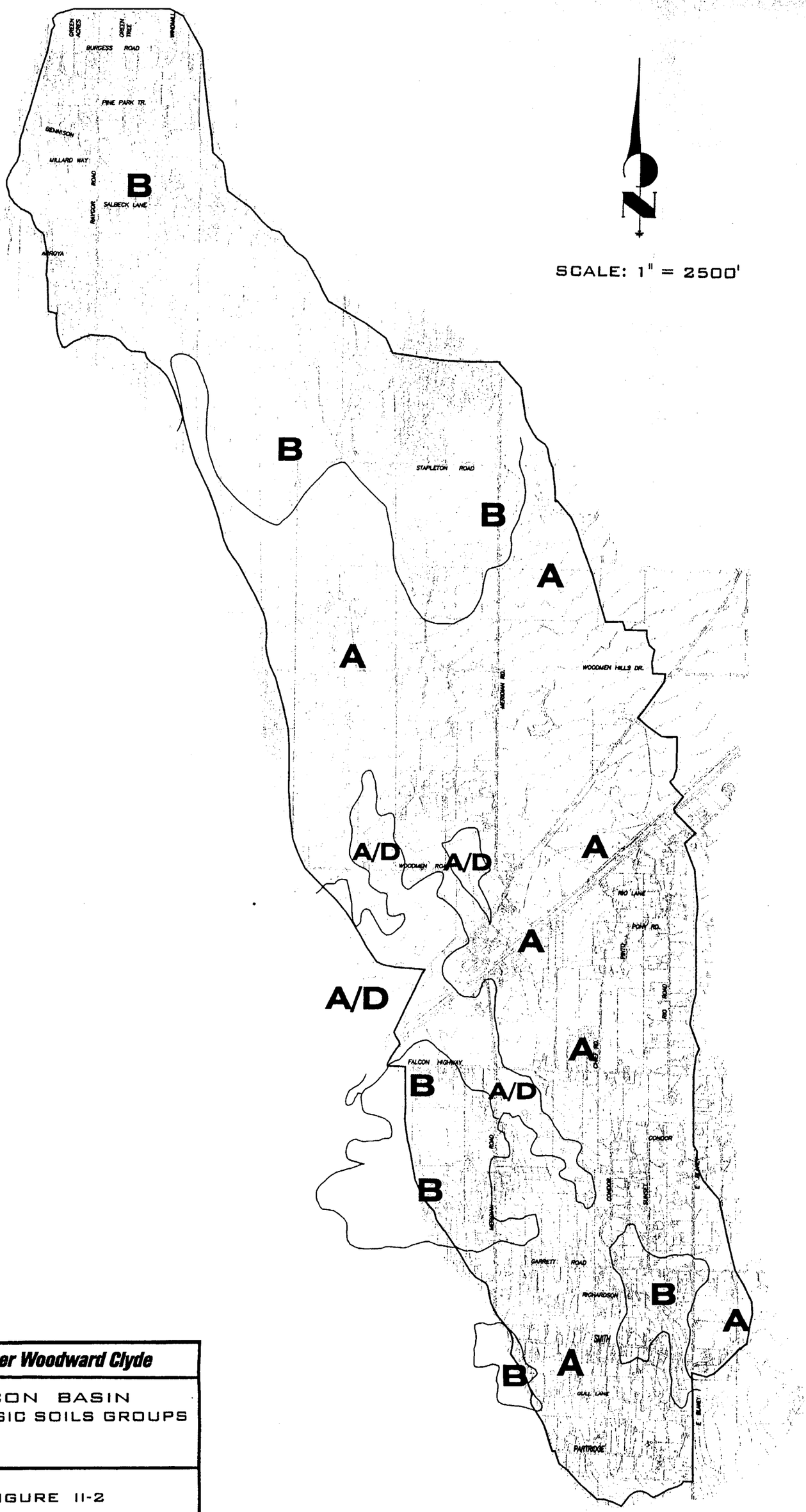
URS Greiner Woodward Clyde

FALCON BASIN
VICINITY MAP

FIGURE II-1

JOB NO. 6742284

DATE: 1-21-00

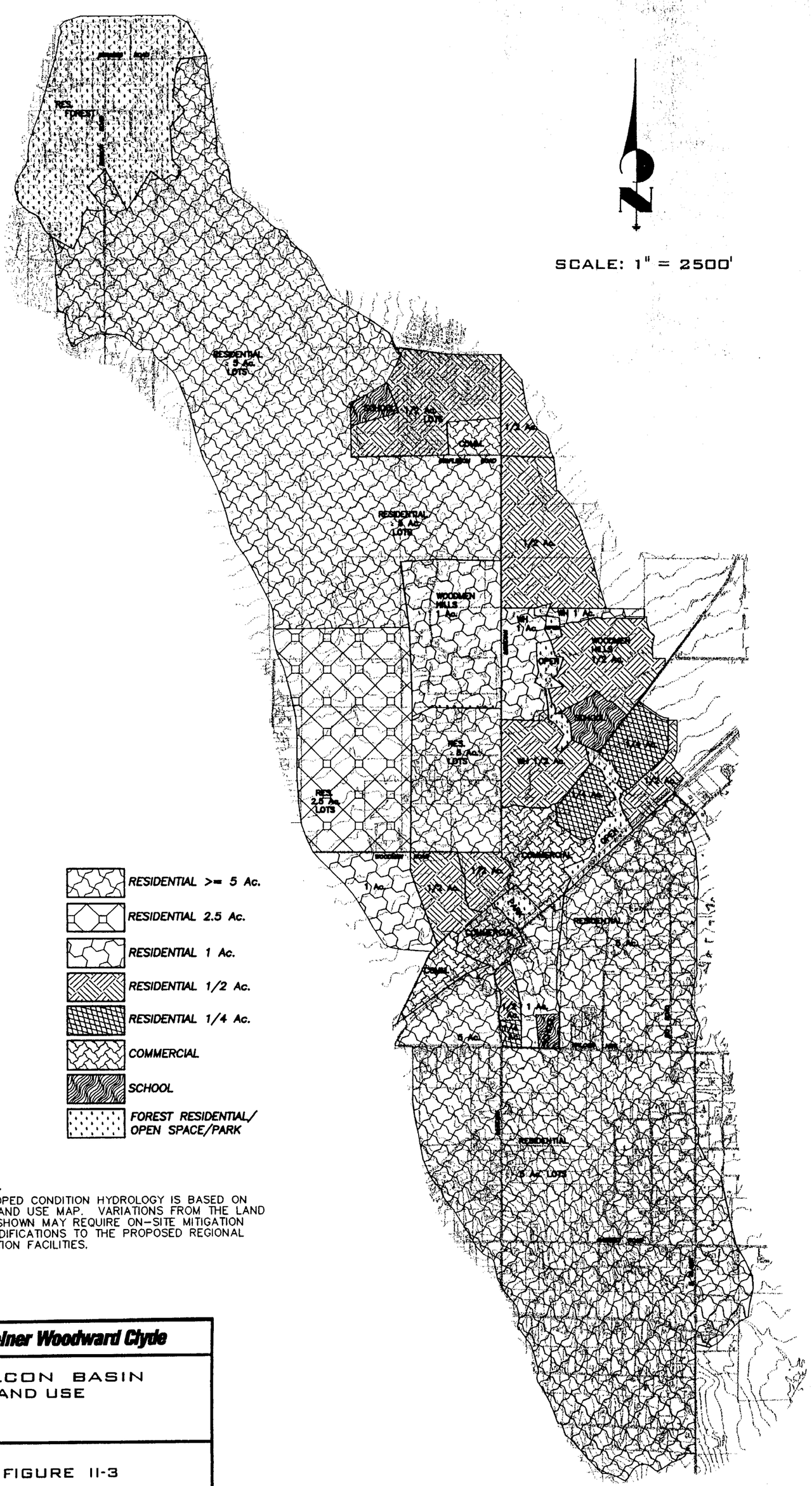


URS Greiner Woodward Clyde

FALCON BASIN
HYDROLOGIC SOILS GROUPS

FIGURE II-2

JOB NO. 6742284 DATE: 1-21-00



NOTE:

DEVELOPED CONDITION HYDROLOGY IS BASED ON THIS LAND USE MAP. VARIATIONS FROM THE LAND USES SHOWN MAY REQUIRE ON-SITE MITIGATION OR MODIFICATIONS TO THE PROPOSED REGIONAL DETENTION FACILITIES.

URS Greiner Woodward Clyde

FALCON BASIN
LAND USE

FIGURE II-3

JOB NO. 6742284 DATE: 1-21-00

III. HYDROLOGIC ANALYSIS

A hydrologic analysis was conducted in order to determine peak discharges and runoff volumes for various storm types, and basin development conditions. This data was used in the evaluation of existing flood problems, and in the evaluation of alternative plans. Detailed information with respect to the hydrologic analysis is contained within this study in Appendix A. The hydrology information contained within these reports was reviewed by the County and the Federal Emergency Management Agency (FEMA).

Based on FEMA guidelines for hydrologic modeling and floodplain mapping, the detention capacity of existing stock ponds with unimproved (and often unmaintained) spillways was *not* included in the calculations. Neither were these ponds accounted for in the developed condition hydraulic model Several of these ponds are flooding hazards for both the property owner and neighbors. From an engineering design and practical maintenance point of view, this report recommends that the majority of these private stock ponds be removed. However this report does not attempt to address surface water rights or other legal issues. Improving existing spillways, and granting access easements to the County for inspection purposes are absolute minimum recommendations for keeping these ponds in place.

Runoff Model

The runoff model used to determine the peak flows and volumes within the study area is the US Army Corps of Engineers Flood Hydrograph Package HEC-1. The version is available for the IBM personal computer (PC) or a compatible PC. The use of this hydrological model is in compliance with the City of Colorado Springs/E1 Paso County Drainage Criteria Manual.

Basin Characteristics

The study area subject to the hydrologic evaluation is the Falcon Basin. The Falcon Basin was divided into three regional basins for analysis purposes namely the East Tributary (ET), Middle Tributary (MT), and West Tributary (WT). The major regional basins are shown in Figure III-1.

Basin characteristics such as size, curve numbers (CN-values), basin slope, soils flow path, time of concentration (Tc), channel type, slope and size, channel routing coefficient "X" and "M" values, and velocity were estimated. These parameters were determined from 1998 aerial topography, land use and soils maps, and field investigation. Basin characteristic summary tables and HEC 1 computer input and output are contained within this report in Appendix A.

Previous Studies

Various floodplain and Final Drainage Reports have been prepared for areas within the Falcon Basin. These reports include Final Drainage Reports for Woodmen Hills Filings 1 through 7 and a Final Drainage Report for Paint Brush Hills. These reports are all on file with El Paso County Department of Transportation. The Woodmen Hills development has prepared a CLOMR for a limited section of the East Tributary. This CLOMR was accepted by FEMA on February 2, 1999 under Case No. 99-08-053R. A LOMR for this same stretch will be filed upon completion of proposed improvements. Results of the CLOMR are shown in this study.

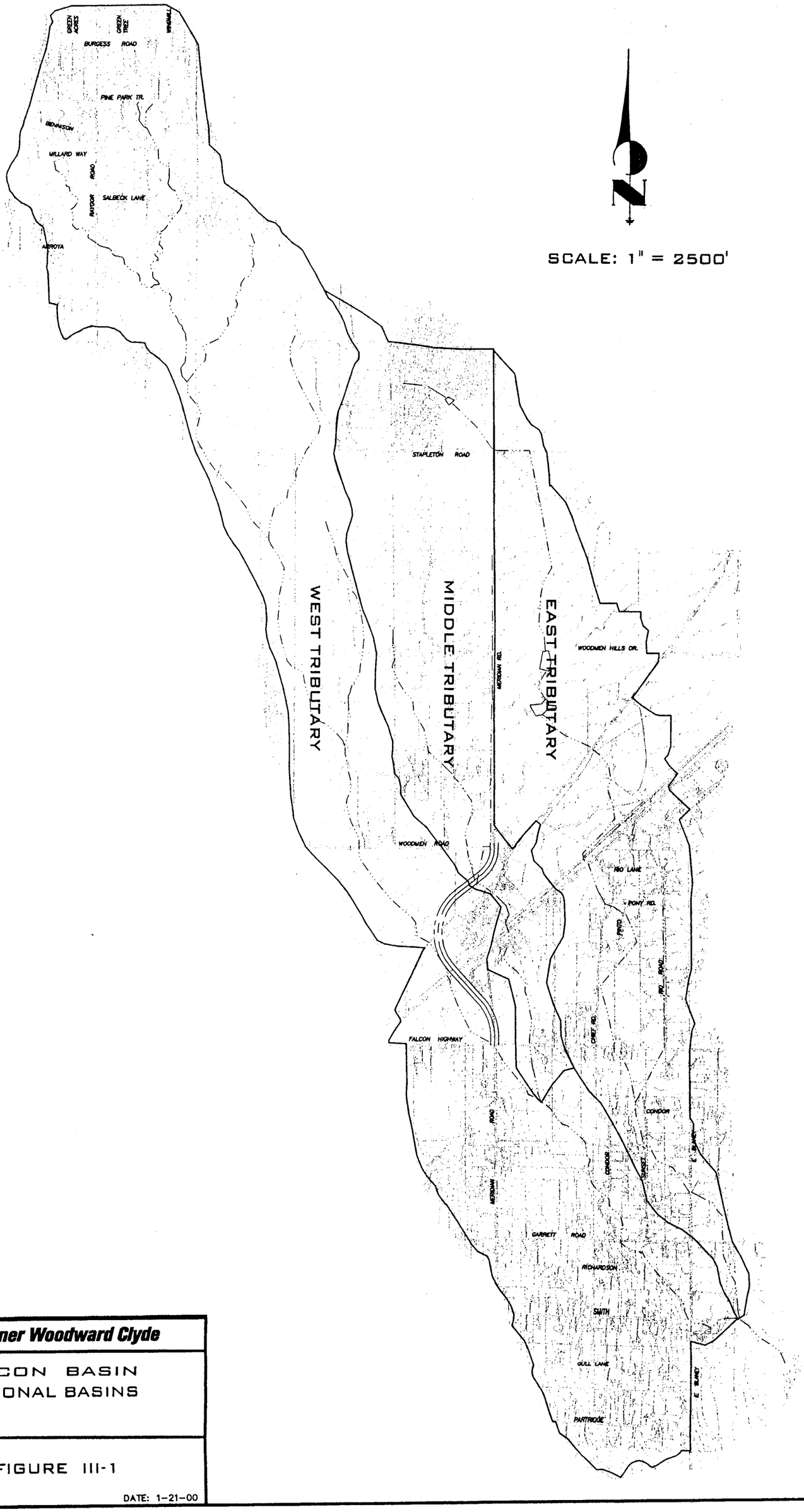
Impervious Land Density

Land uses for existing and future basin conditions were determined using a combination of zoning maps, City/County Comprehensive Plan(s), aerial photographs, transportation plan(s), and other related land use documents. Land use density and corresponding curve numbers were determined in accordance with the City/County Drainage Criteria Manual. Presented on Figure II-3 are the proposed land uses assumed for hydrologic modeling purposes. Table III-1 shows the percent of imperviousness assigned for each of the land use categories presented on Figure II-3. Soil Conservation Service (SCS) curve numbers for both the existing and future conditions for the East Tributary, Middle Tributary and the West Tributary of Falcon Basin are presented in Appendix A.

The Falcon Basin has been experiencing dynamic growth, and proposed land uses are continually changing. In the event that proposed land uses vary from those shown on Figure II-3, the impact of any increased imperviousness should be carefully evaluated. On-site mitigation, or modification to the proposed Regional Detention Facilities are potential alternatives which may be deemed necessary to avoid negative impacts to existing and proposed downstream facilities.

Design Rainfall

In accordance with the City/County Drainage Criteria Manual the 24-hour Type II-A storm with an antecedent moisture condition (AMC) of II was applied in the hydrologic modeling. The 24-hour duration storm events for the 5-year and 100-year recurrence intervals were evaluated. Rainfall depths are 4.4 and 2.6 inches for the 100-year and 5-year frequencies, respectively. For smaller basins (i.e., less than 100 acres), the 2-hour duration storm with an antecedent moisture condition may yield a higher peak runoff. **The final design of drainageway and storm sewer systems will require that the most applicable storm pattern be applied, depending upon the specific basin characteristics.** For basins the size of Falcon Basin, it was determined that the 24-hour duration should be used in the estimation of peak discharges.



URS Greiner Woodward Clyde

FALCON BASIN
REGIONAL BASINS

FIGURE III-1

JOB NO. 6742284

DATE: 1-21-00

Table III-1
Percent Imperviousness for Designated Land Uses

Land Use Description	CN	% Impervious
Forest	60	0%
Residential Forest	62	15%
Open Space (Rangeland)	60	0%
Residential ≥5Ac	62.5	18%
Residential 1 Ac	64	20%
Residential 1/2 Ac	69	25%
Residential 1/4 Ac	75	38%
Multi-Family Residential	84	65%
School	68	24%
Park	65	21%
Industrial	90	85%
Commercial	92	95%

TABLE III-2
FALCON BASIN DBPS HEC-1 RESULTS: DESIGN POINTS

DESIGN POINT	CALCULATED FLOWS (cfs) EXISTING CONDITIONS 5-Year	EXISTING CONDITIONS 100-Year	DEVELOPED COND'N NO DETENTION* 5-Year	DEVELOPED COND'N NO DETENTION* 100-Year	PROPOSED DESIGN REGIONAL DETN 5-Year	PROPOSED DESIGN REGIONAL DETN 100-Year	DESIGN POINT
West Tributary							**West Tributary**
WA	7	57	10	65	10	65	WA
WB	10	95	15	106	15	106	WB
WC	11	105	16	118	16	118	WC
WD	7	60	10	69	10	69	WD
WE	14	114	20	130	20	130	WE
WF	29	265	41	295	41	295	WF
WG	41	398	60	457	60	457	WG
WH	41	415	61	478	61	478	WH
WI	5	38	7	43	7	43	WI
WJ	9	69	10	74	10	74	WJ
WK	15	162	20	182	20	182	WK
WL	15	162	20	182	20	182	WL
WM	57	681	87	782	87	782	WM
WN	61	724	90	851	90	851	WN
WO	20	127	20	127	20	127	WO
WP	77	956	113	1128	113	1128	WP
WP1	79	977	112	1151	112	1151	WP1
WP2	17	196	34	243	34	243	WP2
WQ	95	1287	138	1438	138	1438	WQ
WQ1	98	1287	141	1467	141	1467	WQ1
WR	108	1450	155	1620	155	1620	WR
WS	111	1482	162	1623	162	1623	WS
WT	118	1514	175	1749	175	1749	WT
WU	118	1518	176	1734	176	1734	WU
POND WU					70	1186	POND WU
WV	124	1523	251	1732	113	1197	WV
WW	125	1533	273	1762	133	1216	WW
WX	161	2150	343	2449	212	1735	WX
WZ	165	2166	383	2485	249	1756	WZ
WAB	166	2170	378	2497	251	1763	WAB
WAC	165	2167	369	2502	243	1765	WAC
WAD	15	92	15	92	15	92	WAD
WAE	167	2173	375	2515	245	1772	WAE
WAF	168	2142	383	2528	255	1769	WAF
WAG*	80	823					WAG*
WAH	28	207	41	237	41	237	WAH
WAI	50	406	61	430	61	430	WAI
WAJ	220	2921	435	2669	307	1847	WAJ

TABLE III-2
FALCON BASIN DBPS HEC-1 RESULTS: DESIGN POINTS

DESIGN POINT	CALCULATED FLOWS (cfs) EXISTING CONDITIONS 5-Year	EXISTING CONDITIONS 100-Year	DEVELOPED COND'N NO DETENTION* 5-Year	DEVELOPED COND'N NO DETENTION* 100-Year	PROPOSED DESIGN REGIONAL DETN 5-Year	PROPOSED DESIGN REGIONAL DETN 100-Year	DESIGN POINT
Middle Tributary							**Middle Tributary**
MB	9	70	9	70	9	70	MB
MC	11	105	11	105	11	105	MC
MD	25	174	111	396	111	396	MD
PondMD					12	167	PondMD
ME	18	91	63	160	63	160	ME
MF	56	400	33	188	33	188	MF
MG	30	176	30	176	30	176	MG
Pond W	9	16	9	86	9	86	Pond W
MH	62	399	36	232	36	232	MH
DIVRT1	58	85			--	--	DIVRT1
MI	18	382	46	311	46	311	MI
MJ	20	394	48	327	48	327	MJ
MK	23	192	55	285	55	285	MK
ML	23	204	56	298	56	298	ML
MM	23	216	58	322	58	322	MM
MN	38	666	115	752	115	752	MN
POND MN					32	564	POND MN
MO	39	666	115	770	34	562	MO
Pond 5	--	--	6	39	6	39	Pond 5
MP	40	677	119	799	39	597	MP
MQ	40	677	117	795	39	597	MQ
MR	47	733	127	903	53	642	MR
East Tributary							**East Tributary**
E1IN	--	--	183	569	17	173	E1IN
EA	13	143	220	741	61	242	EA
EB	15	179	225	789	70	317	EB
Pond 1	2	99	38	346	10	132	Pond 1
EC	60	182	41	357	21	140	EC
Pond 2	6	93	14	153	6	83	Pond 2
ED1	10	121	67	285	80	337	ED1
ED	15	172	78	348	92	401	ED
Pond 3	--	--	15	168	15	134	Pond 3
EE	18	193	48	175	48	175	EE
EF	19	205	55	217	55	222	EF
EG1	10	89	120	328	120	328	EG1
EG	38	402	256	779	257	844	EG
Pond 4	--	--	32	281	38	336	Pond 4
EH	39	416	32	286	38	340	EH
EI	11	63	11	63	11	63	EI
EJ1	40	412	33	291	39	346	EJ1
EJ2	22	132	22	132	22	132	EJ2
EK	38	297	23	175	23	175	EK
EL	45	518	39	366	45	412	EL
EM	80	843	55	545	59	576	EM
EN	76	831	56	550	60	579	EN
EO	79	822	64	631	68	657	EO
EP*	80	823	66	642	69	672	EP*
EZ	7	67	67	645	70	671	EZ
CONFLUENCE							**CONFLUENCE**
ZZ	222	2935	458	3303	328	2367	ZZ

* NOTE: DP EP moves east approx 900 ft in proposed model.
WAG in proposed model is same location as EP in existing model.

APPENDIX B:
Existing Condition Hydrology
Input Data and HEC-1 Model

FALCON BASIN DBPS
HEC-1 BASE DATA: EXISTING CONDITIONS

BASIN No.	AREA (Ac)	AREA[1] (sq. mi.)	AVG CN[4]	UD[7] (hr)	CALCULATED FLOWS EXISTING CONDITION 5-Year	100-Year	BASIN No.
WEST TRIBUTARY							
W-1	30.67	0.0479	60	0.097	5	40	W-1
W-2	17.80	0.0278	60	0.160	2	20	W-2
W-3	31.86	0.0498	61	0.139	5	39	W-3
W-4	3.45	0.0054	62	0.044	1	6	W-4
W-5	10.19	0.0159	60	0.075	2	15	W-5
W-6	31.11	0.0486	60	0.085	5	43	W-6
W-7	13.90	0.0217	60	0.074	2	20	W-7
W-8	18.29	0.0286	60	0.069	3	27	W-8
W-9	25.76	0.0402	61	0.097	5	36	W-9
W-10	27.60	0.0431	61	0.096	5	39	W-10
W-11	20.13	0.0314	60	0.077	3	29	W-11
W-12	25.49	0.0398	60	0.095	4	33	W-12
W-13	71.85	0.1123	61	0.182	10	80	W-13
W-14	30.26	0.0473	61	0.135	5	38	W-14
W-15	56.42	0.0881	61	0.141	10	70	W-15
W-16	18.66	0.0292	61	0.092	4	27	W-16
W-17	11.77	0.0184	60	0.085	2	16	W-17
W-18	80.07	0.1251	60	0.189	9	80	W-18
W-19	27.36	0.0428	61	0.083	5	41	W-19
W-20	20.15	0.0315	61	0.071	5	32	W-20
W-21	86.18	0.1347	60	0.156	11	96	W-21
W-22	5.53	0.0086	63	0.055	2	10	W-22
W-23	15.63	0.0244	60	0.112	2	19	W-23
W-24	28.30	0.0442	60	0.140	4	33	W-24
W-25	61.26	0.0957	61	0.197	8	64	W-25
W-26	19.23	0.0301	63	0.062	7	36	W-26
W-27	104.49	0.1633	60	0.253	10	89	W-27
W-28	25.40	0.0397	63	0.128	7	36	W-28
W-29	26.18	0.0409	63	0.145	6	37	W-29
W-30	32.55	0.0509	63	0.123	9	46	W-30
W-31	7.85	0.0123	63	0.073	3	14	W-31
W-32	56.98	0.0890	60	0.170	7	61	W-32
W-33A	80.68	0.1261	60	0.186	9	82	W-33A
W-33B	87.07	0.1360	60	0.225	9	78	W-33B
W-34A	90.73	0.1418	60	0.173	10	96	W-34A
W-34B	113.01	0.1766	60	0.224	11	101	W-34B
W-34C	103.98	0.1625	60	0.244	10	90	W-34C
W-35A	61.28	0.0958	60	0.187	7	62	W-35A
W-35B	96.45	0.1507	60	0.259	9	81	W-35B
W-36A	91.48	0.1429	60	0.234	9	81	W-36A
W-36B	122.73	0.1918	60	0.306	10	91	W-36B
W-37A	72.84	0.1138	60	0.185	8	74	W-37A
W-37B	104.68	0.1636	61	0.218	13	102	W-37B
W-38	58.05	0.0907	62	0.190	10	67	W-38
W-39	117.33	0.1833	60	0.251	11	100	W-39

FALCON BASIN DBPS
HEC-1 BASE DATA: EXISTING CONDITIONS

BASIN No.	AREA (Ac)	AREA[1] (sq. mi.)	AVG CN[4]	UD[7] (hr)	CALCULATED FLOWS EXISTING CONDITION 5-Year	100-Year	BASIN No.
W-40	61.72	0.0964	60	0.165	7	67	W-40
W-41	38.49	0.0601	60	0.117	6	45	W-41
W-42	37.21	0.0581	81	0.127	50	125	W-42
W-43	93.27	0.1457	61	0.169	13	108	W-43
W-44	24.56	0.0384	60	0.141	3	28	W-44
W-45	123.59	0.1931	61	0.189	17	134	W-45
W-46	26.78	0.0418	61	0.154	4	32	W-46
W-47	34.60	0.0541	60	0.148	4	39	W-47
W-48	75.46	0.1179	61	0.091	14	108	W-48
W-49A	65.63	0.1026	61	0.189	9	71	W-49A
W-49B	104.03	0.1625	61	0.208	14	105	W-49B
W-50	67.91	0.1061	61	0.145	11	83	W-50
W-51	34.95	0.0546	63	0.172	7	46	W-51
W-52	31.93	0.0499	63	0.109	9	48	W-52
W-53	33.98	0.0531	63	0.156	8	47	W-53
W-54	4.98	0.0078	60	0.050	1	8	W-54
W-55	28.92	0.0452	60	0.093	5	38	W-55
W-56	117.20	0.1831	60	0.191	13	116	W-56
W-57	46.87	0.0732	63	0.140	12	66	W-57
W-58A	97.52	0.1524	63	0.251	16	104	W-58A
W-58B	49.44	0.0772	63	0.167	11	66	W-58B
W-59	45.10	0.0705	60	0.200	5	43	W-59
W-60	45.50	0.0711	60	0.182	5	47	W-60
W-61	122.86	0.1920	62	0.251	17	122	W-61
W-62	48.00	0.0750	60	0.090	7	64	W-62
W-63	30.07	0.0470	60	0.109	5	36	W-63

FALCON BASIN DBPS
HEC-1 BASE DATA: EXISTING CONDITIONS

BASIN No.	AREA (Ac)	AREA[1] (sq. mi.)	AVG CN[4]	UD[7] (hr)	CALCULATED FLOWS EXISTING CONDITION 5-Year	100-Year	BASIN No.
MIDDLE TRIBUTARY							
M-1	42.57	0.0665	62	0.108	7	52	M-1
M-2	17.45	0.0273	69	0.114	3	21	M-2
M-3	9.56	0.0149	69	0.076	2	14	M-3
M-4	22.13	0.0346	69	0.121	3	26	M-4
M-5	11.28	0.0176	69	0.108	6	24	M-5
M-6	40.80	0.0637	65	0.233	10	51	M-6
M-7	33.55	0.0524	69	0.170	16	63	M-7
M-8	23.67	0.0370	61	0.126	4	30	M-8
M-9	10.81	0.0169	69	0.087	7	25	M-9
M-10	37.16	0.0581	62	0.102	8	54	M-10
M-11A	68.27	0.1067	61	0.313	7	54	M-11A
M-11B	56.25	0.0879	60	0.180	6	58	M-11B
M-11C	59.74	0.0933	60	0.188	7	60	M-11C
M-12A	42.12	0.0658	60	0.159	5	47	M-12A
M-12B	94.79	0.1481	60	0.219	10	86	M-12B
M-13	39.30	0.0614	64	0.165	10	56	M-13
M-14	103.91	0.1624	64	0.228	22	122	M-14
M-15	79.49	0.1242	64	0.203	18	101	M-15
M-16	26.89	0.0420	60	0.139	4	31	M-16
M-17	48.98	0.0765	61	0.133	9	61	M-17
M-18	39.04	0.0610	61	0.142	7	48	M-18
M-19	31.91	0.0499	61	0.159	5	38	M-19
M-20	85.81	0.1341	61	0.211	11	85	M-20
M-21	15.41	0.0241	61	0.125	3	19	M-21
M-23	29.52	0.0461	60	0.120	4	34	M-23
M-24	49.65	0.0776	60	0.125	7	58	M-24
M-25	6.72	0.0105	60	0.130	1	8	M-25
M-26	113.83	0.1779	65	0.250	26	139	M-26
M-27	33.78	0.0528	60	0.132	5	39	M-27

FALCON BASIN DBPS
HEC-1 BASE DATA: EXISTING CONDITIONS

BASIN No.	AREA (Ac)	AREA[1] (sq. mi.)	AVG CN[4]	UD[7] (hr)	CALCULATED FLOWS EXISTING CONDITION 5-Year	100-Year	BASIN No.
EAST TRIBUTARY							
E-1A	73.64	0.1151	60	0.234	7	65	E-1A
E-1B	106.59	0.1665	60	0.233	10	94	E-1B
E-1C	54.08	0.0845	60	0.200	6	52	E-1C
E-2	66.79	0.1040	60	0.149	9	75	E-2
E-3	57.56	0.0899	60	0.128	8	67	E-3
E-4	80.97	0.1265	60	0.200	9	78	E-4
E-5	60.49	0.0945	60	0.160	7	67	E-5
E-6	76.57	0.1196	60	0.228	7	68	E-6
E-7	19.56	0.0306	60	0.082	3	28	E-7
E-8	28.55	0.0446	60	0.139	4	33	E-8
E-9	48.97	0.0765	60	0.222	5	44	E-9
E-10	18.57	0.0290	60	0.158	2	21	E-10
E-11	28.49	0.0445	60	0.195	3	28	E-11
E-12	59.18	0.0925	60	0.156	7	66	E-12
E-13	10.56	0.0165	60	0.252	1	9	E-13
E-14	3.26	0.0051	60	0.153	0	4	E-14
E-15	22.71	0.0355	63	0.097	6	36	E-15
E-16	19.65	0.0307	63	0.100	5	31	E-16
E-17	19.99	0.0312	63	0.097	5	32	E-17
E-18	31.25	0.0488	63	0.180	6	40	E-18
E-19	26.00	0.0406	62	0.127	6	35	E-19
E-20	49.37	0.0771	62	0.219	8	51	E-20
E-21	55.89	0.0873	60	0.183	6	57	E-21
E-22	43.33	0.0677	61	0.240	5	41	E-22
E-23	107.74	0.1683	62	0.250	15	108	E-23
E-24	89.62	0.1400	63	0.371	11	74	E-24
E-25	106.53	0.1665	61	0.176	15	121	E-25
E-26	23.09	0.0361	63	0.096	6	37	E-26
E-27	79.07	0.1236	63	0.172	17	104	E-27
E-28	45.94	0.0718	61	0.223	6	44	E-28
E-29	29.77	0.0465	61	0.166	4	35	E-29

NOTES: [1] Areas delineated in Autocad in sq. ft.

[4] Avg CN = $(\Sigma\ CN_i * A_i) / (\Sigma\ A_i)$

[7] $Tc = [(11.9 * L^3)/H]^{.385}$ UD = 0.67*Tc

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE (HEC-1)    *
*     BY THE COE IN FEBRUARY 1981       *
*          REVISED 02 AUG 88            *
*                                       *
*  RUN DATE 12/28/1999  TIME 05:46:06   *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*      DODSON AND ASSOCIATES, INC.      *
*   HYDROLOGIST AND CIVIL ENGINEERS     *
*      7015 W TIDWELL SUITE 107         *
*        HOUSTON, TEXAS  77092          *
*          (713) 895-8322               *
*                                       *
*****************************************
```


```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
   1      ID   FALCON BASIN 100-YR/ 24-HOUR FLOOD/ EXISTING CONDITIONS
   2      ID      UPPER EAST TRIBUTARY (WOODMEN HILLS) BASED ON CLOMR APPROVED 2/2/99
   3      ID      INCLUDING 2 EXISTING SCS STOCK PONDS, WEST WOODMEN HILLS POND
   4      ID      NOTE: M1-M4 (PAINT BRUSH HILLS) MODELED AS HISTORIC TO ACCOUNT FOR
   5      ID            DETENTION POND AT MC
   6      ID      NOTE: NO CULVERT AT STAPLETON & MERIDIAN, TEMP CULVERTS AT MERIDIAN
   7      ID            DOWNSTREAM OF WOODMEN HILLS DRIVE (DIVERSION)
          *DIAGRAM
   8      IT      5 16JUL99    800     300
   9      IO      5

  10      KK    M1
  11      KM
  12      BA  .0479
  13      PB   4.4
  14      IN    15
  15      PC  .0005  .0015  .0030  .0045  .0060  .0080  .0100  .0120  .0143  .0165
  16      PC  .0188  .0210  .0233  .0255  .0278  .0320  .0390  .0460  .0530  .0600
  17      PC  .0750  .1000  .4000  .7000  .7250  .7500  .7650  .7800  .7900  .8000
  18      PC  .8100  .8200  .8250  .8300  .8350  .8400  .8450  .8500  .8550  .8600
  19      PC  .8638  .8675  .8713  .8750  .8788  .8825  .8863  .8900  .8938  .8975
  20      PC  .9013  .9050  .9088  .9115  .9148  .9180  .9210  .9240  .9270  .9300
  21      PC  .9325  .9350  .9375  .9400  .9425  .9450  .9475  .9500  .9525  .9550
  22      PC  .9575  .9600  .9625  .9650  .9675  .9700  .9725  .9750  .9775  .9800
  23      PC  .9813  .9825  .9838  .9850  .9863  .9875  .9888  .9900  .9913  .9925
  24      PC  .9938  .9950  .9963  .9975  .9988 1.000
  25      LS          60
  26      UD  .097

  27      KK
  28      KM
  29      RK  1519  .0263  .035        TRAP     5     4

  30      KK    M2
  31      KM
  32      BA  .0278
  33      LS          60
  34      UD  .160

  35      KK    MA
  36      KM
  37      MC     2

  38      KK
  39      KM
  40      RK   464  .0151  .035        TRAP     5     4

  41      KK    M3
  42      KM
  43      BA  .0498
  44      LS          61
  45      UD  .139
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  87      KK    WD
  88      KM
  89      HC      2
  90      KK    D-E
  91      KM
  92      RK    1044   .0479    .035          TRAP     5       4
  93      KK    WB
  94      KM
  95      BA   .0286
  96      LS             60
  97      UD    .069
  98      KK
  99      KM
 100      RK    1449   .0504    .035          TRAP     5       4
 101      KK    W9
 102      KM
 103      BA   .0402
 104      LS             61
 105      UD    .097
 106      KK    WE
 107      KM
 108      HC      3
 109      KK    E-F
 110      KM
 111      RK     789   .0038    .035          TRAP     5       4
 112      KK    W10
 113      KM
 114      BA   .0431
 115      LS             61
 116      UD    .096
 117      KK
 118      KM
 119      RK     824   .0388    .035          TRAP     5       4
 120      KK    W11
 121      KM
 122      BA   .0314
 123      LS             60
 124      UD    .077
 125      KK    WF
 126      KM
 127      HC      4
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  169     KK    WH
  170     KM
  171     HC      2
  172     KK    W16
  173     KM
  174     BA  .0292
  175     LS            61
  176     UD  .092
  177     KK
  178     KM
  179     RK    1345  .0260  .035          TRAP    5       4
  180     KK    W17
  181     KM
  182     BA  .0184
  183     LS            60
  184     UD  .085
  185     KK    WI
  186     KM
  187     HC      2
  188     KK    I-H
  189     KM
  190     RK    2650  .0370  .035          TRAP    15      4
  191     KK    W19
  192     KM
  193     BA  .0428
  194     LS            61
  195     UD  .083
  196     KK
  197     KM
  198     RK    881   .0329  .035          TRAP    5       4
  199     KK    W20
  200     KM
  201     BA  .0315
  202     LS            61
  203     UD  .071
  204     KK    WJ
  205     KM
  206     HC      2
  207     KK
  208     KM
  209     RK    3061  .0235  .035          TRAP    5       4
```

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10								
253	KK	M25							
254	KM								
255	BA	.0957							
256	LS		61						
257	UD	.197							
258	KK	MN							
259	KM								
260	RC	3							
261	KK	M-P							
262	KM								
263	RK	1589	.017	.035		TRAP	20	4	
264	KK	M28							
265	KM								
266	BA	.0397							
267	LS		63						
268	UD	.128							
269	KK								
270	KM								
271	RK	1345	.0208	.035		TRAP	5	4	
272	KK	M30							
273	KM								
274	BA	.0509							
275	LS		63						
276	UD	.123							
277	KK								
278	KM								
279	RK	1078	.0074	.035		TRAP	5	4	
280	KK	M29							
281	KM								
282	BA	.0409							
283	LS		63						
284	UD	.145							
285	KK	M31							
286	KM								
287	BA	.0123							
288	LS		63						
289	UD	.073							
290	KK	MO							
291	KM								
292	RC	4							

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  336     KK   W34A
  337     KM
  338     BA   .1418
  339     LS            60
  340     UD   .173

  341     KK   34A-P2
  342     KM
  343     RK   2550    .0176   .035          TRAP    25      4

  344     KK   W34B
  345     KM
  346     BA   .1766
  347     LS            60
  348     UD   .224

  349     KK   WP2
  350     KM
  351     HC     2

  352     KK   P2-Q
  353     KM
  354     RK   2640    .021    .035          TRAP    25      4

  355     KK   W34C
  356     KM
  357     BA   .1625
  358     LS            60
  359     UD   .244

  360     KK   WQ
  361     KM
  362     HC     4

  363     KK   Q-Q1
  364     KM
  365     RK   2940    .022    .035          TRAP    25      4

  366     KK   W36A
  367     KM
  368     BA   .1429
  369     LS            60
  370     UD   .234

  371     KK   WQ1
  372     KM
  373     HC     2

  374     KK   Q1-R
  375     KM
  376     RK   3400    .022    .035          TRAP    25      4
```

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10								
417	KK	S-T							
418	KM								
419	RK	3653	.0164	.035		TRAP	25	4	
420	KK	W38							
421	KM								
422	BA	.0907							
423	LS		62						
424	UD	.190							
425	KK								
426	KM								
427	RK	2922	.0171	.035		TRAP	5	4	
428	KK	W39							
429	KM								
430	BA	.1833							
431	LS		60						
432	UD	.251							
433	KK	W40							
434	KM								
435	BA	.0964							
436	LS		60						
437	UD	.165							
438	KK	MT							
439	KM								
440	HC	4							
441	KK	T-U							
442	KM								
443	RK	1125	.0098	.035		TRAP	25	4	
444	KK	W41							
445	KM								
446	BA	.0601							
447	LS		60						
448	UD	.117							
449	KK	WJ							
450	KM								
451	HC	2							
452	KK								
453	KM								
454	RK	2215	.0181	.035		TRAP	25	4	
455	KK	W42							
456	KM								
457	BA	.0581							
458	LS		81						
459	UD	.127							

LINE	ID	1	2	3	4	5	6	7	8	9	10
501	KK										
502	KM										
503	RK	928	.0302	.035		TRAP	5	4			
504	KK	M4									
505	KM										
506	BA	.0346									
507	LS		60								
508	UD	.121									
509	KK										
510	KM										
511	RK	406	.0197	.02		TRAP	40	0			
512	KK	M3									
513	KM										
514	BA	.0149									
515	LS		60								
516	UD	.076									
517	KK	MC									
518	KM										
519	HC	3									
520	KK										
521	KM										
522	RK	1902	.0231	.035		TRAP	5	4			
523	KK	M5									
524	KM										
525	BA	.0176									
526	LS		69								
527	UD	.108									
528	KK										
529	KM										
530	RK	1717	.0186	.02		TRAP	40	0			
531	KK	M6									
532	KM										
533	BA	.0637									
534	LS		65								
535	UD	.233									
536	KK	MD									
537	KM										
538	HC	3									
539	KK										
540	KM										
541	RK	2841	.019	.035		TRAP	5	4			

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  582     KK
  583     KM
  584     RK    2586   .0224    .035          TRAP      10       4

  585     KK     M13
  586     KM
  587     BA   .0614
  588     LS             64
  589     UD    .165

  590     KK
  591     KM
  592     RK    1700     .01    .035          TRAP       6       4

  593     KK     M14
  594     KM
  595     BA   .1624
  596     LS             64
  597     UD    .228

  598     KK      MG
  599     KM
  600     HC       2

  601     KK   PONDW
  602     KM        WOODMEN HILLS DETENTION POND WEST (FROM FDR WH FLG F4)
  603     SV       0     .68     1.5     235      3.6      4.9      6.3     7.34     7.34
  604     SE     968     969     970     971      972      973      974      975      976
  605     SQ       0       8    15.5      41     84.4      110      138      152      205
  606     RS       1    ELEV     968

  607     KK      MH
  608     KM
  609     HC       2

  610     KK
  611     KM
  612     RK    1276   .0212    .035          TRAP      15       4

  613     KK   MH-P2
  614     KM        DIVERT FLOW TO POND 2 VIA TWIN 23x47 ARCH CMPS UNDER MERIDIAN
  615     DT  DIVRT1       90
  616     DI       0      39      72     152      263      318      377      442      591
  617     DQ       0      39      70      80       80       80       85       85       90

  618     KK     M15
  619     KM
  620     BA   .1242
  621     LS             64
  622     UD    .203
```

LINE	ID	1	2	3	4	5	6	7	8	9	10
664	KK	M11C									
665	KM										
666	BA	.0933									
667	LS		60								
668	UD	.188									
669	KK	MK									
670	KM										
671	MC	4									
672	KK	K1-ML									
673	KM										
674	RK	1821	.028	.035		TRAP	10	4			
675	KK	M16									
676	KM										
677	BA	.042									
678	LS		60								
679	UD	.139									
680	KK	ML									
681	KM										
682	MC	2									
683	KK										
684	KM										
685	RK	2099	.02	.035		TRAP	10	4			
686	KK	M17									
687	KM										
688	BA	.0765									
689	LS		61								
690	UD	.133									
691	KK	MM									
692	KM										
693	MC	2									
694	KK										
695	KM										
696	RK	2320	.0121	.035		TRAP	10	4			
697	KK	M18									
698	KM										
699	BA	.061									
700	LS		61								
701	UD	.142									
702	KK										
703	KM										
704	RK	2122	.017	.035		TRAP	10	4			

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  746     KK     M25
  747     KM
  748     BA   .0105
  749     LS             60
  750     UD   .130

  751     KK     M9
  752     KM
  753     RC     2

  754     KK
  755     KM
  756     RK   3305   .0136   .035          TRAP    25      4

  757     KK     M26
  758     KM
  759     BA   .1779
  760     LS             65
  761     UD   .250

  762     KK     MR
  763     KM
  764     RC     2

  765     KK     M44
  766     KM
  767     BA   .0384
  768     LS             60
  769     UD   .141

  770     KK
  771     KM
  772     RK   2029   .0148   .035          TRAP    5       4

  773     KK     M47
  774     KM
  775     BA   .0541
  776     LS             60
  777     UD   .148

  778     KK
  779     KM
  780     RK   1438   .0223   .035          TRAP    5       4

  781     KK     M46
  782     KM
  783     BA   .0418
  784     LS             61
  785     UD   .154
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  826     KK    WA8
  827     KM
  828     HC      2
  829     KK
  830     KM
  831     RK    742   .0108   .035          TRAP    40      4
  832     KK    W51
  833     KM
  834     BA   .0546
  835     LS             63
  836     UD    .172
  837     KK    WAC
  838     KM
  839     HC      2
  840     KK
  841     KM
  842     RK    638   .0345   .035          TRAP    40      4
  843     KK    W52
  844     KM
  845     BA   .0499
  846     LS             63
  847     UD    .109
  848     KK
  849     KM
  850     RK   1171   .0205   .035          TRAP     5      4
  851     KK    W53
  852     KM
  853     BA   .0531
  854     LS             63
  855     UD    .156
  856     KK    WA0
  857     KM
  858     HC      2
  859     KK
  860     KM
  861     RK    290   .0310   .035          TRAP    10      4
  862     KK    W54
  863     KM
  864     BA   .0078
  865     LS             60
  866     UD    .050
```

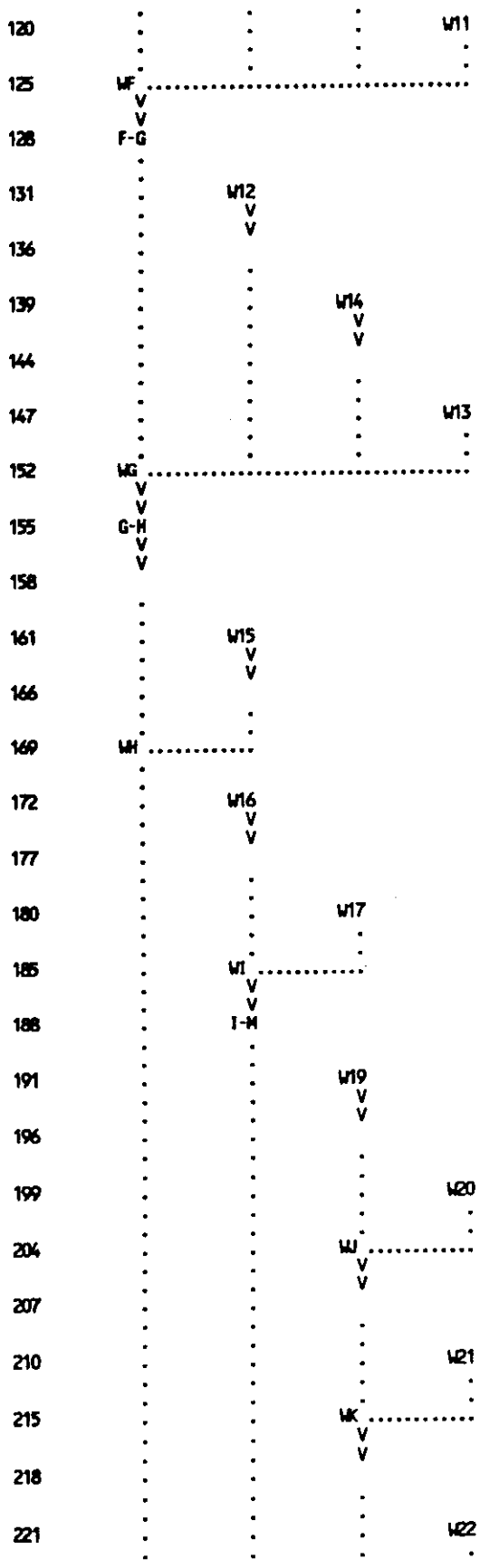
```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  908     KK
  909     KM
  910     RK    1241   .0153   .035          TRAP     5       4
  911     KK    V57
  912     KM
  913     BA   .0732
  914     LS             63
  915     UD    .140
  916     KK
  917     KM
  918     RK    5903   .0254   .035          TRAP     5       4
  919     KK    V58A
  920     KM
  921     BA   .1524
  922     LS             63
  923     UD    .251
  924     KK    V58B
  925     KM
  926     BA   .0772
  927     LS             63
  928     UD    .167
  929     KK    VAI
  930     KM
  931     RC      4
  932     KK
  933     KM
  934     RK     232   .0086   .035          TRAP    15       4
  935     KK    E1A
  936     KM
  937     BA   .1151
  938     LS      0      60
  939     UD    .234
  940     KK    E1A-EA
  941     KM
  942     RK    4000    .022   .035          TRAP     5       4
  943     KK    E1B
  944     KM
  945     BA   .1665
  946     LS      0      60
  947     UD    .233
```

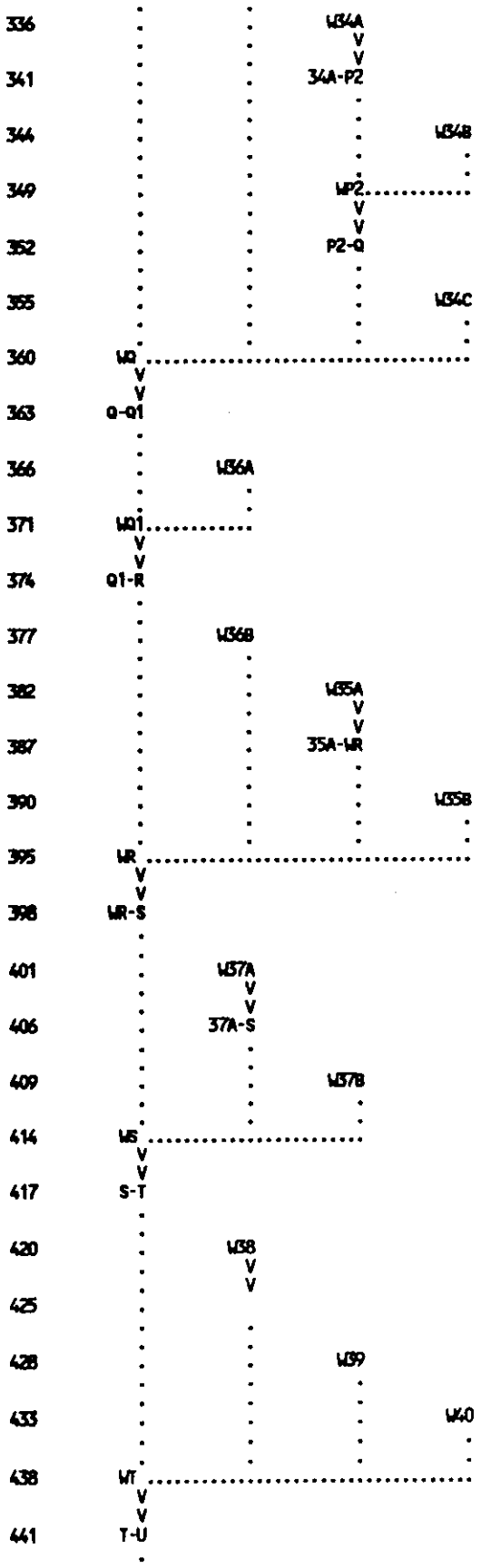
```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  988     KK
  989     KM
  990     RK    1700   .0141   .035          TRAP     5       4

  991     KK     E1C
  992     KM
  993     BA   .0845
  994     LS             60
  995     UD    .200

  996     KK   1C-ED1
  997     KM
  998     RK    3450   .022    .035          TRAP     5       4

  999     KK     E4
 1000     KM
 1001     BA    .127
 1002     LS             60
 1003     UD    .200

 1004     KK     ED1
 1005     KM
 1006     HC       2

 1007     KK   ED1-ED
 1008     KM
 1009     RK     450   .0178   .03           TRAP     5       4

 1010     KK     E5
 1011     KM
 1012     BA    .0945
 1013     LS             60
 1014     UD    .160

 1015     KK     ED
 1016     KM
 1017     HC       3

 1018     KK
 1019     KM
 1020     RK     950   .0211   .035          TRAP     10      4

 1021     KK     E8
 1022     KM
 1023     BA    .0446
 1024     LS             60
 1025     UD    .139

 1026     KK     EE
 1027     KM
 1028     HC       2
```

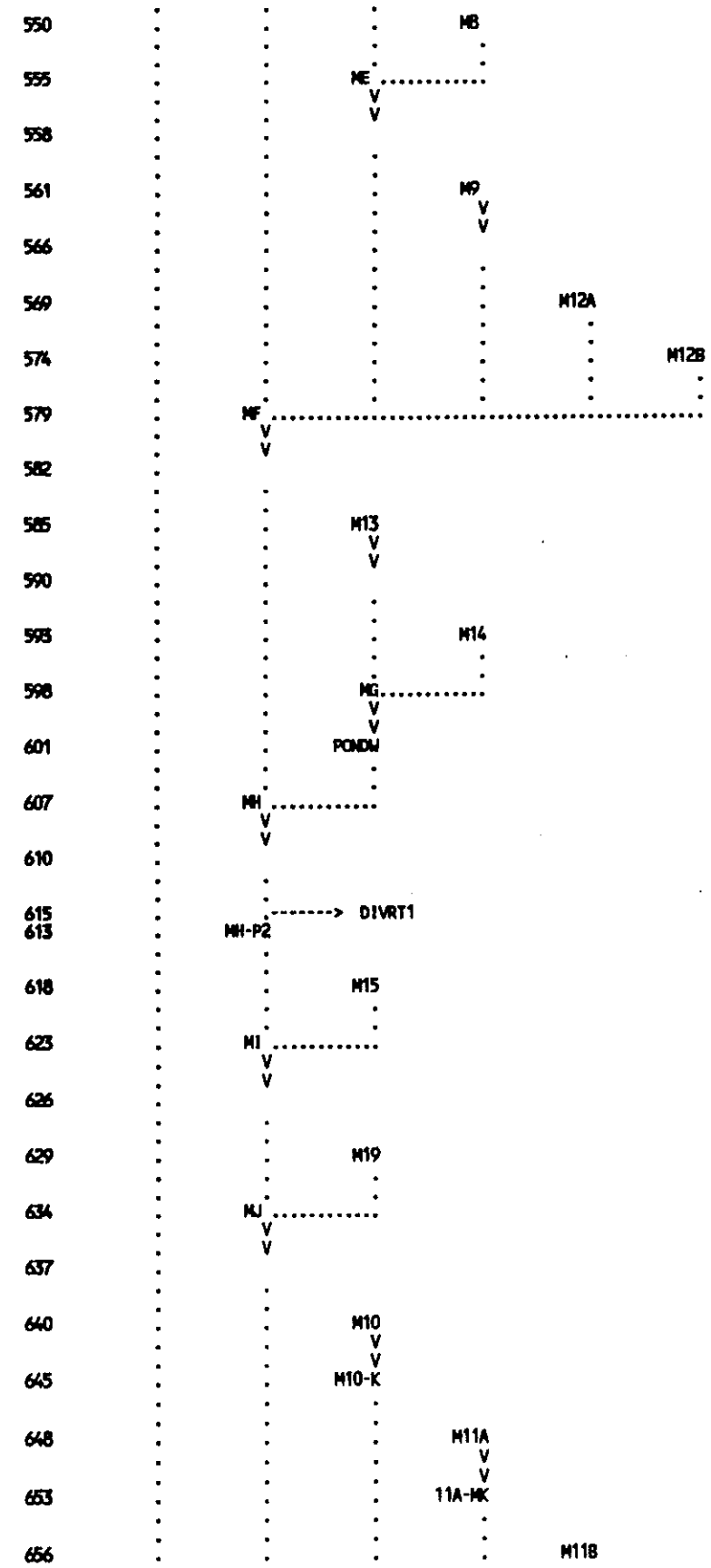
```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1070      KK    E11
1071      KM
1072      BA    .045
1073      LS              60
1074      UD    .195

1075      KK    E12
1076      KM
1077      BA    .0925
1078      LS              60
1079      UD    .156

1080      KK    EG
1081      KM
1082      KC      5

1083      KK    E13
1084      KM
1085      BA    .0165
1086      LS              60
1087      UD    .252

1088      KK    E14
1089      KM
1090      BA    .0051
1091      LS              60
1092      UD    .153

1093      KK
1094      KM
1095      RK      279   .0108    .03        TRAP     5      4

1096      KK    EH
1097      KM
1098      KC      3

1099      KK
1100      KM
1101      RK     2400   .0204    .035       TRAP    10      4

1102      KK    E19
1103      KM
1104      BA    .0406
1105      LS              62
1106      UD    .127

1107      KK    EJ1
1108      KM
1109      KC      2
```

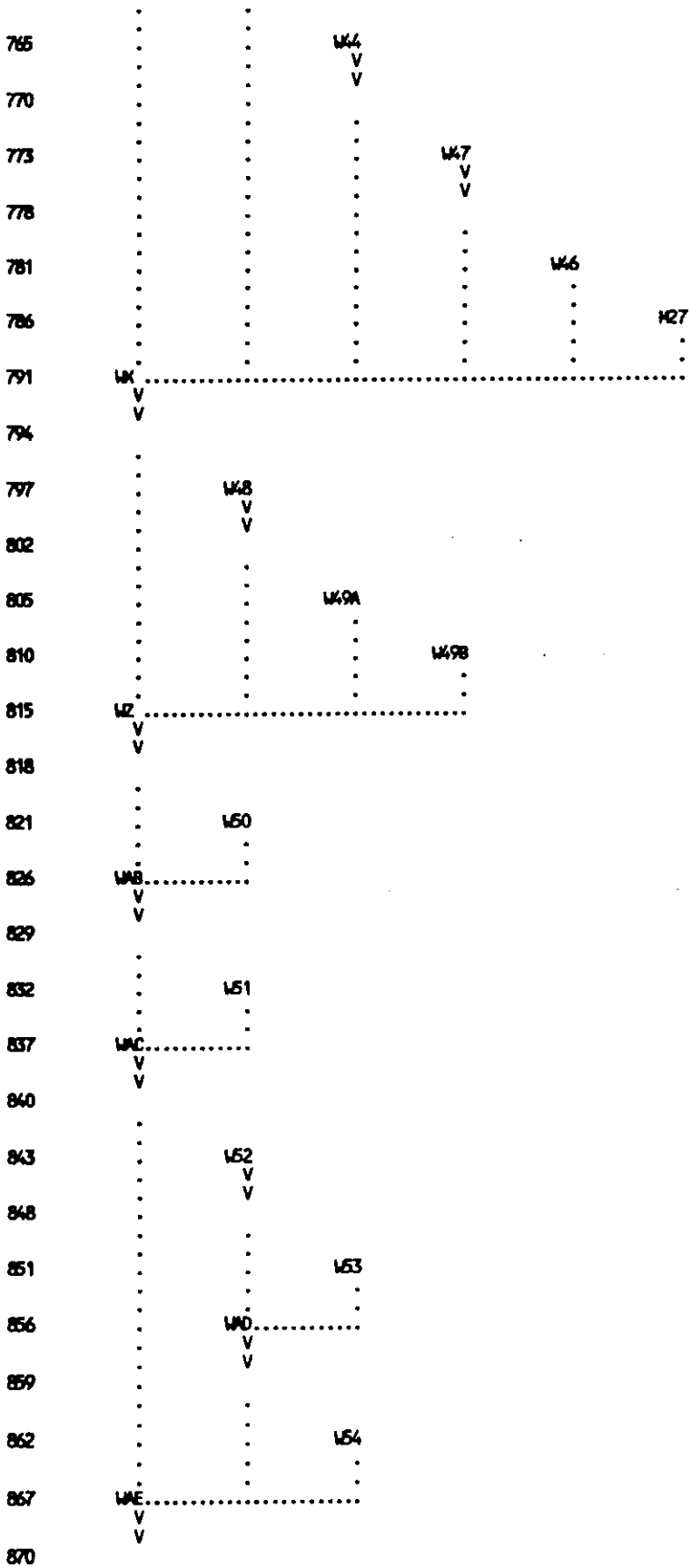
```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1153      KK    E1
1154      KM
1155      HC      2

1156      KK
1157      KM
1158      RK    1334   .0105    .035          TRAP     5       4

1159      KK    E17
1160      KM
1161      BA   .0312
1162      LS             63
1163      LD    .097

1164      KK
1165      KM
1166      RK    1728   .0145    .035          TRAP     5       4

1167      KK    E18
1168      KM
1169      BA   .0488
1170      LS             63
1171      LD    .180

1172      KK    EJ2
1173      KM
1174      HC      3

1175      KK
1176      KM
1177      RK    4221   .0123    .035          TRAP    20       4

1178      KK    E23
1179      KM
1180      BA   .1683
1181      LS             62
1182      LD    .250

1183      KK    E24
1184      KM
1185      BA    .140
1186      LS             63
1187      LD    .371

1188      KK    EK
1189      KM
1190      HC      3

1191      KK
1192      KM
1193      RK    2817   .0149    .035          TRAP    25       4
```

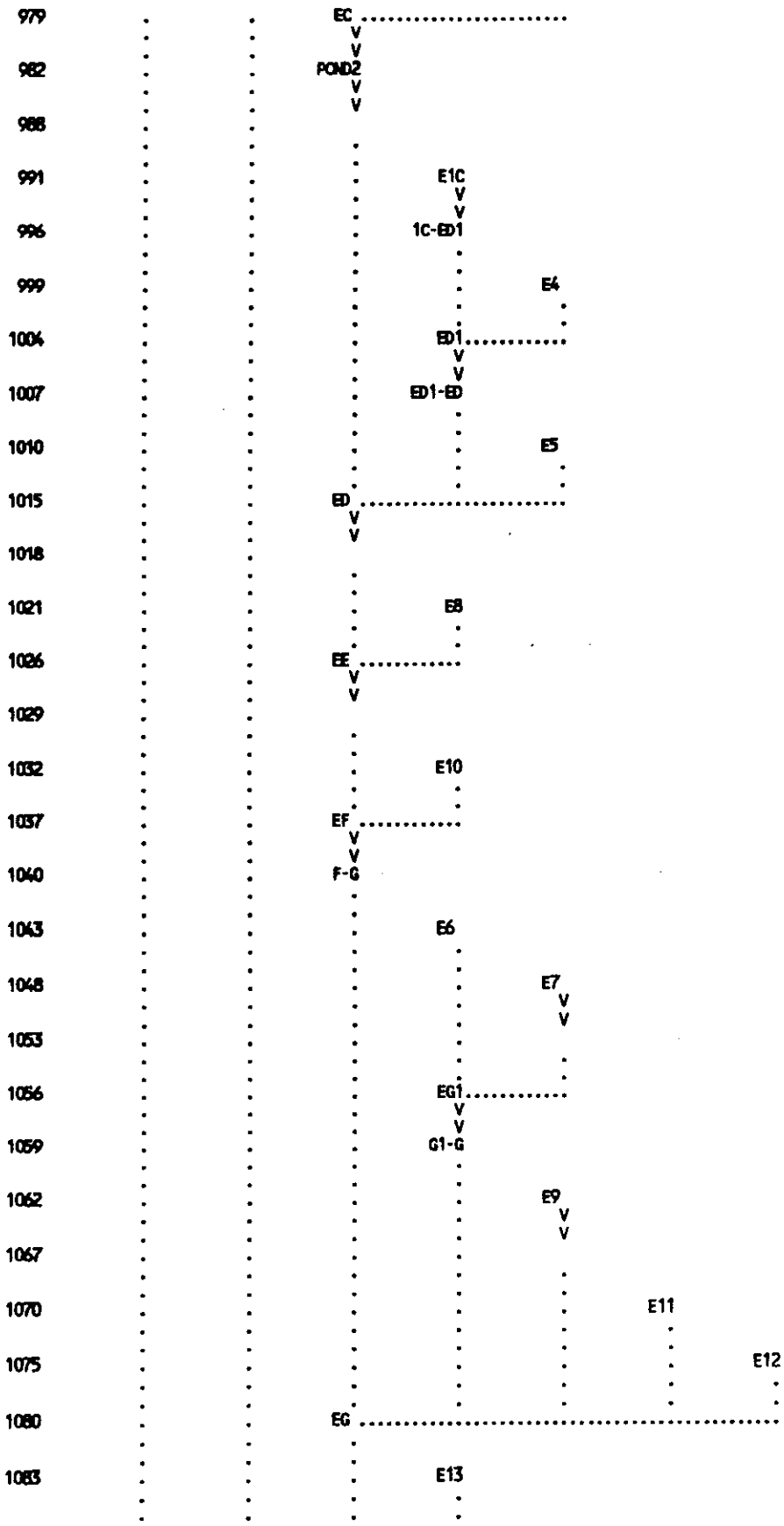
```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1235      KK
1236      KM
1237      RK    2025   .0109    .035          TRAP      5       4
1238      KK    W59
1239      KM
1240      BA   .0705
1241      LS             60
1242      UD    .200
1243      KK    WAJ
1244      KM
1245      HC      4
1246      KK
1247      KM
1248      RK    1450   .0124    .035          TRAP     40       4
1249      KK    E28
1250      KM
1251      BA   .0718
1252      LS             61
1253      UD    .223
1254      KK
1255      KM
1256      RK    2064   .0165    .035          TRAP     40       4
1257      KK    E29
1258      KM
1259      BA   .0465
1260      LS             61
1261      UD    .166
1262      KK    EZZ
1263      KM       COMBINE E29 & E30 AT DP ZZ
1264      HC       2
1265      KK    W60
1266      KM
1267      BA   .0711
1268      LS             60
1269      UD    .182
1270      KK    ZZ
1271      KM       COMBINE ALL AT DP ZZ
1272      HC       3
1273      ZZ
```

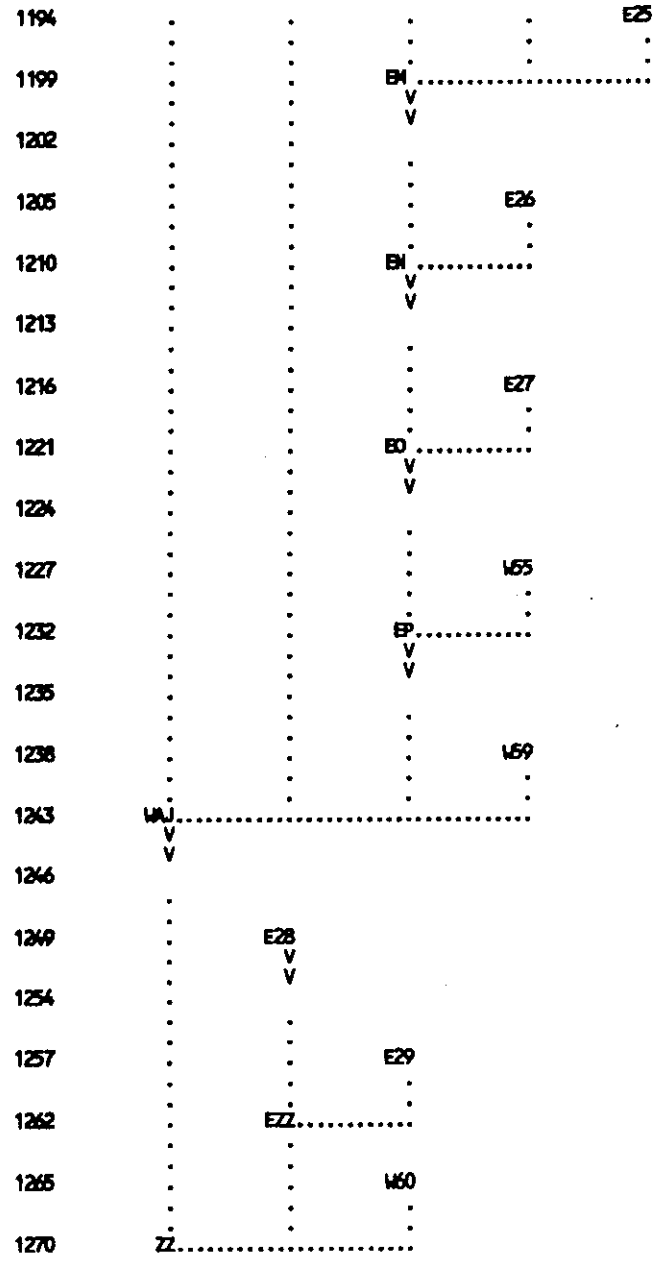

120
125
128
131
136
139
144
147
152
155
158
161
166
169
172
177
180
185
188
191
196
199
204
207
210
215
218
221
W11
WF
F-G
W12
W14
W13
WG
G-H
W15
WH
W16
W17
WI
I-H
W19
W20
WJ
W21
WK
W22


336
341
344
349
352
355
360
363
366
371
374
377
382
387
390
395
398
401
406
409
414
417
420
425
428
433
438
441
W34A
34A-P2
W34B
WP2
P2-Q
W34C
WQ
Q-Q1
W36A
WQ1
Q1-R
W36B
W35A
35A-WR
W35B
WR
WR-S
W37A
37A-S
W37B
WS
S-T
W38
W39
W40
WT
T-U


550
555
558
561
566
569
574
579
582
585
590
595
598
601
607
610
615
613
618
623
626
629
634
637
640
645
648
653
656
M8
ME
M9
M12A
M12B
MF
M13
M14
MG
PONDM
MH
DIVRT1
MH-P2
M15
MI
M19
MJ
M10
M10-K
M11A
11A-MK
M11B


765
W4
770
773
W7
778
781
W6
786
H27
791
WK
794
797
W8
802
805
W9A
810
W9B
815
WZ
818
821
W50
826
WB
829
832
W51
837
WC
840
843
W52
848
851
W53
856
WD
859
862
W54
867
WE
870


979
EC
982
POND2
988
991
E1C
996
1C-ED1
999
E4
1004
ED1
1007
ED1-ED
1010
E5
1015
ED
1018
1021
E8
1026
EE
1029
1032
E10
1037
EF
1040
F-G
1043
E6
1048
E7
1053
1056
EG1
1059
G1-G
1062
E9
1067
1070
E11
1075
E12
1080
EG
1083
E13

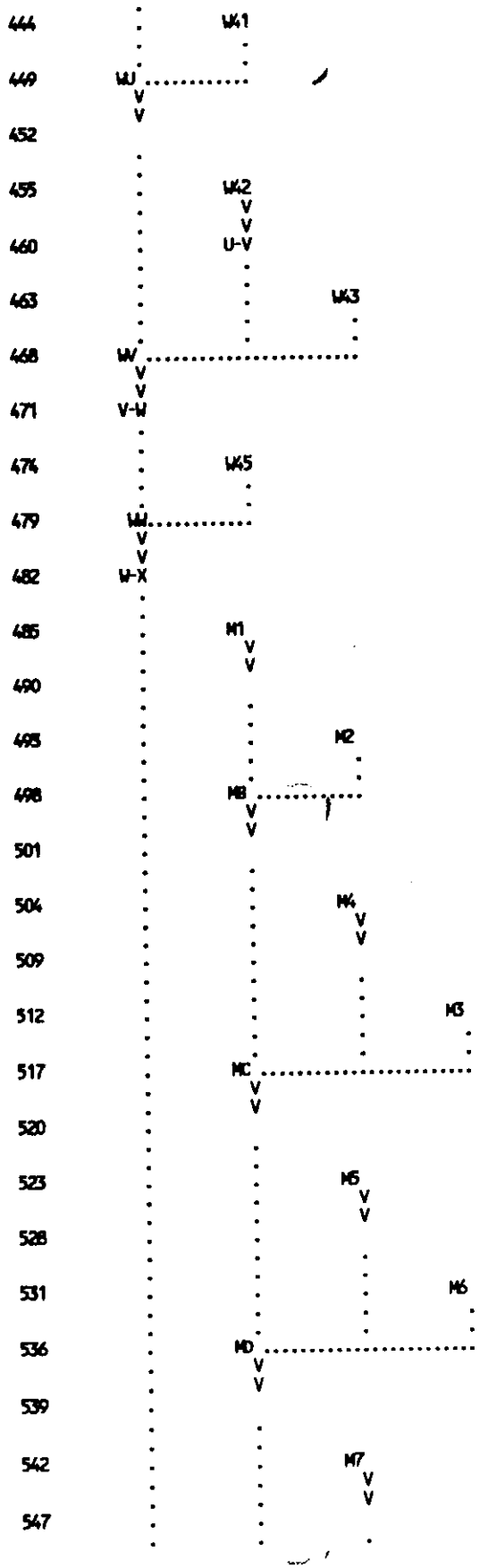


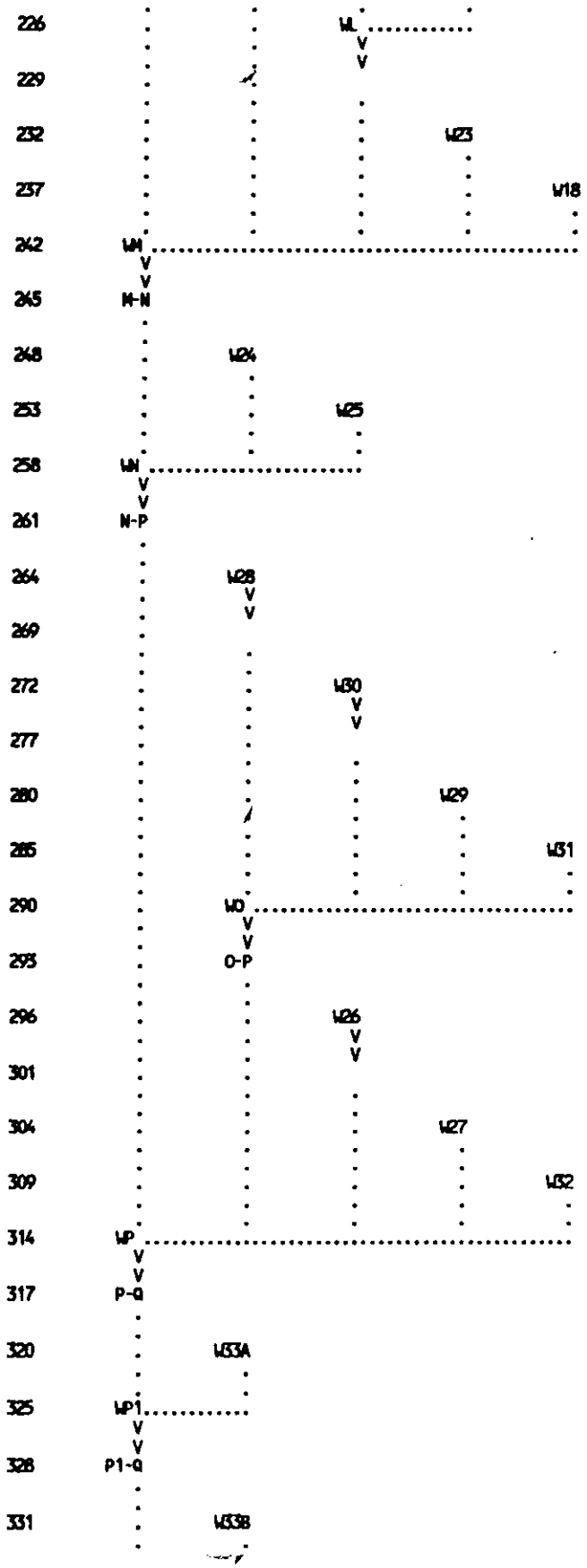
(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

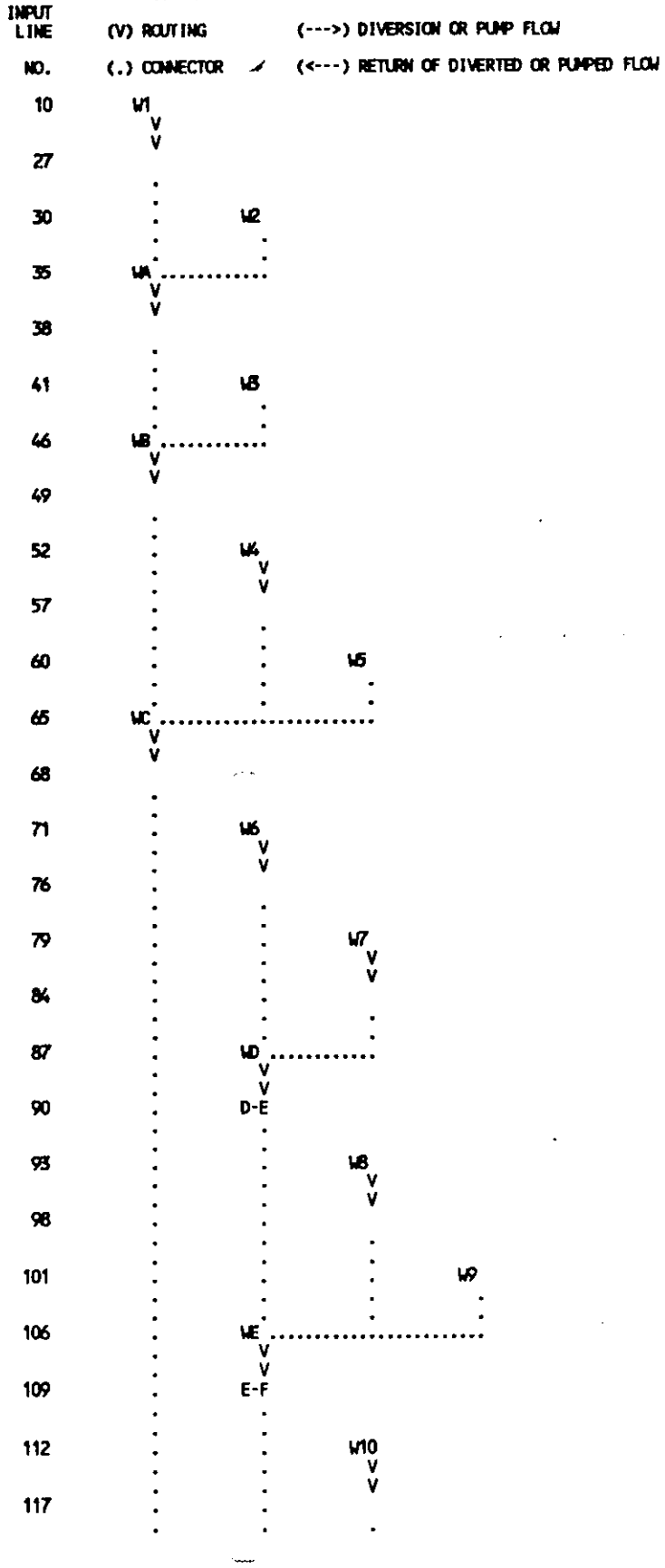
OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	W1	40.	5.75	4.	1.	1.	.05		
ROUTED TO		38.	5.83	4.	1.	1.	.05		
HYDROGRAPH AT	W2	20.	5.83	2.	1.	1.	.03		
2 COMBINED AT	WA	57.	5.83	6.	2.	2.	.08		
ROUTED TO		55.	5.83	6.	2.	2.	.08		
HYDROGRAPH AT	W3	39.	5.83	4.	1.	1.	.05		
2 COMBINED AT	WB	95.	5.83	10.	3.	3.	.13		
ROUTED TO		90.	5.83	10.	3.	3.	.13		
HYDROGRAPH AT	W4	6.	5.75	0.	0.	0.	.01		
ROUTED TO		6.	5.75	0.	0.	0.	.01		
HYDROGRAPH AT	W5	15.	5.75	1.	0.	0.	.02		
3 COMBINED AT	WC	105.	5.83	11.	4.	4.	.15		
ROUTED TO		103.	5.83	11.	4.	4.	.15		
HYDROGRAPH AT	W6	43.	5.75	4.	1.	1.	.05		
ROUTED TO		40.	5.75	4.	1.	1.	.05		
HYDROGRAPH AT	W7	20.	5.75	2.	1.	1.	.02		
ROUTED TO		20.	5.75	2.	1.	1.	.02		
2 COMBINED AT	WD	60.	5.75	5.	2.	2.	.07		
ROUTED TO	D-E	55.	5.75	5.	2.	2.	.07		
HYDROGRAPH AT	W8	27.	5.75	2.	1.	1.	.03		
ROUTED TO		24.	5.75	2.	1.	1.	.03		
HYDROGRAPH AT	W9	36.	5.75	3.	1.	1.	.04		
3 COMBINED AT	WE	114.	5.75	11.	4.	4.	.14		
ROUTED TO	E-F	108.	5.83	11.	4.	4.	.14		
HYDROGRAPH AT	W10	39.	5.75	3.	1.	1.	.04		
ROUTED TO		36.	5.75	3.	1.	1.	.04		
HYDROGRAPH AT	W11	29.	5.75	2.	1.	1.	.03		
4 COMBINED AT	WF	265.	5.83	28.	10.	9.	.36		
ROUTED TO	F-G	249.	5.83	28.	10.	9.	.36		
HYDROGRAPH AT	W12	33.	5.75	3.	1.	1.	.04		
ROUTED TO		32.	5.83	3.	1.	1.	.04		
HYDROGRAPH AT	W14	38.	5.83	4.	1.	1.	.05		
ROUTED TO		37.	5.83	4.	1.	1.	.05		
HYDROGRAPH AT	W13	80.	5.83	9.	3.	3.	.11		
4 COMBINED AT	WG	398.	5.83	43.	15.	14.	.56		
ROUTED TO	G-H	386.	5.92	43.	15.	14.	.56		
ROUTED TO		356.	5.92	43.	15.	14.	.56		
HYDROGRAPH AT	W15	70.	5.83	7.	2.	2.	.09		

ROUTED TO	P1-Q	953.	6.00	134.	47.	45.	1.75
HYDROGRAPH AT	W33B	78.	5.92	10.	4.	3.	.14
HYDROGRAPH AT	W34A	96.	5.83	11.	4.	4.	.14
ROUTED TO	34A-P2	94.	5.92	11.	4.	4.	.14
HYDROGRAPH AT	W34B	101.	5.92	13.	5.	4.	.18
2 COMBINED AT	WP2	196.	5.92	24.	8.	8.	.32
ROUTED TO	P2-Q	191.	6.00	24.	8.	8.	.32
HYDROGRAPH AT	W34C	90.	5.92	12.	4.	4.	.16
4 COMBINED AT	WQ	1287.	6.00	180.	63.	60.	2.37
ROUTED TO	Q-Q1	1237.	6.08	179.	62.	60.	2.37
HYDROGRAPH AT	W36A	81.	5.92	11.	4.	4.	.14
2 COMBINED AT	WQ1	1287.	6.08	189.	66.	64.	2.51
ROUTED TO	Q1-R	1259.	6.08	187.	66.	63.	2.51
HYDROGRAPH AT	W36B	91.	6.00	14.	5.	5.	.19
HYDROGRAPH AT	W35A	62.	5.83	7.	2.	2.	.10
ROUTED TO	35A-WR	60.	6.00	7.	2.	2.	.10
HYDROGRAPH AT	W35B	81.	5.92	11.	4.	4.	.15
4 COMBINED AT	WR	1450.	6.08	219.	77.	74.	2.95 ←
ROUTED TO	WR-S	1411.	6.17	217.	77.	74.	2.95
HYDROGRAPH AT	W37A	74.	5.83	9.	3.	3.	.11
ROUTED TO	37A-S	71.	5.92	9.	3.	3.	.11
HYDROGRAPH AT	W37B	102.	5.92	13.	5.	4.	.16
3 COMBINED AT	WS	1482.	6.17	237.	84.	81.	3.23 ←
ROUTED TO	S-T	1432.	6.25	236.	84.	80.	3.23
HYDROGRAPH AT	W38	67.	5.83	8.	3.	3.	.09
ROUTED TO		66.	5.92	8.	3.	3.	.09
HYDROGRAPH AT	W39	100.	5.92	14.	5.	5.	.18
HYDROGRAPH AT	W40	67.	5.83	7.	3.	2.	.10
4 COMBINED AT	WT	1514.	6.17	263.	93.	90.	3.60
ROUTED TO	T-U	1511.	6.25	263.	93.	90.	3.60
HYDROGRAPH AT	W41	45.	5.83	5.	2.	2.	.06
2 COMBINED AT	WU	1518.	6.25	267.	95.	91.	3.66
ROUTED TO		1480.	6.25	267.	95.	91.	3.66
HYDROGRAPH AT	W42	125.	5.75	13.	4.	4.	.06
ROUTED TO	U-V	122.	5.83	13.	4.	4.	.06
HYDROGRAPH AT	W43	108.	5.83	12.	4.	4.	.15
3 COMBINED AT	WV	1523.	6.25	289.	103.	99.	3.86
ROUTED TO	V-W	1500.	6.25	289.	103.	99.	3.86
HYDROGRAPH AT	W45	134.	5.83	16.	5.	5.	.19
2 COMBINED AT	WW	1533.	6.25	304.	108.	104.	4.06
ROUTED TO	W-X	1502.	6.33	304.	108.	104.	4.06
HYDROGRAPH AT	M1	52.	5.75	5.	2.	2.	.07


444
W1
449
WJ
452
455
W2
460
U-V
463
W3
468
WV
471
V-W
476
W5
479
WW
482
W-X
485
M1
490
495
M2
498
M8
501
504
M4
509
512
M3
517
MC
520
523
M5
528
531
M6
536
MD
539
542
M7
547


226
ML
229
232
M23
237
M18
242
MH
245
M-N
248
M24
253
M25
258
MN
261
N-P
264
M28
269
272
M30
277
280
M29
285
M31
290
MO
293
O-P
296
M26
301
304
M27
309
M32
314
MP
317
P-Q
320
M33A
325
MP1
328
P1-Q
331
M33B

SCHEMATIC DIAGRAM OF STREAM NETWORK



```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1110      KK    J1
1111      KM
1112      RK    4013    .013    .035          TRAP    10      4

1113      KK    E20
1114      KM
1115      BA    .0771
1116      LS              62
1117      UD    .219

1118      KK
1119      KM
1120      RK    569     .0141   .035          TRAP    5       4

1121      KK    E21
1122      KM
1123      BA    .0873
1124      LS              60
1125      UD    .183

1126      KK
1127      KM
1128      RK    1647    .0121   .035          TRAP    5       4

1129      KK    E22
1130      KM
1131      BA    .0677
1132      LS              61
1133      UD    .240

1134      KK    EL
1135      KM
1136      KC    4

1137      KK
1138      KM
1139      RK    2041    .0162   .035          TRAP    25      4

1140      KK    E15
1141      KM
1142      BA    .0355
1143      LS              63
1144      UD    .097

1145      KK
1146      KM
1147      RK    951     .0189   .035          TRAP    5       4

1148      KK    E16
1149      KM
1150      BA    .0307
1151      LS              63
1152      UD    .100
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

1029      KK
1030      KM
1031      RK    1500   .0127   .035          TRAP     10       4

1032      KK     E10
1033      KM
1034      BA    .029
1035      LS              60
1036      UD    .158

1037      KK     EF
1038      KM
1039      HC       2

1040      KK     F-G
1041      KM
1042      RK     950   .0074   .035          TRAP     15       4

1043      KK     E6
1044      KM
1045      BA   .1196
1046      LS              60
1047      UD    .228

1048      KK     E7
1049      KM
1050      BA    .031
1051      LS              60
1052      UD    .082

1053      KK
1054      KM
1055      RK    1100   .0100   .035          TRAP      5       4

1056      KK     EG1
1057      KM
1058      HC       2

1059      KK    G1-G
1060      KM
1061      RK    1650   .0176   .035          TRAP      5       4

1062      KK     E9
1063      KM
1064      BA    .077
1065      LS              60
1066      UD    .222

1067      KK
1068      KM
1069      RK    1500   .0080   .03           TRAP      5       4
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  948     KK     EA
  949     KM
  950     HC      2
  951     KK     EA-EB
  952     KM
  953     RK    1900    .022    .035          TRAP      5       4
  954     KK     E2
  955     KM
  956     BA    .104
  957     LS       0      60
  958     LD    .149
  959     KK     EB
  960     KM
  961     HC      2
  962     KK     POND1
  963     KM          ROUTE FLOW THROUGH SCS POND 1
  964     SV       0     .01     .28    1.12    2.70    5.18    6.00    6.94
  965     SE   945.5     946     948     950     952     954   954.5     955
  966     SQ       0       0       0       0       0    48.5   176.4   351.4
  967     RS       1    ELEV   945.5
  968     KK
  969     KM
  970     RK    1300   .0192    .035          TRAP      5       4
  971     KK     E3
  972     KM
  973     BA    .090
  974     LS              60
  975     LD    .128
  976     KK     MH-P2
  977     KM          RETRIEVE DIVERSION FROM W. MERIDIAN RD DITCH
  978     DR   DIVRT1
  979     KK     E0
  980     KM
  981     HC      3
  982     KK     POND2
  983     KM          ROUTE FLOW THROUGH SCS POND 2
  984     SV       0     .21    1.11    3.19    6.89    9.52   11.08   12.82   14.72   16.70
  985     SE     920     922     924     926     928     929   929.5     930   930.5     931
  986     SQ       0       0       0       0       0       0      25    86.5   186.2   308.4
  987     RS       1    ELEV     920
```

HEC-1 INPUT

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10							
867	KK	WAE						
868	KM							
869	HC	3						
870	KK							
871	KM							
872	RK	1925	.0052	.035		TRAP	40	4
873	KK	W56						
874	KM							
875	BA	.1831						
876	LS		60					
877	UD	.191						
878	KK	WAF						
879	KM							
880	HC	2						
881	KK							
882	KM							
883	RK	1032	.0155	.035		TRAP	40	4
884	KK	W62						
885	KM							
886	BA	.0750						
887	LS		60					
888	UD	.090						
889	KK							
890	KM							
891	RK	2169	.0203	.035		TRAP	5	4
892	KK	W63						
893	KM							
894	BA	.047						
895	LS		60					
896	UD	.109						
897	KK							
898	KM							
899	RK	1480	.0131	.035		TRAP	5	4
900	KK	W61						
901	KM							
902	BA	.192						
903	LS		62					
904	UD	.251						
905	KK	WAH						
906	KM							
907	HC	3						

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10							
786	KK	M27						
787	KM							
788	BA	.0528						
789	LS		60					
790	UD	.132						
791	KK	MK						
792	KM							
793	MC	6						
794	KK							
795	KM							
796	RK	2563	.0125	.035		TRAP	40	4
797	KK	M48						
798	KM							
799	BA	.1179						
800	LS		61					
801	UD	.091						
802	KK							
803	KM							
804	RK	2400	.0188	.035		TRAP	5	4
805	KK	M49A						
806	KM							
807	BA	.1026						
808	LS		61					
809	UD	.189						
810	KK	M49B						
811	KM							
812	BA	.1625						
813	LS		61					
814	UD	.208						
815	KK	M2						
816	KM							
817	MC	4						
818	KK							
819	KM							
820	RK	800	.0125	.035		TRAP	40	4
821	KK	M50						
822	KM							
823	BA	.1061						
824	LS		61					
825	UD	.145						

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  705     KK    M20
  706     KM
  707     BA  .1341
  708     LS          61
  709     UD  .211
  710     KK    MN
  711     KM
  712     HC     4
  713     KK
  714     KM
  715     RK    1531  .0202  .035        TRAP   25     4
  716     KK    M21
  717     KM
  718     BA  .0241
  719     LS          61
  720     UD  .125
  721     KK
  722     KM
  723     RK    1322  .0212  .035        TRAP    5     4
  724     KK    M23
  725     KM
  726     BA  .0461
  727     LS          60
  728     UD  .120
  729     KK    MO
  730     KM
  731     HC     3
  732     KK
  733     KM
  734     RK    974   .0133  .035        TRAP   25     4
  735     KK    M24
  736     KM
  737     BA  .0776
  738     LS          60
  739     UD  .125
  740     KK    MP
  741     KM
  742     HC     2
  743     KK
  744     KM
  745     RK    290   .0138  .035        TRAP   25     4
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  623     KK    MI
  624     KM
  625     KC     2
  626     KK
  627     KM
  628     RK   1995   .0165   .035          TRAP    15      4
  629     KK    M19
  630     KM
  631     BA   .0499
  632     LS             61
  633     LD   .159
  634     KK    MJ
  635     KM
  636     KC     2
  637     KK
  638     KM
  639     RK   2215   .0158   .035          TRAP    15      4
  640     KK    M10
  641     KM
  642     BA   .0581
  643     LS             62
  644     LD   .102
  645     KK   M10-K
  646     KM
  647     RK   5833   .0255   .035          TRAP     5      4
  648     KK    M11A
  649     KM
  650     BA   .1067
  651     LS             61
  652     LD   .313
  653     KK   11A-MK
  654     KM
  655     RK   3100   .025    .035          TRAP    10      4
  656     KK    M11B
  657     KM
  658     BA   .0879
  659     LS             60
  660     LD   .180
  661     KK   11B-MK
  662     KM
  663     RK   3200   .025    .035          TRAP     5      4
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  542     KK    M7
  543     KM
  544     BA  .0524
  545     LS            69
  546     LD  .170
  547     KK
  548     KM
  549     RK    1044  .0268    .02          TRAP    40      0
  550     KK    M8
  551     KM
  552     BA  .0370
  553     LS            61
  554     LD  .126
  555     KK    ME
  556     KM
  557     HC     2
  558     KK
  559     KM
  560     RK    2992  .0187    .035         TRAP    5       4
  561     KK    M9
  562     KM
  563     BA  .0169
  564     LS            69
  565     LD  .087
  566     KK
  567     KM
  568     RK    3433  .0253    .03          TRAP    5       4
  569     KK    M12A
  570     KM
  571     BA  .0658
  572     LS            60
  573     LD  .159
  574     KK    M12B
  575     KM
  576     BA  .1481
  577     LS            60
  578     LD  .219
  579     KK    MF
  580     KM
  581     HC     5
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  460     KK    U-V
  461     KM
  462     RK    2656   .0184   .035          TRAP     5       4
  463     KK    W3
  464     KM
  465     BA   .1457
  466     LS             61
  467     UD    .169
  468     KK    W
  469     KM
  470     HC       3
  471     KK    V-W
  472     KM
  473     RK     487   .0103   .035          TRAP    25       4
  474     KK    W5
  475     KM
  476     BA   .1931
  477     LS             61
  478     UD    .189
  479     KK    W
  480     KM
  481     HC       2
  482     KK    W-X
  483     KM
  484     RK    1542   .0149   .035          TRAP     5       4
  485     KK    M1
  486     KM
  487     BA   .0665
  488     LS             60
  489     UD    .108
  490     KK
  491     KM
  492     RK     650   .0308   .035          TRAP     5       4
  493     KK    M2
  494     KM
  495     BA   .0273
  496     LS             60
  497     UD    .114
  498     KK    M3
  499     KM
  500     HC       2
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  377     KK   M368
  378     KM
  379     BA   .1918
  380     LS              60
  381     LO   .306

  382     KK   M35A
  383     KM
  384     BA   .0958
  385     LS              60
  386     LO   .187

  387     KK   35A-MR
  388     KM
  389     RK   3715   .023   .035        TRAP    25      4

  390     KK   M358
  391     KM
  392     BA   .1507
  393     LS      0       60
  394     LO   .259

  395     KK   MR
  396     KM
  397     KC      4

  398     KK   MR-S
  399     KM
  400     RK   2922   .0168  .035        TRAP    25      4

  401     KK   M37A
  402     KM
  403     BA   .1138
  404     LS              60
  405     LO   .185

  406     KK   37A-S
  407     KM
  408     RK   1430   .014   .035        TRAP    25      4

  409     KK   M37B
  410     KM
  411     BA   .1636
  412     LS              61
  413     LO   .218

  414     KK   MS
  415     KM
  416     KC      3
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  293     KK    O-P
  294     KM
  295     RK    2169   .0226   .035          TRAP    5       4
  296     KK    M26
  297     KM
  298     BA   .0301
  299     LS             63
  300     UD    .062
  301     KK
  302     KM
  303     RK    4662   .0225   .035          TRAP    5       4
  304     KK    M27
  305     KM
  306     BA   .1633
  307     LS             60
  308     UD    .253
  309     KK    M52
  310     KM
  311     BA   .0890
  312     LS             60
  313     UD    .170
  314     KK    MP
  315     KM
  316     HC      5
  317     KK    P-Q
  318     KM
  319     RK    1925   .0182   .035          TRAP    25      4
  320     KK    M53A
  321     KM
  322     BA   .1261
  323     LS             60
  324     UD    .186
  325     KK    MP1
  326     KM
  327     HC      2
  328     KK    P1-Q
  329     KM
  330     RK    3000   .020    .035          TRAP    25      4
  331     KK    M53B
  332     KM
  333     BA   .1360
  334     LS             60
  335     UD    .225
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  210     KK    M21
  211     KM
  212     BA  .1347
  213     LS          60
  214     LD   .156

  215     KK    MK
  216     KM
  217     HC     2

  218     KK
  219     KM
  220     RK   487  .0246   .035          TRAP    5     4

  221     KK    M22
  222     KM
  223     BA  .0086
  224     LS          63
  225     LD   .055

  226     KK    ML
  227     KM
  228     HC     2

  229     KK
  230     KM
  231     RK  1786  .0297   .035          TRAP    5     4

  232     KK    M23
  233     KM
  234     BA  .0244
  235     LS          60
  236     LD   .112

  237     KK    M18
  238     KM
  239     BA  .1251
  240     LS          60
  241     LD   .189

  242     KK    MM
  243     KM
  244     HC     5

  245     KK    M-N
  246     KM
  247     RK  1345  .0149   .035          TRAP   20     4

  248     KK    M24
  249     KM
  250     BA  .0442
  251     LS          60
  252     LD   .140
```

HEC-1 INPUT

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10							
128	KK	F-G						
129	KM							
130	RK	2319	.0211	.035		TRAP	10	4
131	KK	W12						
132	KM							
133	BA	.0398						
134	LS		60					
135	UD	.095						
136	KK							
137	KM							
138	RK	2478	.0307	.035		TRAP	5	4
139	KK	W14						
140	KM							
141	BA	.0473						
142	LS		61					
143	UD	.135						
144	KK							
145	KM							
146	RK	81	0.0001	.035		TRAP	5	4
147	KK	W13						
148	KM							
149	BA	.1123						
150	LS		61					
151	UD	.182						
152	KK	WG						
153	KM							
154	RC	4						
155	KK	G-H						
156	KM							
157	RK	2632	.0217	.035		TRAP	15	4
158	KK							
159	KM							
160	RK	2447	.0372	.035		TRAP	5	4
161	KK	W15						
162	KM							
163	BA	.0881						
164	LS		61					
165	UD	.141						
166	KK							
167	KM							
168	RK	1763	.0289	.035		TRAP	5	4

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  46      KK    MB
  47      KM
  48      HC     2

  49      KK
  50      KM
  51      RK    823   .0279   .035          TRAP     5       4              54

  52      KK    M4
  53      KM
  54      BA   .0054
  55      LS             62
  56      LD   .044

  57      KK
  58      KM
  59      RK   1078   .0482   .035          TRAP     5       4

  60      KK    M5
  61      KM
  62      BA   .0159
  63      LS             60
  64      LD   .075

  65      KK    MC
  66      KM
  67      HC     3

  68      KK
  69      KM
  70      RK    557   .0449   .035          TRAP    10       4

  71      KK    M6
  72      KM
  73      BA   .0486
  74      LS             60
  75      LD   .085

  76      KK
  77      KM
  78      RK    592   .0372   .035          TRAP     5       4

  79      KK    M7
  80      KM
  81      BA   .0217
  82      LS             60
  83      LD   .074

  84      KK
  85      KM
  86      RK    464   .1466   .035          TRAP     5       4
```

4 COMBINED AT	EL	518.	6.00	124.	51.	49.	1.51
ROUTED TO		507.	6.08	123.	51.	49.	1.51
HYDROGRAPH AT	E15	36.	5.75	3.	1.	1.	.04
ROUTED TO		33.	5.83	3.	1.	1.	.04
HYDROGRAPH AT	E16	31.	5.75	3.	1.	1.	.03
2 COMBINED AT	EI	63.	5.75	6.	2.	2.	.07
ROUTED TO		61.	5.83	6.	2.	2.	.07
HYDROGRAPH AT	E17	32.	5.75	3.	1.	1.	.03
ROUTED TO		31.	5.83	3.	1.	1.	.03
HYDROGRAPH AT	E18	40.	5.83	4.	2.	1.	.05
3 COMBINED AT	EJ2	132.	5.83	13.	4.	4.	.15
ROUTED TO		129.	6.00	13.	4.	4.	.15
HYDROGRAPH AT	EZ3	108.	5.92	14.	5.	5.	.17
HYDROGRAPH AT	E24	74.	6.00	13.	4.	4.	.14
3 COMBINED AT	EK	297.	6.00	40.	14.	13.	.45
ROUTED TO		291.	6.08	40.	14.	13.	.45
HYDROGRAPH AT	E25	121.	5.83	13.	5.	4.	.17
3 COMBINED AT	EM	843.	6.08	175.	69.	66.	2.14
ROUTED TO		825.	6.08	175.	69.	66.	2.14
HYDROGRAPH AT	E26	37.	5.75	3.	1.	1.	.04
2 COMBINED AT	EN	831.	6.08	178.	70.	68.	2.17
ROUTED TO		794.	6.17	177.	70.	67.	2.17
HYDROGRAPH AT	EZ7	104.	5.83	11.	4.	4.	.12
2 COMBINED AT	EO	822.	6.17	187.	74.	71.	2.30
ROUTED TO		818.	6.17	187.	74.	71.	2.30
HYDROGRAPH AT	W55	38.	5.75	3.	1.	1.	.05
2 COMBINED AT	EP	823.	6.17	190.	75.	72.	2.34
ROUTED TO		796.	6.17	190.	75.	72.	2.34
HYDROGRAPH AT	W59	43.	5.83	5.	2.	2.	.07
4 COMBINED AT	WJ	2921.	6.33	741.	268.	258.	10.05
ROUTED TO		2902.	6.33	741.	268.	258.	10.05
HYDROGRAPH AT	E28	44.	5.92	6.	2.	2.	.07
ROUTED TO		44.	6.00	6.	2.	2.	.07
HYDROGRAPH AT	E29	35.	5.83	4.	1.	1.	.05
2 COMBINED AT	EZZ	67.	5.92	9.	3.	3.	.12
HYDROGRAPH AT	W60	47.	5.83	5.	2.	2.	.07
3 COMBINED AT	ZZ	2935.	6.33	755.	273.	263.	10.24

ROUTED TO		50.	5.83	5.	2.	2.	.07		
HYDROGRAPH AT	M2	21.	5.75	2.	1.	1.	.03		
2 COMBINED AT	MB	70.	5.83	7.	2.	2.	.09		
ROUTED TO		70.	5.83	7.	2.	2.	.09		
HYDROGRAPH AT	M4	26.	5.83	3.	1.	1.	.03		
ROUTED TO		26.	5.83	3.	1.	1.	.03		
HYDROGRAPH AT	M3	14.	5.75	1.	0.	0.	.01		
3 COMBINED AT	MC	105.	5.83	11.	4.	4.	.14		
ROUTED TO		102.	5.83	11.	4.	4.	.14		
HYDROGRAPH AT	M5	24.	5.75	2.	1.	1.	.02		
ROUTED TO		23.	5.83	2.	1.	1.	.02		
HYDROGRAPH AT	M6	51.	5.92	7.	2.	2.	.06		
3 COMBINED AT	MD	174.	5.83	20.	7.	6.	.22		
ROUTED TO		170.	5.92	20.	7.	6.	.22		
HYDROGRAPH AT	M7	63.	5.83	7.	2.	2.	.05		
ROUTED TO		61.	5.83	7.	2.	2.	.05		
HYDROGRAPH AT	M8	30.	5.83	3.	1.	1.	.04		
2 COMBINED AT	ME	91.	5.83	10.	3.	3.	.09		
ROUTED TO		88.	5.92	10.	3.	3.	.09		
HYDROGRAPH AT	M9	25.	5.75	2.	1.	1.	.02		
ROUTED TO		24.	5.83	2.	1.	1.	.02		
HYDROGRAPH AT	M12A	47.	5.83	5.	2.	2.	.07		
HYDROGRAPH AT	M12B	86.	5.92	11.	4.	4.	.15		
5 COMBINED AT	MF	400.	5.92	47.	16.	15.	.54		
ROUTED TO		383.	5.92	47.	16.	15.	.54		
HYDROGRAPH AT	M13	56.	5.83	6.	2.	2.	.06		
ROUTED TO		53.	5.92	6.	2.	2.	.06		
HYDROGRAPH AT	M14	122.	5.92	16.	5.	5.	.16		
2 COMBINED AT	MG	176.	5.92	22.	7.	7.	.22		
ROUTED TO	POND	16.	7.00	16.	7.	7.	.22	970.02	6.92
2 COMBINED AT	MH	399.	5.92	63.	23.	22.	.77		
ROUTED TO		384.	6.00	62.	23.	22.	.77		
DIVERSION TO	DIVRT1	85.	6.00	43.	18.	18.	.77		
HYDROGRAPH AT	MH-P2	299.	6.00	20.	5.	5.	.77		
HYDROGRAPH AT	M15	101.	5.83	12.	4.	4.	.12		
2 COMBINED AT	MI	382.	5.92	32.	9.	9.	.89		
ROUTED TO		375.	6.00	32.	9.	9.	.89		
HYDROGRAPH AT	M19	38.	5.83	4.	1.	1.	.05		
2 COMBINED AT	MJ	394.	6.00	36.	10.	10.	.94		
ROUTED TO		373.	6.00	35.	10.	10.	.94		
HYDROGRAPH AT	M10	54.	5.75	5.	2.	2.	.06		
ROUTED TO	M10-K	50.	6.00	5.	2.	2.	.06		

ROUTED TO		66.	5.83	7.	2.	2.	.09
2 COMBINED AT	WH	415.	5.92	49.	17.	17.	.65
HYDROGRAPH AT	W16	27.	5.75	2.	1.	1.	.03
ROUTED TO		24.	5.83	2.	1.	1.	.03
HYDROGRAPH AT	W17	16.	5.75	1.	0.	0.	.02
2 COMBINED AT	WI	38.	5.75	4.	1.	1.	.05
ROUTED TO	I-N	37.	5.83	4.	1.	1.	.05
HYDROGRAPH AT	W19	41.	5.75	3.	1.	1.	.04
ROUTED TO		37.	5.75	3.	1.	1.	.04
HYDROGRAPH AT	W20	32.	5.75	3.	1.	1.	.03
2 COMBINED AT	WJ	69.	5.75	6.	2.	2.	.07
ROUTED TO		66.	5.83	6.	2.	2.	.07
HYDROGRAPH AT	W21	96.	5.83	10.	3.	3.	.13
2 COMBINED AT	WK	162.	5.83	16.	6.	5.	.21
ROUTED TO		157.	5.83	16.	6.	5.	.21
HYDROGRAPH AT	W22	10.	5.75	1.	0.	0.	.01
2 COMBINED AT	WL	162.	5.83	17.	6.	6.	.22
ROUTED TO		146.	5.92	17.	6.	6.	.22
HYDROGRAPH AT	W23	19.	5.75	2.	1.	1.	.02
HYDROGRAPH AT	W18	80.	5.83	9.	3.	3.	.13
5 COMBINED AT	WM	681.	5.92	81.	28.	27.	1.06
ROUTED TO	M-N	641.	5.92	81.	28.	27.	1.06
HYDROGRAPH AT	W24	33.	5.83	3.	1.	1.	.04
HYDROGRAPH AT	W25	64.	5.83	8.	3.	3.	.10
3 COMBINED AT	WN	724.	5.92	92.	32.	31.	1.20
ROUTED TO	N-P	685.	6.00	92.	32.	31.	1.20
HYDROGRAPH AT	W28	36.	5.83	4.	1.	1.	.04
ROUTED TO		35.	5.83	4.	1.	1.	.04
HYDROGRAPH AT	W30	46.	5.83	5.	2.	2.	.05
ROUTED TO		46.	5.83	5.	2.	1.	.05
HYDROGRAPH AT	W29	37.	5.83	4.	1.	1.	.04
HYDROGRAPH AT	W31	14.	5.75	1.	0.	0.	.01
4 COMBINED AT	WO	127.	5.83	13.	4.	4.	.14
ROUTED TO	O-P	118.	5.83	13.	4.	4.	.14
HYDROGRAPH AT	W26	36.	5.75	3.	1.	1.	.03
ROUTED TO		33.	5.92	3.	1.	1.	.03
HYDROGRAPH AT	W27	89.	5.92	12.	4.	4.	.16
HYDROGRAPH AT	W32	61.	5.83	7.	2.	2.	.09
5 COMBINED AT	WP	956.	5.92	126.	44.	42.	1.63
ROUTED TO	P-Q	925.	6.00	126.	44.	42.	1.63
HYDROGRAPH AT	W33A	82.	5.83	10.	3.	3.	.13
2 COMBINED AT	WP1	977.	6.00	135.	47.	45.	1.75

```
**********************************************
*                                            *
*  FLOOD HYDROGRAPH PACKAGE (HEC-1)          *
*    BY THE COE IN FEBRUARY 1981             *
*          REVISED 02 AUG 88                 *
*                                            *
*  RUN DATE  12/28/1999  TIME  05:46:06      *
*                                            *
**********************************************
```


```
**********************************************
*                                            *
*  DODSON AND ASSOCIATES, INC.               *
*  HYDROLOGIST AND CIVIL ENGINEERS           *
*  7015 W TIDWELL SUITE 107                  *
*  HOUSTON, TEXAS  77092                     *
*  (713) 895-8522                            *
*                                            *
**********************************************
```


FALCON BASIN 100-YR/ 24-HOUR FLOOD/ EXISTING CONDITIONS
UPPER EAST TRIBUTARY (WOODMEN HILLS) BASED ON CLOMR APPROVED 2/2/99
INCLUDING 2 EXISTING SCS STOCK PONDS, WEST WOODMEN HILLS POND
NOTE: M1-M4 (PAINT BRUSH HILLS) MODELED AS HISTORIC TO ACCOUNT FOR DETENTION POND AT MC
NOTE: NO CULVERT AT STAPLETON & MERIDIAN, TEMP CULVERTS AT MERIDIAN DOWNSTREAM OF WOODMEN HILLS DRIVE (DIVERSION)

9 IO — OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

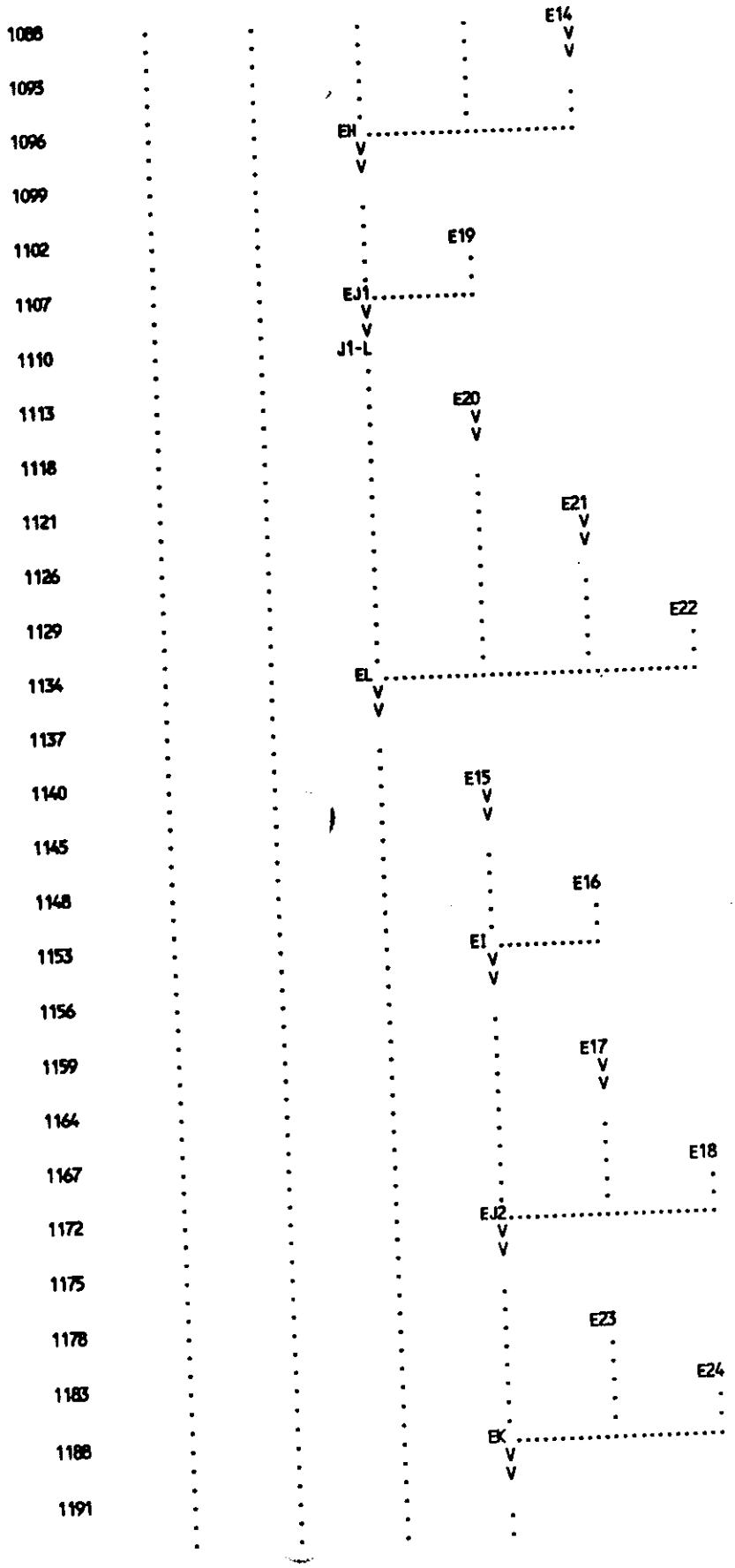
IT — HYDROGRAPH TIME DATA

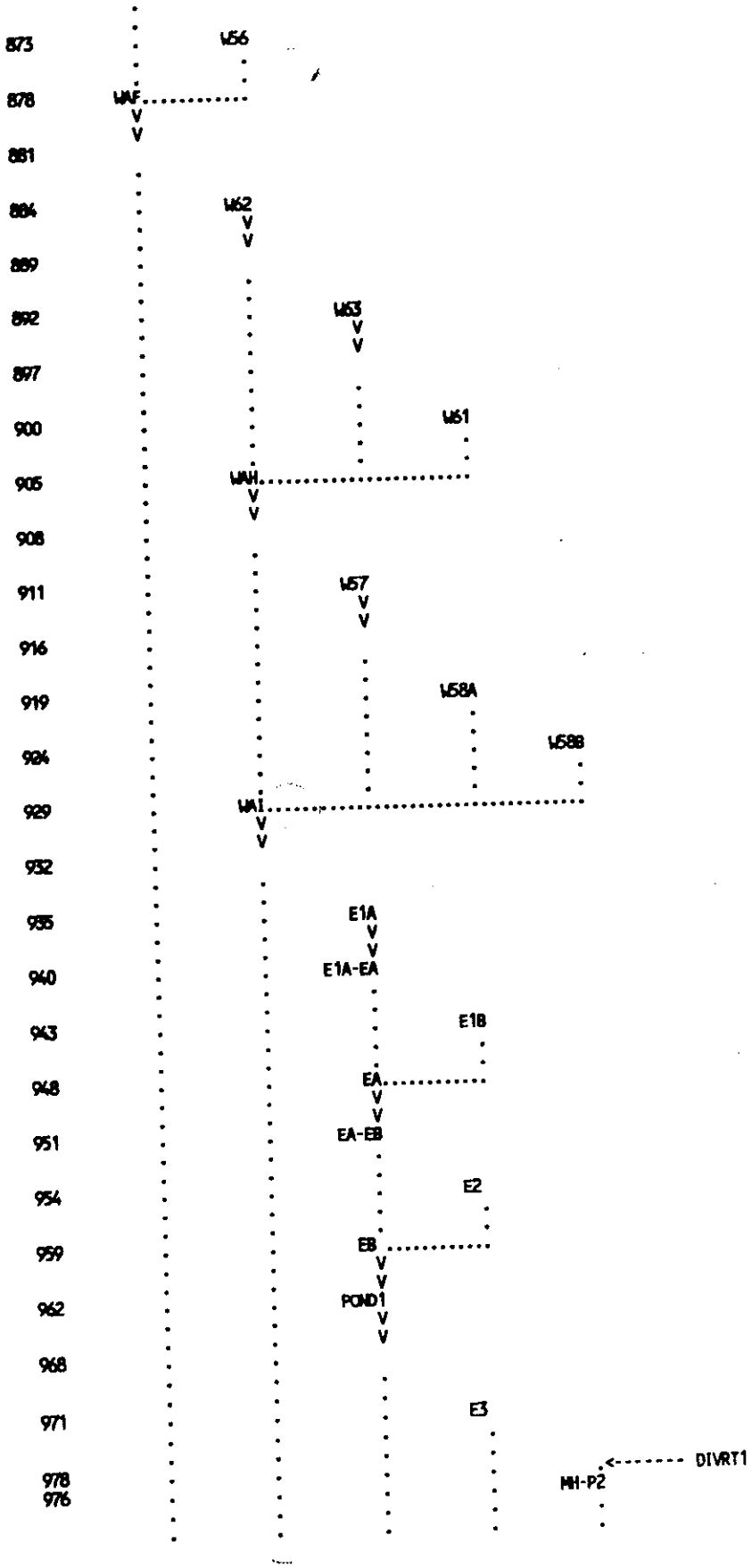
NMIN	5	MINUTES IN COMPUTATION INTERVAL
IDATE	16JUL99	STARTING DATE
ITIME	0800	STARTING TIME
NQ	300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	17JUL99	ENDING DATE
NDTIME	0855	ENDING TIME
ICENT	19	CENTURY MARK

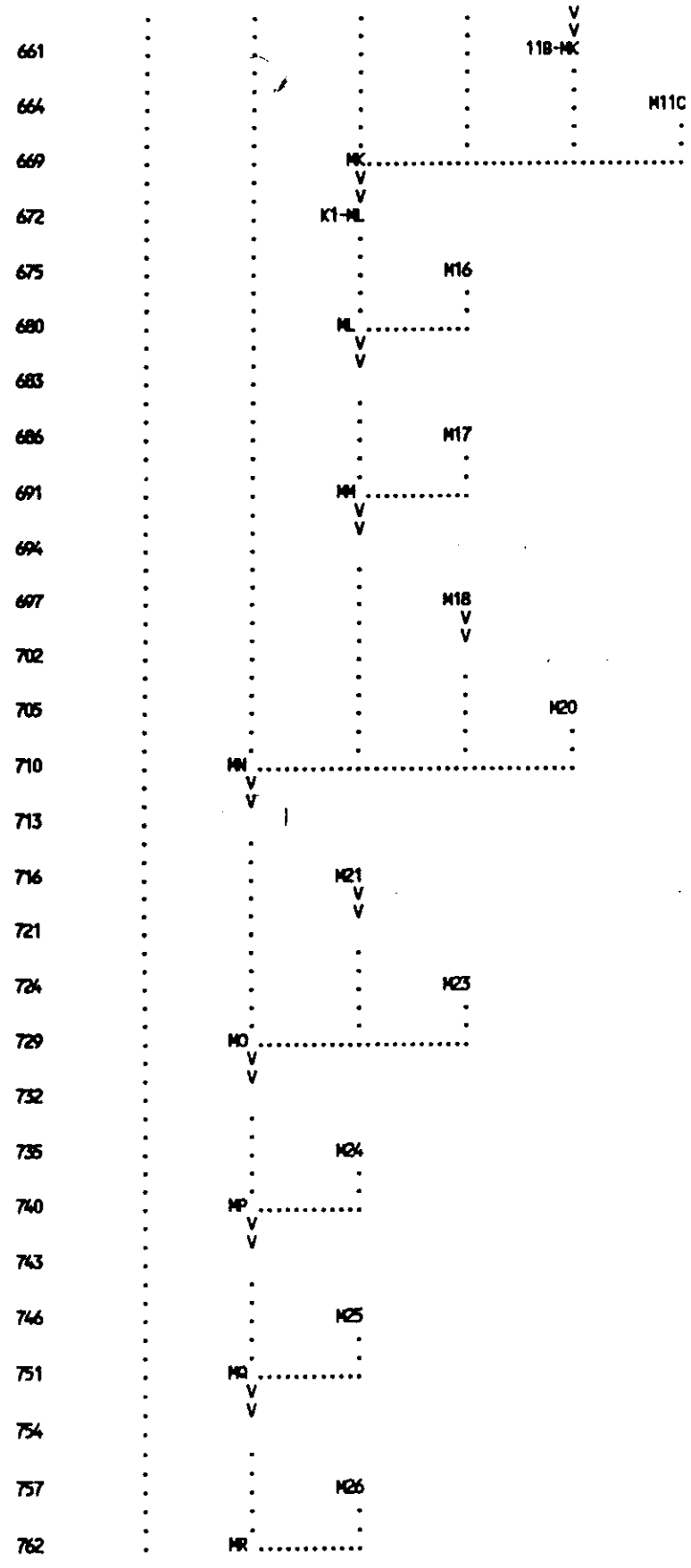
COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

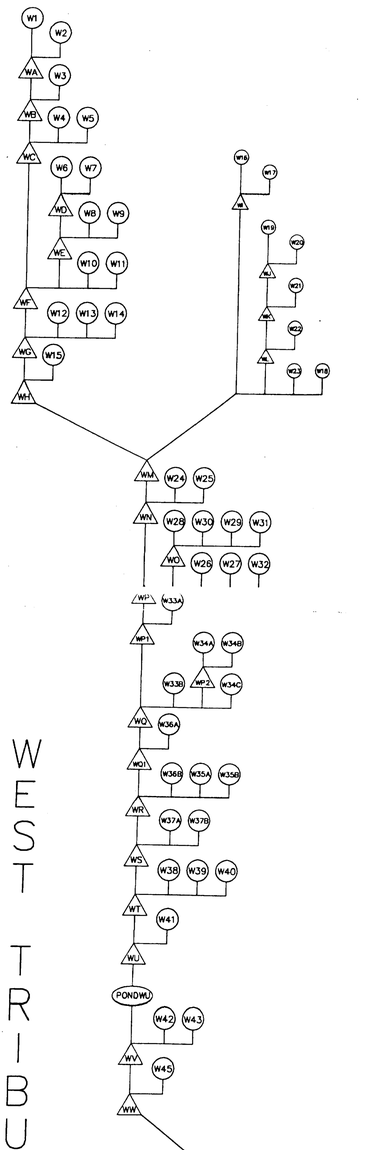
ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

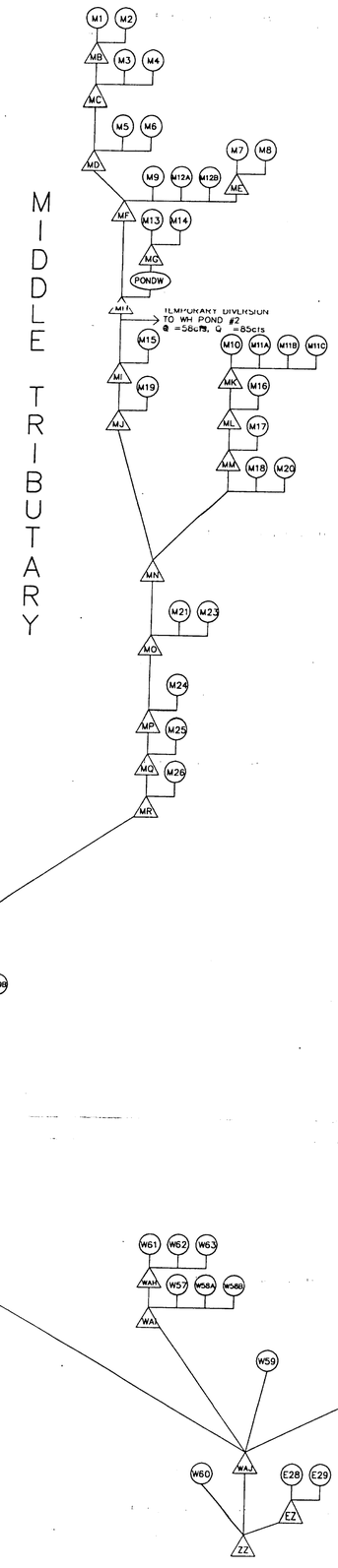

1088
1093
1096
1099
1102
1107
1110
1113
1118
1121
1126
1129
1134
1137
1140
1145
1148
1153
1156
1159
1164
1167
1172
1175
1178
1183
1188
1191
E14
EH
E19
EJ1
J1-L
E20
E21
E22
EL
E15
E16
EI
E17
E18
EJ2
E23
E24
EK


873
878
881
884
889
892
897
900
905
908
911
916
919
924
929
932
935
940
943
948
951
954
959
962
968
971
978
976
W56
WAF
W62
W63
W61
WAH
W57
W58A
W58B
WA1
E1A
E1A-EA
E1B
EA
EA-EB
E2
EB
POND1
E3
DIVRT1
MH-P2

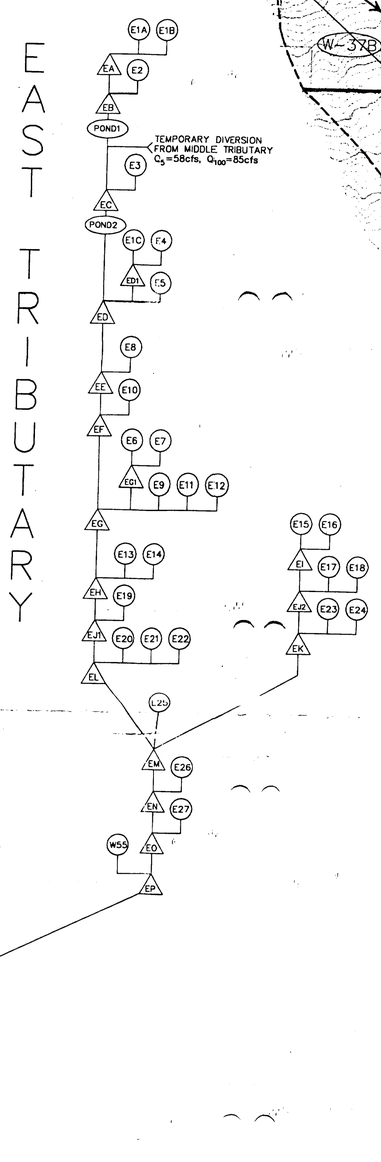

661
664
669
672
675
680
683
686
691
694
697
702
705
710
713
716
721
724
729
732
735
740
743
746
751
754
757
762
11B-MK
M11C
MK
K1-ML
M16
ML
M17
MM
M18
M20
MN
M21
M23
MO
M24
MP
M25
MQ
M26
MR



WEST TRIBUTARY

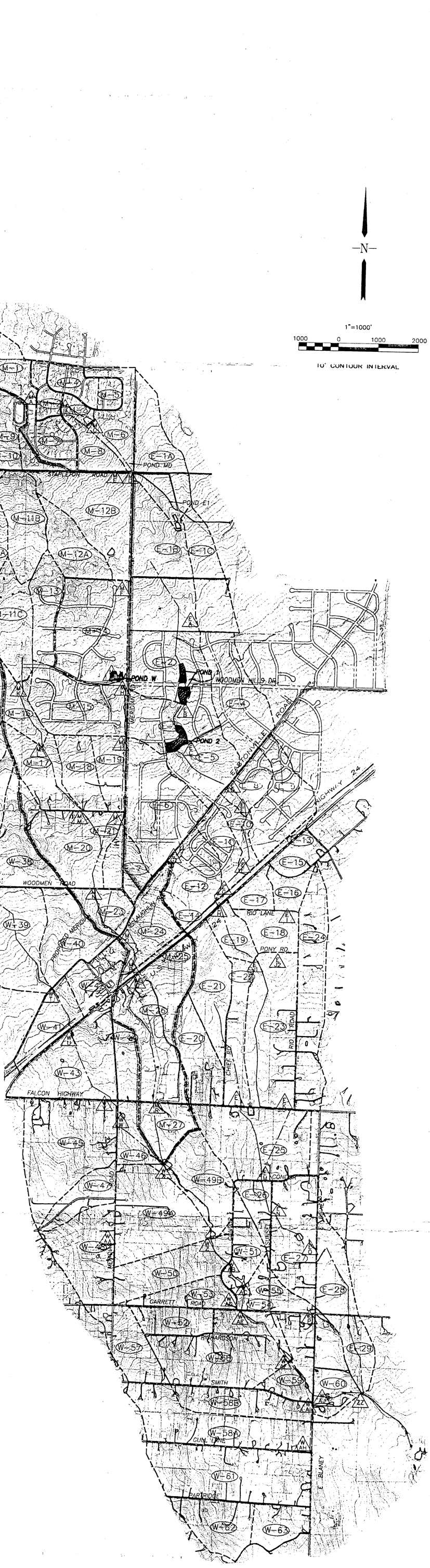


MIDDLE TRIBUTARY



EAST TRIBUTARY

WEST TRIBUTARY
LOMR LIMITS



URS Greiner Woodward Clyde

FALCON BASIN
EXISTING CONDITION HYDROLOGIC MODEL

EXHIBIT 1

JOB NO. 6742284

DATE: 10/09/00

APPENDIX C

WEST TRIBUTARY FALCON BASIN

REQUESTOR FORMS

FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM FEMA

This request is for a (check one):

☐ CLOMR: A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☒ LOMR: A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See Parts 60 & 65 of the NFIP Regulations.)

B. OVERVIEW

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

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
080059	El Paso	CO	08041C	0575F	03/17/97

2. Flooding Source: West Tributary Falcon Basin

3. Project Name/Identifier: West Tributary Falcon Basin Zone A Conversion

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

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

☒ Physical Change ☒ Improved Methodology/Data

☐ Regulatory Floodway Revision ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following types of flooding and structures (check all that apply)

Types of Flooding:	☒ Riverine	☐ Coastal	☐ Shallow Flooding (e.g., Zones AO and AH)
	☐ Alluvial fan	☐ Lakes	☐ Other (Attach Description)
Structures:	☐ Channelization	☐ Levee/Floodwall	☐ Bridge/Culvert
	☐ Dam	☐ Fill	☐ Other, Attach Description

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $4500

☐ No, Attach Explanation

Please see the FEMA Web site at http://www.fema.gov/mit/tsd/frm_fees.htm **for Fee Amounts and Exemptions.**

D. SIGNATURE

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.

Name: Richard N. Wray	Company: Kiowa Engineering Corp.	
Mailing Address: 1604 South 21st Street Colorado Springs, Colorado 80904	Daytime Telephone No.: 719-630-7342	Fax No.: 719-630-0406
	E-Mail Address: rwray@kiowaengineeringcs.com	
Signature of Requester (required):		Date: 4-18-2003

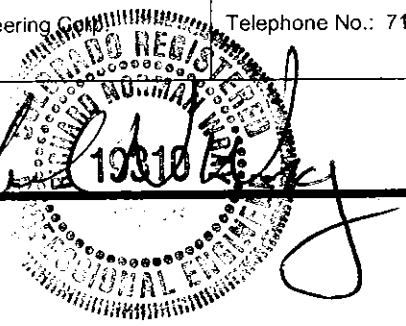
As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Kevin Stilson, Regional Floodplain Administrator		Telephone No.: 719-327-2906
Community Name: El Paso County	Community Official's Signature (required):	Date: 4/17/03

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. 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.

Certifier's Name: Richard N. Wray	License No.: PE 19310, Colorado	Expiration Date: May 2005
Company Name: Kiowa Engineering Corp.	Telephone No.: 719-630-7342	Fax No.: 719-630-0406
Signature:		Date: 4/18/2003



Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☐ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

Seal (Optional)

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: West Tributary Falcon Basin
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☒ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model HEC-1 [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/mit/tsd/en_modl.htm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	205' North of Woodmen Road	1	Zone A	6895.0
Upstream Limit	4270' north of Woodmen Road	9	None	6967.3

2. Hydraulic Method Used

Hydraulic Analysis HEC-2 [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/mit/tsd/frm_soft.htm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☐ Yes ☒ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name: wtrb100.dat	Floodway File Name:
Revised or Post-Project Conditions Model	Natural File Name:	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name:

*Not required for revisions to approximate 1%annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document 'Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/mit/tsd/en_modl.htm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1% and 0.2%annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1% and 0.2%annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1% and 0.2%annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No

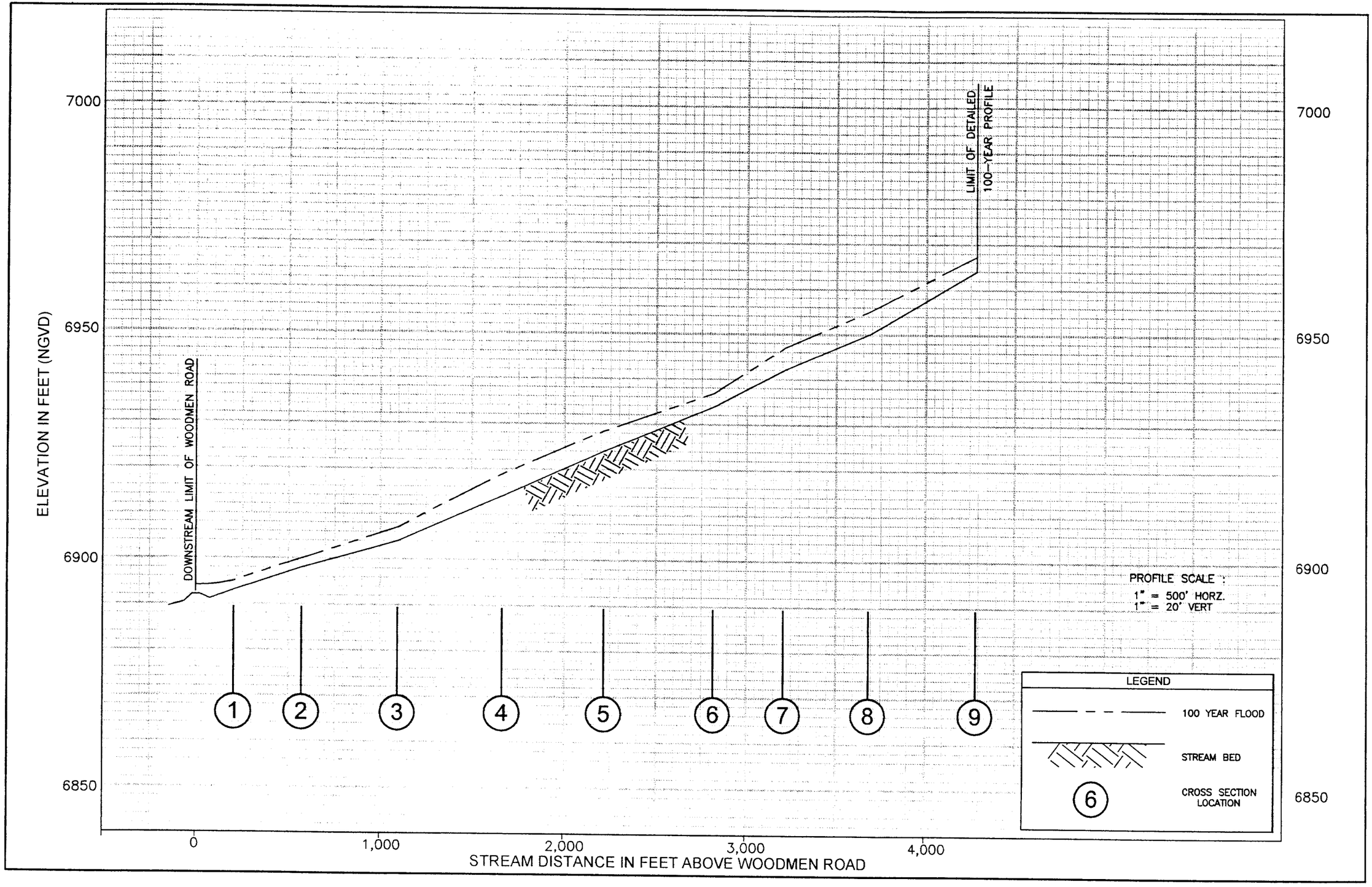
If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☒ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☒ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.



Kiowa Engineering Corporation
1604 South 21st Street
Colorado Springs, Colorado
80904 - 4208
(719) 630-7342

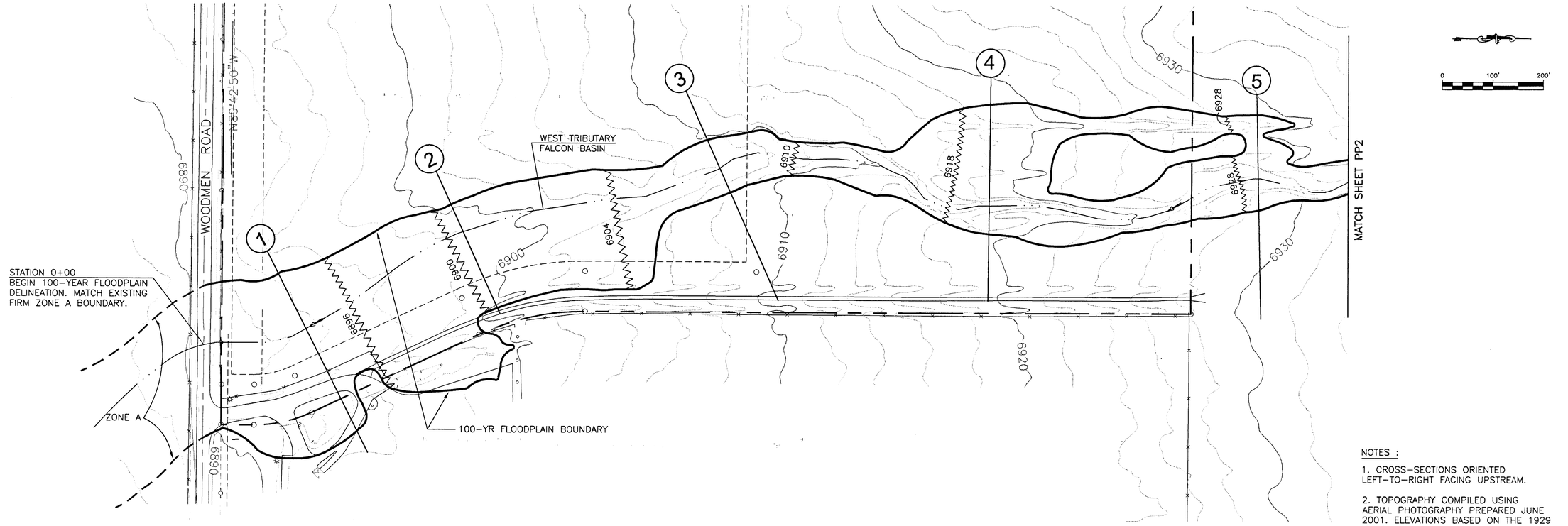
WEST TRIBUTARY FALCON BASIN
LETTER OF MAP REVISION
100-YEAR EFFECTIVE PROFILE
EL PASO COUNTY, COLORADO

Project No.:	03016
Scale:	As Shown
Date:	04/15/03
Design:	RNW
Drawn:	JLN
Check:	RNW
Revisions:	

SHEET
P1

APPENDIX D

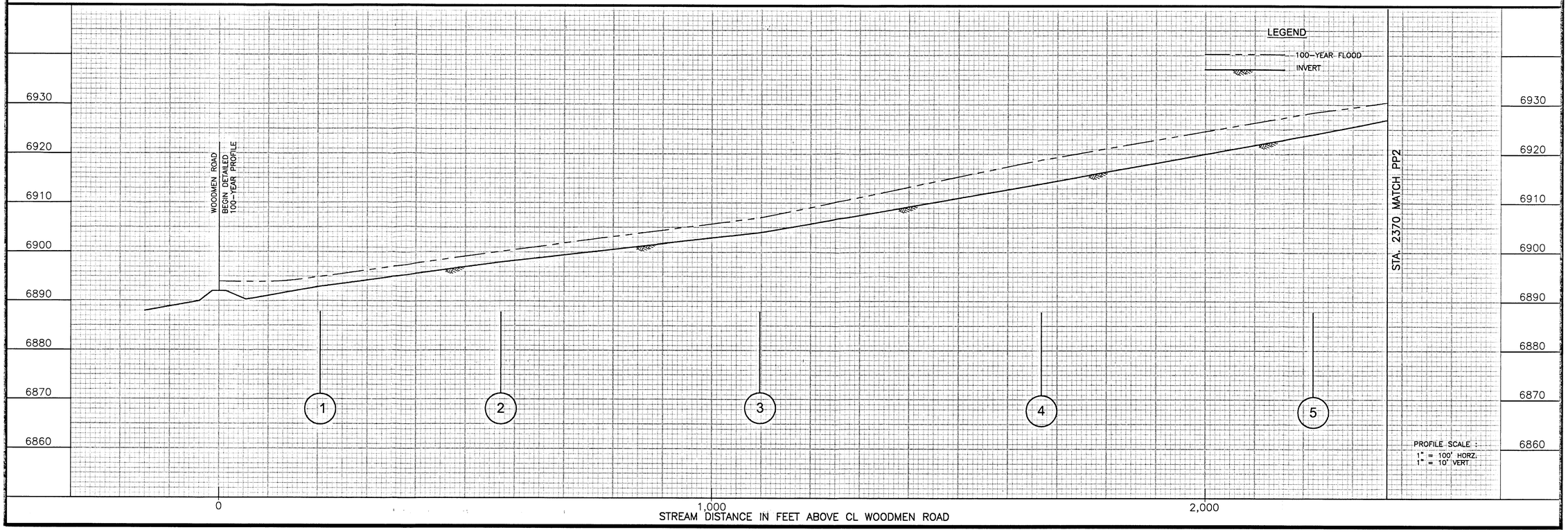
EXHIBITS



NOTES :

1. CROSS-SECTIONS ORIENTED LEFT-TO-RIGHT FACING UPSTREAM.

2. TOPOGRAPHY COMPILED USING AERIAL PHOTOGRAPHY PREPARED JUNE 2001. ELEVATIONS BASED ON THE 1929 NGVD.



Kiowa Engineering Corporation
1604 South 21st St.
Colorado Springs, Colorado
80904 - 4208
(719) 630-7342

WEST TRIBUTARY FALCON BASIN
PROPOSED EFFECTIVE CONDITION
100-YEAR FLOODPLAIN BOUNDARY & PROFILE
EL PASO COUNTY, COLORADO

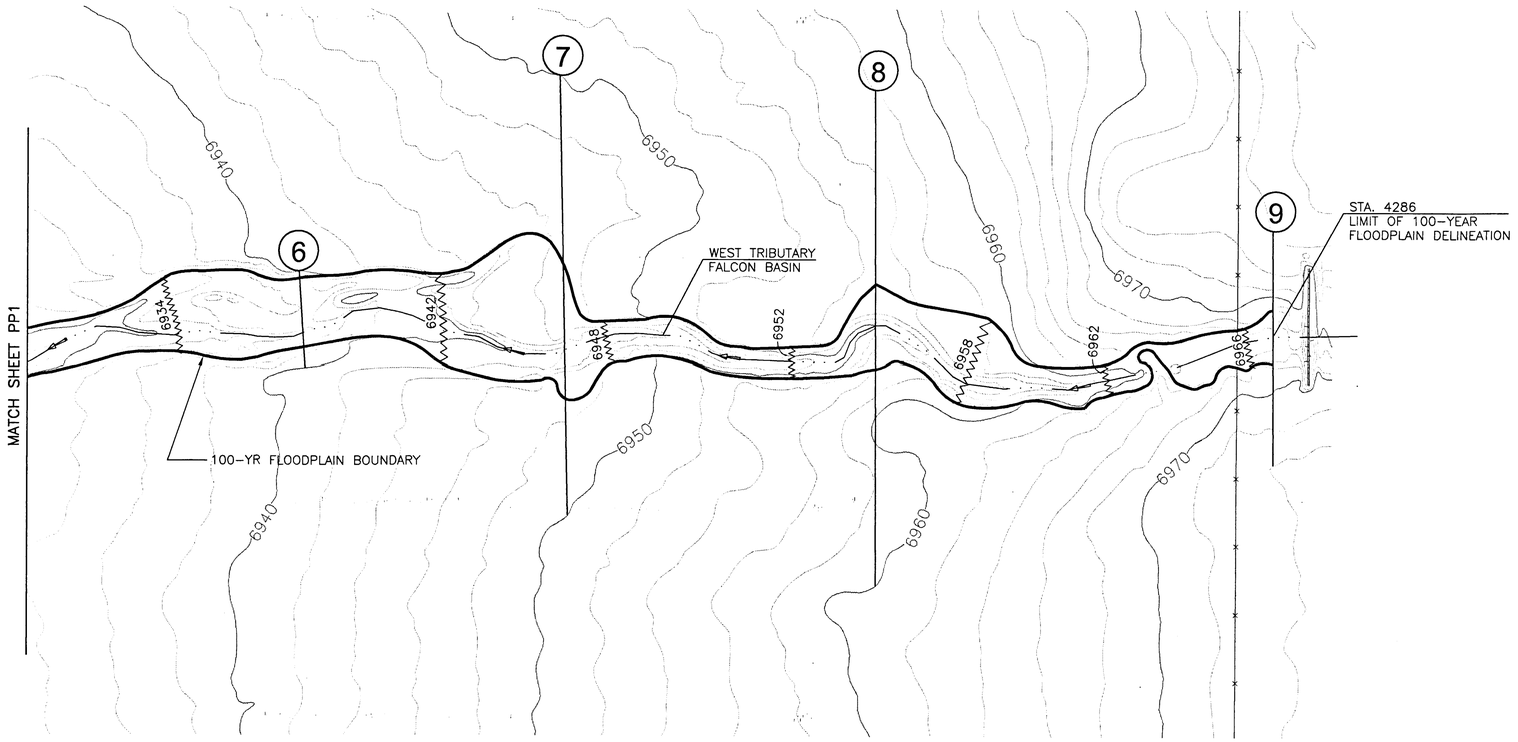
Project No.:	03016
Date:	April, 2003
Design:	RNW
Drawn:	JLN
Check:	RNW
Revisions:	

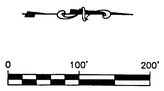
SHEET

PP1

OF X SHEETS

03016 PP1-2.dwg/Apr 16, 2003

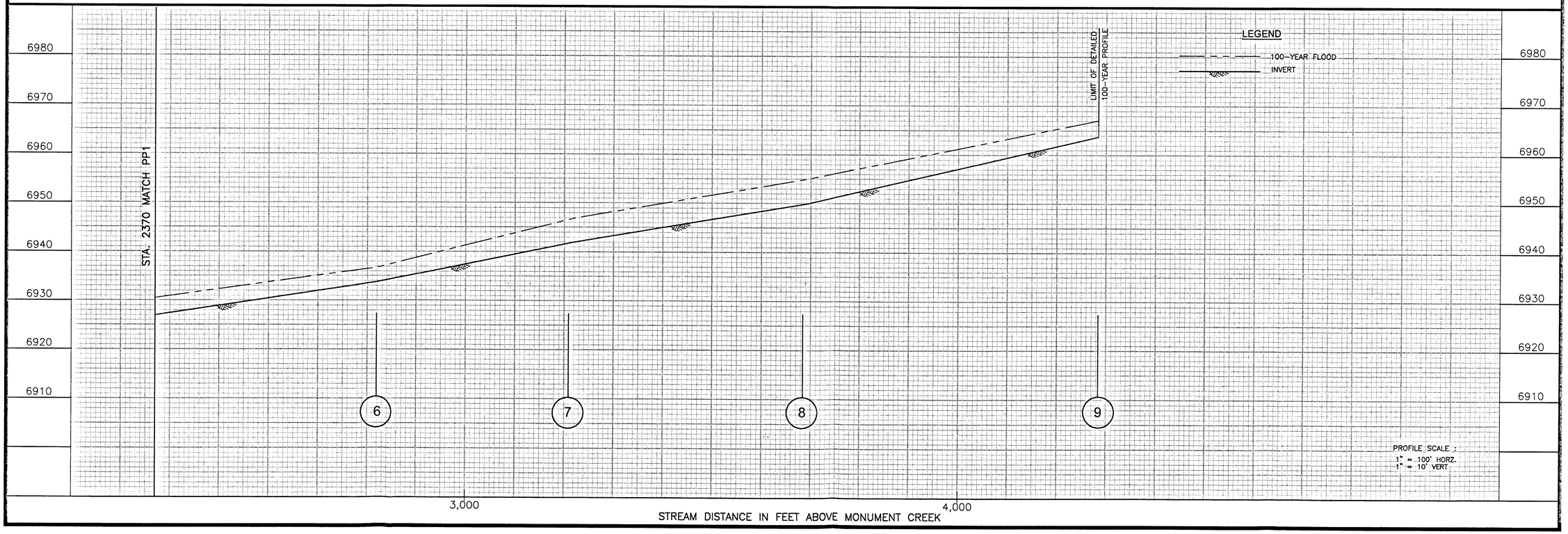




NOTES :

1. CROSS-SECTIONS ORIENTED LEFT-TO-RIGHT FACING UPSTREAM.

2. TOPOGRAPHY COMPILED USING AERIAL PHOTOGRAPHY PREPARED JUNE 2001. ELEVATIONS BASED ON THE 1929 NGVD.



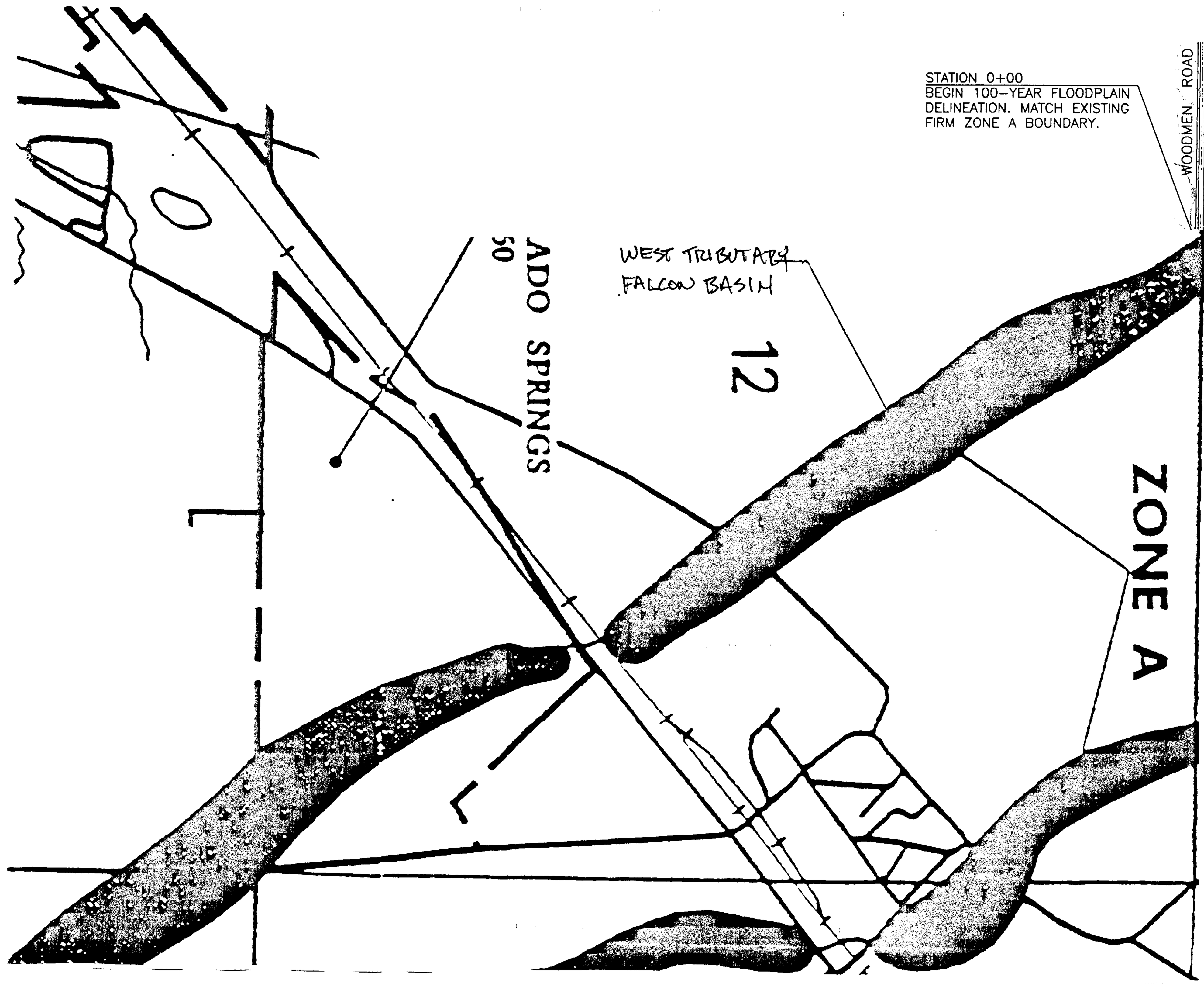
Kiowa Engineering Corporation
1604 South 21st St.
Colorado Springs, Colorado
80904-4208
(719) 630-7342

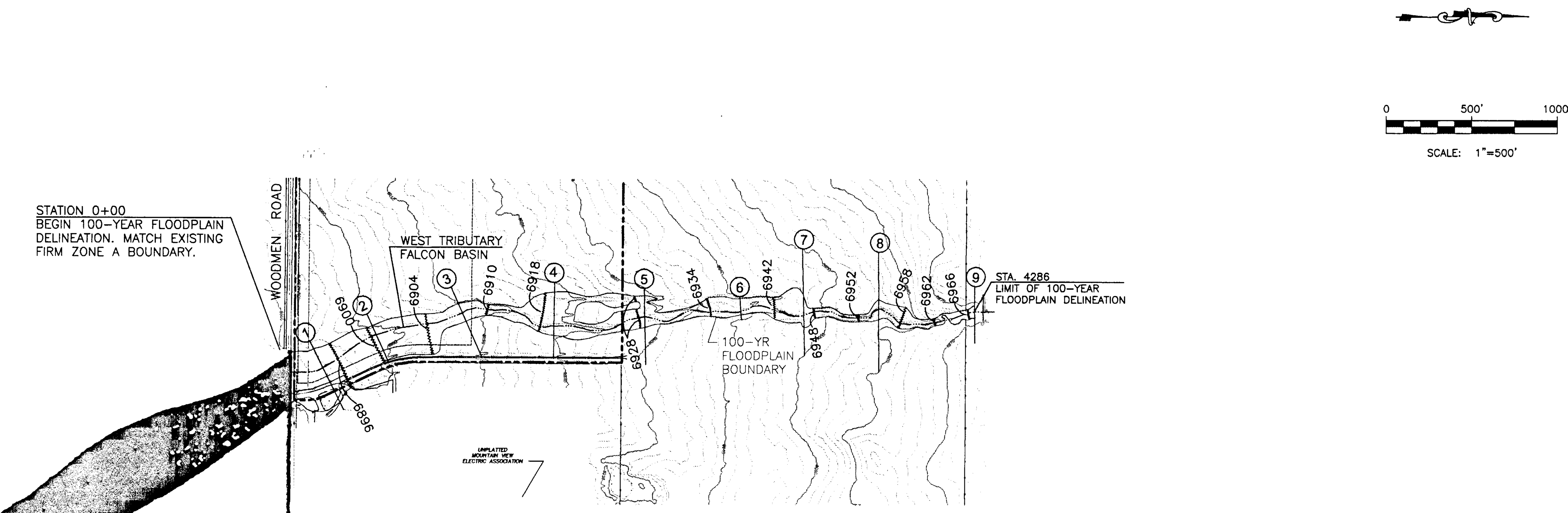
WEST TRIBUTARY FALCON BASIN
PROPOSED EFFECTIVE CONDITION
100-YEAR FLOODPLAIN BOUNDARY & PROFILE
EL PASO COUNTY, COLORADO

Project No.:	03016
Date:	April, 2003
Design:	RNW
Drawn:	JLN
Check:	RNW
Revisions:	

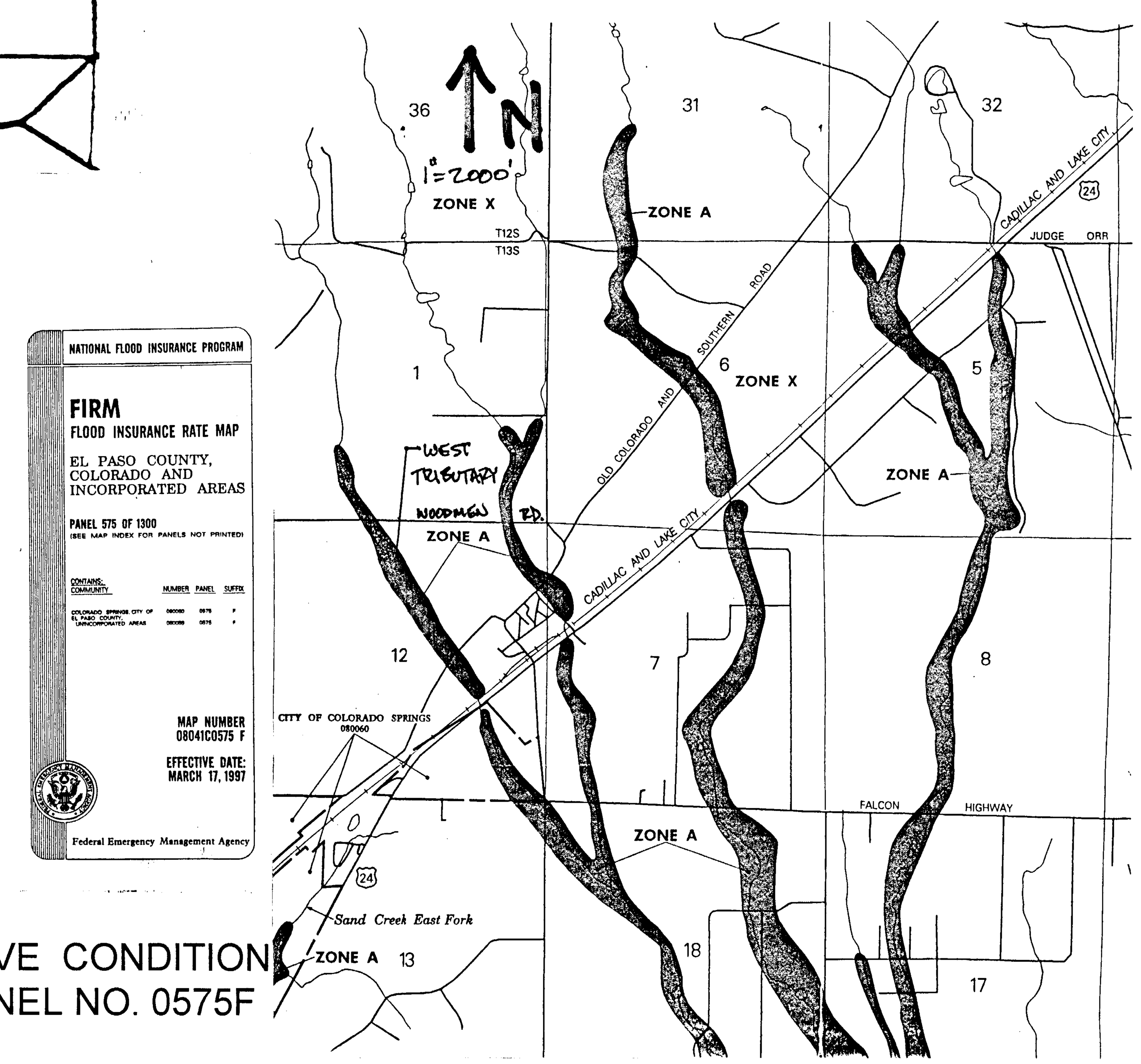
SHEET
PP2
OF X SHEETS

03016 PP1-2.dwg/Apr 16, 2003





PROPOSED EFFECTIVE CONDITION



EFFECTIVE CONDITION
MAP PANEL NO. 0575F

Kiowa Engineering Corporation
1604 South 21st St.
Colorado Springs, Colorado
80904-4208
(719) 630-7342

WEST TRIBUTARY FALCON BASIN
REVISED FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO

Project No.: 03016
Date: April, 2003
Design: RNW
Drawn: JLN
Check: RNW
Revisions:

SHEET
Exh. 1

03016 Exh1.dwg/Apr 17, 2003