COE & VAN LOO
CONSULTANTS, INC.

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

Alluvial Fan Site 37A
(East of Sun Valley Parkway)
TOWN OF BUCKEYE, ARIZONA

TECHNICAL DATA NOTEBOOK

January 25, 2006
Revised: August 10, 2006
2nd Revision: October 12, 2006

Prepared for:

Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, AZ 85009
(602) 506-1501

Prepared by:

Coe & Van Loo Consultants, Inc.
4550 N. 12th Street
Phoenix, AZ 85014
(602) 264-6831

CVL Job Number: 72-0001-22-01

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Registered Professional Engineer (Civil) CERTIFICATE NO. 41454 RICARDO E. AGUIRRE Date Signed 10.12.06 ARIZONA, U.S.A.

CVL Job Number: 72-0001-22-01

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Approximate Flood Hazard Assessment
for
White Tank Fans
Alluvial Fan Site 37A
(East of Sun Valley Parkway)

Technical Data Notebook

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SECTION 1: INTRODUCTION

1.1 Purpose of Study

The purpose of this study is to identify and delineate the 100-year flood zones for portions of the White Tank alluvial fan designated as Site 37 (Hjalmarson and Kemna, 1992) located in Township 2 North, Range 4 and 5 West and in Township 1 North, Range 4 and 5 West in Maricopa County, Arizona. The term Site 37A (East of Sun Valley Parkway) is the subject of this report and will be used to describe that portion of the western piedmont of the White Tank Mountains. Site 37A is one of several alluvial fans located on the western piedmont of the White Tank Mountains. This study incorporates the methods for assessment of piedmont flood hazards as outlined in Piedmont Flood Hazard Assessment Manual for Maricopa County (PFHAM) (Hjalmarson, 1998) and in the *Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix G: Guidance for Alluvial Fan Flooding Analyses and Mapping*, February 2002 (FEMA Guidelines). Both a hydraulic approach and a geomorphic approach will be considered in determining the approximate flood hazard delineation. However, it is understood from other reports written on alluvial fans in the area of the western piedmont of the White Tank Mountains that the geomorphic approach will be the primary method of analysis in determining the approximate flood hazard delineation.

1.2 Authority for study

Coe & Van Loo Consultants, Inc. (CVL) performed this study under contract for Lennar Communities Development, Inc., who were working in conjunction with the Flood Control District of Maricopa County (FCDMC). CVL's Project Manager for this Project was J. Doug Both, CFM. The contract number was FCD2004C049. FCDMC is located at 2801 West Durango Street, Phoenix, AZ 85009, (602) 506-1501. The Project Manager for the FCDMC was Valerie Swick.

1.3 Location of study reach

The study area is located in western Maricopa County, Buckeye, Arizona. The study area is north of Interstate 10, east of Sun Valley Parkway (east of the Hassayampa River), and west of

the White Tank Mountains (see Figure 1.1 and Figure 1.2). The total upstream watershed contributing to Site 37A is 4.24 square miles ending at the hydrographic apex of the alluvial fan (see Figure 1.3). Downstream from this point the wash becomes distributary where the riverine system begins to break off into smaller branches as it gets farther away from the hydrographic apex. The floodplain encompasses the Site 37A alluvial fan which extends from the hydrographic apex near the Oglesby Road and Bethany Home Road alignments to Sun Valley Parkway.

The alluvial fans on the western piedmont of the White Tank Mountains intersect four master planned communities. The developers of these communities are working in conjunction with the FCDMC to assess the flood hazards in this area (see Figure 1.4).

1.4 Methodology

This study is based on the assessment of piedmont flood hazard methodologies found in the PFHAM and the FEMA Guidelines as well as the Approximate Floodplain Delineation Study for White Tank Fan Site 36 (AFDS – Site 36 TDN). The PFHAM and the FEMA Guidelines were based and rely heavily on the National Research Council's *Alluvial Fan Flooding* report (NRC, 1996). The FEMA Guidelines focus on the determination of flood hazards on alluvial fan landforms, and the PFHAM focus on piedmonts specifically in Maricopa County, Arizona. Each document provides guidelines for carrying out the geomorphic based approach presented in this TDN. The AFDS – Site 36 TDN was extensively relied on for its research, its thorough approach, and its proximity to Site 37. The development of this Approximate Flood Hazard Assessment for Site 37A would not have been as easily achieved without the materials presented in the AFDS – Site 36 TDN.

1.5 Hydrology

The hydrologic information used in this study is derived from the 100-year 24-hour storm event defined in the HEC-1 model of the *Buckeye/Sun Valley Area Drainage Master Study Technical Data Notebook Volumes V-A1 and V-A2: Area 3 Hydrology Report*, January 2006 (BSV ADMS

HEC-1). This study was conducted by PBS&J for the FCDMC. The 100-year peak discharge at the hydrographic apex of Site 37A is 2,520 cfs, which is the flow at the HEC-1 L2BR Concentration Point.

1.6 Hydraulics

Hydraulic analysis using the HEC-RAS backwater model has been performed for the riverine reach upstream of the Fan 37 hydrographic apex. The hydraulic analysis for this part of the approximate floodplain delineation is discussed in Section 5 of this TDN. Figure 5.1, which shows the HEC-RAS cross-section locations, is also included in Section 5. The HEC-RAS model output is provided in Appendix E. The flood hazards for the rest of the Fan 37 study area has been determined by using the geomorphic approach described in Section 6B.

1.7 *Geomorphic Analysis*

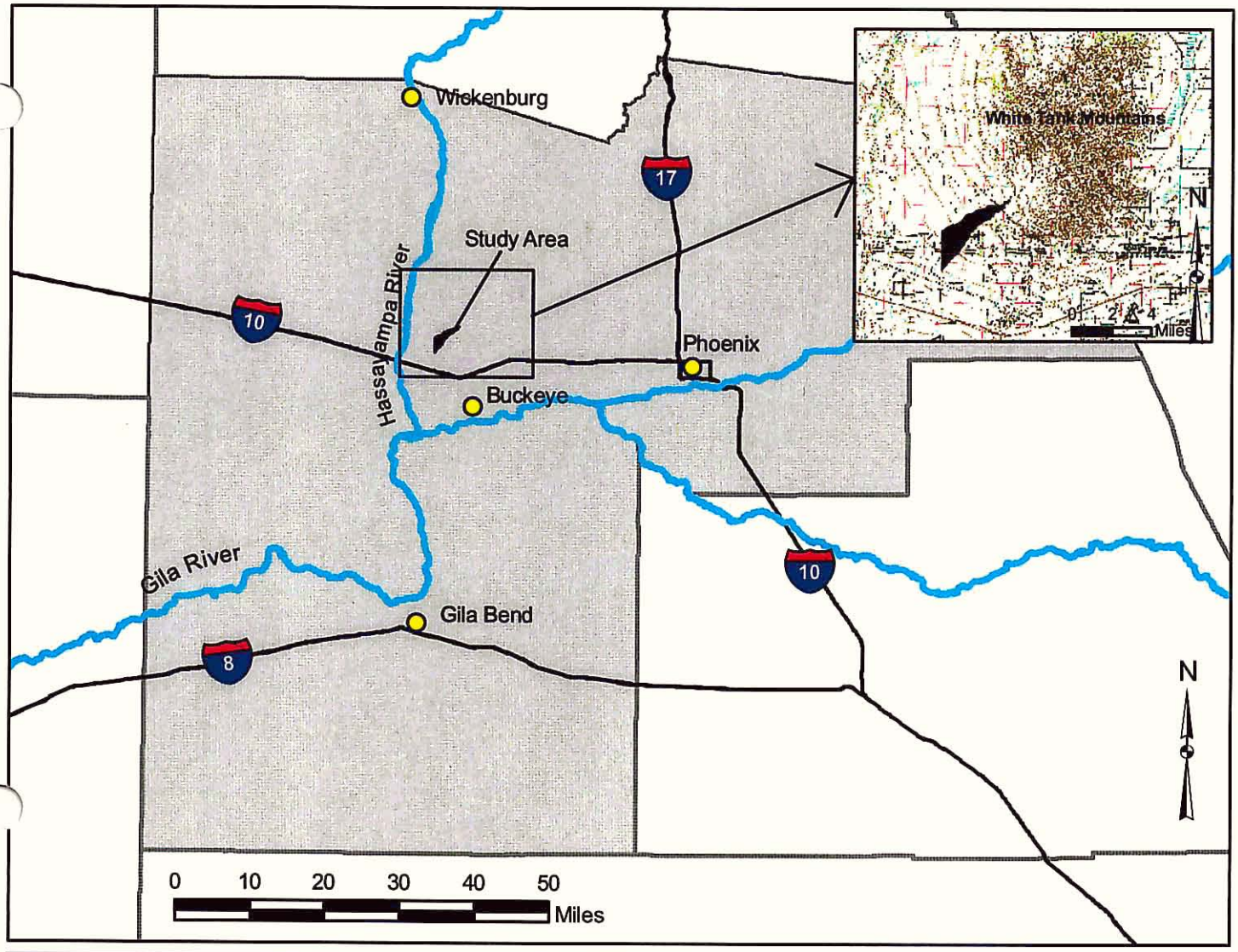
The geomorphic analysis is an approximate method chosen in this TDN to define the Stage 3 100-year floodplain areas. The geomorphic analysis was determined to be the most suitable approach for Fan 37A after evaluating both field and map data. The geomorphic analysis relies mostly on qualitative information, post-flood verification, historical data, and interpretive studies. The procedures applied follow the three stage method described in the PFHAM and the FEMA Guidelines. Section 6B of this TDN discusses this approach as well as the results of the analysis.

1.8 Study Results

The results of the study show approximately 3.2 square miles of delineated flood hazard area determined by applying geomorphology and hydraulics. Note that hydraulic analysis was only performed upstream of the hydrographic apex. Figure 1.5 shows the outline of Fan 37A, as well as the hydrographic apices of neighboring alluvial fans.

FEMA Designation	Flood Hazard Type	Area (sq. mi.)
Zone A	AAFF	0.75
Zone A	AFHH	0.60
Zone A	AFUFD	0.18
Zone A	AFZA	0.48
Zone A	Zone A	0.02
	Shaded X	1.14

Please refer to Section 6B, Section 7, and the Exhibit Maps at the end of this TDN for illustrations of the proposed floodplain delineation. The floodplain mapping also includes administrative flood hazard zones for the alluvial fans defined by the FCDMC.



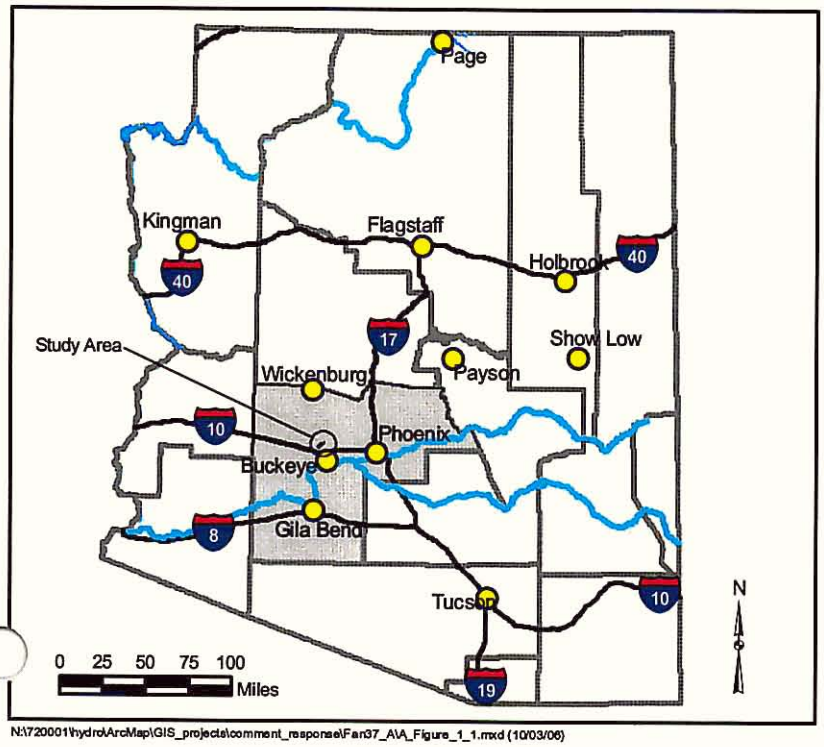


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Figure 1.1
Location Map

Approximate Flood Hazard Assessment
For
White Tank Fans

Alluvial Fan Site 37A

(East of Sun Valley Parkway)

COE & VAN LOO CONSULTANTS, INC.

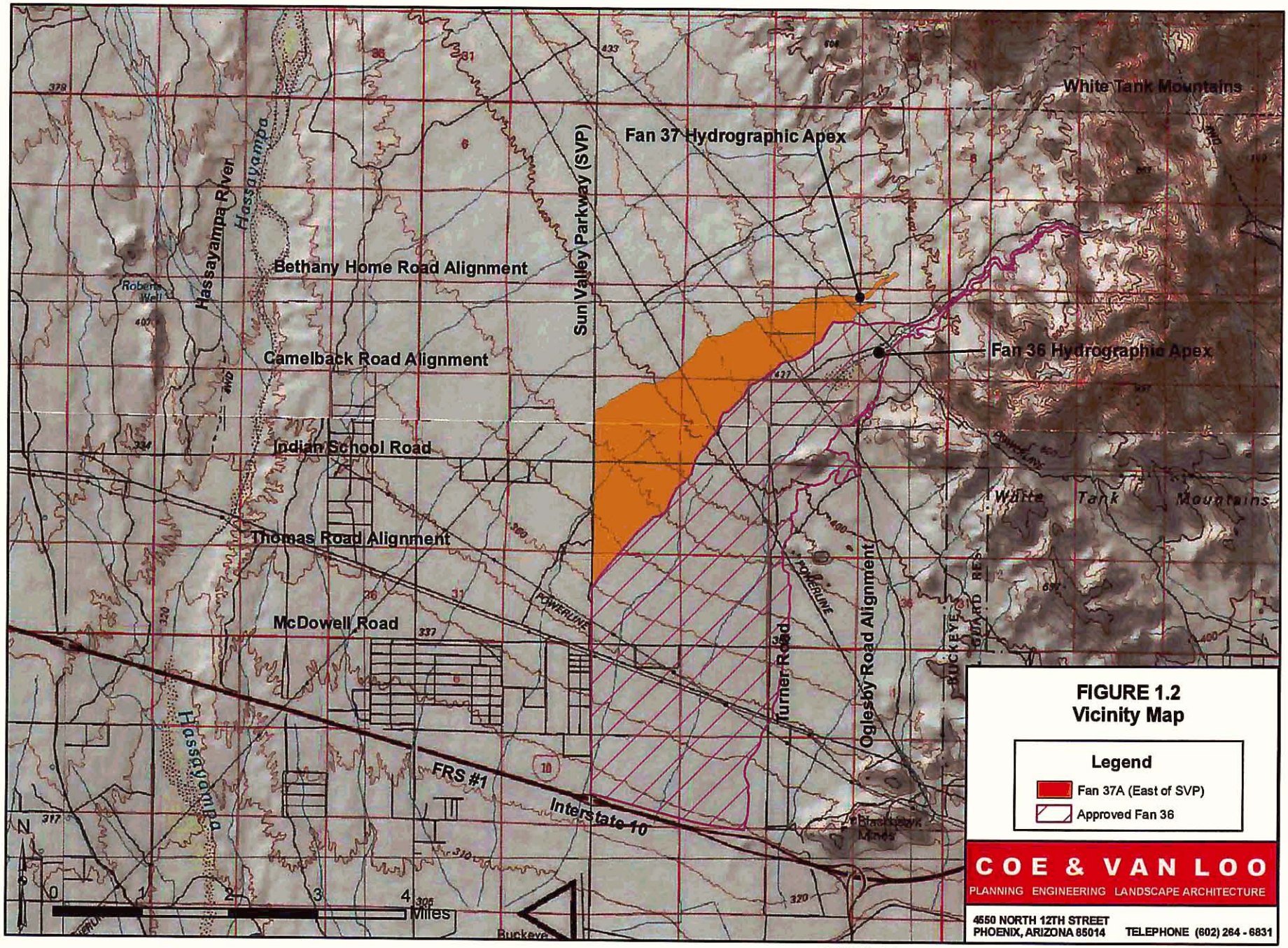

FIGURE 1.2
Vicinity Map

Legend

- Fan 37A (East of SVP)
- Approved Fan 36

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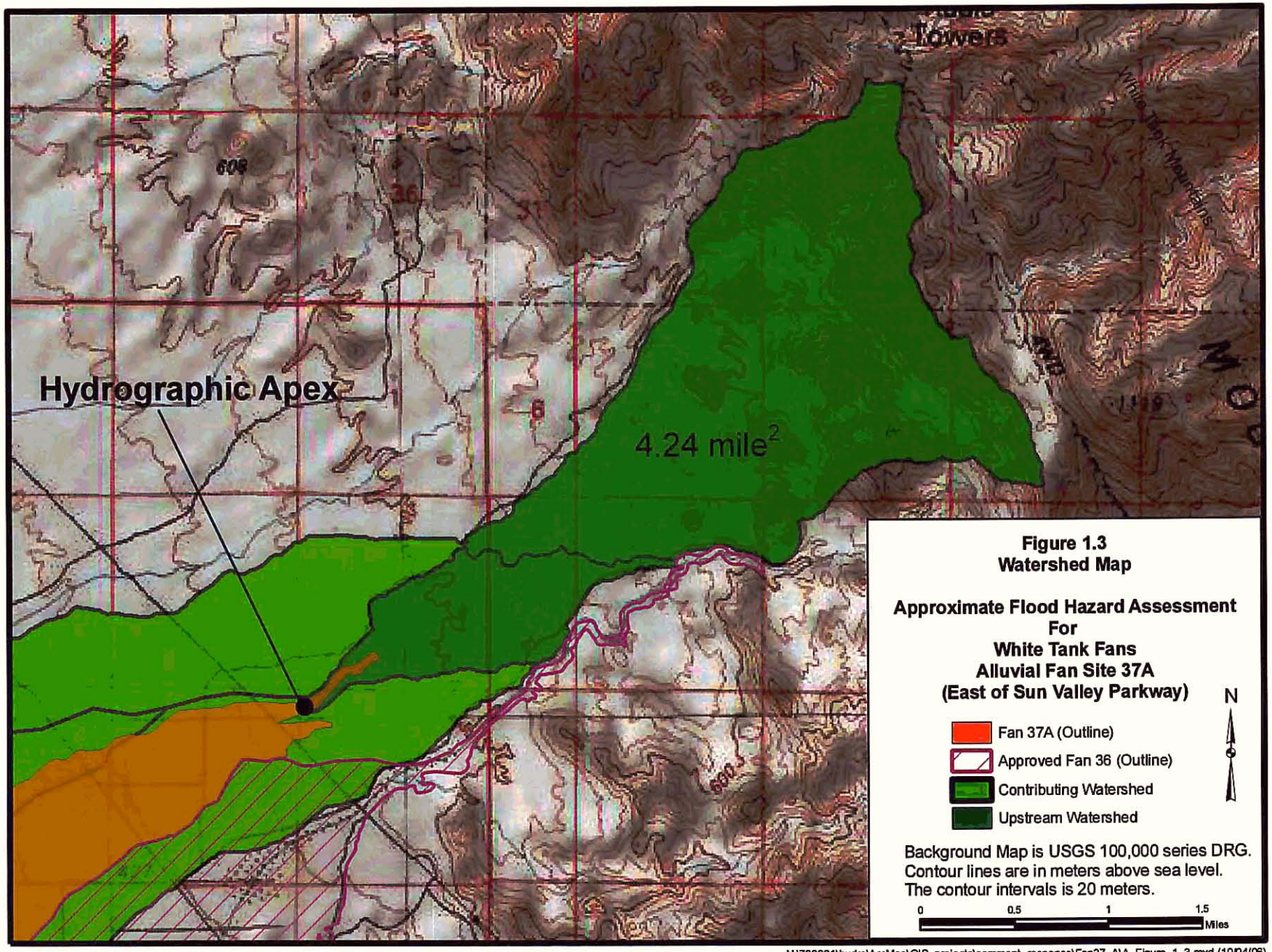

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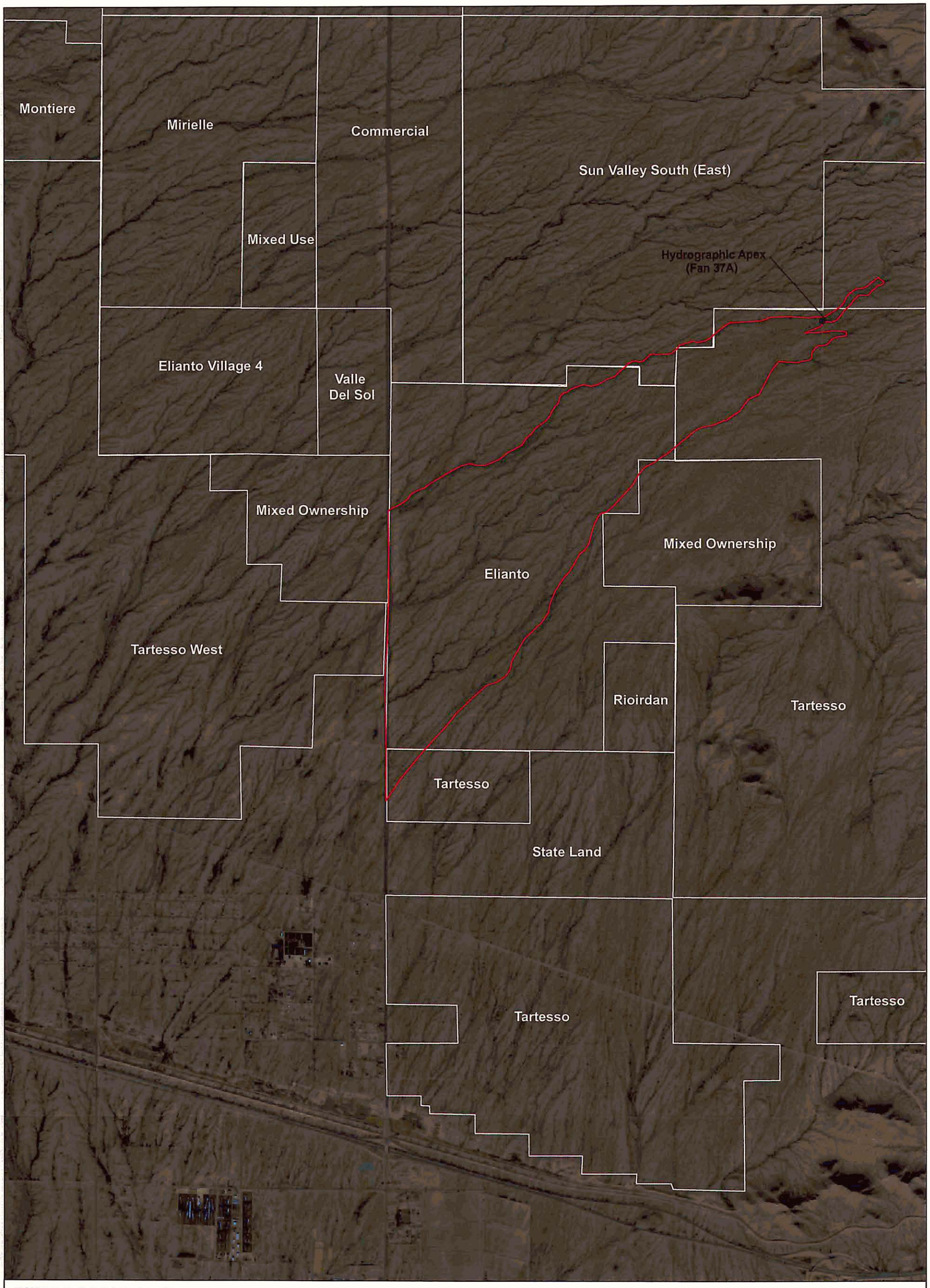

FIGURE 1.4 - Subdivision Location

COE & VAN LOO
PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014 TELEPHONE (602) 264 - 6831

Approximate
Flood Hazard Assessment
For
White Tank Fans

Alluvial Fan Site 37A

(East of Sun Valley Parkway)

LEGEND
Fan 37A Outline
Subdivision Boundary

0 2,000 4,000 6,000 8,000 Feet

N

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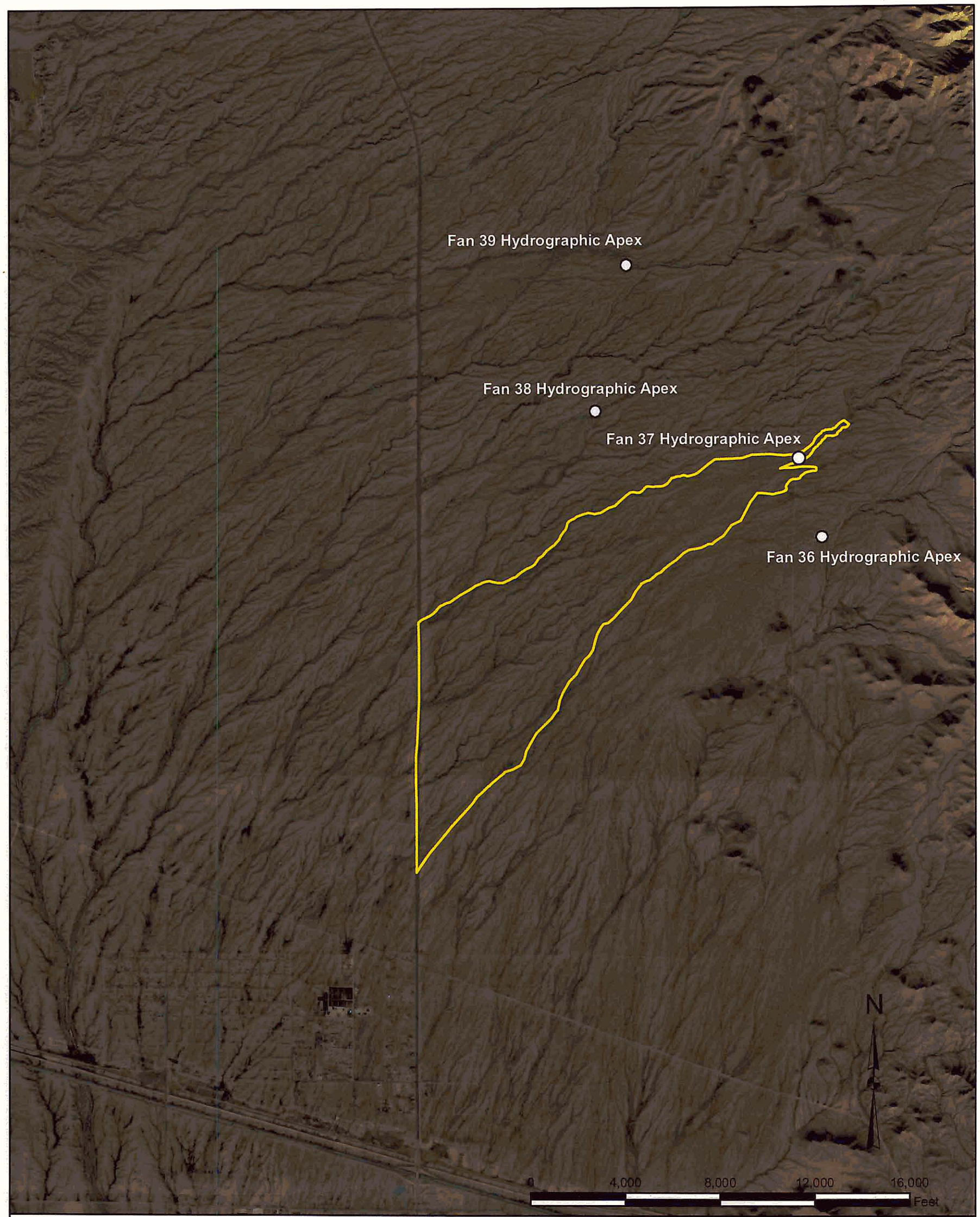


FIGURE 1.5 - Hydrographic Apeces and Outline of Fan 37A (East of Sun Valley Parkway)

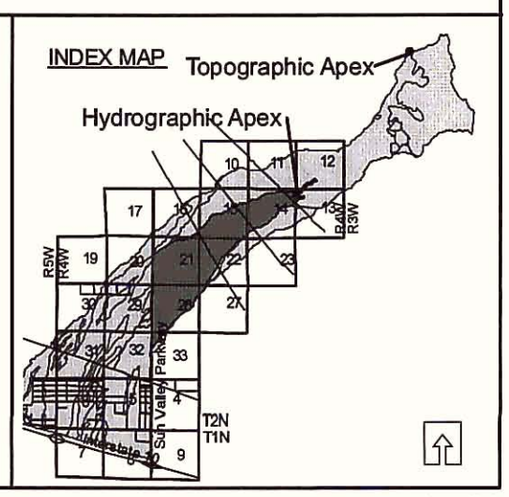
APPROXIMATE
FLOOD HAZARD ASSESSMENT
FOR
WHITE TANK FANS

ALLUVIAL FAN SITE 37A
(East of Sun Valley Parkway)

COE & VAN LOO
PLANNING ENGINEERING • LANDSCAPE ARCHITECTURE
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014 TELEPHONE (602) 264 - 6831

LEGEND

- Apex
- Fan 37A (East of Sun Valley Parkway)



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SECTION 2: FEMA FORMS

2.1 Study Documentation Abstract for FEMA Submittals

Study Documentation Abstract For FEMA Submittals	Initial Study	Restudy	CLOMR	LOMR	X	Other

2.1.1	Date Study Accepted	
2.1.2	Study Prime Contractor	Coe & Van Loo Consultants, Inc.
	Contact(s)	Doug Both, CFM, & Ricardo E. Aguirre, P.E.
	Address	4550 N. 12th St. Phoenix, AZ 85014
	Phone	(602) 264-6831
	Internal Reference Number	FCDMC Sun Valley ADMP
2.1.2	Study Sub-Contractor	None
	Contact(s)	
	Address	
	Phone	
	Internal Reference Number	
2.1.2	Sub Study Sub-Contractor	None
	Contact(s)	
	Address	
	Phone	
	Internal Reference Number	
2.1.3	FEMA Technical Review Contractor	Michael Baker, Jr.
	Contact(s)	Mounir Boudjemaa
	Address	3600 Eisenhower Ave. Suite 600 Alexandria, VA 22304
	Phone	703-960-8800
	Internal Reference Number	
2.1.4	FEMA Regional Reviewer	Michael Baker, Jr. Engineering
	Phone	(703) 960-8800
2.1.5	State Technical Reviewer	None
	Phone	
2.1.6	Local Technical Reviewer	Flood Control District of Maricopa County (FCDMC) Kathryn Gross, CFM
	Phone	(602) 506-1501
2.1.7	Reach Description	White Tank Mountains Fan 37A (East of Sun Valley Parkway)
2.1.8	USGS Quad Sheet(s) with original photo date & latest photo revision date	Wagner Wash Well, Arizona, Photo date 1984 Buckeye NW, AZ, Photo date 1955, Photo revised using 1978 White Tank MTS., Arizona, 1954, Photo revision 1971
2.1.9	Unique Conditions and Problems	Alluvial Fan Flooding
2.1.10	Coordination of Peak Discharges (Agency, Date, Comments)	FCDMC – Sun Valley ADMS (2005); Sun Valley ADMS (2006) Existing Conditions HEC-1 Model Results

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
040037	Maricopa County	AZ	04013C	2010H	09/30/05
040039	Buckeye, Town of	AZ	04013C	2010H	09/30/05
040037	Maricopa County	AZ	04013C	1545H	09/30/05
040039	Buckeye, Town of	AZ	04013C	1545H	09/30/05
040037	Maricopa County	AZ	04013C	1565F	09/30/05
040039	Buckeye, Town of	AZ	04013C	1565F	09/30/05

2. Flooding Source: White Tank Mountains Fan 37

3. Project Name/Identifier: Approximate Flood Hazard Assessment for White Tank Fan 37A – East of Sun Valley Parkway

4. FEMA zone designations affected: A, D, X (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

FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 3067-0148
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040037	Maricopa County	AZ	04013C	1545H	09/30/05
040039	Buckeye, Town of	AZ	04013C	1545H	09/30/05
040037	Maricopa County	AZ	04013C	1565F	09/30/05
040039	Buckeye, Town of	AZ	04013C	1565F	09/30/05

2. Flooding Source: White Tank Mountains Fan 37

3. Project Name/Identifier: Approximate Flood Hazard Assessment for White Tank Fan 37A – East of Sun Valley Parkway

4. FEMA zone designations affected: A, D, X (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: $_____
☒ No, Explanation: New Delineation by Agency

Map changes based on flood hazard information meant to improve upon that shown on the flood map or within the flood study.
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: Ricardo E. Aguirre, P.E.	Company: Coe & Van Loo Consultants, Inc.	
Mailing Address: 4550 N. 12th Street Phoenix, AZ 85014	Daytime Telephone No.: (602) 264-6831	Fax No.: 602-264-0928
	E-Mail Address: raguirre@cvlci.com	
Signature of Requester (required):		Date: 11/14/06

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: Timothy S. Phillips, P.E., Chief Engineer & General Manager		Telephone No.: 602-506-1501
Community Name: Maricopa County, AZ	Community Official's Signature (required):	Date: 12/1/06

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: Ricardo E. Aguirre, P.E.	License No.: 41454	Expiration Date: 09/30/07
Company Name: Coe & Van Loo Consultants, Inc.	Telephone No.: 602-264-6831	Fax No.: 602-264-0928
Signature:		Date: 11/14/06

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

Registered Professional Engineer (Civil) CERTIFICATE NO. 41454 RICARDO E. AGUIRRE Date Signed 11/14/06 Arizona U.S.A.

D. SIGNATURE (continued)

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: Ricardo E. Aguirre, P.E.	Company: Coe & Van Loo Consultants, Inc.	
Mailing Address: 4550 N. 12th Street Phoenix, AZ 85014	Daytime Telephone No.: (602) 264-6831	Fax No.: 602-264-0928
	E-Mail Address: raguirre@cvlci.com	
Signature of Requester (required):		Date: 11/14/06

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: Scott Lowe, P.E., Public Works Director		Telephone No.: (623) 349-6815
Community Name: Town of Buckeye, AZ	Community Official's Signature (required):	Date: 1 DEC 2006

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: Ricardo E. Aguirre, P.E.	License No.: 41454	Expiration Date: 09/30/07
Company Name: Coe & Van Loo Consultants, Inc.	Telephone No.: 602-264-6831	Fax No.: 602-264-0928
Signature:		Date: 11/14/06

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: White Tank Mountains Fan 37
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply) Using Buckeye/Sun Valley Area Drainage Master Study Technical Data Notebook, Vol. V-A1 & V-A2: Area 3 Hydrology

☒ 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 [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.
Explanation: Sediment transport implicitly considered in Geomorphic Analysis. See Section 6.

B. HYDRAULICS

1. Reach to be Revised: No existing delineations are revised. New approximate riverine delineations are submitted upstream of fan apex.

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	See attached annotated FIRMs			
Upstream Limit	See attached annotated FIRMs			

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [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: Zone A	Floodway File Name: Zone A
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.

FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLUVIAL FAN FLOODING FORM

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

PAPERWORK REDUCTION ACT

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.**

Flooding Source: White Tank Mountains Fan 37

Note: Fill out one form for each flooding source studied

A. THREE-STAGE ANALYSIS (Based on FEMA Guidelines dated February 2002)

1. Stage 1 Analysis
   a. The landform is composed of (check one) ☒ alluvial ☐ debris flow deposits.
   b. Source of data used to determine composition, morphology, and location of the landform:
      Topo at 1' and 10' contour intervals, aerial photography, approved thalwegs from FCDMC, site visits.
   c. Is there an NRCS soils survey and soil survey map available? ☒ Yes ☐ No
      If Yes, please include a copy of the map and any pertinent sections of the soil survey
2. Stage 2 Analysis
   a. The alluvial fan exhibits ☐ active ☐ inactive ☒ a combination of active and inactive alluvial fan flooding.
   b. Approximate age of inactive fan surfaces (thousands of years): > 10,000 yrs.
   c. Is there an opportunity for avulsions that could lead channels or sheetfloods across the older fan surfaces?
      ☐ Yes ☒ No
   d. Is there evidence of headcutting that could lead to stream piracy? ☒ Yes ☐ No (Only in active, unstable areas)
   e. Is there geomorphic evidence of past avulsions during the Holocene epoch? ☒ Yes ☐ No (Only in active, unstable areas)
   f. The fan exhibits the following types of flooding (check one):
      ☒ Flooding along stable channels
      ☒ Sheetflow
      ☐ Debris flow
      ☒ Unstable flow path flooding
3. Stage 3 Analysis
   The boundaries of the 1%-annual-chance floodplain have been determined using (check one):
   ☐ Risk-Based Analysis
   ☐ FEMA FAN program (if discharge at the apex is different than that given in the effective FIS, then attach MT-2, Form 2 along with a plot of the flood frequency curve on log-normal probability paper and include the drainage area above the hydrographic apex, and the mean, standard deviation, and skew coefficient of the curve)
   ☐ Sheetflow Methods
   ☐ Hydraulic Analytical Methods
   ☒ Geomorphic Data, Post-Flood Hazard Verification, and Historical Information
   ☐ Composite Methods

B. STRUCTURAL FLOOD CONTROL MEASURES

1. The following structural flood control measures are proposed or built (check one):

   ☐ Channelization ☐ Levee/Floodwall ☐ Dam ☐ Sedimentation Basin

2. Do the constructed or proposed structural measures affect flood hazards (including velocity, scour, and sediment deposition) on other areas of the fan? ☐ Yes ☐ No

3. Attach completed Form 3 (Riverine Structures Form).

4. Sediment Transport Considerations: Sediment transport not explicitly considered, used Ayres Sediment Yield Analysis. See Section 6.

   Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Form 3, Section F (Sediment Transport).

   If No, then attach your explanation for why sediment transport was not considered.

5. Please attach a copy of the formal Operations and Maintenance Plan.

C. MAPPING REQUIREMENTS

Attach a certified topographic work map showing the following:

- The boundaries of the alluvial fan including: toe, topographic and hydrologic apexes, and lateral boundaries
- The delineation of the active and inactive portions of the fan as determined by the Stage 2 analysis
- The revised 1%-annual-chance floodplain boundaries, as determined by the Stage 3 Analysis, that tie into the effective floodplain boundaries
- The correct alignment of all structural features
- The map scale

SECTION 3: SURVEY/MAPPING

3.1 Field Survey Information

Ground control survey work associated with the topographic mapping was performed by RBF Consulting of Phoenix, Arizona under contract with the FCDMC. The survey data for this project is presented in the North American Datum of 1983 (NAD 83), 1992 Central Zone of Arizona State Plane Coordinate System. Elevations are referenced to the North American Vertical Datum of 1988 (NAVD88).

3.2 Mapping

The topographic mapping was provided by Landata Airborne Systems of Irvine California, under contract with the FCDMC in 2000/2001. The flight dates for the mapping were 12-16-00, 12-17-00, and 12-27-00. The topographic mapping was prepared by photogrammetric methods to national map accuracy standards for 1-inch equals 500 feet with a 10-foot contour interval (see Figure 3.1 and Appendix C for larger exhibit).

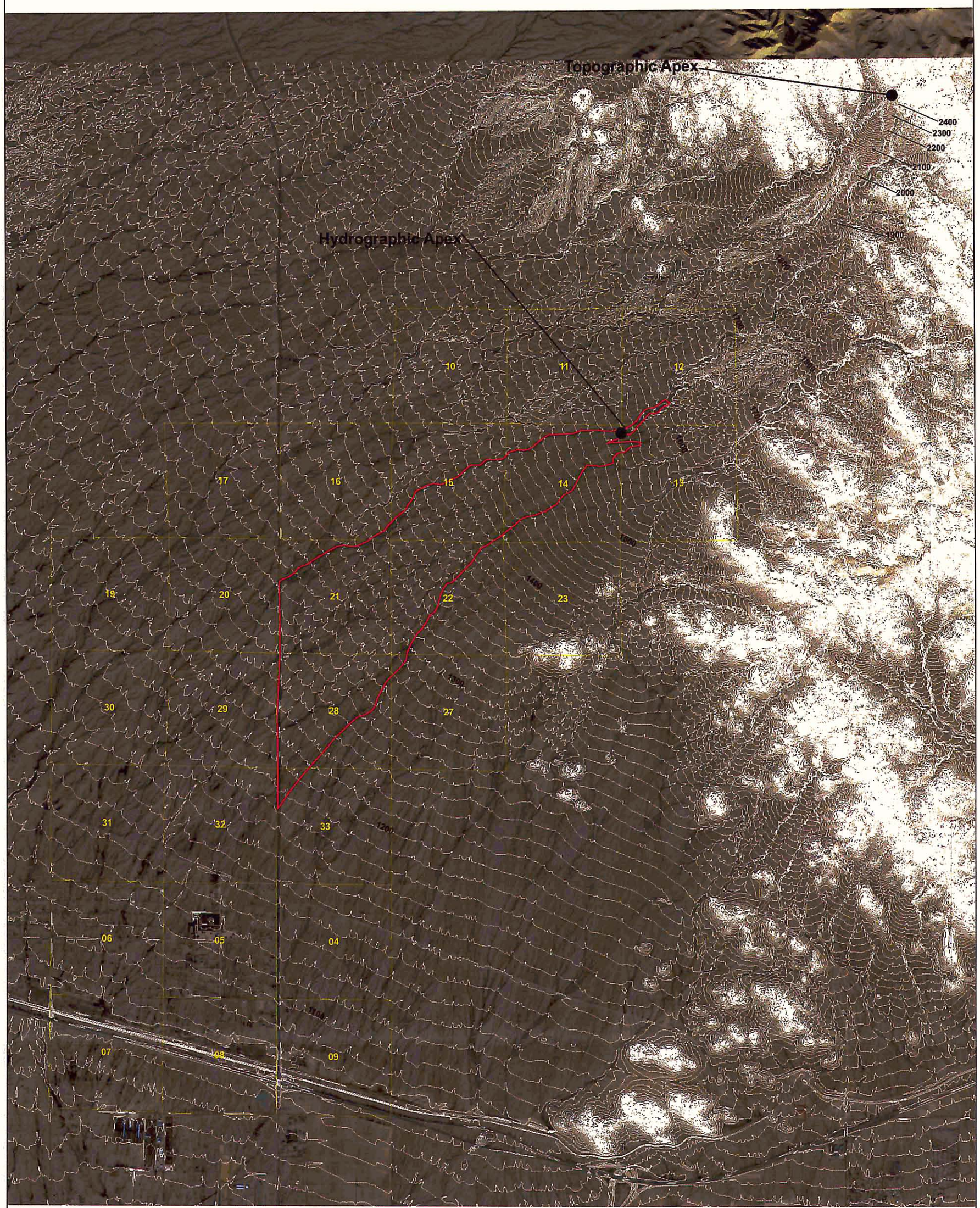

Figure 3.1 - Topography on Aerial Photograph

COE & VAN LOO
PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE

4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014 TELEPHONE (602) 264 - 6831

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

ALLUVIAL FAN SITE 37A (East of Sun Valley Parkway)

LEGEND

Topography (10ft interval)

14 Section

NOTE

Aerial Photography: Flood Control District of Maricopa County (2004)

Topography: Flood Control District of Maricopa County (2000/2001)

N

0 2,000 4,000 8,000 Feet

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SECTION 4: HYDROLOGY

4.1 Method Description

The hydrologic information used in this report was received from the FCDMC. The study that they provided is the BSV ADMS, prepared by PBS&J, January 2006. This report considers the hydrology of the piedmont on the west side of the White Tank Mountains. The floodplain of the riverine reach upstream of the hydrographic apex was determined using traditional hydraulic methods. The peak flow used in the hydraulic model is from the 100-year 24-hour storm event at Concentration Point L2BR in the BSV ADMS HEC-1 model.

Provided below is a table listing the flow rates of the hydrographic apex for the 100-year 24-hour storm event and the 100-year 6-hour storm event. This analysis used the higher of the two flow rates.

Discharge at Concentration Point L2BR

Flooding Source and Location	Drainage Area	Peak Discharge (cfs)			
White Tank Fan 37 above hydrographic apex	(square miles)	10-Year[1]	50-Year[1]	100-Year	500-Year[1]
24 hour	4.24	--	--	2,520	--
6 hour	4.24	--	--	2,391	--

Notes: [1]Not computed.

4.2 Parameter Estimation

Refer to the BSV ADMS.

4.2.1 Drainage Area Boundaries

Refer to the BSV ADMS.

4.2.2 Watershed Workmap

Refer to the BSV ADMS.

4.2.3 Gage Data

Refer to the BSV ADMS.

4.2.4 Statistical Parameters

Refer to the BSV ADMS.

4.2.5 Precipitation

Refer to the BSV ADMS.

4.2.6 Physical Parameters

Refer to the BSV ADMS.

SECTION 5: HYDRAULICS

5.1 Method Description

Upstream of the Site 37 alluvial fan hydrographic apex, the 100-year floodplain was delineated for approximately ½ mile of a fully contained stream. This stream consists of characteristics that are typical of riverine systems found upstream of hydrographic apices. This stream has emerged from the steep topography of the White Tank Mountains and is confined to a relatively straight and narrow channel. The purpose of analyzing the riverine reach upstream of the hydrologic apex was to determine the extent of the floodplain coming into the Site 37 alluvial fan.

The Hydrologic Engineering Center River Analysis System (HEC-RAS) hydraulic model was used for determining the floodplain delineation. HEC-RAS is a one dimensional model that allows the user to perform both unsteady and steady flow water surface profile calculations. This study uses the steady flow feature of the program, which is based on the solution for the one dimensional energy equation. The HEC-RAS model used for this study is Version 3.1, dated November 2002, and is developed by the United States Army Corps of Engineers.

The flow data used for this analysis is 2,520 cfs which, as discussed in Section 4, is generated from the 100-year 24-hour storm event. The flowrate is from Concentration Point L2BR found in the BSV ADMS HEC-1 model. See Section 4 for further information. In the HEC-RAS model, the user has the opportunity to choose four different starting water surface elevations. Normal depth was determined to be the most conservative starting water surface elevation for modeling the floodplain along this reach.

5.2 Work Study Maps

The 24" x 36" work study floodplain map with scale 1 inch equal to 200 feet has been provided in Appendix E. See Figure 5.1 at the end of this section for an 11" x 17" version of this map. This map contains 10-foot contour topography and aerial photography provided by the FCDMC. Cross-section locations and the resulting delineated floodplain are also illustrated on the map.

5.3 Parameter Estimation

5.3.1 Roughness Coefficients

The Manning's n values used in the HEC-RAS model were determined using the Thomsen and Hjalmarson (1991) guidelines. Both site visits and aerial photography provided insight in determining the appropriate Manning's n values. Appendix E provides an n-value report, which includes photographs of the area, a summary table, a representative cross-section, and pertinent tables copied from the Thomsen and Hjalmarson report. The n-values determined in this report are used in the hydraulic analysis.

5.3.2 Expansion and Contraction Coefficients

The expansion and contraction coefficients used for this approximate delineation are the default values of 0.3 and 0.1, respectively.

5.4 Cross-Section Description

The geometric data consists of 6 cross-sections spaced throughout the reach. The cross-sections were located approximately every 700 feet where some placement was adjusted to account for changes in channel geometry. The contour data used is from the 10-foot contour topography received by the FCDMC. The geometric data was used to model the normal flow depths of the 100-year discharge. The water surface elevations for each cross-section were plotted on the FCDMC 10-foot contours overlaid onto aerial photography. See Figure 5.1.

5.5 Modeling Considerations

5.5.1 Hydraulic Jump and Drop Analysis

No hydraulic jumps or significant drops occur along this reach.

5.5.2 Bridges and Culverts

There are no bridges or culverts along this reach.

5.5.3 Levees and Dikes

There are no levees or dikes along this reach.

5.5.4 Islands and Flow Splits

There are no significant islands causing flow splits and joins along this reach.

5.5.5 Ineffective Flow Areas

There are no ineffective flow areas along this reach.

5.5.6 Supercritical Flow

As mentioned, cross-section 2261 defaulted to a supercritical flow regime; however, according to ADWR State Standard 3-94, three consecutive cross-sections have to default to supercritical before triggering the need to follow alternative modeling guidelines.

5.6 Floodway Modeling

No floodway was analyzed using traditional hydraulic analysis along this reach. Downstream of the hydrographic apex, geomorphology was used to determine floodway delineation of the 100-year floodplain. The identification and designation of floodplain zones are described in Section 6.

5.7 Problems Encountered During the Study

5.7.1 Special Problems and Solutions

No problems were encountered during this study

5.7.2 Modeling Warning and Error Messages

The warning and error messages did not present any information that would compromise that accuracy of the results.

5.8 Calibration

No calibration was performed. Some of the data available was considered broad and not well defined, such as the 10-foot contour intervals, making calibrations inconsequential.

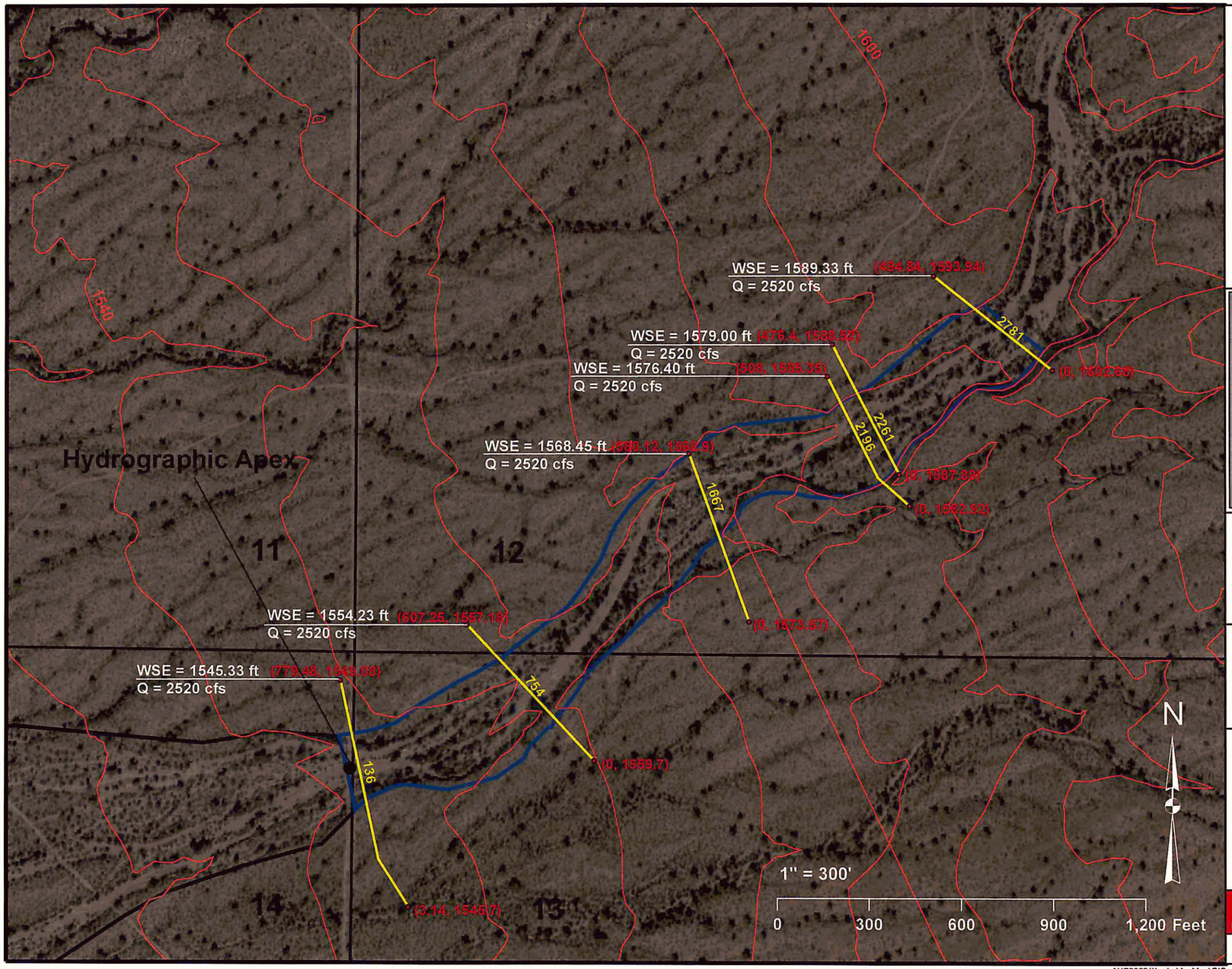
5.9 Final Results

5.9.1 Hydraulic Analysis Results

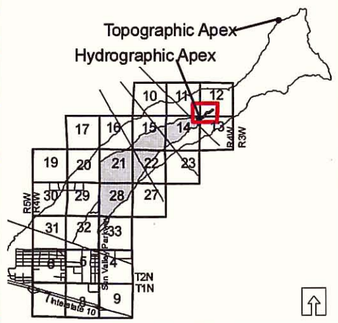
The approximate delineation of the 100-year floodplain upstream of the hydrographic apex resulted in 0.5 miles of new riverine floodplain. The floodplain limits are illustrated in Figure 5.1 of this section.

5.9.2 Verification of Results

The results of the hydraulic analysis are appropriate based on engineering judgment and the application of the HEC-RAS model. Previous studies on similar reaches have produced similar results. The 100-year floodplain delineation also fits the geomorphic effect seen both in the field and on aerial photography. See Appendix E for detailed output of this model including the general report output, cross-sections, profile, and a table of results. The flow is well contained within the channel corridor with no signs of bank breaching. Use of the 10-foot contour topography did, however, present a limitation on accuracy, but a review of the cross-section still showed that the channel corridor had an average of 2 feet of additional containment.



INDEX MAP



LEGEND

- 2781 Cross-sections
- 10 ft contours
- 11 Section Boundary
- A
- AFHH
- WSE = 1589.33 ft / Q = 2520 cfs — Water Surface Elevation (ft) / 100-Year Discharge
- (0, 1602.68) (Cross-section Station, Elevation)

NOTE

Aerial Photography: Flood Control District of Maricopa County, 2000

Topography: Flood Control Disctrict of Maricopa County (2000/2001)

FIGURE 5.1 - Riverine Reach Upstream from Hydrographic Apex, Cross-Section Layout and Approximate Floodplain

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

ALLUVIAL FAN SITE 37A (East of Sun Valley Parkway)

COE & VAN LOO
PLANNING ENGINEERING • LANDSCAPE ARCHITECTURE
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014 TELEPHONE (602) 264 - 6831

N:\720001\hydro\ArcMap\GIS_projects\comment_response\Fan37_A\A_Figure_5_1.mxd (10/11/06)

SECTION 6A: EROSION AND SEDIMENT TRANSPORT

Ayres Associates conducted the sediment yield analysis for the Buckeye Sun Valley ADMS provided in Technical Memorandum FCD T2.6.7, dated May 2005. The purpose of this report was to provide an evaluation of the 100-year storm event sediment yield for three of the Buckeye Flood Retarding Structures (FRS). The methods used included field data collection, measurement of sediment deposition volumes, average annual sediment yield analysis using RUSLE2, and the single event sediment yield analysis.

Ayres Associates concluded from the assessment of the data produced from the various methods that using the 20% concentration by volume sediment load was the most appropriate estimate when compared to field data collection and measured sediment deposition volumes at the FRS. CVL feels, however, that for a long term average a more appropriate sediment load value would be the 5% concentration by volume. This conclusion stems from the assessment of soils encountered during field visits. 20% concentration by volume is considered to be practically a mud flow condition. Soils in the field don't appear to have characteristics that would achieve the condition of mud flow. Therefore, the Site 37 alluvial fan was estimated to produce approximately 51 acre-feet during the 100-year 24-hour storm event. See the sediment yield report provided in Appendix A.

SECTION 6B: GEOMORPHOLOGY

This section is included to provide a separate place for describing the geomorphic methods and results used to identify the 100-year flood hazards for Site 37A. The outline of this section generally follows the PFHAM and the FEMA Guidelines.

6B.1 Previous Studies

Several previous studies of the geomorphology and relative flood hazards have been conducted in and around the study area. These studies are: Hjalmarson and Kemna (1991), CH2M Hill (1992), Field & Pearthree (1991, 1992), Field (1994), Hjalmarson (1994), and Ferguson, Spencer, Pearthree, Youberg, and Field (2004). None of these studies present their analyses or results according to the 3 stage process. The AFDS – Site 36 TDN, however, does present its analysis and results according to the 3 stage process.

6B.2 Method Description

The White Tank Fan, Site 37A, Approximate Floodplain Delineation Study area is located in western Maricopa County, Arizona (Figure 6B.1). The watershed contributing to the hydrographic apex encompasses approximately 4.2 square miles. The piedmont surface downstream of the hydrographic apex covers approximately 3.2 square miles.

The flood hazard delineation for this study begins close to the northwest corner of Sec. 13, T2N, R4W, approximately 0.5 miles upstream of the hydrographic apex. Downstream of the hydrographic apex, the delineation covers flood areas on the piedmont on both active and inactive alluvial fan surfaces for approximately 3.8 miles to the Sun Valley Parkway. The study contract limited the scope of the study to the FRS # 1; however, this study only includes delineation of a total of about 3.2 square miles of floodplain on Site 37A (East of Sun Valley Parkway).

Footnote:
1. Format, descriptions, and framework from AFDS – Site 36 TDN have been used to characterize and describe the Site 37 geomorphology.

This section provides a description of the methods used to identify the type and extent of the flood hazard within the study area. The organization of this section follows the general outline presented in the PFHAM and the FEMA Guidelines. Both of these documents describe a procedure that follows a three stage process: the first for piedmonts and the second for alluvial fans. In the PFHAM, which is applicable for use in Maricopa County, Arizona, the three stages are described as follows: 1) recognizing and characterizing piedmont landforms, 2) identifying the active or unstable and inactive or stable areas of the piedmont, and 3) defining and characterizing the flood hazard.

The geomorphic analysis was used to determine the flood hazard delineation within the Site 37A study area downstream of the hydrographic apex and east of Sun Valley Parkway. Upstream of the hydrographic apex, hydraulic analytical methods were used to determine the flood hazard delineation as described in Section 5 of the TDN.

6B.3 Work Study Maps

This study includes geomorphic mapping and floodplain delineation for Site 37A. Large scale versions (1:12,000) of the Landform, Stability, and Floodplain study work maps are located in the map pockets at the back of this TDN under the section labeled Exhibit Maps. The procedures for creating the information on these exhibits are described in the following sections. The following figures are located at the end of this section.

Figure 6B.1 – Location Map
Figure 6B.2 – NRCS Soil Map with Stage 1 Landform Delineations
Figure 6B.3 – Stage 1 Landform Delineation overlayed onto Aerial Photography
Figure 6B.4 – Surficial Geology Map with Stage 1 Landform Delineations
Figure 6B.5 – NRCS Soil Map and Surficial Geology Map overlay
Figure 6B.6-A – Cross-sections of the Site 37 Piedmont
Figure 6B.6-B – Cross-sections of the Site 37 Piedmont – Plan View

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Figure 6B.7 – Longitudinal Profile

Figure 6B.8 – Location Map of Aerial Photos

Figure 6B.9 – Historical channel changes downstream of the hydrographic apex

Figure 6B.10 – Historical channel changes on the middle piedmont

Figure 6B.11 – Stage 2 Stability Assessment map

Figure 6B.12 – Stage 3 Floodplain Delineation Map

Figure 6B.13 – Flood Hazard Assessment Map (Arizona Geological Survey)

Figure 6B.14 – Surficial Geology overlayed onto Flood Hazard Assessment

6B.4 Description of Approach

The 100-year flood zone delineation for Site 37A generally follows the guidelines outlined in both the PFHAM and the FEMA Guidelines. In particular, the geomorphic method for an approximate flood zone delineation discussed in the PFHAM and the FEMA Guidelines served as the basis for identification of the 100-year flood zones for Site 37A.

Both the PFHAM and the FEMA Guidelines methods are founded on the alluvial fan flood hazard assessment approach outlined in the National Research Council's 1996 *Alluvial Fan Flooding* report. Both documents describe a three stage method used to identify alluvial fan flood hazards. The PFHAM broadens the approach by considering the entire piedmont.

The first stage is the recognition and characterization of piedmont landforms. Data from published sources including topographic maps, NRCS soil survey, geologic mapping, aerial photographs, and field observations are the basis for differentiating piedmont landforms which include mountains, inselbergs, alluvial fans, relict alluvial fans, pediments, and alluvial plains. Also identified for alluvial fan landforms are the location of the topographic and hydrographic apices of the alluvial fan. The hydrographic apex is of particular interest because it is the location at which flow of water and sediment becomes unconfined and spreads out rapidly. Sudden expansion of flow causes deposition of sediment and uncertain flood flow paths and

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distribution below this point. The complex hydraulics associated with this flow expansion and sediment deposition create significant uncertainties (unpredictability) that "cannot be set aside in the realistic assessment of the flood hazard" (FEMA Guidelines) near the hydrographic apex and for some distance downstream. The topographic apex is at the extreme upstream extent of the alluvial fan landform.

The second stage is the identification of active and inactive areas of the piedmont. Active areas are those locations where the uncertainty associated with such changes occur to such a degree that it cannot be set aside sufficiently to allow use of traditional engineering analysis. The second stage also shall identify the portions of the piedmont subject to various types of flooding such as stable riverine flooding, active alluvial fan flooding, inactive alluvial fan flooding, and broad sheet flooding.

The second stage may be applied using a geomorphic approach on alluvial fans with little or no urbanization (Table 6-1, row 5, FEMA Guidelines). In the geomorphic approach, surface characteristics that indicate surface stability are assessed and compiled. Surface characteristics such as vegetation patterns, presence or absence of rock varnish and desert pavement, and degree of soil development provide important information. Surfaces with well developed soils, rock varnish, and desert pavement, for example, have developed these features because they have not experienced significant flooding or erosion for thousands of years. Therefore, it can be assumed that they will continue to remain free from flooding in the future. Similarly, areas strongly dissected by drainage channels are less likely to unpredictably change their location than channels with little to no lateral relief relative to the neighboring land. Historical aerial photographs can also be examined to see if any movement of channel positions can be detected over the photographic record. In many instances, 50 to 60 years of record can be obtained from aerial photographs. All of these characteristics are used to produce a map of areas subject to flooding and those not subject to flooding. Furthermore, the areas subject to flooding are evaluated and mapped to show whether the flooding occurs on stable surfaces or unstable ones.

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The third stage is to delineate the 100-year flood event. The methods available to delineate the flood hazards on an alluvial fan include: risk-based analysis; applying the FAN computer program; sheetflow; hydraulic analytical methods; geomorphology; and composite methods. This study primarily uses the geomorphology method with a general fan wide check using hydraulic analysis to confirm both geomorphic data researched and collected from the field. The geomorphology method relies primarily on the review and evaluation of qualitative information, which consists of geomorphic data, post flood hazard verification, and historical information. This method is ideal for alluvial fans with little or no urbanization as found on Fan 37A.

For each of the stages, a number of maps will be presented to illustrate the various data and results. All of the maps for Section 6B are located at the end of the Section. To maintain the required layout for this TDN, a discussion of each stage will be presented. Please note that to maintain a sense of congruency throughout the White Tank Study Area, much of the presentation found is in the Approximate Floodplain Study for White Tank Fan – Site 36 by JE Fuller (an approved TDN) is repeated in this TDN with some adjustments that reflect this Site 37A study.

6B.5 Stage 1: Recognizing and Characterizing Piedmont Landforms

The first stage of the assessment of the flood hazard on the piedmont was to distinguish the types of landforms on the piedmont using a variety of characteristics shown on soils maps, surficial geology maps, topographic maps, and aerial photographs. Field observations also aided in distinguishing landforms. These data also begin to reveal active and inactive areas of the piedmont which will be detailed in Stage 2. However, the focus of Stage 1 is to identify the landforms. Additionally, when alluvial fan landforms are identified, the locations of the topographic and hydrographic apices require identification. The topographic apex is the uppermost apex of the alluvial fan and may not be the location where sediment deposition begins at the present time. The hydrographic apex is the highest location on an active alluvial fan and the topographic apex is the highest point on the alluvial fan landform. On alluvial fans with entrenched channels at their head, the topographic apex can be located some distance upstream

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from the beginning of active alluvial fan flooding. The hydrographic apex is the highest point on an alluvial fan where flow is last confined (Hjalmarson, 1998).

The Site 37 landform is an alluvial fan with a topographic apex which is coincident with the Site 38 alluvial fan upstream of the hydrographic apex. The flow from the Site 38 fan is well entrenched and does not appear to have flowed into the Site 37 watershed during the Holocene Epoch, based on the age of deposits and bank heights. Currently, flows into Site 37 come from the eastern and extreme east-southeast portion of the basin. Relict fan deposits flank the entrenched channel downstream from the base of the historic channel connecting sites 37 and 38 for about three miles before the wash loses confinement and spreads out into an active alluvial fan. Site 37 was also identified as an alluvial fan in previous studies (Hjalmarson and Kemna (1991), CH2M Hill (1992), Field & Pearthree (1991, 1992), Field (1994), Hjalmarson (1994), and Ayres (2004).

6B.5.1 Composition

NRCS soils maps (Figure 6B.2 adapted from Camp, 1986) and surficial geology maps (Figure 6B.4 adapted from Field & Pearthree, 1991, show that the western side of the White Tank Mountains is composed of alluvial sediments. Specifically, with the exception of a few inselbergs, the study area is entirely composed of alluvial sediments. Figure 6B.5 shows the combined NRCS soils map and surficial geology map for dual comparison.

6B.5.1.1 Soils Data

Figure 6B.2 shows the NRCS soil map units on the aerial photograph with the Stage 1 Landform Delineation. Figure 6B.3 shows the Stage 1 Landform Delineation overlayed on aerial photography. The soil polygons in Figure 6B.2 are from the *Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona* (Camp, 1986) for Site 37A. Table 6B.1 gives a list and description of the soil units within the study area. In addition to showing the map unit boundaries and designations, Figure 6B.2 shows the type of landforms generally associated

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with each of the various map units as distinguished by the NRCS. The two main categories of landforms distinguished by the NRCS, which apply to Site 37A are: 1) drainageways, alluvial fans, and floodplains, and 2) alluvial fan terraces. Copies of the complete soil unit descriptions for the study area from Camp (1986) are provided in Appendix A.

The middle and upper piedmont upstream is shown as composed predominately of fan terraces of the Gunsight-Rillito complex (70), the Rillito Gravelly loam (102), and Denure-Momoli-Carrizo complexes (29) (19) (30).

Table 6B.1 also shows the relationship between the NRCS soil map units and the landforms of Site 37A. As can be seen from the table, each soil map unit is actually comprised of several soil series. Each series has its own associated position or landform which is identified in the table. Characteristics important to the soil series age, stability, and flood history are also presented in Table 6B.1. These characteristics help identify the landform type, as well as the stability, the flood history and flood potential of the unit.

The Carrizo and Maripo soils series represent the areas subject to flooding on alluvial fans, drainageways, floodplains and low stream terraces. The Carrizo series in particular are identified and positioned on alluvial fans. However, the most active area of Site 37A is mapped as unit 91 (Figure 6B.2). Unit 91 is composed of Momoli and Carrizo soils. The Momoli series is described as being located on stream terraces and fan terraces. The lower portions of the 91 polygon in Section 14 show numerous small narrow areas of older surfaces which appear to be in the process of being buried and eroded by water and sediment discharges from the Site 37 watershed (Figure 6B.5). Sub section 6B.6.4.6 Sediment Delivery Potential quantifies the potential aggradation impacts downstream of the hydrographic apex. The NRCS reports that unit 91 is composed of 45% Momoli and 35% Carrizo soils along with 20% other soils including Mohall, Tremant, Gunsight, Chuckwalla, Denure, Gilman, and Maripo series. The Mohall, Tremant, Gunsight, and Chuckwalla soils are indicated as being located on higher terraces. The

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Denure soil is also associated with stream and fan terraces. The Gilman series is associated with floodplains and alluvial fans while the Maripo is found on floodplains and low terraces. Therefore, the area immediately downstream of the hydrographic apex mapped as unit 91 may transition from Carrizo, Gilman, and/or Maripo soils into the terrace soils of the other series found in unit 91. The older surfaces in the downstream portions of this area are being actively buried and eroded by floodwaters from the more active area upstream. Another active area of Site 37A is mapped as unit 14 (Figure 6B.2). Unit 14 is composed of Carrizo, Antho, Brios, and Maripo. Unit 14 is exhibiting the same effects as described for Unit 91.

The Chuckwalla, Gunsight, Ebon, and Pinamt soil series are located on fan terraces. These soils are also more well-developed and have characteristics of much older surfaces such as enriched clay and/or carbonate horizons.

The above description of the soils of Site 37A is consistent with the common soil types for alluvial fans shown in Table 2.1 of the PFHAM, which shows typical relict fan soils found adjacent to the alluvial fan soils in the upper piedmont and on the middle piedmont of Site 37A.

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Table 6B.1: Soil Units and Characteristics on the White Tank Fan Site 37A (East of Sun Valley Parkway) Piedment
(From Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona)

SCS Soils Map Units	Component Soil Series	Position/Landform	Important Characteristics	Subgroup, Order
Antho-Carrizo-Maripo complex (4)	Antho – 35% Carrizo – 30% Maripo – 20%	- on floodplains, alluvial fans, and drainageways - on floodplains, alluvial fans, and drainageways, fan terraces, and stream terraces - on floodplains and low stream terraces	- see above -subject to occasional flooding; hazard due to water erosion is severe; channeling, deposition, and streambank erosion occur during flooding -subject to rare periods of flooding *Main limitation for urban development of entire units is that they are subject to flooding See also unit AGB in Hartman (1997)	- Typic Torrifluvents, Entisols - Typic Torrifluvents, Entisols - Typic Torrifluvents, Entisols
Carrizo Very Gravelly Sand (14)	Carrizo – 80% Anotho – vary Brios – vary Maripo - vary	-on floodplains, alluvial fans and drainageways - alluvial fans and drainageways - on floodplains, alluvial fans, and drainageways, fan terraces, and stream terraces - on floodplains and low stream terraces	- hazard of water erosion is slight, but where unprotected, this soil is subject to core periods of flooding	- Typic Torrifluvents, Entisols - Typic Torrifluvents, Entisols - Typic Torrifluvents, Entisols
Chuckawalla-Gunsight complex (19)	Chuckwalla – 45% Gunsight – 35%	- on tops of fan terraces - on sides of fan terraces	- 85-95% of surface typically covered with varnished desert pavement - C horizon is strongly to violently effervescent and weakly cementaed in some pedons ** These are old surfaces generally free from flooding	- Typic Haplargrids, Aridisols - Typic Calciorthids, Aridisols
Denure-Momoli-Carrizo complex (29)	Denure – 40% Momoli – 30% Carrizo – 20%	- on fan terraces - on stream terraces and fan terraces - on floodplains, drainageways, alluvial fans, fan terraces, and stream terraces	- runoff is slow and hazard of water erosion is slight - B horizon development; strongly effervescent at depth	- Typic Calciorthids, Aridisols - Typic Calciorthids, Aridisols - Typic Torriorthents, Entisols
Denure-Momoli-Carrizo Complex, Low Precipitation (30)	Denure – 40% Momoli – 30% Carrizo – 20%	- on fan terraces - on stream terraces and fan terraces - on floodplains, drainageways, alluvial fans, fan terraces, and stream terraces	- runoff is slow and hazard of water corron is slight - B horizon development: strongly effervescent at depth	- Typic Calciorthids, Aridisols - Typic Calciorthids, Aridisols - Typic Torriorthents, Entisols
Gunsight-Rillito complex (70)	Gunsight – 40% Rillito – 40%	- on fan terraces - on fan terraces	- see above - weakly cemented calcic horizon at 4 to 36 inches	- Typic Calciorthids, Aridisols - Typic Calciorthids, Aridisols
Momoli-Carrizo complex (91)	Momoli – 45% Carrizo – 35%	- on stream terraces and fan terraces - on floodplains, drainageways, alluvial fans, fan terraces, and stream terraces	- weakly developed, light brown -poorly developed, pinkish gray, brown moist	- Typic Calciorthids, Aridisols - Typic Torriorthents, Entisols
Pinamt-Tremant complex (98)	Pinamt – 45% Tremant – 35%	- on fan terraces - on fan terraces and stream terraces	- yellowish red B horizons which are strongly to violently effervescent - light reddish brown B horizons, calcic horizon at 5 to 24 inches, strongly to violently effervescent at depth, clay accumulation at depth	- Typic Haplargrids, Aridisols - Typic Haplargrids, Aridisols
Quilotosa-Valva-Rock outcrop complex (100)	Quilotosa – 50% Vaiva – 20% Rock outcrop – 20%	- on hillslopes and mountain slopes - on hillslopes and mountain slopes	- mapped on surfaces with 20 to 65% slopes; basically thin hillslope soils in the mountains	- Lithic Torriorthents, Entisols - Lithis Haplargids, Aridisols
Rillito Gravelly Loam (102)	Rillito – 80%	- on fan terraces	- runoff is slow and hazard of water erosion is slight	
Tremant Gravelly Loam, (114)	Tremant – 80%	- on fan terraces	- light reddish brown B horizons, calcic horizon at 5 to 24 inches, strongly to violently effervescent at depth, clay accumulation at depth - runoff is slow and hazard of water erosion is slight	

6B.5.1.2 Surficial Geology

Figure 6B.4 shows the surficial geology of Site 37A as mapped by the Arizona Geological Survey (AZGS) (adapted from Field and Pearthree, 1991) (Appendix A). It shows the entire study area composed of alluvial fans of various ages, as well as terraces and active stream channels.

Table 6B.2 summarizes the significant distinguishing characteristics of each of the surficial geological units. Complete descriptions of the surficial geologic units from Ferguson, Spencer, Pearthree, Youberg and Field (2004) are included in Appendix A.

The Qy units (Qy1 and Qy2) shown in Table 6B.2 are surfaces of Holocene age. That is, these surfaces have been experiencing active deposition and erosion during the last 10,000 years. The Qy2 unit is the youngest unit. It is found on alluvial fans, low terraces, and active channels and covers a significant portion of Site 37A downstream of the hydrographic apex. The Qi units are of Pleistocene age, that is, greater than 10,000 years old. The Qo unit represents very old Pleistocene to Pliocene aged surfaces of relict alluvial fans greater than 1 million years old.

The surficial geology shows a general pattern of alluvial surfaces decreasing in age moving downslope from the White Tank Mountains. In addition to decreasing age, the extent of young alluvial deposits also increases. Ferguson, Spencer, Pearthree, Youberg and Field (2004) suggest that the location of active distributary flow areas on the alluvial fans has not shifted significantly since the Pleistocene. They also speculate that the younger Qi3, Qy, and Qy2 surfaces in the middle piedmont are primarily the product of the erosion of Qi3 surfaces on the piedmont. In other words, the sediments being deposited on the lower piedmont are being eroded from older upstream piedmont surfaces, not the upper mountainous watersheds. The different sediment source areas may be responsible for the contrast in sediment size and surface texture between the most active areas of the alluvial fan in Section 14 downstream from the hydrographic apex, and the Qy2 areas further downstream of the middle piedmont. The downstream of the middle

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piedmont Qy2 areas are comprised of silts and sands and look more like overbank floodplain deposits compared with the much more gravelly deposits in the large Qy2 area downstream of the hydrographic apex.

While the surficial geology provided greater detail than the NRCS soils maps, one can see the general agreement about the alluvial nature and origin of Site 37A. The distinguishing characteristics of the landforms shown in Figure 6B.4 are described in Table 6B.2 and the following sections. The advantage of the surficial geology data is that areas are distinguished by characteristics related to their age and stability. Both are important to the assessment of the flood hazard of the piedmont and will be elaborated further in Stage 3.

Table 6B.2
Landforms as Indicated by Surficial Geology

Landform	Unit	Name	Significant Distinguishing Characteristics	SCS soil units (Characterized by 3 types of Landforms)	% by Landforms
Active Alluvial fans, Low Terrace, And active Channels	Qy2	Late Holocene deposits in active stream channels, low terraces, and alluvial fans	Composition: active channels Soil development: minimal to none Age: < 3,000 years Surficial features: typically undissected, smooth surfaces with a distributary drainage network, some bar and swale topography in middle piedmont, no desert pavement or rock varnish Flooding potential: subject to occasional to flooding	Alluvial Fans, drainageways, floodplains: Carrizo (14), Antho-Carrizo-Maripo complex (4), Momoli-Carrizo complex (91)	29%
				Fan Terraces: Chuckawalla-Gunsight (19), Denure-Momoli-Carrizo (29, 30), Gunsight-Rillito (70), Rillito (102), Tremant (114)	71%
Active and inactive alluvial fans and alluvial plains	Qy1	Late to early Holocene deposits on alluvial fans and terraces	Composition: sheetflood areas, terraces, and limited overbank areas which are occasionally flooded Soil development: minimal Age: 1,000 to 10,000 years Surficial features: fine grained, locally shallow channels (incision < 0.5 m), poorly developed desert pavement, light and incomple brownish black rock varnish along base of surface cobbles	Alluvial Fans, drainageways, floodplains: Antho-Carrizo-Maripo complex (4), Carrizo (14), Momoli-Carrizo complex (91)	9%
				Fan Terraces: Denure-Momoli-Carrizo complex (29,30), Gunsight-Rillito (70), Rillito (102), Tremant (114), Chuckawalla-Gunsight (19)	91%

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Landform	Unit	Name	Significant Distinguishing Characteristics	SCS soil units (Characterized by 3 types of Landforms)	% by Landforms
Inactive alluvial fan	Qi3	Late Pleistocene alluvial fan and terrace deposits	Composition: inactive alluvial fan and terrace deposits Soil development: weak to moderate, slight reddening, weak structure, and thin discontinours carbonate coatings on clasts Age: isolated from deposition for 10,000 to 150,000 years Surficial features: moderately dissected by active channels which moderately to well preserved original *gravel bar and swale topography*, poorly to moderately varnished to very dark brown with reddish brown to more commonly dull orange undersides Flooding potential: restricted to active incised channels except for areas of low relief	Alluvial Fans, drainageways, floodplains: Momoli-Carrizo complex (91)	5%
				Fan Terraces: Denure-Momoli-Carrizo complex (29), Gunsight-Rillito (70), Rillito (102), Pinant-Tremant complex (98)	95%
Inactive alluvial fan and relict fans	Qi2	Middle Pleistocene alluvial fan deposits	Composition: old relict alluvial fan deposits Soil development: moderate, reddened zones of clay accumulation, continuous carbonate coatings, locally weak carbonate cementation Age: isolated from deposition for 150,000 to 300,000 years Surficial features: strongly developed desert pavement with dark brown to *black varnish with red coatings on* undersides, well-developed tributary drainage networks, channels incised up to 3 m Flooding potential: restricted to entrenched channels except for low relief areas on lower piedmont	Alluvial Fans, drainageways, floodplains: Antho-Carrizo-Maripo complex (4), Carrizo (14), Momoli-Carrizo complex (91)	4%
				Fan Terraces: Chuckawalla-Gunsight (19), Gunsight-Rillito (70), Rillito (102), Denure-Momoli-Carrizo (30)	96%
Inactive alluvial fan and relict alluvial fans	Qi1	Middle to early Pleistocene alluvial fan deposits	Composition: old relict alluvial fan deposits Soil development: moderate to very strongly developed reddened zones of clay accumulation (argillic horizons), commonly over stage IV calcic horizons (caliche)	Alluvial Fans, drainageways, floodplains: Carrizo (14), Momoli-Carrizo complex (91)	0.3%

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Landform	Unit	Name	Significant Distinguishing Characteristics	SCS soil units (Characterized by 3 types of Landforms)	% by Landforms
			Age: isolated from deposition for 300,000 to 1,000,000 years Surficial features: well developed desert pavement with completely varnished black with deffish interfluves, bar and swale topography absent or poorly preserved, channels incised 1-6 m Flooding potential: restricted to entrenced channels	Fan Terraces: Rillito (102), Chuckawalla-Gunsight (19), Gunsight-Rillito (70), Pinant-Tremant complex (98)	99.7%
Inactive alluvial fan and relict alluvial fans	Qi	Middle and late Pleistocene alluvial fan and terrace deposits, undifferentiated	Composition: inactive alluvial fan and terrace deposits Soil development: weak to moderate, slight reddening, weak structure, and thin discontinours carbonate coatings on clasts Age: isolated from deposition for 10,000 to 150,000 years Surficial features: moderately dissected by active channels which moderately to well preserved original gravel bar and swale topography, poorly to moderately varnished to very dark brown with reddish brown to more commonly dull orange undersides Flooding potential: restricted to active incised channels except for areas of low relief	Alluvial Fans, drainageways, floodplains: Carrizo (14)	0.1%
				Fan Terraces: Chuckawalla-Gunsight (19), Rillito (102)	99.9%

Adapted from Geologic Map of the Wagner Wash Well 7.5' Quadrangle, Maricopa County, Arizona (Ferguson, Spencer, Pearthree, Youberg and Field, 2004); Geologic Map of the Buckeye NW 7.5' Quadrangle, Maricopa County, Arizona (Field, Pearthree and Ferguson, 2004); Surficial Geology between the Southwestern White Tank Mountains and Hassayampa River, Maricopa County, Arizona (Richard, in preparation).

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6B.5.2 Morphology

According to the National Research Council definition (1996), "alluvial fans are landforms that have the shape of a fan, either partly or fully extended." The Site 37A study area shows the general form of a partially extended fan (Figure 6B.3). The area of youngest sediments in Sections 12 and 14 of T2N, R4W (shown as Qy2 on the surficial geology mapping (Figure 6B.4) and as NRCS soil unit 91, Momoli-Carrizo complex (Figure 6B.2)) exhibits a more obvious partly extended fan shape.

Topographic data also support the definition of a fan shaped landform. The topographic mapping (FCDMC, 2000/2001) shows mostly nearly straight or slightly concave downstream shape down the piedmont (Figure 3.1). Contour crenulations show channels ranging from 1 to 2 feet in depth across large areas. The mild transverse relief suggests bifurcating channels which are also evident in the aerial photographs of the piedmont. Areas upstream of the hydrographic apex also show much greater degree of entrenchment than downstream of the hydrographic apex. These are all characteristics of an alluvial fan.

Transverse cross-sections of Site 37A (Figure 6B.6-A and Figure 6B.6-B) downstream of the hydrographic apex look most similar to the active alluvial fan shown in Figure 2.2 of the PFHAM. Notice that the crenulation in Figure 6B.6-A shows more definition than Figure 2.2 of the PFHAM, but that the concept is still the same. Locally, areas of more defined crenulations are noted along the middle part of the piedmont. Areas upstream of the hydrographic apex also show much greater degree of entrenchment.

6B.5.3 Location

The NRC definition also states that "alluvial fan landforms are located at a topographic break." The Site 37 alluvial fan begins as the Site 38 main wash exits the mountains below about 2040 feet elevation. Downstream of the topographic apex, the relict channel is confined by very old alluvial fan deposits. Where the existing Site 37 main channel meets the southern edge of the

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Site 38 relict fan, the wash remains deeply incised into these very old alluvial fan deposits. The wash then quickly widens and diverges into numerous channels as the wash becomes progressively less confined downstream of the 1600-foot contour. The topographic mapping (FCDMC, 2000/2001) shows a stippled pattern indicating an area of deposition in this area. The longitudinal profile (Figure 6B.7) shows slight humps or decreases in slope in the same areas, where the slope profile creates a trough. There are five areas where this occurs: at elevations 1720, 1560, 1360, 1210 and 1120. These are areas where the channel's ability to carry sediment load have peaked and the sediments begin to drop out and spread out in a fan shape.

6B.5.4 Boundaries

The alluvial fan landform limits were determined from the evaluation of NRCS soil data, the AZGS geology, and several aerial photographs taken from as early as 1954 to as recent as 2004. The limits or boundaries have been characterized by implementing the suggested methods found in the Alluvial Fan Flooding report (NRC, 1996)

Fan 37 exists with other sister fans that make up a larger alluvial fan landform. The toe or distal terminus of this larger fan is defined by the floodplains of the Hassayampa River on the west side of the White Tank Mountains. The Hassayampa River is considered the terminus because it transports deposits away from the fan and precludes the fan's ability to continue to distribute sediments in a fan like fashion.

As mentioned above, Fan 37 exists with other sister fans. Fan 37 coalesces by combining stream networks, which creates a bajada. Bajadas, like Fan 37, have lateral boundaries that are difficult to define due to deposited and reworked material. Pleistocene-aged surfaces do however; border Fan 37 mostly on the northwest lateral boundary in Sections 12, 14, and 15, T2N, R4W, and presents a more distinct lateral boundary. The other lateral boundaries of Fan 37 consist of random intermingling of water and sediment shared via crisscrossing wash patterns. These

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boundaries occur generally along both of the Fan 36 and 38 interfaces. See Figure 6B.3 and 6B.4.

6B.5.5 Conclusion

The soil survey and surficial geology data clearly show the piedmont to be composed of sedimentary deposits. Figure 6B.3 shows that the landform is located at the base of a mountain front and has the shape of a partially extended fan. Therefore, it can be concluded that Site 37A in the study area is an alluvial fan.

After review of the NRCS data, the surficial geology, aerial photographs, topographic maps, and field observations, the Stage 1 landform delineation can be better understood. Figure 6B.3, the Stage 1 – Landform map, shows the delineation of relict fan, alluvial fan piedmont, and bedrock areas on Site 37. The references to the active and inactive areas made in Table 6B.2 are incorporated into Stage 2, which results in the Stability map described in the later Stage 2 and Stage 3 sections of this report.

6B.6 Stage 2: Defining Active and Inactive Areas

In Stage 2, the objective is to define the active and inactive areas of the alluvial fan, and characterize the nature of flooding on different parts of the piedmont. Portions of Site 37A can be identified as being active as indicated by recent channel movement observed in historical aerial photographs. This study evaluates the specific limits of the active and inactive portions of the site. This study assesses the piedmont from the hydrographic apex downstream to east of Sun Valley Parkway.

6B.6.1 Introduction

The physical characteristics of a landform surface provide clues as to its depositional history, stability, and its flood potential. If an area of the landform ceases to receive new deposits, its surface will begin to age. As it ages, the surface begins to develop physical and chemical

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characteristics indicative of its age. In an arid environment like Site 37, soils begin to develop distinctive characteristics. As the soil develops, its structure, color and content changes. Soils tend to become reddish in color due to the accumulation and weathering. Accumulation of carbonate cements the soils together, and develops what is known as caliche.

Surfaces may also develop an accumulation of pebbles and cobbles at the surface as they age. These gravel coverings are known as *desert pavement* which is believed to form by the accumulation of windblown silt and clay between the gravels. Repeated wetting by precipitation causes the fine-grained materials to swell, lifting the larger gravels to the surface. Repeated surface drying creates cracks into which more fine windblown material may accumulate. Over thousands of years these processes result in a mantle of closely packed gravels over a silt- and clay-rich soil layer (Dohrenwend, 1987; Vanden Dolder, 1992). The surface pebbles and cobbles, if they contain sufficient ferromagnesian minerals, will develop a dark black patina on their tops and an orange coating underneath known as *rock varnish*.

Surfaces free from new deposition will also begin to erode. As they erode, new tributary channel networks develop. These channels will also begin to entrench themselves into the surface creating a greater degree of relief between the channel bottoms and the ridges which separate them.

It takes thousands of years for many of these characteristics to develop. Therefore, surfaces that exhibit well developed soils, red color, significant carbonate development, desert pavements of strongly varnished gravels, and tributary drainage networks have been relatively free from flooding for thousands of years. As such, without external disturbance, it can be reasonably anticipated that the flood hazard potential in the future will remain low.

The NRCS soils survey data and surficial geology mapping differentiate surfaces based on the types of characteristics discussed above. Therefore, these data also describe the surface's age,

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stability, and flood potential. Young surfaces with little soil development are likely to continue to see water and sediment discharges. Older surfaces are much less likely to experience inundation by water and sediment in the future. Older surfaces with cemented soils and entrenched channels also tend to be stable. That is, the likelihood of the channel changing its location over time is greatly diminished. Conversely, areas with loose soil and little lateral relief are more susceptible to avulsions due to the affects of major storm events, which have the capacity to carry sediment.

Older surfaces may also be susceptible to flooding when lateral relief is low. Where local relief is great, the likelihood that higher areas will be flooded is lower than when an older surface lies relatively low compared to neighboring younger flood prone surfaces. In such a situation, the older surface may be susceptible to flooding from the adjacent area. An example of a flooded older surface adjacent to a younger surface with little lateral relief is found in the southeast quarter of Sec. 15, T2N, R4W (Figure 6B.4).

6B.6.2 Overview of Flooding on Site 37A

The approximately 3.8-mile long entrenched reach upstream of the hydrographic apex to the topographic apex is characterized by stable channel riverine flood hazards. Section 5 describes a normal depth approximate floodplain delineation for the part of this reach just upstream of the hydrographic apex.

Downstream of the hydrographic apex, floodwaters become unconfined and spread out creating a fan shape of approximately one square mile in area. The 1954 aerial photograph clearly shows the general area of unstable, very hazardous alluvial fan flooding (see Figure 6B.8 to Figure 6B.10). Downstream of the wash near the 1480-foot contour, floodwaters generally reorganize themselves into a series of parallel washes across more stable older surfaces. Comparison of the 1954 and 2004 aerial photographs shows several channels narrowing and lengthening over time.

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Another noticeable characteristic that has occurred over time is the growth of vegetation. This growth is a sign that the area has repaired itself from the flooding that occurred in 1950.

Floodwaters flow across the middle piedmont through a number of stable channels across older surfaces before entering an area of younger late Holocene sediments. Islands of older sediments are also located between these broad sheet flooding areas. Within these broad areas of relatively shallow sheet flooding are several more prominent washes. The more prominent washes connect to the main channels coming from the upper and middle piedmont in a tributary manner.

Field and Pearthree (1991) suggested that the younger sediments originate from the erosion of older surfaces in the middle piedmont. During more frequent runoff events, water and sediment both originate from areas of the middle piedmont. Only the largest runoff events translate significant floodwater and sediment across the entire broad alluvial area immediately downstream of the hydrographic apex. The high infiltration rates of this broad area of young gravels transmit more frequent runoff into the subsurface before it can continue on. Evidence of significant transmission losses can be seen in the field by the lines of flotsam that stop within channels on the active fan. Moreover, the size of surface sediments generally decreases moving down piedmont. Smaller sediment sizes mean lower infiltration rates. For example, according to the Drainage Design Manual of Maricopa County (Sabol, et al., 1995), NRCS soil unit 91, located just downstream of the hydrographic apex, has a saturated hydraulic conductivity rate of 0.93 inches per hour, while units located on the middle piedmont have a saturated hydraulic conductivity rate averaging 0.40 inches per hour (see Figures 6B.2 and 6B.5 for location of soil units on the piedmont).

6B.6.3 Identification of Active Areas

Site 37 is mostly an eroding landform. Although significant aggradation occurs in several localized areas covering a limited area of the total landform, there are aggradational areas that indicate water and sediment discharge passing way within systems of Site 37.

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These areas of aggradation (active areas) are located:

1) at and immediately downstream of the hydrologic apex
2) one inset active fans in the middle part of the piedmont

The limits of the active areas of the Site 37A are shown in Figure 6B.11. These areas were identified by using NRCS soil surveys, AZGS surficial geology, aerial photography, field observation, and topographic mapping (FCDMC, 2000/2001). The relationship of each of these types of evidence to the limits of active and inactive areas is discussed below. Finally, a discussion of the relevance of the active areas and locations of various types of flooding to the Stage 3 evaluation of the 100-year flood hazard areas will be presented.

6B.6.3.1 NRCS Soil Surveys – Camp (1986)

The NRCS soils maps (Figure 6B.2) for the area shows that Carrizo, and Momoli-Carrizo soils series as major soils within the areas identified here as active or unstable areas. This designation is consistent with the information presented in the PFHAM (Appendix L). These soils are poorly developed and exhibit little sign of age.

6B.6.3.2 AZGS Surficial Geology – Ferguson, Spencer, Pearthree, Youberg, and Field (2004)

The AZGS surficial geology mapping of the White Tank piedmont differentiated areas based primarily on their relative age. The relative topographic position, surface characteristics such as desert pavement and rock varnish, and the degree of soil development were the primary criteria used to distinguish the relative ages of the surfaces. The AZGS delineated the youngest areas of the piedmont as Qy2, Late Holocene alluvial fans, low terraces, and active stream channels. The Qy2 areas shown in Figure 6B.4 include the active alluvial fan areas identified in this study. The broad areas of sheet flooding, generally identified as Qi2, are considered stable areas in this study, and can also be found in Figure 6B.4. Those areas are discussed in the identification of inactive areas below.

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Field and Pearthree (1991) suggest that the overall morphology of the active area immediately downstream of the hydrographic apex has not changed significantly since the late Pleistocene. They suggest that the active areas further down the piedmont result from deposition of sediment eroded from Pleistocene surfaces on the piedmont.

6B.6.3.3 Interpretation of Topography

Contour crenulations are areas where surfaces become incised and form established channels. These well established channels are usually located in stable landforms. Hence, surfaces shown on the topographic map as highly crenulated tend to be stable surfaces. In contrast, smooth contour lines indicate very little incision. When smooth contour lines bow downstream, this is a good indication of an active area of deposition.

Topographic mapping (FCDMC, 2000/2001) on Site 37A shows highly crenulated yet fan shaped contours just downstream of the topographic apex (Figure 3.1 and Appendix C for larger exhibit). Downstream from there, between the topographic and hydrographic apices, the contour lines remain quite crenulated indicating a continuing area of incised channels and an eroded landform. Immediately downstream of the hydrographic apex, an area of stippled pattern shows the expanding gravel bed of the wash. The stipple pattern actually splits into two paths for a short distance before ending within the most active area of Site 37A. The areas between the 1500-foot and 1350-foot contour shows relatively smooth slightly concave downstream contours. The piedmont generally increased in age and stability as one moves north onto the adjacent alluvial fans.

Topographic mapping (FCDMC, 2000/2001) bow more but also show greater crenulation in the area around the middle of the piedmont. From about the 1350-foot to the 1250-foot contour, the piedmont is more entrenched. The upper portion of this area is where the unstable, uncertain distribution of floodwater and sediment begins to reorganize itself into a series of parallel channels moving down the piedmont. Downstream from this area, the contours become much

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more parallel to one another and the degree of crenulation decreases. This is an area almost completely composed of Holocene sediments.

6B.6.3.4 Historical Aerial Photography

Historical aerial photographic coverage of the study is an important component of the piedmont flood hazard assessment, especially the Stage 2 stability analysis. A number of different dates of aerial photography were identified for use in this study. Table 6B.3 summarizes these data.

The movement and formation of channels between 1954 and 2004 provides an excellent example of the nature and extent of alluvial fan flood hazards that have occurred on the Site 37 piedmont. The historical aerial photo record shows how over a 50 year period vegetation can re-establish itself and old channel positions can be filled in, masking the evidence of prior channel locations.

Table 6B.3 – List of Historical Aerial Photographs of White Tank Fan Study Area

Source	Photo Date	Scale	Type	Digital
National Archives (courtesy of JE Fuller)	1954	1:20,000	Black and white	No
USGS (ASU map collection)	1972	1:24,000	Black and white	No
FCDMC image database	1997	1:7,200	Black and white	Part of FCD database
FCDMC image database	2004	1:7,200	Color	Part of FCD digital database

Figures 6B.9-10 show sequences of historical aerial photos at the active areas along Site 37A. Note the changes in channel positions from 1949 to 2004. Also note the lack of change in position in many of the neighboring stable areas. Figure 6B.8 shows the locations of each of the areas within Site 37A.

Figures 6B.9 a-d show the area downstream from the hydrographic apex. Dramatic differences occur between 1954 and 2004. The extensive development of new channels, narrowing of existing channels, and widespread sedimentation are clearly visible. A one mile long by 2500-

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foot wide area experienced the greatest changes. Between 1954 and 2004 the vegetation was re-established and the extent of the flood scars was dramatically reduced. Also, the tributary channels collect the broad areas of floodwater as they flow off the active area of the fan downstream of the hydrographic apex.

Figures 6B.10 a-d show the comparison of photographs from 1954 to 2004 for an area on the middle piedmont. In the 1954 photo, new, lighter colored channels are visible. These new channels tend to be more evident in the 2004 photo. Also evident are the divergent new channels in the lower half of the view frame. Overall, while many channel changes are evident in this series of photographs, one can see that the changes were largely limited to an area between older surfaces. Ferguson, Spencer, Pearthree, Youberg, and Field (2004) identify the adjacent surfaces as Qi, middle to late Pleistocene, 150,000 to 300,000 years in age. All of this corridor is designated here as unstable, though only the lower half is somewhat fan-shaped.

Comparison of historical photographs from 1954 to 2004 indicate the formation of new channels (presumably from the flooding) and subsequent disappearance of old channel locations from 1954 to 2004. Vegetation grew up, stabilizing the new channel and the old channel filled in over time. Neighboring drainage channels remain largely in the same locations over time. Some small channels disappear while others gain in significance. Also, the largest of the channels are about 15 feet in total width. The larger new channel formation occurs along one of the larger throughflow channels connected to the middle and upper piedmont.

6B.6.3.5 Vegetation

While saguaro cacti can be found in portions of the upper unstable area, the area exhibits a generally scattered appearance of vegetation downstream of the hydrographic apex. This is in contrast to the linearly aligned riparian vegetation seen in aerial photographs elsewhere on the piedmont. The riparian vegetation helps create, as well as indicate, the stability of large portions of the middle piedmont within the study limits. However, as shown in the comparison of

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historical aerial photographs, floodwaters do not always follow the washes that are lined by riparian trees such as palo verde, ironwood, and mesquite.

6B.6.3.6 Sediment Delivery Potential

Revised Universal Soil Loss Equation (RUSLE2) computations (see Ayres Associates Technical Memorandum FCD 2.6.7, Appendix A) of sediment yield from the watershed above the hydrographic apex predict that about 51 acre-feet of sediment will be delivered to the hydrographic apex during the 100-year 24-hour flood. Refer to Section 6A of this TDN. Given the cross-sectional area of the channel at the hydrographic apex, 51 ac-ft would cover approximately 1 mile of channel if it were deposited 1 foot deep, and approximately ½ mile if it were deposited 2 feet deep. Additionally, the active area just downstream of the hydrographic apex is approximately 425 acres in area over which 51 ac-ft of sediment would be very thin if deposited uniformly. While this amount of sediment deposition is appreciable and capable of causing changes in the direction of floodwaters downstream of the hydrographic apex, it is not capable of covering very large areas in many feet of sediment delivered from the upper watershed. Field observations and aerial photo examination confirm that sediment within the channel upstream of the hydrographic apex is adequate to create a sedimentation hazard in the vicinity downstream of the apex.

6B.6.4 Identification of Inactive Area

Along with the active areas of the alluvial fan, Figure 6B.11 also shows the limits of the inactive areas of the alluvial fan. The discussions on the interpretation of topography, vegetation, and historical aerial photo comparisons in Section 6B.6.3 on the identification of active areas also suggests that large portions of the middle piedmont have been and are likely to continue to be stable with respect to flooding in the future.

In particular, the inactive areas are on fan and/or stream terrace soils (series Chuckwalla, Gunsight, Momoli, Denure, Tremant) on units identified as Qyl or older on the surficial geology, and having a variety of characteristics associated with inactive (stable) areas in the PFHAM (see

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Figure 6B.4). These characteristics include many of the same ones used by the NRCS and AZGS in the soils and geology mapping, such as, areas of desert pavement, desert varnish, tributary drainage patterns, reddened soils, and incision of channels relative to the adjacent interfluve areas. Large tree vegetation, like palo verde, mesquite, and ironwood, within these areas are found predominantly along existing washes. Field observations also identified depositing of fine materials along channel banks. The depositing of fine alluvial sediment onto the channel banks increases the shear strength of the bank, making it more resistant to erosion.

6B.6.5 Inactive Areas Still Subject to Flooding

The soils data, surficial geology, topographic contours, and historical aerial photographs indicate that large areas of the piedmont are subject to flooding, but that the nature of that flooding is within stable throughflow channels or broad sheet flooding across wide stable areas.

Within some of the throughflow channel corridors, some channel changes can be observed in the historical aerial photo record. However, these channel changes are confined within the corridors. These corridors are bounded by higher, generally older geomorphic surfaces. While channel changes do occur during floods, the limits of the flooding for large discharges are similar. Local velocities will vary between floods, but floodwaters will be confined to the same overall channel. Additionally, the degree of flood hazard varies spatially within these corridors and between floods.

Downstream of the active area, floodwater recollects and enters channels that flow through the middle of the fan and onto the lower piedmont. The broad sheet flooding areas are located on the lower piedmont. Some of these sheet flooding areas are dominated by local runoff while others also experience distributary and overbank flow from the middle of the fan channels. For example, the large, prominent channel crossing at the northwest diagonal half of Sec. 28, T2N, R4W has two locations where overbank flow exits into distributary washes at high stage (Figure

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6B.3). Between these two channels is a sheet flooding area where the flood hazard is dominated by local runoff.

In addition to the inactive areas still subject to local and throughflow corridor flooding, the channel upstream of the hydrographic apex also represents a flood hazard. The flood hazard in the 3.7 mile reach making up part of the distance between the topographic and hydrographic apex was evaluated using approximate normal depth methods and is described in Section 5 and Appendix E.

6B.6.6 Summary of Active and Inactive Areas

Figure 6B.11 shows the limits of the active and inactive areas of Site 37A that form an important foundation in the evaluation of the 100-year flood hazard in Stage 3. The most active area of Site 37A is an area about 1 square mile in extent downstream of the hydrographic apex. However, there is also one other local inset active area noted in this study. Upstream of the hydrographic apex, flooding is limited to the entrenched channel. The middle piedmont is characterized by stable throughflow corridor channels that recollect floodwaters exiting the active area upstream. These throughflow corridor channels spread out into broad areas of sheet flooding as the slope decreases on the lower piedmont.

6B.7 Stage 3: Defining the Approximate 100-Year Floodplain

The 100-year flood hazard assessment is an outgrowth of the information and results identified and generated in Stages 1 and 2. The results of the 100-year flood zone areas are shown in Figure 6B.12 and the Stage 3 – 100-year Flood Zone Map in the Exhibit Maps section of the TDN. The following is a more detailed description of the methods used in the identification and delineation of the various flood hazard zones shown in Figure 6B.12.

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6B.7.1 Flood Hazard Zones

The following table (Table 6B.4) lists and describes the flood hazard zones identified and shown in Figure 6B.12 and the Stage 3 – 100-year Flood Zone Map in the Exhibit Maps section of this TDN. These zones have been newly defined for use in the delineation of piedmont flood hazards in Maricopa County, Arizona by the FCDMC. The resulting flood hazard map is similar in nature to the one shown in Example 4 in Figure 6-9 of the FEMA Guidelines.

The Arizona Geological Survey (AZGS) performed detailed mapping of the surficial geology of the White Tank piedmont most recently in 2004 (Ferguson, Spencer, Pearthree, Youberg, and Field, 2004). This mapping project was followed with an evaluation of flood hazards based on the surficial geology mapping (Figure 6B.14 adapted from Field and Pearthree, 1992). The current approximate floodplain delineation study builds from and incorporates many of the findings and evaluation of the AZGS work. The flood hazard areas shown in Figure 6B.13 were developed by interpretation of aerial photographs and inclusions of areas adjacent to geologically young surfaces where uncertainties associated with alluvial fan flooding were incorporated. Finally, these interpretations were supplemented and finalized based on observations of ground conditions in the field. Additionally, approximate floodway corridors were identified to allow for conveyance of floodwater and sediment throughout the piedmont.

Table 6B. 4 – Flood Hazard Zones Mapped in White Tank Fan (Site 37)

Zone Name	Local Community Zone Designation	Description
Zone A	Zone A	Approximate 100-yr floodplain; riverine reaches upstream of hydrologic apex, and previously mapped ponding area behind Buckeye FRS #1.
Zone A – Administrative Floodway Active Alluvial Fan	AFHH – Administrative Floodway	Alluvial Fan High Hazard, community to treat as a floodway district
Zone A – Administrative Floodway Active Alluvial Fan	AFUFD – Administrative Floodway	Alluvial Fan Uncertain Flow Distribution Area; transitional area downstream of AFHH zone characterized by channelized and sheet flooding generally becoming more stable and less uncertain

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Zone Name	Local Community Zone Designation	Description
Zone A – Administrative Floodway Inactive Alluvial Fan	AAFF – Administrative Floodway	Approximate Alluvial Fan Floodway; corridors for conveyance of water and sediment on a stable alluvial fan surface downstream of the AFHH and AFUFD; community to treat as a floodway district
Zone A – Inactive Alluvial Fan	AFZA	Alluvial Fan Zone A; areas within the 100-year floodplain on an inactive alluvial fan characterized by shallow channelized flow and sheet flooding in stable channels; zone is considered approximate because no base flood elevations are provided; flood hazards within this zone are not necessarily equal throughout, that is, the frequency and magnitude of flooding with respect to depth and velocity of flow may vary within the AFZA zone; floodplain managers should consult available aerial photographs and topographic maps for more detailed evaluation of site specific flood hazard within this zone; development will be allowed in this zone given demonstration of adequacy of site and/or design that addresses safety from inundation and sedimentation hazards
X (shaded) – Inactive Alluvial Fan	X (shaded)	Areas flooded between 100-yr and 500-yr discharge; or areas of flooding with depth of 100-yr flood less than 1 foot; or drainage area less than 1 square mile

Specifically, the unstable areas determined from analysis of the aerial photography, the surficial geology, the NRCS Soils Survey, the topography, and the flood hazards based on surficial geology have been used to identify the location of the Zone A – Administrative Floodway Active Alluvial Fan (Local Community Zones AFHH and AFUFD). The AFHH (active alluvial fan) zone lies within the unstable area. The AFUFD (uncertain flow distribution) zone makes up the remainder of the unstable area as a buffer area along the downstream end of the AFHH as determined by field inspections, surficial geology, data, interpretation of recent and historical aerial photographs, and engineering judgment.

Emanating from the AFUFD zone are Zone A – Administrative Floodway Inactive Alluvial Fan (Local Community Zone AAFF) corridors which traverse the inactive (or stable) portions of the alluvial fan landform. These areas represent the primary throughflow channels that convey the majority of the sediment and water discharges from the Site 37 drainage basin as evidenced by

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the NRCS soils data, the AZGS surficial geology data, and by interpretation of geomorphic features as shown in color aerial photographs and field observations. These channels can be considered similar to riverine floodways in that they are areas reserved for conveyance of the 100-year flood. Although these floodway corridors do not necessarily contain the entire limits of the 100-year flood across the middle and lower piedmont under the existing condition, they are adequate in size and continuity to convey floodwaters across the piedmont if floodwater were restricted to them. Reservation of these corridors will allow for engineered flood protection and mitigation within other flood prone but stable areas of the inactive alluvial fan.

The approximate alluvial fan floodways (Local Community Zone AAFF) were determined by first identifying the most prominent, continuous channels that connect the active alluvial fan upstream to the lower piedmont. These corridors were then compared against the AZGS surficial geology to verify that the main areas of youngest surfaces were included. Flood prone areas in inactive areas outside the alluvial fan floodways are identified in Figure 6B.14 as Zone A – Inactive Alluvial Fan (Local Community Zone AFZA). The channel corridors (Local Community Zone AAFF) would maintain major storm water and sediment conveyance. The areas designated as Local Community Zone AFZA would be subject to overbank flow and local runoff. Engineering would be required to mitigate sheet flooding and overbank flow during major events in areas shown as zone AFZA. Development within these areas would be allowed given an adequately engineered site specific evaluation of the flood hazard and flood mitigation measures. The AFZA zone is generally characterized by sheet flooding and flooding within relatively small stable channels. These small channels may either represent small distributary drainages connected to the primary floodways, small local drainages, or various paths where broad sheet flooding recollects as it flows down the piedmont in an effort to reorganize itself. Consequently, the magnitude and frequency of flood hazards within the AFZA zone should not be considered equal at every location.

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Local drainages and small channels periodically connected to the larger system by wide sheet flooding need to be identified and considered in any site specific design to mitigate flood hazards. The use of large scale aerial photographs, detailed topography, and the data from this study are highly recommended in the evaluation of site specific flood hazards within the AFZA zones identified in this study. Although the surfaces included in the AFZA areas are considered to be stable, they may be connected to and influenced by the larger distributary system of Site 37. As such, the structure of the existing distributary network ought to be considered when evaluating and designing mitigation of flood related hazards at any particular site.

Also included in the AFZA zone are larger islands of stable, often older, geomorphic surfaces. Islands smaller than 10 acres were not separated from the surrounding zone. These large islands of old stable geomorphic surfaces have not been given a flood hazard zone but should be considered as Zone X. These zones include areas of possible flood hazards from local drainage areas smaller than one square mile as well as stable areas potentially flooded by events less frequent than the 100-year flood (e.g. the 500-year flood).

6B.7.2 Verification of Results

Figure 6B.13 shows a comparison of the results of the Stage 3 analysis with the flood hazard evaluation by Field and Pearthree (1992). Figure 6B.14 shows the relationship of the Field and Pearthree surficial geology mapping to their flood hazard evaluation.

In general, everything shown by Field and Pearthree as H1 or H2 surfaces has been mapped as within one of the various 100-year flood hazard areas. H1 surfaces are characterized as "very high flood potential." H1 surfaces included areas with the "potential for localized, high-velocity, relatively deep, channelized flows and sheet flooding" with "some potential for drastic shifts in channel position." H2 surfaces were evaluated as having a "high flood potential" characterized by "predominantly shallow sheet flooding; channelized flow very limited in extent" with "broad areas probably inundated in large floods." The H1 areas largely correspond with the AFHH

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zones mapped in this study. H1 zones are also shown within the AAFF zone administrative floodways.

The Field and Pearthree evaluation differs from this study where approximate alluvial fan floodways (AAFF) cross I, L1, and L2 surfaces. The AAFF corridors follow stable channels or channels confined between older surfaces from the active fan upstream to the broad areas of sheet flooding downstream. The I surfaces are described as "intermediate flood potential; areas not flooded recently; near or within distributary drainage systems, and little topographic relief separates these areas from active alluvial fans or channels; could become floodprone with relatively modest changes in channel configurations." L1 surfaces are described as "relatively low flood potential; areas not flooded for at least 10,000 years, but near or within distributary drainage networks and typically with little topographic relief separating L1 from I, H1 or H2 surfaces." L2 surfaces are described as "very low flood potential; areas not flooded for at least 10,000 years or longer; spatially or topographically separate from distributary drainage networks."

Overall, the 100-year flood hazard assessment of Site 37A and alluvial fan is believed to be reasonable, sound, and defensible based on the data presented in this Technical Data Notebook. However, revisions to the mapping presented here could be justified based on more detailed topographic mapping in the future.

6B.8 References

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Footnote:
1. Format, descriptions, and framework from AFDS – Site 36 TDN have been used to characterize and describe the Site 37 geomorphology.

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National Archive, 1944, Black and white aerial photographs, scale 1:20,000.

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Thomas, Blakemore E., Hjalmarson, H.W., and Waltemeyer, S.D., 1997, Methods for Estimating Magnitude and Frequency of Floods in the Southwest United States: U.S. Geological Survey, Water Supply Paper 2433, 195 p.

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Footnote:
1. Format, descriptions, and framework from AFDS – Site 36 TDN have been used to characterize and describe the Site 37 geomorphology.

U.S. Geological Survey, 1982, Buckeye NW, Ariz. Quadrangle, 7.5 minute series, 1:24,000 (photo date 1955, originally published 1958; photo revised in 1982 using 1978 photography).

U.S. Geological Survey, 1982, Valencia, Ariz. Quadrangle, 7.5 minute series, 1:24,000 (photo date 1954, originally published 1958; photo revised in 1982 using 1978 photography).

U.S. Geological Survey, 1978, White Tank Mtns NE, Ariz. Quadrangle, 7.5 minute series, 1:24,000 (photo date 1954, originally published 1957; photo revised in 1971, and photo inspected with no changes made in 1978).

U.S. Geological Survey, 1997, White Tank Mountains, AZ, SW, Digital Orthographic Quarter Quadrangle, GeoTIFF format, 1 meter resolution, UTM, NAD83 projection.

U.S. Geological Survey, 1997, Wagner Wash Well, AZ, SE, Digital Orthographic Quarter Quadrangle, GeoTIFF format, 1 meter resolution, UTM, NAD83 projection.

U.S. Geological Survey, 1992, Buckeye NW, AZ, NE, Digital Orthographic Quarter Quadrangle, GeoTIFF format, 1 meter resolution, UTM, NAD83 projection.

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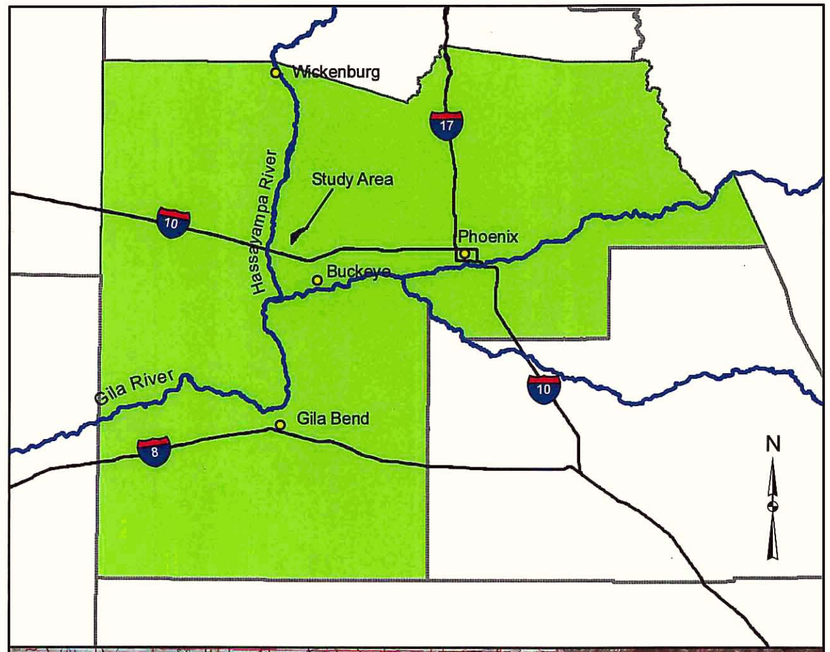
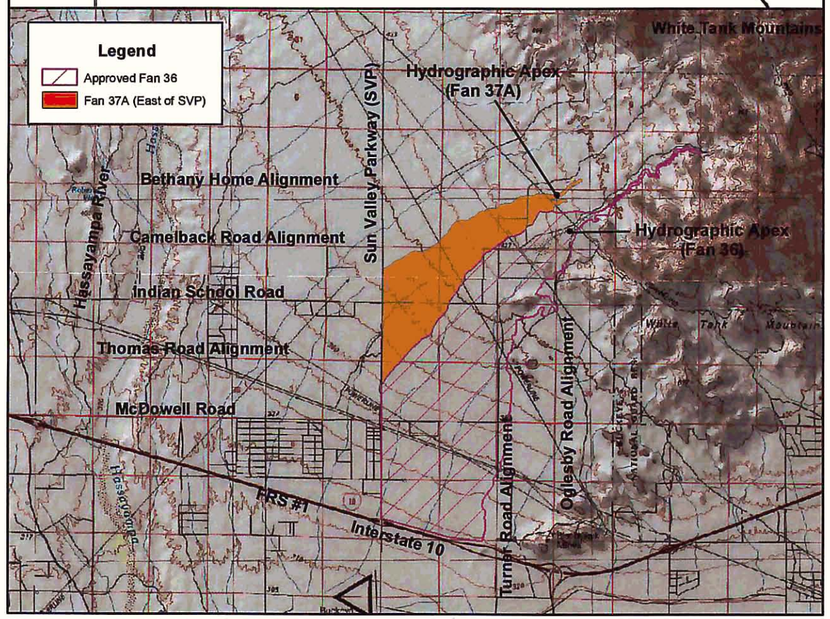
Footnote:
1. Format, descriptions, and framework from AFDS – Site 36 TDN have been used to characterize and describe the Site 37 geomorphology.





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APPROXIMATE FLOOD HAZARD ASSESSMENT
FOR
WHITE TANK FANS

ALLUVIAL FAN SITE 37A
(East of Sun Valley Parkway)

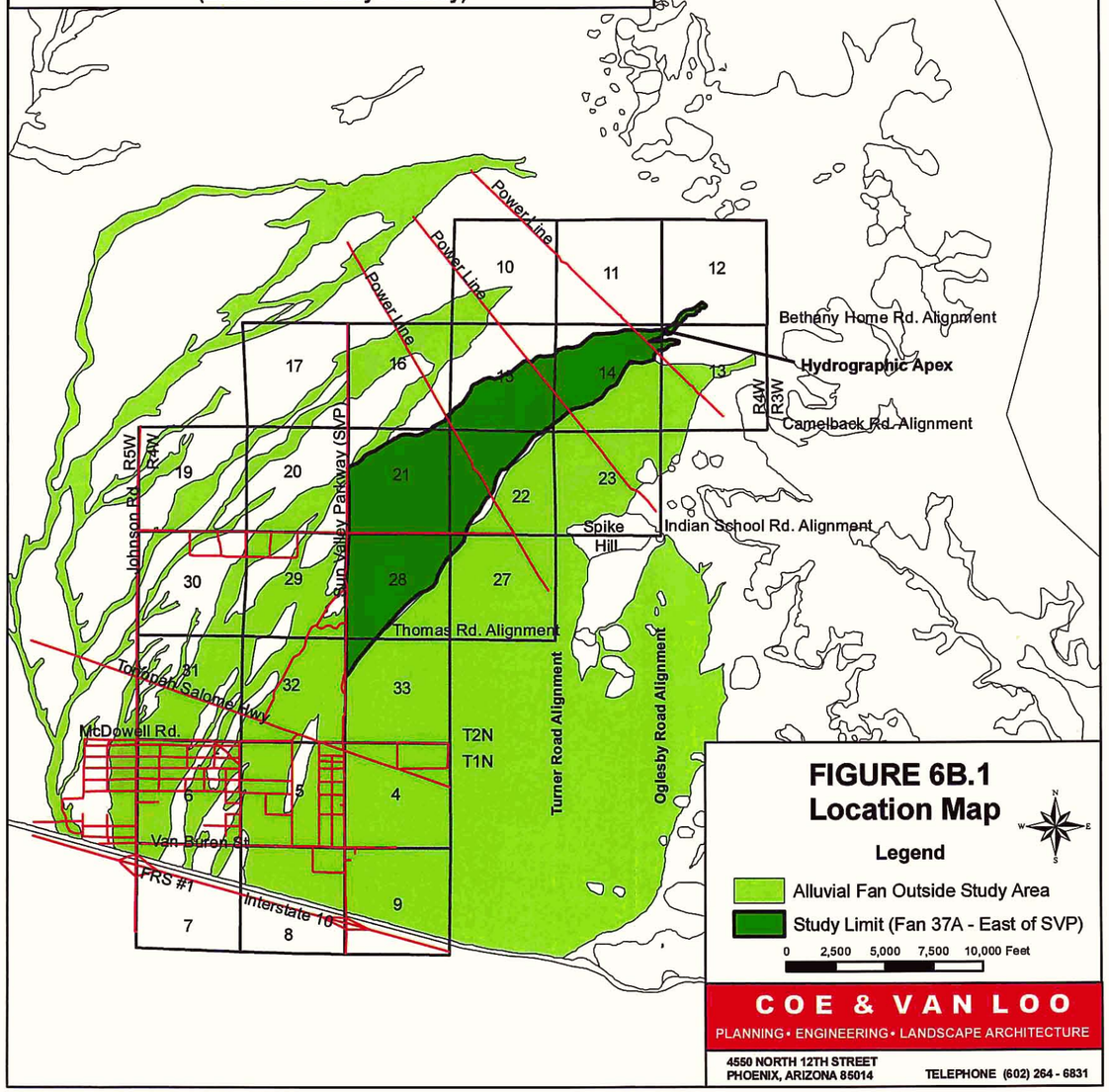

FIGURE 6B.1
Location Map

Legend

Alluvial Fan Outside Study Area

Study Limit (Fan 37A - East of SVP)

0 2,500 5,000 7,500 10,000 Feet

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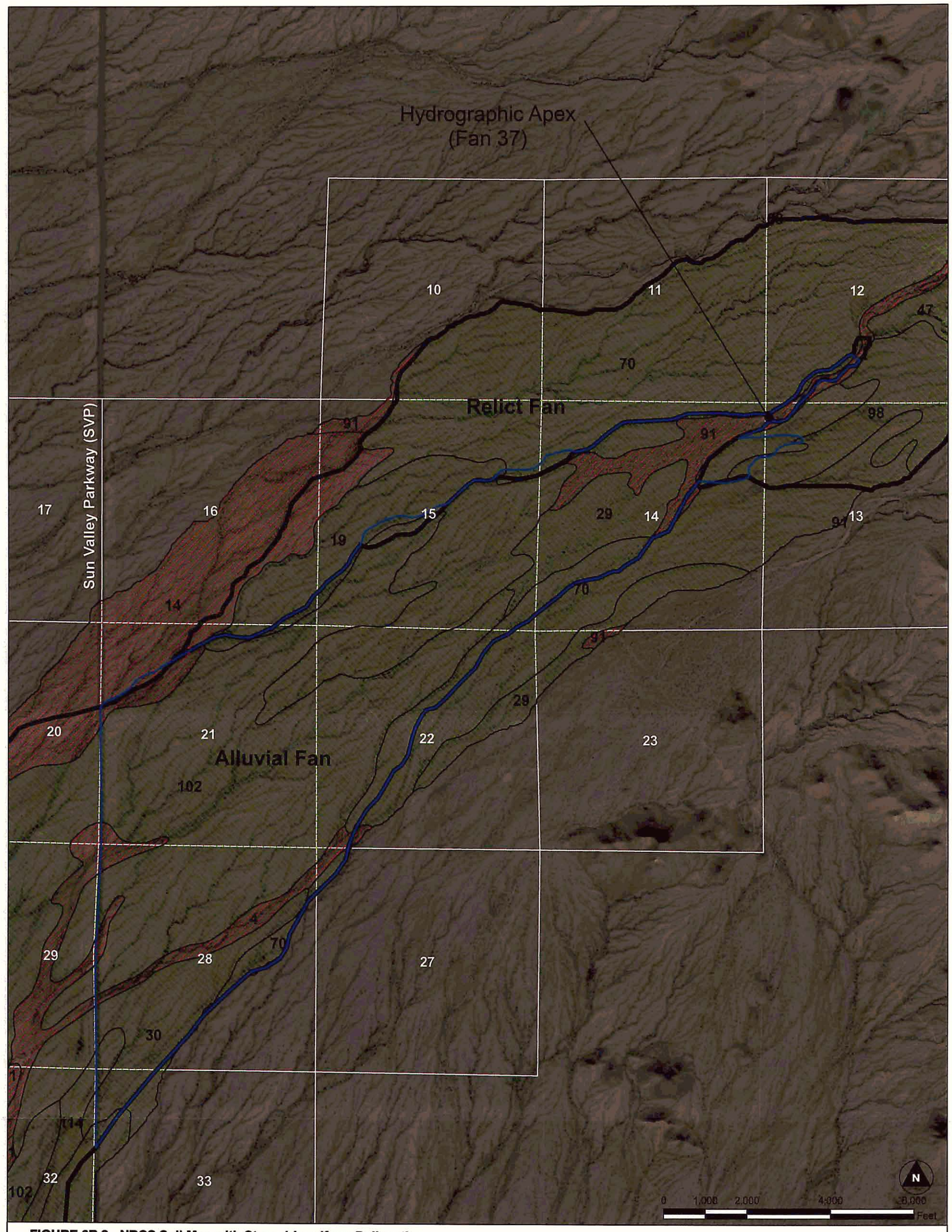

FIGURE 6B.2 - NRCS Soil Map with Stage 1 Landform Delineation

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

ALLUVIAL FAN SITE 37A (East of Sun Valley Parkway)

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LEGEND

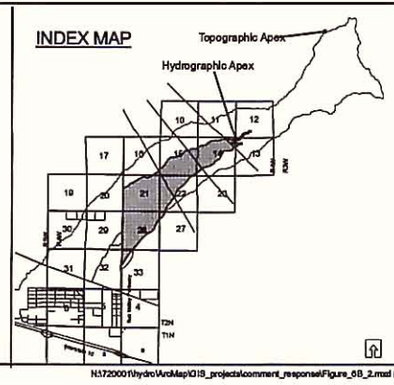
- Alluvial fans, drainageways, floodplains
- Fan terraces
- 14 Section
- Landform
- Fan 37A (East of Sun Valley Parkway)

Refer to Table 6B.1 for description of soil map units.

NOTES

Soils Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona. (Camp, 1986)

INDEX MAP



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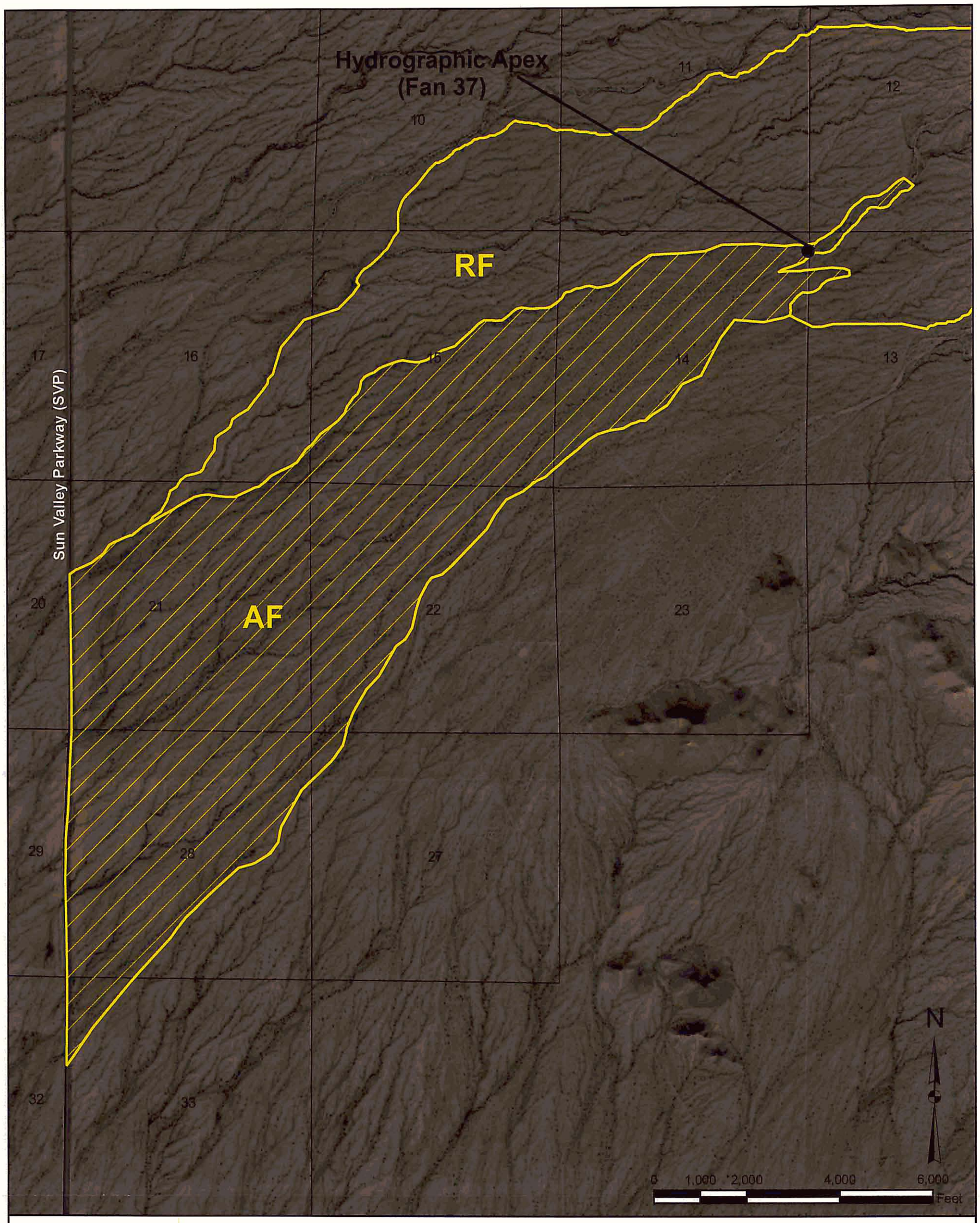

FIGURE 6B.3 - Stage1 Landform Delineation overlayed onto Aerial Photography[1]

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

ALLUVIAL FAN SITE 37A (East of Sun Valley Parkway)

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LEGEND

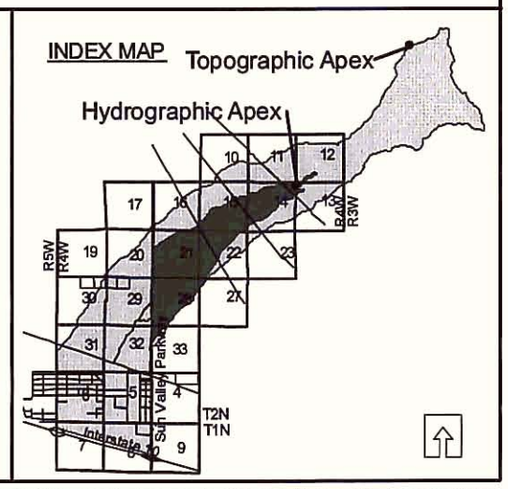
- Stage1 Landform Delineation
- Within Study Area

AF = Alluvial fan
RF = Relict fan

NOTES

1. Aerial Photography: Flood Control District of Maricopa County (2004)

INDEX MAP



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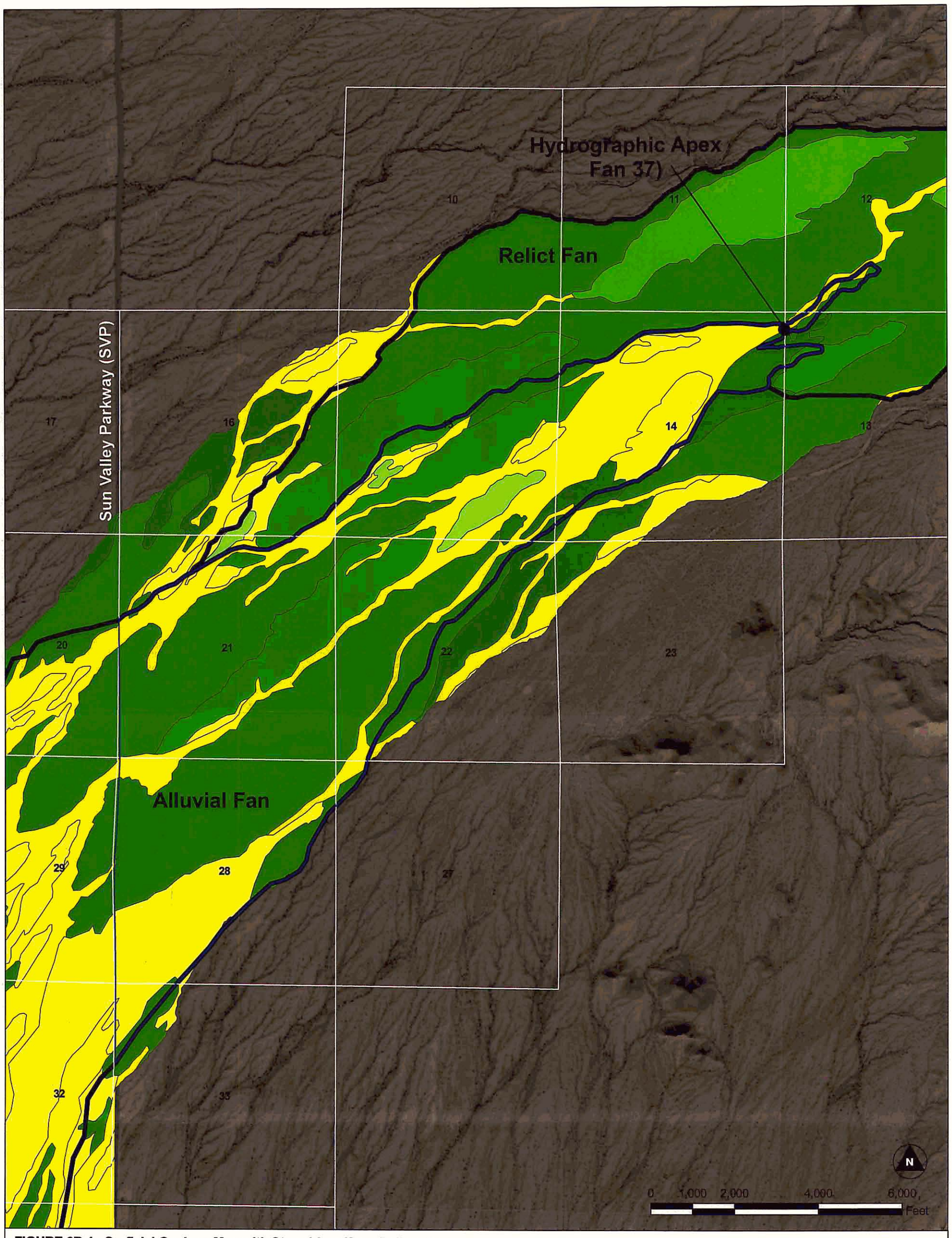

FIGURE 6B.4 - Surficial Geology Map with Stage1 Landform Delineation

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

ALLUVIAL FAN SITE 37A (East of Sun Valley Parkway)

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LEGEND

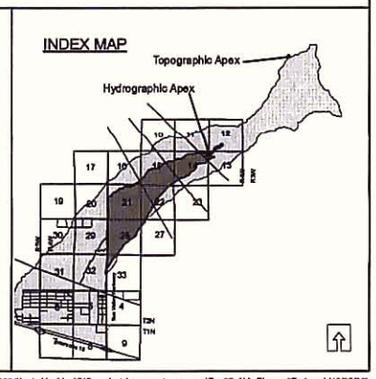
- Ql — Ql - Middle and late pleistocene alluvial fan and terrace deposits, undifferentiated
- Qo — Qo - Early Pleistocene to late Pliocene alluvial fan deposits
- Ql1 — Ql1 - Middle to early Pleistocene alluvial fan deposits
- Ql2 — Ql2 - Middle Pleistocene alluvial fan deposits
- Ql3 — Ql3 - Late Pleistocene alluvial fan and terrace deposits
- Qy1 — Qy1 - Late to early Holocene deposits on alluvial fans and terraces
- Qy2 — Qy2 - Late Holocene deposits in active stream channels, low terraces, and alluvial fans
- Fan 37A (Outline)
- Landform — 12 Section

NOTES

1. Surficial geology data "Arizona Geological Survey Digital Geologic Map 37 (DGM-37) version 1.0 from Field, Pearthree and Ferguson (2004)

2. Surficial geology data "Arizona Geological Survey Digital Geologic Map 38 (DGM-38) version 1.0 from Ferguson, Spencer, Pearthree Youberg, and Field (2004)

INDEX MAP



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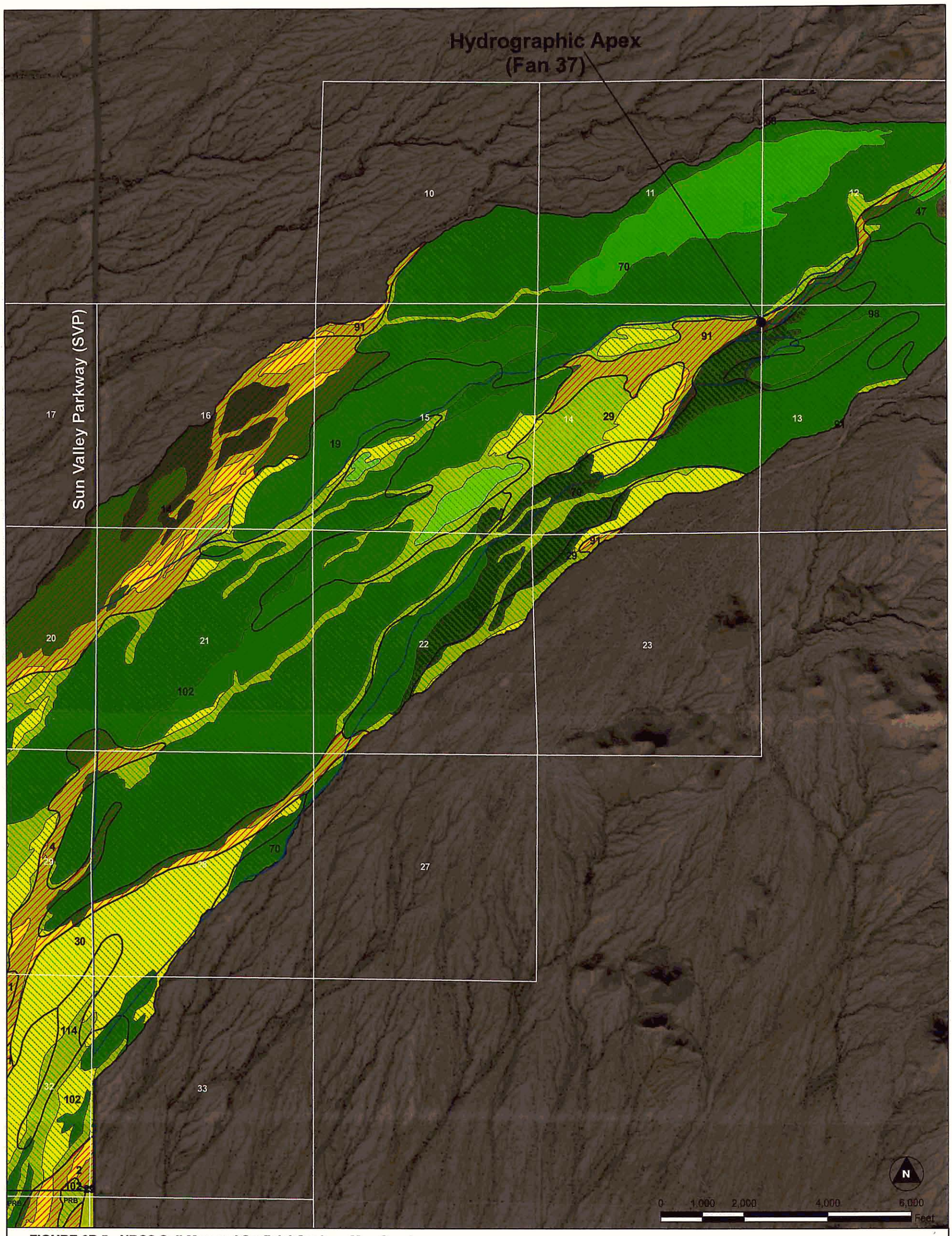

FIGURE 6B.5 - NRCS Soil Map and Surficial Geology Map Overlay

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

ALLUVIAL FAN SITE 37A (East of Sun Valley Parkway)

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LEGEND

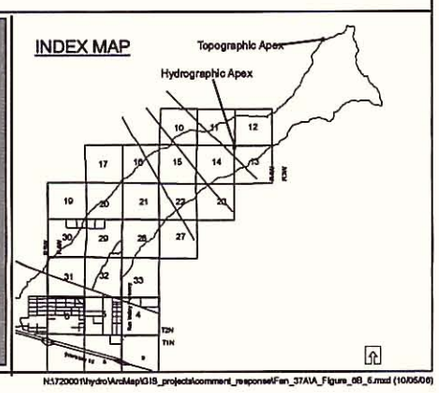
- 14 Section
- Alluvial Fans, drainageways, floodplains
- Fan Terraces
- Fan 37A (Outline)

- Ql - Middle and late pleistocene alluvial fan and terrace deposits, undifferentiated
- Qo - Early Pleistocene to late Pliocene alluvial fan deposits
- Ql1 - Middle to early Pleistocene alluvial fan deposits
- Ql2 - Middle Pleistocene alluvial fan deposits
- Ql3 - Late Pleistocene alluvial fan and terrace deposits
- Qy1 - Late to early Holocene deposits on alluvial fans and terraces
- Qy2 - Late Holocene deposits in active stream channels, low terraces, and alluvial fans

NOTES

Refer to table 6B.1 for description of soil map units.

INDEX MAP



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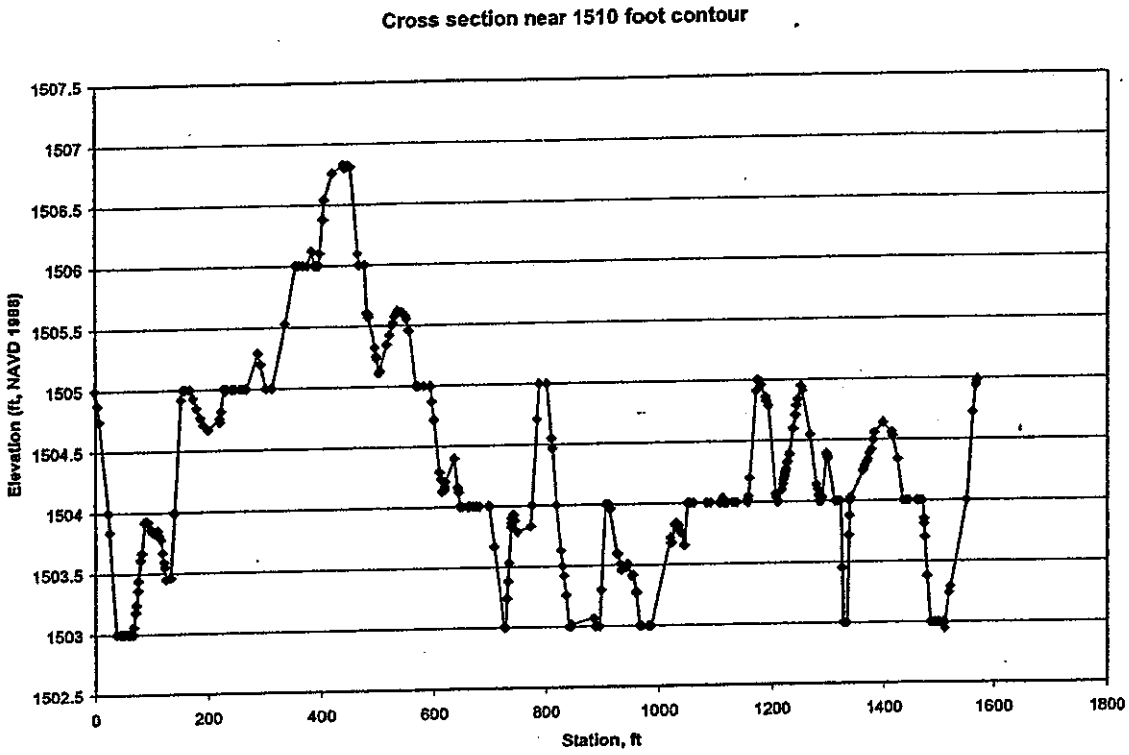

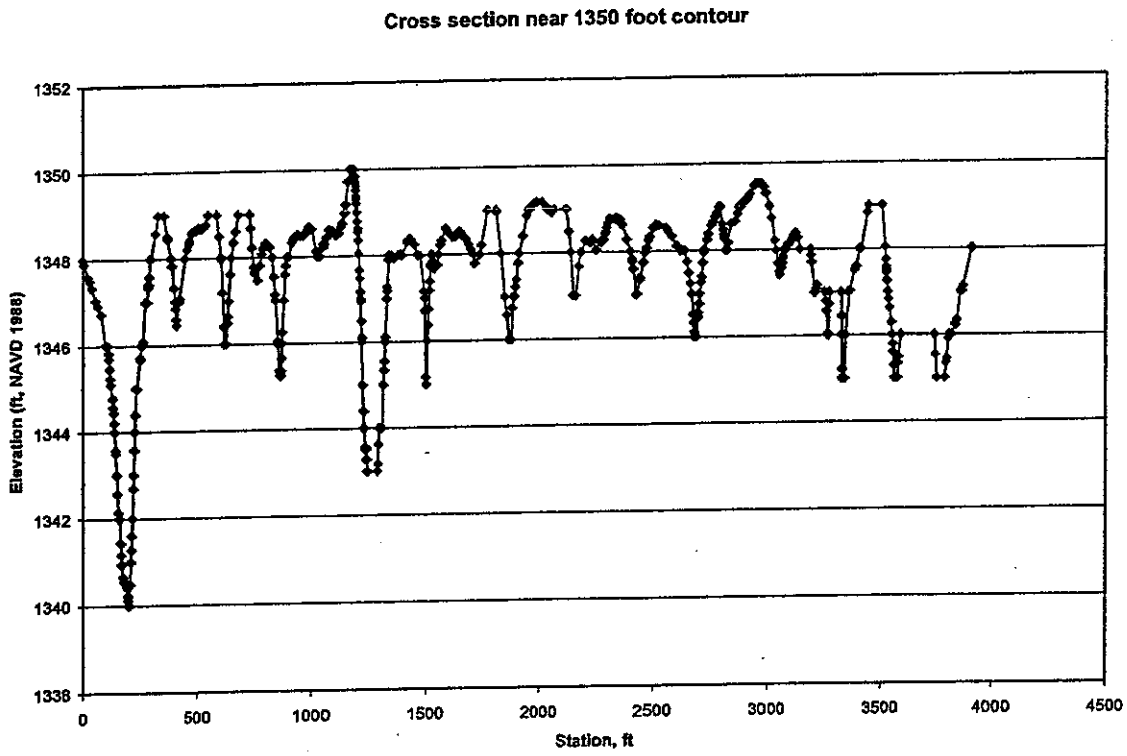

Figure 6B.6-A Cross Sections of the Site 37 Piedmont

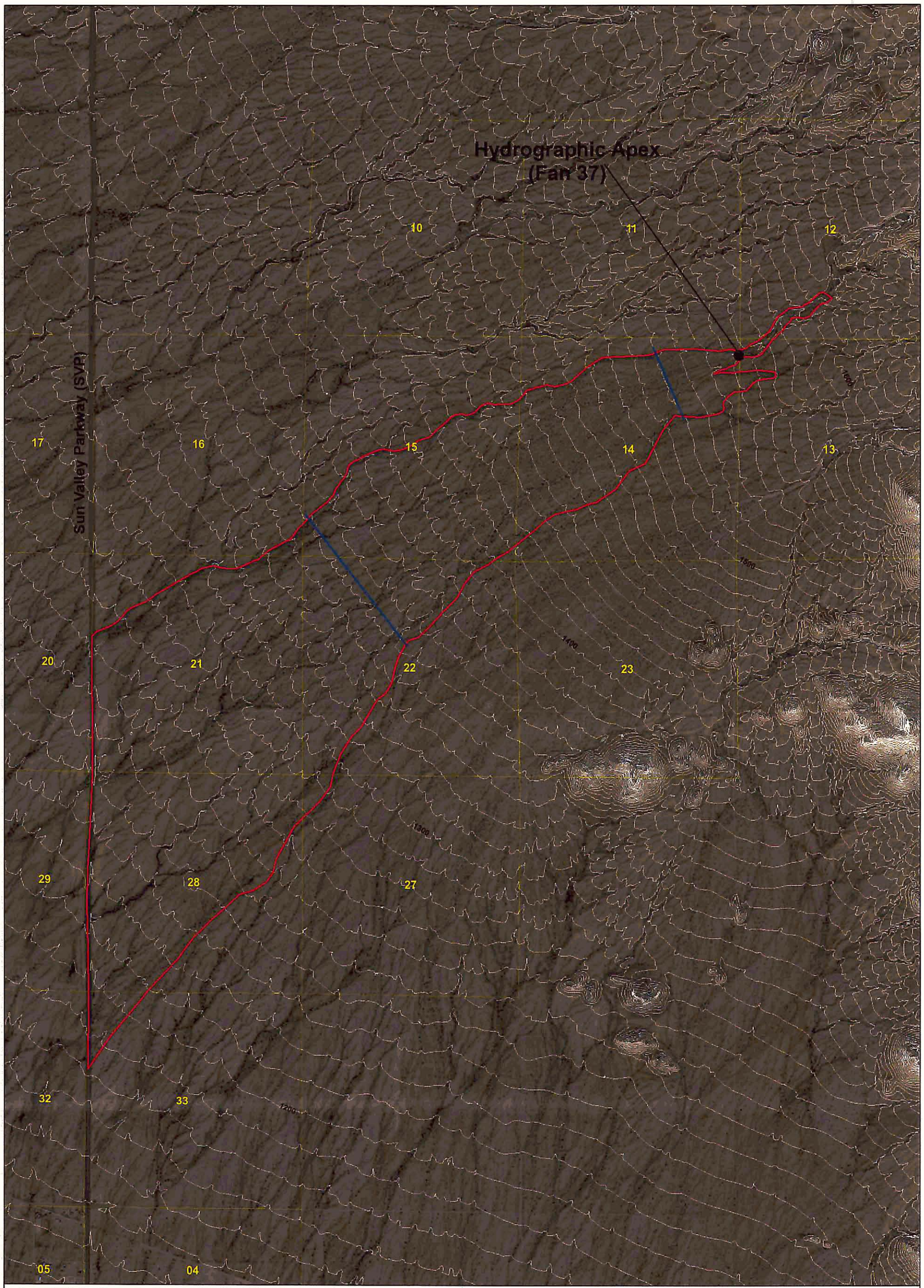

Figure 6B.6-B - Cross-Sections of the Site 37A Piedmont - Plan View

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APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

ALLUVIAL FAN SITE 37A (East of Sun Valley Parkway)

LEGEND

- Topography (10ft interval)
- 11 Section
- Fan 37A Outline
- Cross Section

NOTE

Aerial Photography: Flood Control District of Maricopa County (2004)

Topography: Flood Control District of Maricopa County (2000/2001)

N

0 1,000 2,000 3,000 4,000 Feet

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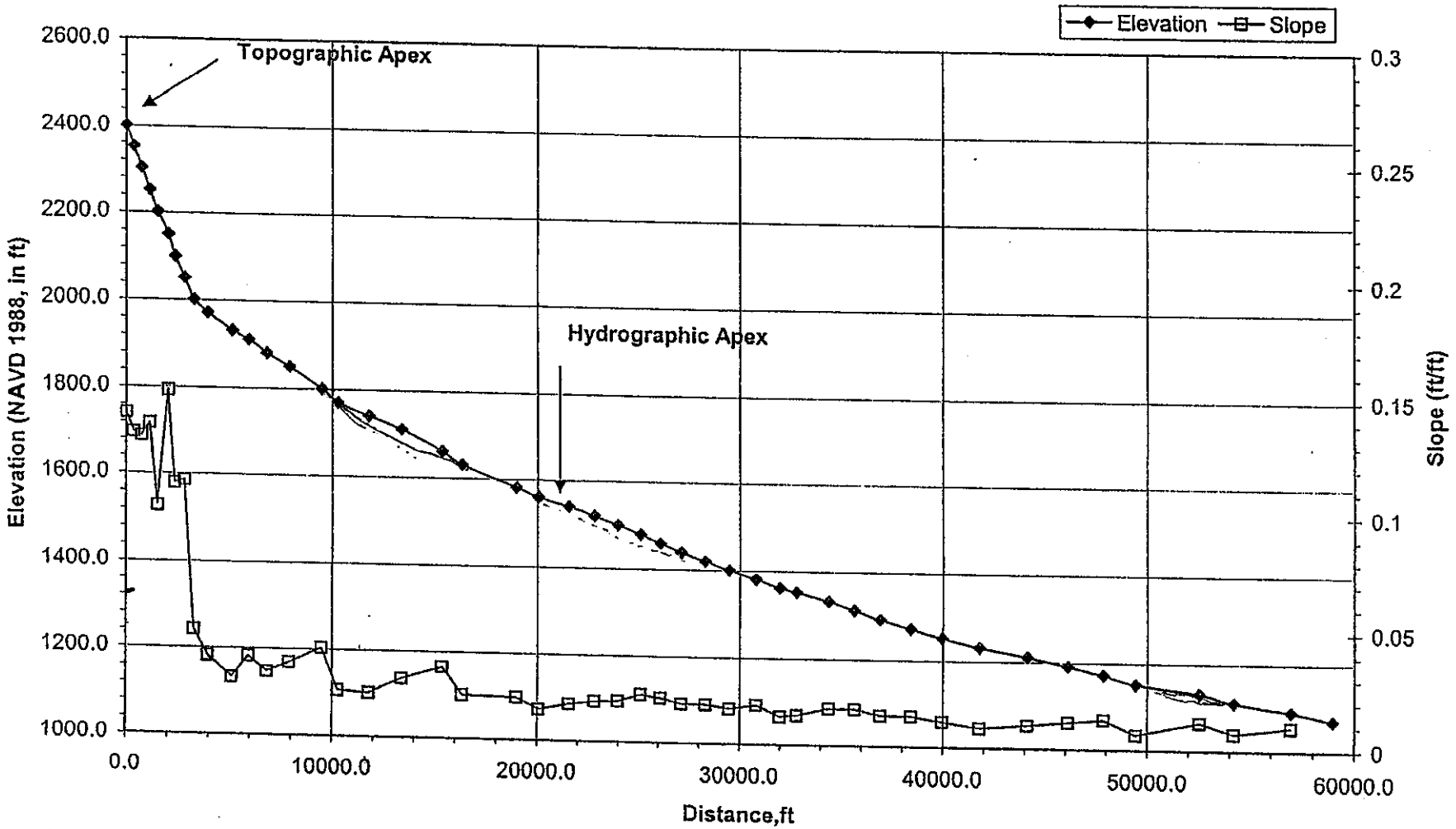
Figure 6B.7 Longitudinal Profile
White Tank Fan, Site 37



Coe & Van Loo Consultants Inc.
January 2006

Approximate Flood Hazard Assessment
for White Tank Fans Site 37

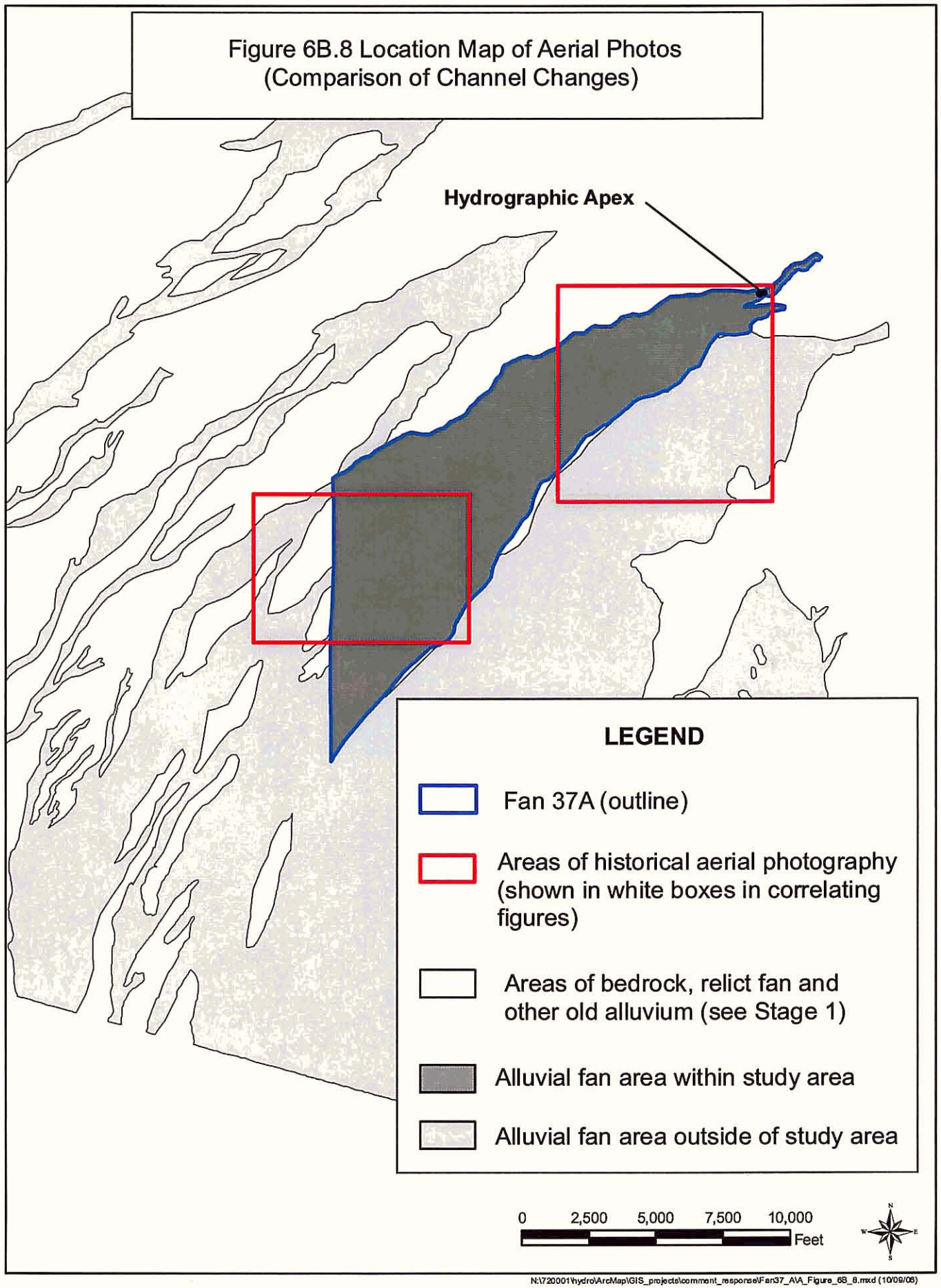


Figure 6B.8 Location Map of Aerial Photos
(Comparison of Channel Changes)
Hydrographic Apex
LEGEND
Fan 37A (outline)
Areas of historical aerial photography (shown in white boxes in correlating figures)
Areas of bedrock, relict fan and other old alluvium (see Stage 1)
Alluvial fan area within study area
Alluvial fan area outside of study area
0
2,500
5,000
7,500
10,000
Feet
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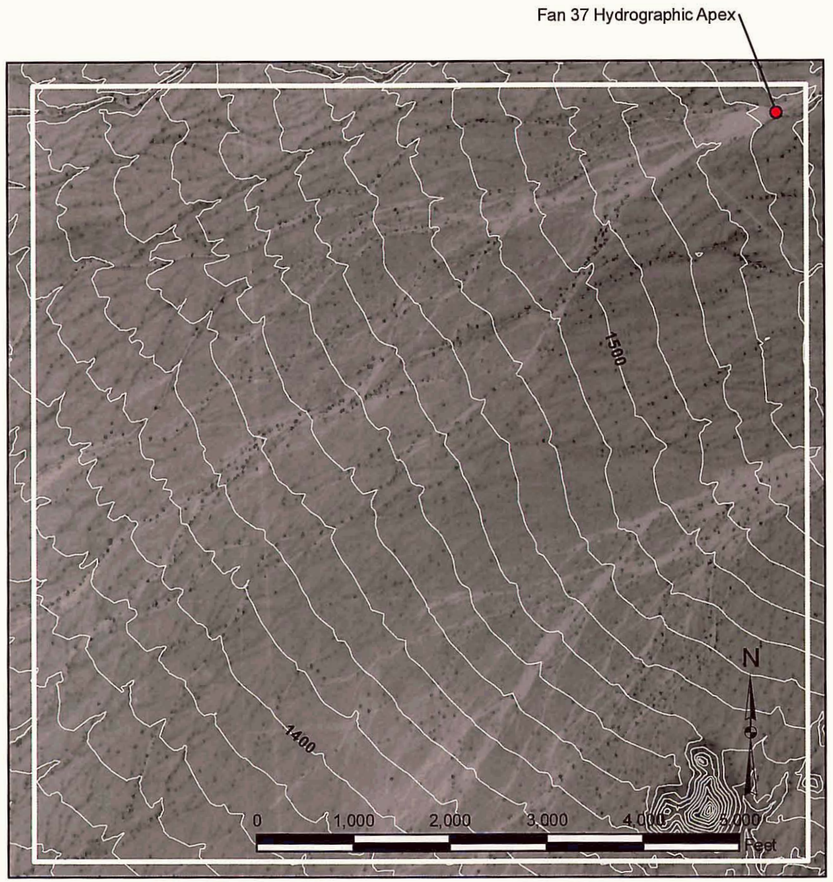
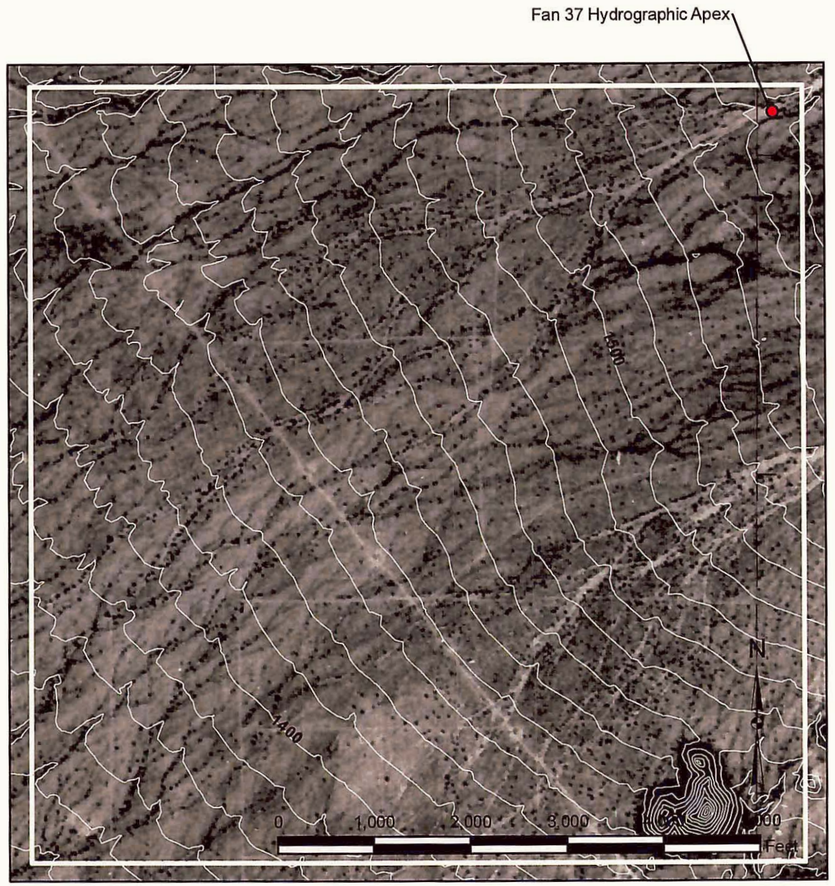
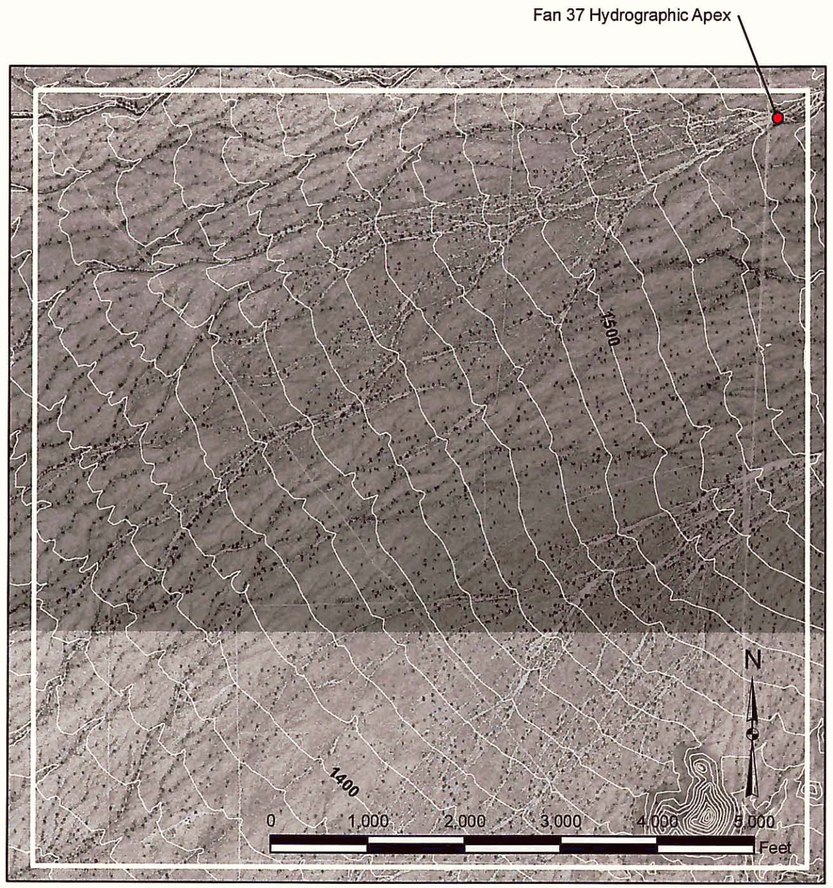


a) 1954

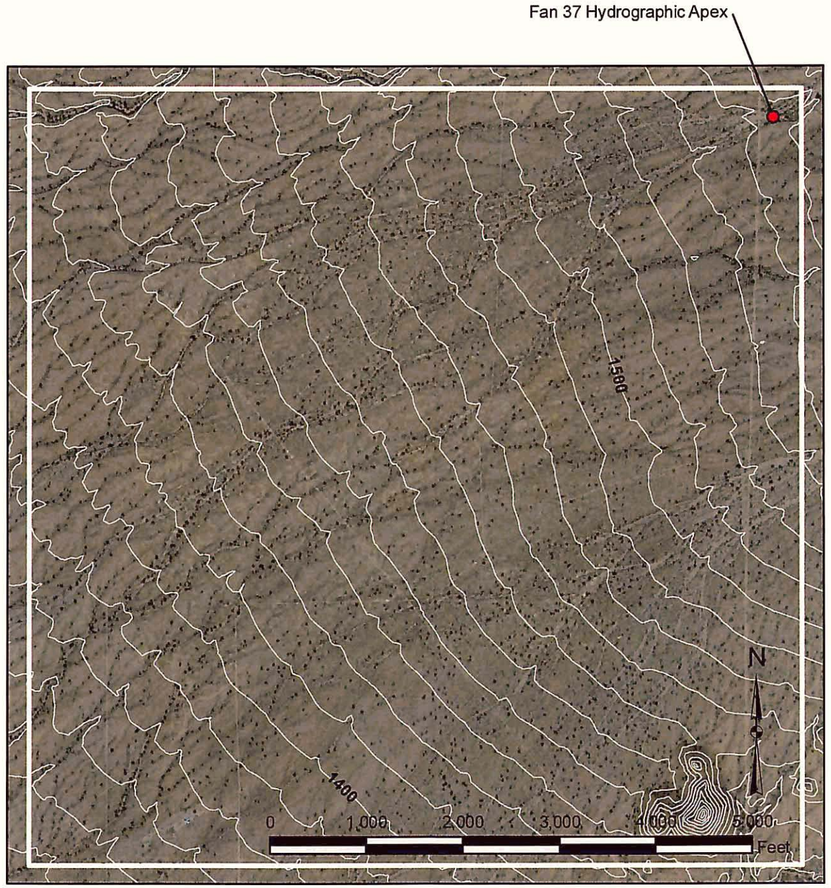


b) 1972

Figure 6B.9 Historical Channel Changes Downstream of the Hydrographic Apex



c) 1997



d) 2004

Figure 6B.9 (cont.) Historical Channel Changes Downstream of the Hydrographic Apex

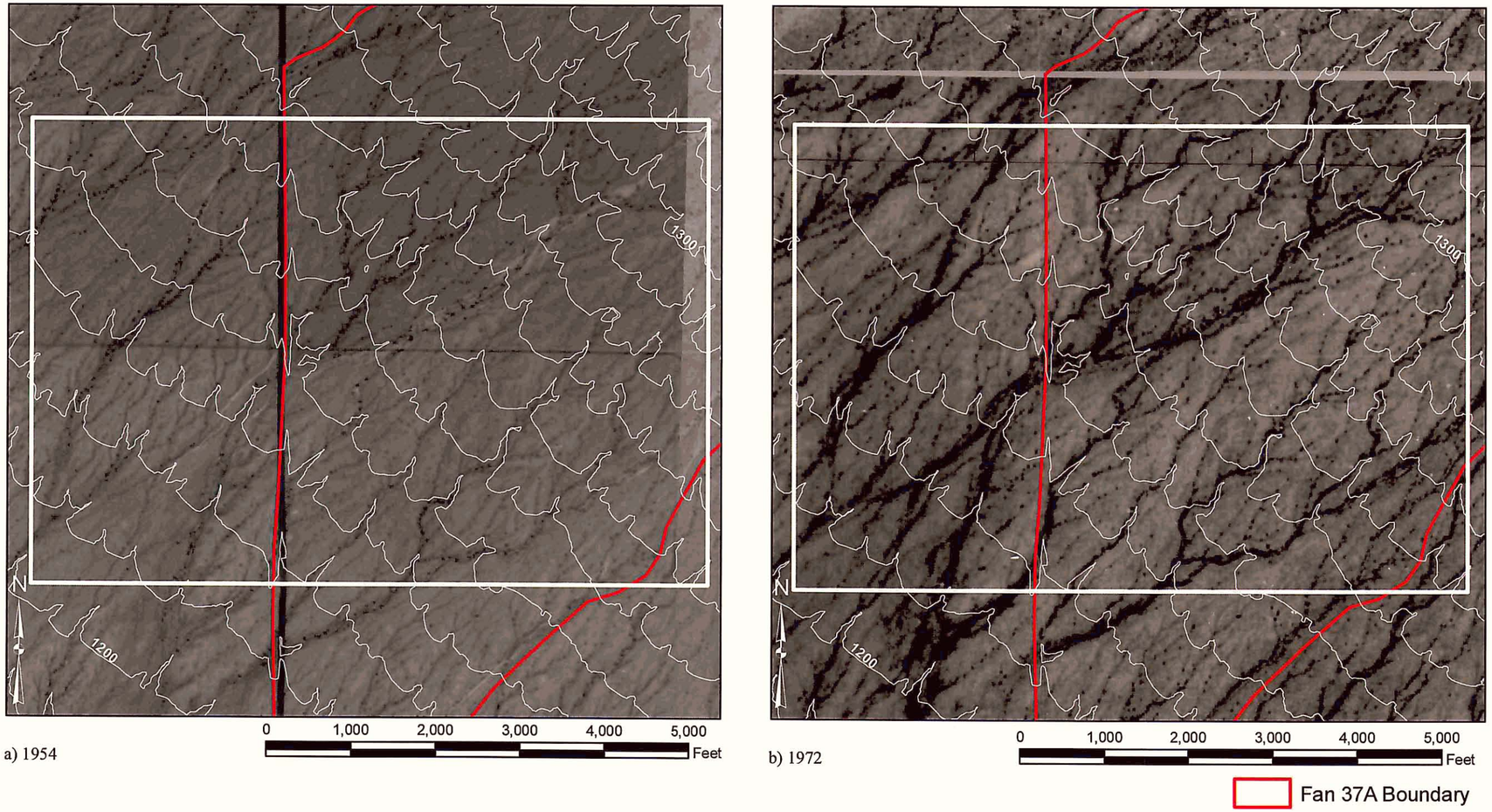


Figure 6B.10 Historical Channel Changes on the Middle Piedmont

c) 1997

0 1,000 2,000 3,000 4,000 5,000 Feet

d) 2004

0 1,000 2,000 3,000 4,000 5,000 Feet

Fan 37A Boundary

Figure 6B.10 (cont.) Historical Channel Changes on the Middle Piedmont

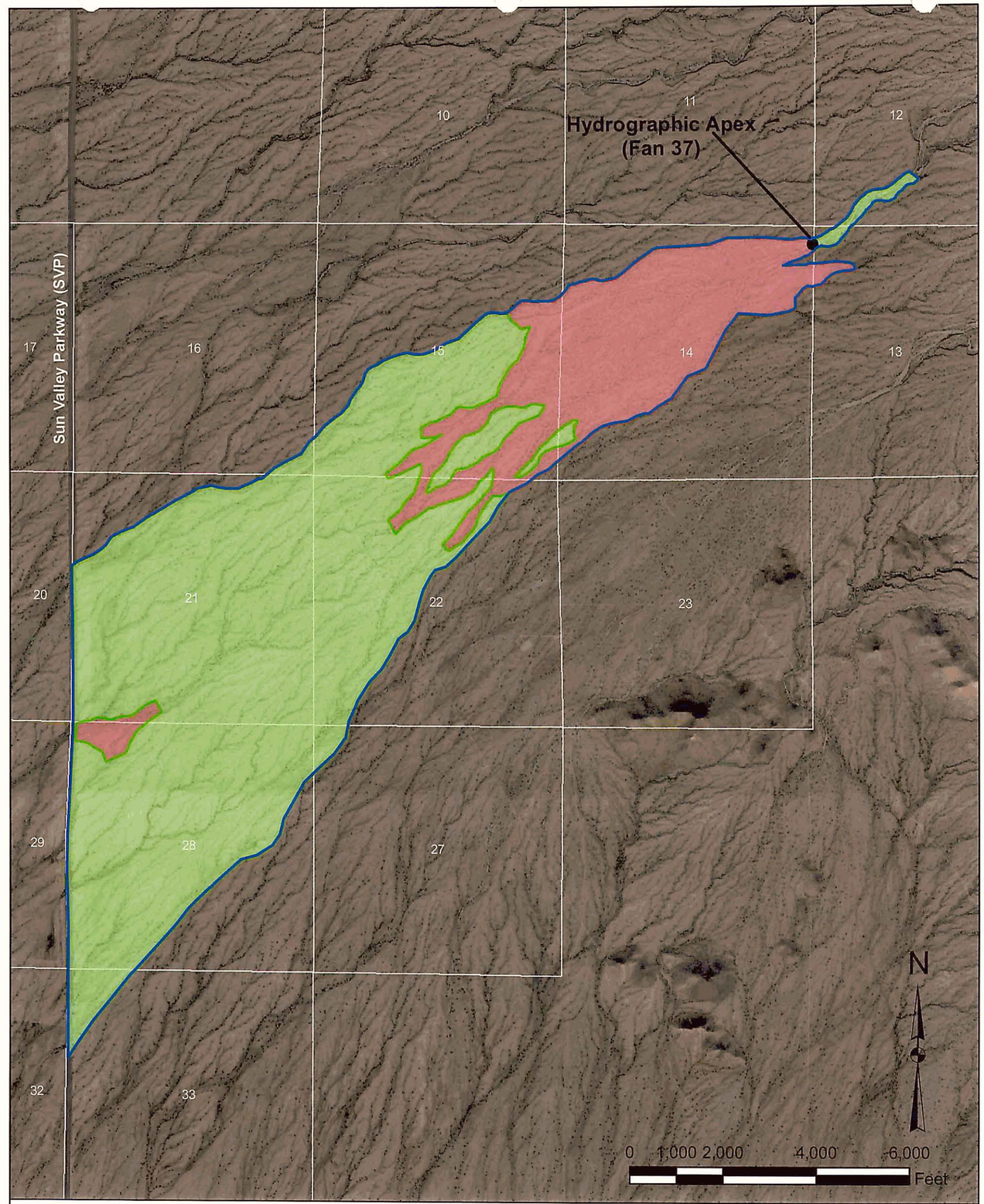


FIGURE 6B.11 - Stage2 - Stability Assessment

APPROXIMATE
FLOOD HAZARD ASSESSMENT
FOR
WHITE TANK FANS

ALLUVIAL FAN SITE 37A
(East of Sun Valley Parkway)

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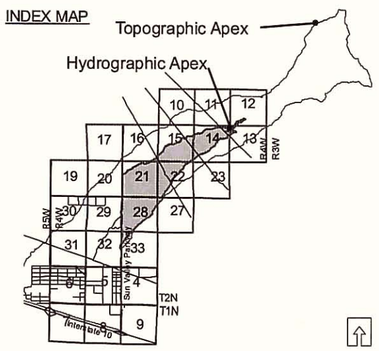
LEGEND

- Fan 37A (Outline)
- Stable
- Unstable

INDEX MAP



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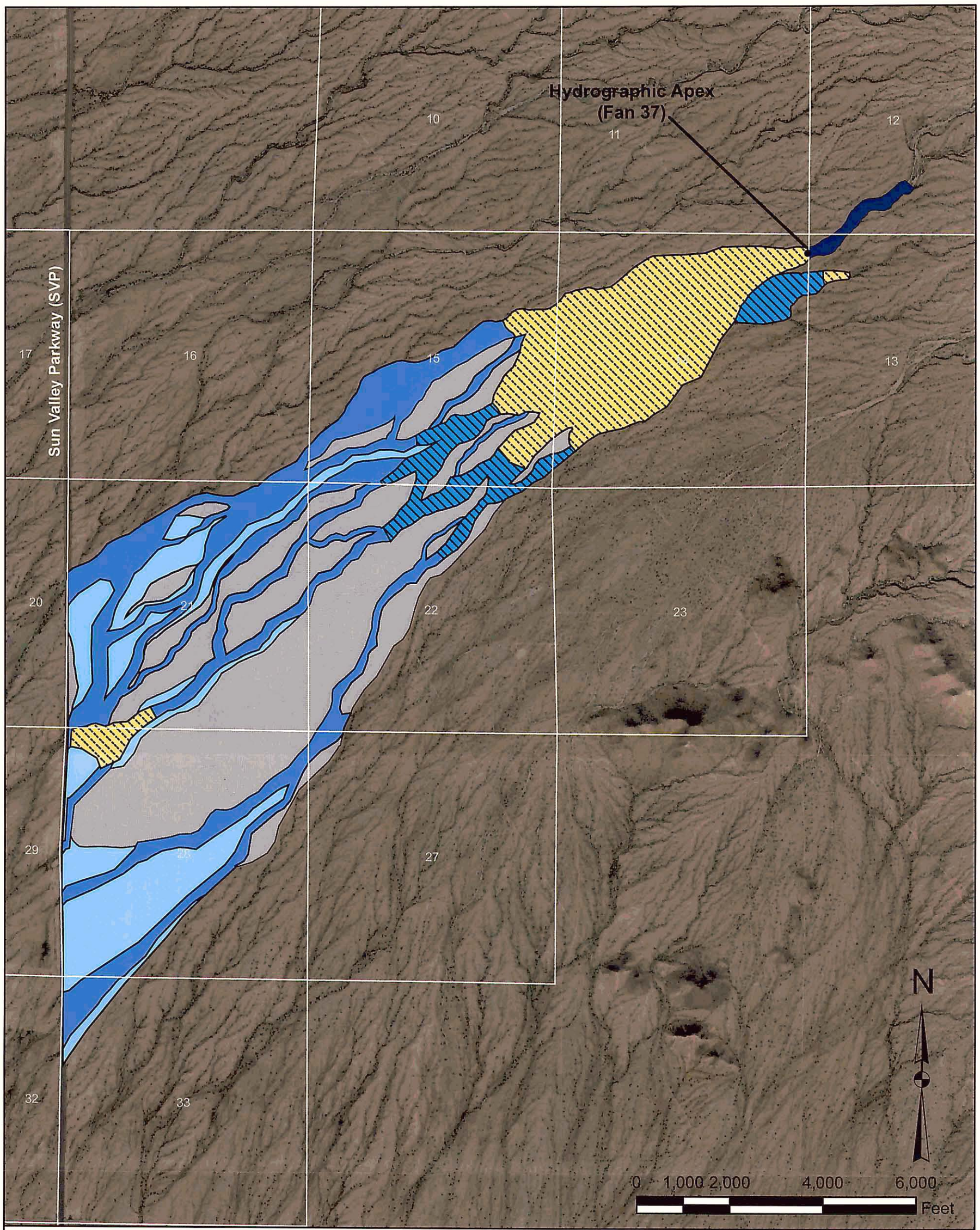

FIGURE 6B.12 - Stage3 Floodplain Delineation Map

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

ALLUVIAL FAN SITE 37A (East of Sun Valley Parkway)

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LEGEND

- A
- AFHH
- AFUFD
- AAFF
- AFZA
- Shaded X

A - Approximate 100-year floodplain; riverine reaches upstream of hydrographic apex, and previously mapped ponding area behind Buckeye FRS #1

AFHH - Alluvial fan high hazard; community to treat as a floodway district

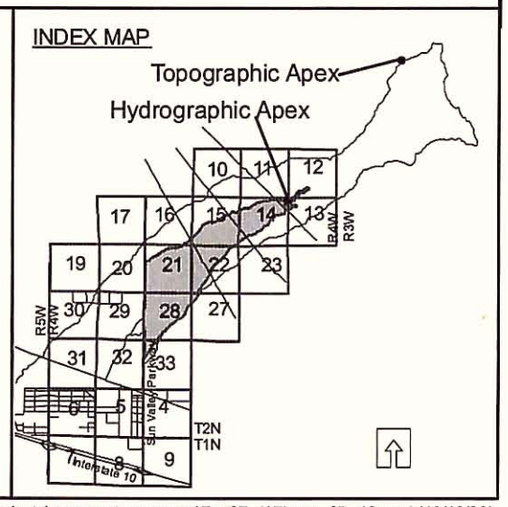
AFUFD - Alluvial fan uncertain flow distribution area; transitional area downstream of AFHH zone characterized by channelized and sheet flooding generally becoming more stable and less uncertain with increasing distance from the AFHH zone; community to treat as a floodway district

AAFF - Approximate Alluvial Fan Floodway; corridors for conveyance of water and sediment on a stable alluvial fan surface downstream of the AFHH and AFUFD zones; community to treat as a floodway district

AFZA - Alluvial fan zone A; areas within the 100-year floodplain on an inactive alluvial fan characterized by shallow channelized flow and sheet flooding in stable channels; zone is considered approximate because no base flood elevations are provided; flood hazards within this zone are not necessarily equal throughout

X (shaded) - Areas flooded between the 100-year and 500-year discharge; or areas of flooding with depth of 100-year flood less than 1 foot; or drainage areas less than 1 square mile

INDEX MAP



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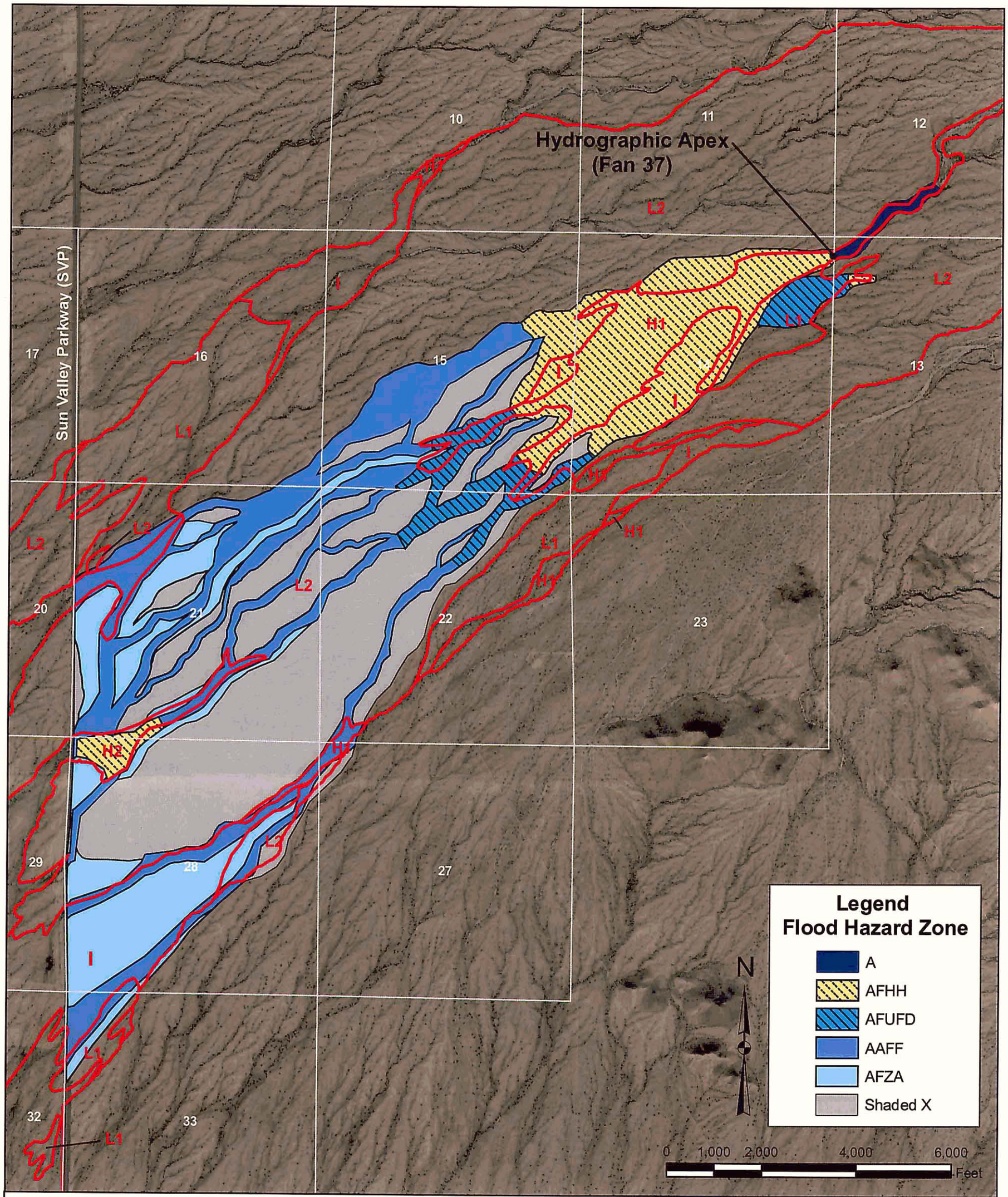

FIGURE 6B.13 - Flood Hazard Assessment Map (Arizona Geological Survey)

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

ALLUVIAL FAN SITE 37A (East of Sun Valley Parkway)

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LEGEND

H1 Flood Hazard Assessment (Arizona Geological Survey)

H1 – Very high flood potential. Extensive young deposits; distributary channel system very evident. Potential for localized, high-velocity, relatively deep, channelized flows and sheetflooding; some potential for drastic shifts in channel positions.

H2 – High flood potential. Extensive young deposits, but channels are small or nonexistent. Predominantly shallow sheetflooding; channelized flow very limited in extent; broad areas probably inundated in large floods.

I – Intermediate flood potential. Areas have not been flooded recently. Near or within distributary drainage systems, and little topographic relief separates these areas from active alluvial fans or channels. Could become flood prone with relatively modest changes in channel configurations.

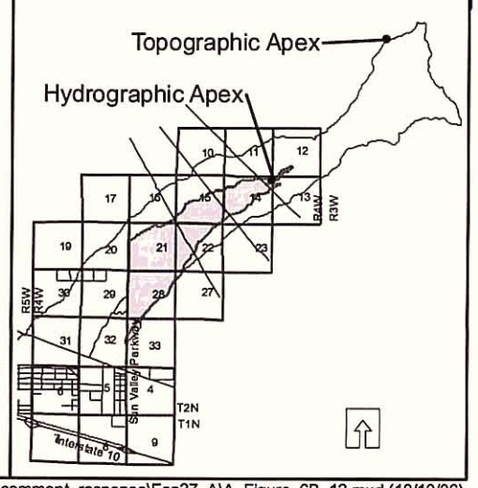
L1 – Relatively low flood potential. Areas have not been flooded for at least 10,000 years. Flooding has been confined to channels and immediately adjacent terraces for that long. However, these areas are near or within distributary drainage networks, and typically little topographic relief separates L1, I, H2, and H1 areas. L1 areas should be carefully evaluated to determine if potential for shifts in channel configurations or depositional patterns could results in these areas becoming flood prone.

L2 – Very low flood potential. Areas have not been flooded for at least 10,000 years, and typically for much longer. Drained by tributary streams that head on the piedmont. Streams entrenched 1 to 10 m (3 to 30 ft) below inactive alluvial surfaces; spatially separate from or topographically isolated from distributary drainage networks. Floodprone areas limited to channels and adjacent low terraces.

M – Mechanized disturbance; flood hazard unknown

1. Digitized from Field and Pearthree, 1992.

INDEX MAP



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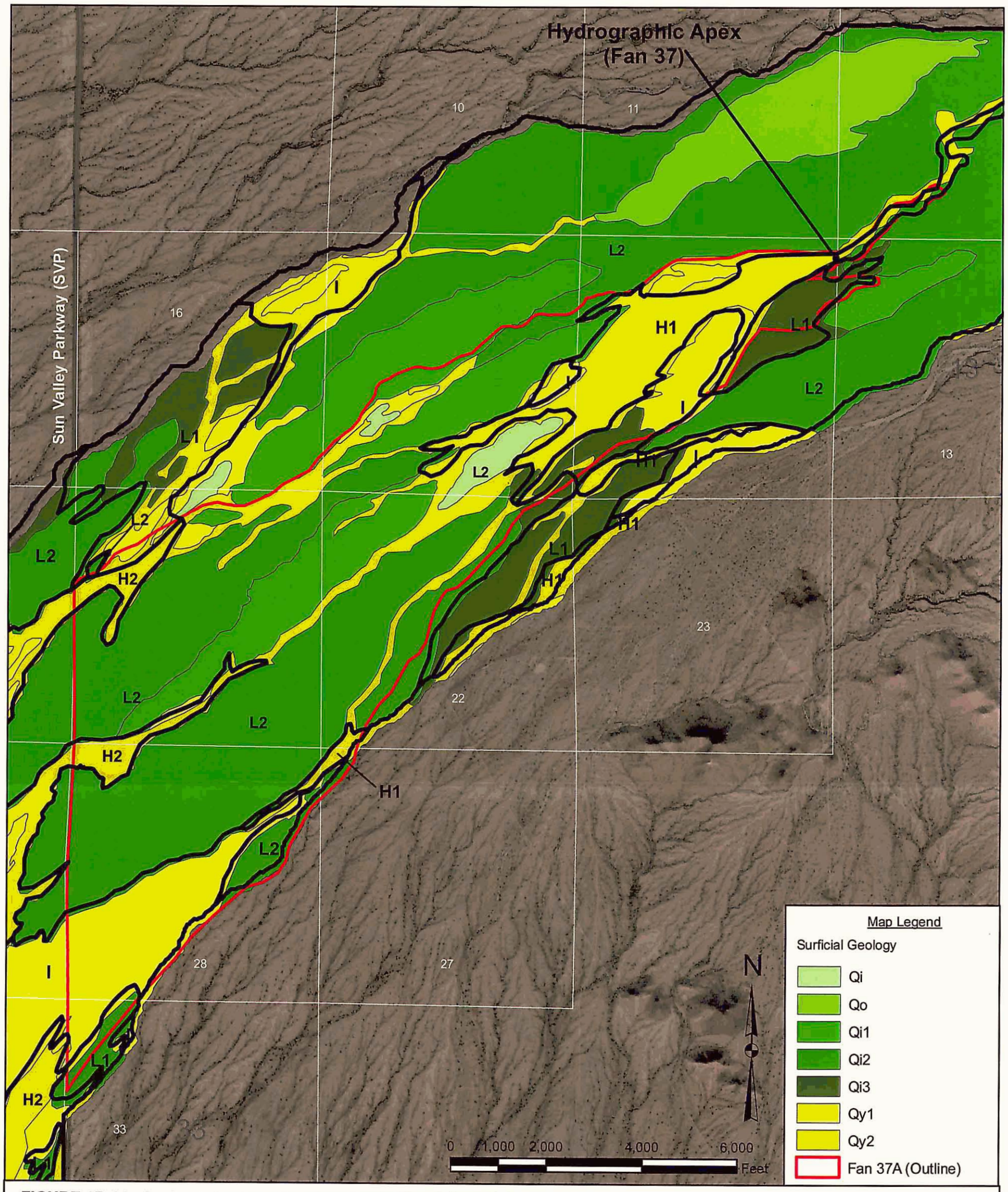


FIGURE 6B.14 - Surficial Geology Overlayed onto Flood Hazard Assessment

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

ALLUVIAL FAN SITE 37A (East of Sun Valley Parkway)

COE & VAN LOO
PLANNING ENGINEERING LANDSCAPE ARCHITECTURE
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014 TELEPHONE (602) 264 - 6831

LEGEND

H1 Flood Hazard Assessment (Arizona Geological Survey)

H1 – Very high flood potential. Extensive young deposits; distributary channel system very evident. Potential for localized, high-velocity, relatively deep, channelized flows and sheetflooding; some potential for drastic shifts in channel positions.

H2 – High flood potential. Extensive young deposits, but channelsare small or nonexistent. Predominantly shallow sheetflooding; channelized flow very limited in extent; broad areas probably inundated in large floods.

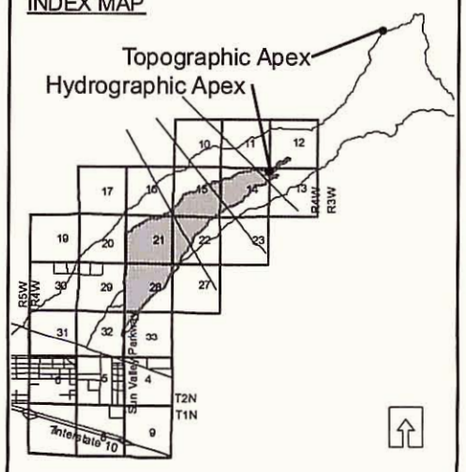
I – Intermediate flood potential. Areas have not been flooded recently. Near or within distributary drainage systems, and little topographic relief separates these areas from active alluvial fans or channels. Could become flood prone with relatively modest changes in channel configurations.

L1 – Relatively low flood potential. Areas have not been flooded for at least 10,000 years. Flooding has been confined to channels and immediately adjacent terraces for that long. However, these areas are near or within distributary drainage networks, and typically little topographic relief separates L1, I, H2, and H1 areas. L1 areas should be carefully evaluated to determine if potential for shifts in channel configurations or depositional patterns could results in these areas becoming flood prone.

L2 – Very low flood potential. Areas have not been flooded for at least 10,000 years, and typically for much longer. Drained by tributary streams that head on the piedmont. Streams entrenched 1 to 10 m (3 to 30 ft) below inactive alluvial surfaces; spatially separate from or topographically isolated from distributary drainage networks. Floodprone areas limited to channels and adjacent low terraces.

M – Mechanized disturbance; flood hazard unknown

INDEX MAP



NOTES

1. Digitized from Field and Pearthree, 1992.
2. Colored areas are surficial geology designations.

N:\720001\hydro\ArcMap\GIS_projects\comment_response\Fan37_A\A_Figure_6B_15.mxd (10/10/06)

SECTION 7: DRAFT FIS

7.1 Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharge (cfs)			
		10-Year[1]	50- Year[1]	100- Year	500- Year[1]
White Tank Fan 37 above hydrographic apex	4.24	--	--	2,520	--

Notes: [1]Not Computed

The discharges listed above are taken from the Buckeye Sun Valley Area Drainage Master Study Technical Data Notebook Volumes V-A1 and V-A2: Area 3 Hydrology Report, January 2006, prepared by PBS&J for the FCDMC.

7.2 Floodway Data

No floodway data based on detailed hydraulic modeling was provided since this was not a detailed study. However, floodways were developed for alluvial fan management by the local community. The designation for floodway corridors are Zone AFHH, Zone AFUFD, and Zone AAFF (Approximate Alluvial Fan Floodways).

7.3 Annotated Flood Insurance Rate Maps

See Figure 7.1 for the revised Flood Insurance Rate Map. This figure encompasses three FIRM panels in unincorporated Maricopa County and Buckeye Arizona.

7.4 Flood Profiles

No flood profiles were computed since this was not a detailed study.

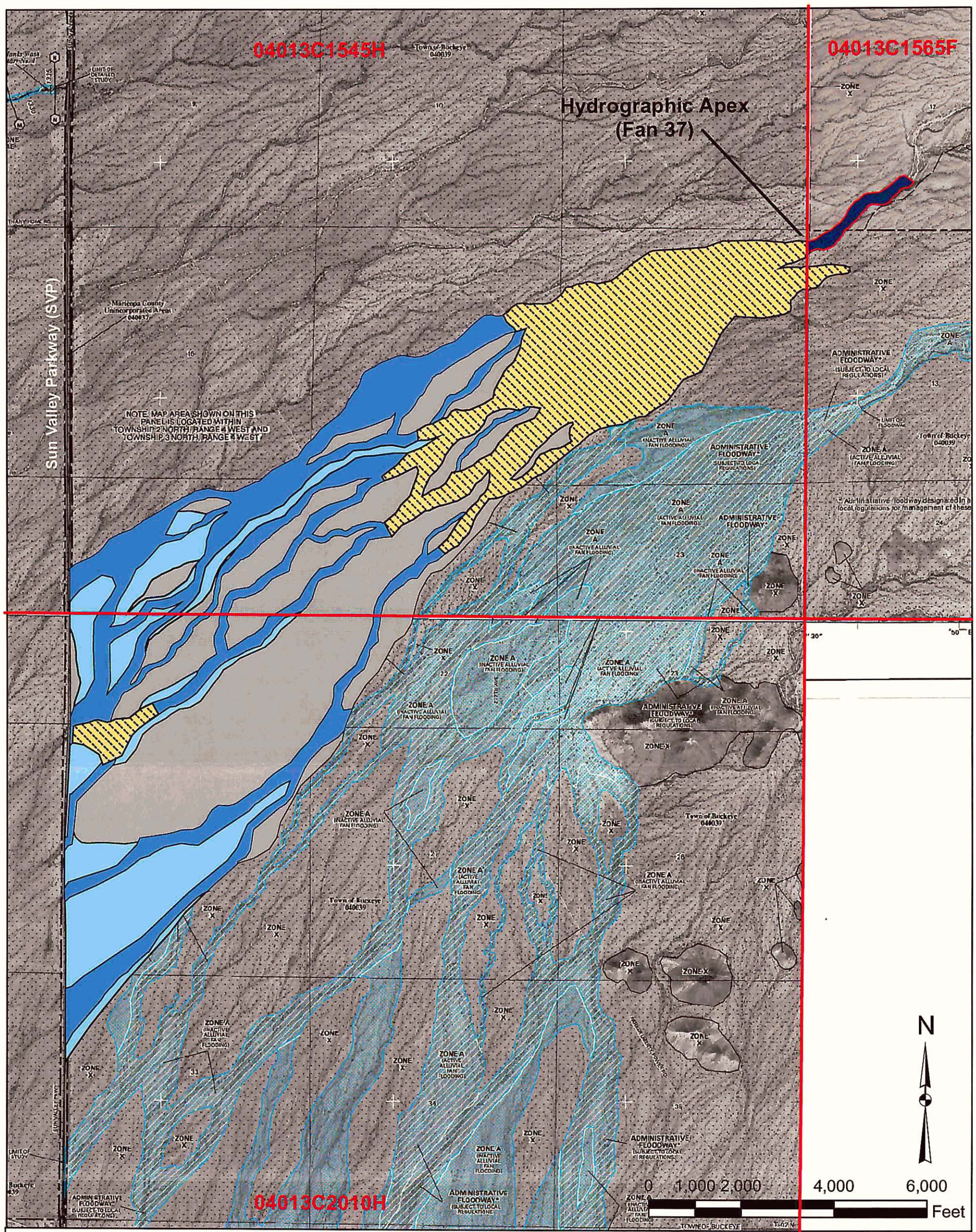


FIGURE 7.1 - Location of FIRM Panels, Existing Floodplains, and Revisions From This Study

APPROXIMATE
FLOOD HAZARD ASSESSMENT
FOR
WHITE TANK FANS

ALLUVIAL FAN SITE 37A
(East of Sun Valley Parkway)

COE & VAN LOO
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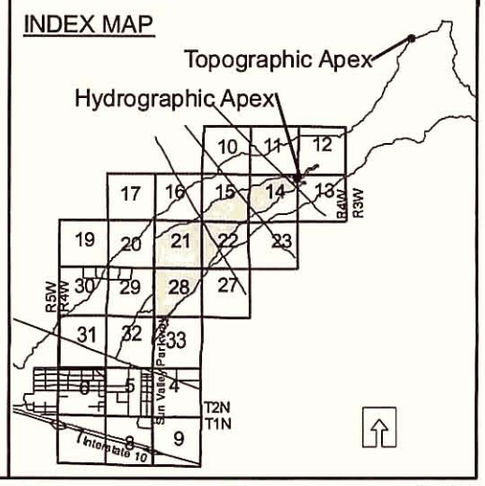
LEGEND

New 100-year Flood Hazard Zones

- ZONE A (Approximate 100-year Floodplain for Riverine Reaches Upstream of Hydrographic Apex)
- ZONE A (Active Alluvial Fan, Administrative Floodway)
- ZONE A (Inactive Alluvial Fan, Administrative Floodway)
- ZONE A (Inactive Alluvial Fan)
- Shaded X Zones

04013C2010H FIRM MAP Panel Number

INDEX MAP



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APPENDIX A

References

See Appendix G – Supplemental Information of the JE Fuller/H&G TDNs 1, 2, 3, 4, 5, 6, 10, 11, 13, 16, 17, 18, 19 and 20

APPENDIX B

General Documentation & Correspondence

JE Fuller/ Hydrology & Geomorphology, Inc.

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September 30, 2004

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Doug Both, CFM
Coe & Van Loo Consultants, Inc.
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(602) 264-0928

RE: Elianto Alluvial Fan

Dear Ryan & Doug:

As you know, the Flood Control District of Maricopa County requires assistance with scoping, coordinating, and reviewing the upcoming alluvial fan floodplain delineations for the White Tank Mountain Piedmont. In order for our firm to complete that work for the District, District's counsel has advised me to formally sever our business relationship for work in the study area. This letter serves as our notice of our intent to sever our current working agreement with CVL as of today's date. Our final bill is attached.

We have enjoyed working with your staff and look forward to doing so again in the future.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Jonathan Fuller, PE
Principal

Cc Valerie Swick/FCDMC

White Tank Mountain Piedmont Stage III Flood Hazard Assessment
Scope of Work

Overview

The Stage III Flood Hazard Assessment of the White Tank Mountain western piedmont will be completed using the methodologies outlined in the District's most recent version (April 2003) of the Piedmont Flood Hazard Assessment Manual (PFHAM). The PFHAM methodology consists of the following three stages of flood hazard delineation:

- Stage I – identification of the landform types (pediment, alluvial fan, relict fan, alluvial plain) within the piedmont area.
- Stage II – identification of stable and unstable areas on the piedmont
- Stage III – selection and application of appropriate method(s) for delineating the regulatory floodplains. Traditional engineering methods are typically applied in stable areas, and geomorphic methods are applied in unstable areas.

Stage I and II delineations are being completed by the District's Buckeye-Sun Valley ADMS consultant team and should be finalized by the end of November 2004. The District has required that an existing conditions (pre-development) Stage III delineation be completed by consultants working on development master plans prior to design of structural flood measures. The consultants will submit the existing conditions Stage III flood hazard delineation by fan(s) to FEMA at the time they submit their CLOMR package for their development affected by the particular fan(s) to FEMA. District review and approval of the existing conditions Stage III delineation and CLOMR are required prior to submittal to FEMA.

The study area consists of the watercourses located downstream of the western slopes of the White Tank Mountains outside the White Tank Mountains Regional Park, and which intersect the following master planned communities:

- Elianto (Lennar, Coe & Van Loo)
- Tartesso (Stardust, David Evans & Assoc.)
- Festival Ranch (Pulte, WRG)
- Sun Valley South (Communities Southwest, CMX?)
- Sun Valley South (Pulte, CMX))

The floodplains of those watercourses that intersect the communities listed above will be delineated from the hydrographic apex to their confluence with another piedmont watercourse, mapped floodplain, the Hassayampa River, or the Buckeye Flood Retarding Structure (FRS). For watercourses that head on the piedmont itself, watercourses that exceed 0.25 square miles in drainage area will be delineated. (Jon-this seems to be more than what they're asking us to do)

The District will provide the following base engineering information at no cost to the consultant team:

1. HEC-1 model and hydrologic modeling report from the Buckeye-Sun Valley ADMS. All hydrologic information used in the Stage III delineation will be

obtained or derived from the District's HEC-1 model. Status: The ADMS HEC-1 model is in draft form pending final review by District, with only minor changes expected.

2. Stage I & II piedmont flood hazard assessment and all relevant documentation prepared by Ayres & Associates for the Buckeye-Sun Valley ADMS. Status: Draft, pending review by District, with some significant revisions and additional review possible. Stage III work will begin after Stage II acceptance by FCD.
3. 2004 color digital orthophotography of the study area in workable file(s) size and quality.
4. Section lines in GIS format.
5. 10-foot contour interval digital topographic mapping of the study area.
6. Technical Documentation Notebook (TDN) and HIS layers for the Fan 36 Approximate Method Alluvial Fan Floodplain Delineation.

Scope of Work

1. Prepare Map of Watercourses to be Delineated. The consultant shall prepare a map of the watercourses to be delineated using the Stage III piedmont flood hazard assessment techniques. The map will show the thalweg of each watercourse, a designated name for each watercourse and watercourse segment (using District-approved naming conventions), and the boundaries of the development affected by each proposed delineation. The watercourse map will be submitted for District approval. A two- (2) week District review period will be provided prior to commencement of Stage III analysis.
2. Selection of Regulatory Discharges to be used for Floodplain Delineation. In general, the full apex discharge should be used for delineation of flood hazards within the limits of unstable portions of the piedmont. The method of joins and splits outlined in the PFHAM should be used to estimate peak discharges in stable distributary flow areas, not necessarily full fan discharges. In areas downstream of unstable, active alluvial fans where the magnitude of the regulatory discharge is uncertain because of the uncertainty in flow distribution, the consultant will develop a method to estimate conservative peak discharges. The method may include probability-based techniques advanced by French (2001), simple double counting, or application of geomorphic mapping techniques that circumvent the need for determining a precise estimate of the regulatory discharge. In all cases, regulatory discharges should default to, or be consistent with, the values determined in the Buckeye Sun Valley ADMS, except within the unstable piedmont areas. (Jon-are you saying that discharges consistent w/ ADMS will be used in stable areas and no discharges, only geomorphic approach, is used in unstable areas? If so, can we say "In all cases, regulatory discharges should default to, or be consistent with, the values determined in the Buckeye Sun Valley ADMS. Geomorphic approach will be applied within the unstable piedmont areas.")
3. Assignment of Mapping Responsibility. The consultant team will meet to determine which watercourses will be delineated by each team member.

Contiguous watercourses should be mapped by a single team member wherever possible.

4. Due to being consistent with previous floodplain delineation studies, the existing culverts along Sun Valley Parkway will not be factored into the Stage 3 analysis. This is also consistent with the existing general sloping to the west and southwest.
5. Selection of Delineation Methodology for Stable Areas of the Piedmont. Approximate methods will be used to delineate the existing condition piedmont flood hazard zones in stable areas, as determined in the Stage I and II analyses. Approximate method delineations consist of using geomorphic verification of flood limits determined using single-section Manning's ratings (spaced at 1-3 sections per mile). Delineation of floodplains using detailed methods is not part of this scope. No hydraulic floodways will be defined due to the broad, shallow nature of the floodplains and likely modification of the floodplain by structural measures associated with future development.
6. Selection of Delineation Methodology for Unstable Areas of the Piedmont. Approximate methods will be used to delineate the existing condition piedmont flood hazard zones in unstable areas, as determined in the Stage I and II analyses. Approximate method delineations consist of using geomorphic methods for unstable portions of the piedmont.
7. Submittal of Draft Mapping Plan. A map showing the proposed discharges and development boundaries will be prepared for submittal to the District. Acceptance of the peak flows will be required prior to delineation. The District will have a two- (2) week review period.
8. Floodplain Delineation. Floodplains will be delineated for the watercourses defined in Task 1 using the methodologies outlined in Tasks 6 and 7. The District's alluvial fan flood zones described in the PFHAM will be assigned to the floodplains delineated in Tasks 6 and 7, and will include designation of floodway.
9. Technical Documentation Notebook (TDN). The consultant will prepare a FEMA-submittal-ready TDN using the guidelines provided in State Standard 1-97 and FEMA guidelines.
10. District Review. The consultants will respond to District review comments and make revisions as needed.

JE Fuller/ Hydrology & Geomorphology, Inc.

Jon Fuller, PE, RG, PH, MS, CFM
Brian Iserman, P.E.
John Wallace, P.E.
Ted Lehman, P.E.
W. Scott Ogden, P.E.
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September 30, 2004

Ryan Weed, PE
Doug Both, CFM
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(602) 264-0928

RE: Elianto Alluvial Fan

Dear Ryan & Doug:

As you know, the Flood Control District of Maricopa County requires assistance with scoping, coordinating, and reviewing the upcoming alluvial fan floodplain delineations for the White Tank Mountain Piedmont. In order for our firm to complete that work for the District, District's counsel has advised me to formally sever our business relationship for work in the study area. This letter serves as our notice of our intent to sever our current working agreement with CVL as of today's date. Our final bill is attached.

We have enjoyed working with your staff and look forward to doing so again in the future.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Jonathan Fuller, PE
Principal

Cc Valerie Swick/FCDMC

White Tank Mountain Piedmont Stage III Flood Hazard Assessment
Scope of Work

Overview

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- Stage I – identification of the landform types (pediment, alluvial fan, relict fan, alluvial plain) within the piedmont area.
- Stage II – identification of stable and unstable areas on the piedmont
- Stage III – selection and application of appropriate method(s) for delineating the regulatory floodplains. Traditional engineering methods are typically applied in stable areas, and geomorphic methods are applied in unstable areas.

Stage I and II delineations are being completed by the District's Buckeye-Sun Valley ADMS consultant team and should be finalized by the end of November 2004. The District has required that an existing conditions (pre-development) Stage III delineation be completed by consultants working on development master plans prior to design of structural flood measures. The consultants will submit the existing conditions Stage III flood hazard delineation by fan(s) to FEMA at the time they submit their CLOMR package for their development affected by the particular fan(s) to FEMA. The District will provide the Stage I & II delineations in the TDN format acceptable to FEMA. The consultants will format the Stage III delineation for submittal to FEMA in a similar TDN format. District review and approval of the existing conditions Stage III delineation and CLOMR are required prior to submittal to FEMA.

The study area consists of the watercourses located downstream of the western slopes of the White Tank Mountains outside the White Tank Mountains Regional Park, and which intersect the following master planned communities:

- Elianto (Lennar, Coe & Van Loo)
- Tartesso (Stardust, David Evans & Assoc.)
- Sun Valley South (Communities Southwest, WRG)
- Sun Valley South (Pulte, CMX))

The floodplains of those watercourses that are part of the alluvial fan system and that intersect the communities listed above will be delineated from the hydrographic apex to their confluence with another piedmont watercourse, mapped floodplain, the Hassayampa River, or the Buckeye Flood Retarding Structure (FRS). *(Reference to 0.25 sq. mile watersheds deleted per December 14, 2004 meeting minutes.)*

The District will provide the following base engineering information at no cost to the consultant team:

1. HEC-1 model and hydrologic modeling report from the Buckeye-Sun Valley ADMS. All hydrologic information used in the Stage III delineation will be

obtained or derived from the District's HEC-1 model. Status: The ADMS HEC-1 model is in draft form pending final review by District, with only minor changes expected.

2. Stage I & II piedmont flood hazard assessment and all relevant documentation in a FEMA approved format prepared by Ayres & Associates for the Buckeye-Sun Valley ADMS. Status: Draft, pending review by District, with possible minor revisions and additional review possible. Stage III work will begin utilizing the Stage I & II data available to the consultants as of January 3. If significant changes are made to the data by the District subsequent to the start of the work, costs to modify or extend the analysis will be additional to this scope of work.
3. 2004 color digital orthophotography of the study area in workable file(s) size and quality.
4. Section corners in GIS format.
5. 10-foot contour interval digital topographic mapping of the study area.
6. Technical Documentation Notebook (TDN) and HIS layers for the Fan 36 Approximate Method Alluvial Fan Floodplain Delineation.

Scope of Work

1. Prepare Map of Watercourses to be Delineated. The consultant shall prepare a map of the watercourses to be delineated using the Stage III piedmont flood hazard assessment techniques. The map will show the thalweg of each watercourse, a designated name for each watercourse and watercourse segment (using District-approved naming conventions), and the boundaries of the development affected by each proposed delineation. The watercourse map will be submitted for District approval. A two- (2) week District review period will be provided prior to commencement of Stage III analysis. A GIS coverage of watercourses will be developed and marked final upon District approval.
2. Selection of Regulatory Discharges to be used for Floodplain Delineation. In general, the full apex discharge should be used for delineation of flood hazards within the limits of unstable portions of the piedmont. The method of joins and splits outlined in the PFHAM should be used to estimate peak discharges in stable distributary flow areas, not necessarily full fan discharges (for existing conditions). In areas downstream of unstable, active alluvial fans where the magnitude of the regulatory discharge is uncertain because of the uncertainty in flow distribution, the consultant will develop a method to estimate conservative peak discharges. The method may include probability-based techniques advanced by French (2001), simple double counting, or application of geomorphic mapping techniques that circumvent the need for determining a precise estimate of the regulatory discharge. In all cases, regulatory discharges should default to, or be consistent with, the values determined in the Buckeye Sun Valley ADMS, except within the unstable piedmont areas.
3. Assignment of Mapping Responsibility. The consultant team will meet to determine which watercourses will be delineated by each team member. Contiguous watercourses should be mapped by a single team member wherever possible.

4. The existing conditions floodplain delineation will consider the impacts of the existing culverts along Sun Valley Parkway.
5. Selection of Delineation Methodology for Stable Areas of the Piedmont. Approximate methods will be used to delineate the existing condition piedmont flood hazard zones in stable areas, as determined in the Stage I and II analyses. Approximate method delineations consist of using geomorphic verification of flood limits determined using single-section Manning's ratings (spaced at 1-3 sections per mile). Delineation of floodplains using detailed methods is not part of this scope. No hydraulically-defined floodways will be modeled as part of the existing conditions delineation due to the broad, shallow nature of the floodplains and likely modification of the floodplain by structural measures associated with future development. Administrative floodways will be defined as dictated by the PFHAM methodology.
6. Selection of Delineation Methodology for Unstable Areas of the Piedmont. Approximate methods will be used to delineate the existing condition piedmont flood hazard zones in unstable areas, as determined in the Stage I, II, and III analyses. Approximate method delineations consist of using geomorphic methods for unstable portions of the piedmont. Unstable areas, as defined in the PFHAM, are considered floodway areas.
7. Submittal of Draft Mapping Plan. A map showing the proposed discharges, recommended methodology, firm name, development boundaries (subdivision name), and schedule will be prepared for submittal to the District. Acceptance of the peak flows will be required prior to delineation. The District will commit to two (2) week review period if the consultant schedule is met, and if no more than two submittals are made within a two week period.
8. Floodplain Delineation. Floodplains will be delineated for the watercourses defined in Task 1 using the methodologies outlined in Tasks 5 and 6. The District's alluvial fan flood zones described in the PFHAM will be assigned to the floodplains delineated in Tasks 5 and 6, and will include designation of floodway.
9. Technical Documentation Notebook (TDN). The consultant will prepare a FEMA-submittal-ready TDN using the guidelines provided in State Standard 1-97 and FEMA guidelines, and the TDN modifications noted in the April 2003 version of the PFHAM.
10. District Review. The consultants will respond to District review comments and make revisions as needed.
11. Address one set of comments from both the District and FEMA on the Stage III analysis and resultant Zone A floodplains.
12. Modifications to the District's HEC-1 model are not included in this scope as the extent and scope of modifications cannot be determined until the model is delivered by the District.
13. Some reassignment of fans occurred with WRG analyzing Fan 6; CMX analyzing Fan 39; DEA analyzing Fans 7, 8, 12 and 38; and CVL analyzing Fan 37 as well as the remaining portion of Fan 36. The fan assignments were rearranged subsequent to the December 14th discussions to insure those firms with the most pressing schedules would be working on the fans that impacted their developments.

The outcome of discussions at the December 14, 2004 meeting with the Consultants and the District are also incorporated as a part of this scope to assist in the clarification of tasks and responsibilities.

FYI Doug
June 1, 2005

White Tank Piedmont
Interim Guidelines for Technical Analyses

Overview. These interim guidelines are intended to provide direction to engineers performing technical analyses of new development in the White Tank Mountain piedmont in western Maricopa County. The Flood Control District of Maricopa County commits that their reviewers will reference these guidelines when reviewing technical submittals that assess potential impacts to adjacent properties and flood control planning. If any conflicts exist between these interim guidelines and adopted District Manuals, Ordinances, Regulations and Policies, or those of the Town of Buckeye, or NFIP Regulations, these interim guidelines will be considered to be superceded.

Section 1: Hydrology. All hydrologic modeling will be based on HEC-1 modeling developed for the Sun Valley Buckeye Area Drainage Master Study (SVBADMS) existing condition models. Hydrologic analyses for Fan 36 will use also the SVBADMS HEC-1 models.

1. Multiple Frequency Models. To obtain hydrologic data for frequencies other than the 100-year event, the following guidelines apply:
    a. Q2 – Engineers may use procedures outlined in the District's Hydrology Manual (i.e., JR=0.1) to adjust the SVBADMS Q100 HEC-1 model or develop new modeling based on SVBADMS Q100 model.
    b. Q10 – The existing condition SVBADMS Q10 HEC-1 model is not appropriate for use by developers because it is based on outdated subbasin delineations. Engineers may use procedures outlined in the District's Hydrology Manual (i.e., JR) to adjust the SVBADMS Q100 HEC-1 model or develop new modeling based on SVBADMS Q100 model.
    c. Additional models or discharges may be needed for transportation design or other purposes, but are not required for analysis of alluvial fan impacts at specific locations. Additional, intermediate frequencies may be estimated using ratios and/or probability-weighted plotting of the 2-, 10-, and 100-year peaks.
    d. The SVBADMS Q100 HEC-1 model is not set up to address every concentration point downstream of the fan apexes needed for evaluation of individual project impacts. Where peak discharges and hydrographs are required for concentration points downstream of the apex, but upstream of concentration points in the SVBADMS HEC-1 model, they will be computed by delineating subwatersheds based on the existing ground conditions and hydraulic/geomorphic ratings of existing flow splits.
        i. Coordination with District review staff is recommended following initial identification of all significant concentration points along development perimeter boundaries to be evaluated. The intent of this initial coordination meeting is to finalize the number and location of concentration points to be evaluated.
        ii. Coordination with District review staff is also recommended following initial delineation of on-fan watersheds & distributary areas that drain to the concentration points listed above.
        iii. Engineers must coordinate with engineers working on adjacent developments to assure that drainage inflow and outflow concentration points and discharge

estimates are compatible. If no coordination effort between engineers is made and conflicts arise, the District will assume that the higher discharge estimate and larger flow volume estimate is correct for discharge inflow points and the lower peak and volume is correct for discharge outflow points.

iv. Engineers are cautioned against using JD Records when subdividing and modifying the SVBADMS Q100 HEC-1 model. Instead it is recommended that they select an appropriate storm size and revise the models accordingly.

v. Discharge estimates for intermediate and new concentration points should be verified by comparison with the capacity of the geomorphic flow corridor for the concentration point.

vi. It is not necessary or expected that HEC-1 model revisions made to estimate flow data at new or intermediate concentration points will be permanent modifications to the regional HEC-1 model. That is, such model revisions will be made for the purpose of analysis of the particular development only.

vii. Small drainage areas not part of distributary (alluvial fan) system can be modeled separately using the procedures in District Hydrology Manual.

e. Developed conditions (with project) modeling will be prepared based on the following assumptions:

i. Land Cover – full build out for subject property. Since the interim guidelines dictate that existing Q2, Q10, & Q100 will not be increased due to development, there is no need to address off-site land use changes.

ii. Retention/Detention – on-site retention and detention will be modeled to demonstrate no increase in off-site peak or flow volume. Exceptions for release of non-damaging flows need not be modeled.

iii. Channelization – impacts on routing due to channelization along flow corridors, collection channels and other channels should be included in the developed condition HEC-1 models.

f. Discharge Estimate Downstream of Active Area. FEMA will dictate that the full apex Q100 be used for design of any flood control or conveyance facilities hydrologically connected to the fan apex. Increases to the fan apex discharge due to tributary inflows also should be considered.

i. Coordination between upstream and downstream property owners is required for the alignment and design discharge for through-flow corridors.

ii. Discharge estimates based on analysis of the capacity of the geomorphic flow corridor are useful for assessment of existing conditions, but may underestimate the potential discharge for whole-fan solutions connected to the fan apex.

iii. In distal portions of fan outside the active alluvial fan, a flow distribution analysis of some sort that accounts for flow attenuation and loss may be appropriate for sizing some drainage facilities. However, engineers are cautioned that FEMA requirements may dictate use of the full apex discharge for structure design anywhere below the fan apex, and that District approval does not guarantee FEMA approval.

g. Impact Assessment Standards. The following criteria, if met, will be considered to adequately demonstrate no adverse impact to adjacent properties:

i. Peak Discharge. An increase in peak discharge for the 2-, 10-, and 100-year flood will be considered an adverse impact.
ii. Flow Volume. An increase in flow volume for the 2-, 10-, and 100-year flood will be considered an adverse impact. An increased discharge volume is acceptable if it is release into a stable channel at a rate below the threshold of transport. Channel stability will be determined by geomorphic field assessment and evaluation of the equilibrium slope relative to the existing slope. The threshold of transport will be determined by comparison of bed sediment size distributions with transport capacity estimated by an appropriate sediment transport function.
iii. Decreased Flow. Reduction of flow into any non-jurisdictional (USACE 404 delineation) washes will not be considered an adverse impact.

Section 2: Floodplain Delineation. Floodplain delineations must be completed to District and FEMA standards. Floodplain delineations for alluvial fans must cover entire piedmont, from a point above the apex where no flowpath uncertainty exists downstream to the piedmont axial stream (White Tank Wash, Wagner Wash) or the appropriate Flood Retarding Structure (FRS). In addition, the following criteria apply:

1. Active Alluvial Fans (Unstable Areas).
    a. Existing condition floodplain delineations will be based on the PFHAM Stage 3 Methodology (approximate methods).
    b. Developed condition hydraulic data may be based on any model that is on FEMA's list of acceptable hydraulic models.
2. Stable Areas Within Alluvial Fan Landforms.
    a. Existing & Developed Conditions. Hydraulic data may be based on any model that is on FEMA's list of acceptable hydraulic models.
3. Non-Structural Solutions. Development outside alluvial fan flood hazard zones delineated by Stage III methodology requires no structural flood control measures, except those that would be required by standard (non-alluvial fan) drainage engineering.
4. For all delineations, lateral tie-in upstream and downstream to effective (approved) floodplain delineations is required by FEMA. Lateral tie-in to Stage III PFHAM delineations is required for CLOMR/LOMR delineations that reflect structural flood control measures.
5. Flow data for floodplain delineations will be obtained as described in Section 1.

Section 3. Sedimentation Engineering. The following guidelines for sedimentation engineering analyses will be applied to the White Tank Piedmont area:

1. Sediment Yield
    a. Above Apex. At or above the alluvial apexes, sediment yield data from the SVBADMS reports may be used to estimate the sediment supply to the apex.
    b. Below Apex. Sediment yield estimates for concentration points located downstream of the alluvial fan apexes should account for sediment storage on fan.
2. Sediment Deposition at Structures on Fan.

a. Active Fan Areas: In active (unstable) portions of alluvial fans the methodology proposed by R.H. French[1] may be used. Other methods may be used, if approved in advance by District review staff.

3. Structure Maintenance & Operation Agreement.
   a. Public maintenance or underwriting of private maintenance by a public agency is a FEMA requirement for approval of structural measures on alluvial fans.
4. General Channelization Criteria.
   a. If channelizing runoff on the piedmont, the drainage system must collect and store any excess sediment before discharging to downstream property. Designs that pass sediment load greater than capacity of downstream channel (natural or constructed) are not acceptable. The intent of this criterion is to concentrate the natural sediment storage occurring on the fan area prior to being developed.
   b. FEMA and District levee standards apply if channels function like levee. Any channel with the 100-year WSEL above the natural ground elevation or where breach of the channel bank would cause a levee-like failure scenario, will be considered a levee.
   c. Bleed off pipes that divert water into the pre-development natural channel network are acceptable to the District. Note that the USACE may have comments on bleed off pipes relative to 404 permitting, especially as it relates to maintenance and potential clogging.
   d. Containment within a channel is defined based on the following:
      i. Containing the 100-year WSEL (water elevation) plus sediment deposition during a 100-year event and between scheduled maintenance, plus any superelevation or momentum run-up. Flow containment criteria are dictated primarily by FEMA regulations.
      ii. Providing a seepage analysis showing that flow won't penetrate or seep through the channel bank/barrier during the design flood.
      iii. Providing freeboard, as defined in the District Hydraulics Manual (plus sediment deposited). Conceptually, one foot freeboard is acceptable unless the District's Hydraulics Manual requires otherwise, given that discharge and sediment estimates may be conservative. However, note that FEMA freeboard standards apply may dictate the level of design.
5. Collector Channels. Collector channels are typically located along the property perimeter, are oriented sub-perpendicular to slope, and collect and convey runoff to centralized drainage facilities.
   a. In Unstable Portion of Alluvial Fans. The following criteria apply to collector channels in active alluvial fan areas:
      i. The channel must convey the full apex water and sediment without overtopping.
      ii. FEMA requirements for collector channels apply and may dictate design criteria for the following:
         1. Freeboard

[1] "Estimating the Depth of Deposition (Erosion) at Slope Transitions on Alluvial Fans," RH French, JJ Miller, and S Curtis, *Journal of Hydraulic Engineering*, Vol. 127, No. 9, September 2001, pp. 780-782.

2. Momentum runup
3. Capacity considering potential sediment deposition

b. In Stable Portions of Alluvial Fans.

i. The channels must be able to convey full apex discharge without overtopping. See the hydrology criteria above for information relating to sites in distal portion of fan, where a reduced design discharge based on distributed flow analysis may be acceptable.

ii. The channels are not required to convey the full apex sediment load, if it can be demonstrated by detailed sediment routing, geomorphic analysis, and hydraulic data that sediment is stored upstream of the interception point defined by the collector channel. The channel must convey the sediment supply derived from a routing model and transport capacity analysis of each of the individual defined channels intercepted by the collector channel.

6. Through-Flow Corridor Channels

a. Scour. Scour in through-flow corridor channels will be estimated based on the following types of analysis, at minimum:

i. Equilibrium slope. Equilibrium slope methods will be used to determine the need for and spacing of grade control structures, as described in the District's Hydraulics Manual. Equilibrium slope analysis may be used to estimate long-term scour potential.

ii. General scour. Scour estimates should include general, bend, and bed form scour elements. Detailed sediment continuity modeling using HEC-6 or other computer modeling is not required, but may be helpful for specific scenarios. Coordination with District review staff prior to initiating modeling is recommended.

iii. Local scour. Local scour should be computed at structures such as bridges, culverts, grade control structures, contractions, weirs, bank protection and other constructed features.

iv. Deposition. Potential for sediment deposition should be evaluated using detailed hydraulic data and application of consistent sediment transport functions.

b. Lateral Erosion. Channels should be designed to control lateral erosion. Lateral erosion protection should be sized and toed-down for the maximum channel velocity and channel invert.

c. Channel Type. Channels with levees or sub-grade channels may be used.

7. Detention Basins.

a. Basins in Unstable Alluvial Fan Areas.

i. Sediment Storage. Basins must provide capacity for sediment storage, which may be estimated from sediment yield data, for the following events:

1. Design event (100-yr)
2. For additional floods that reflect the proposed maintenance scheduling
3. Trapping efficiency option (probably close to 100%)
4. In general, sediment storage for the 100-year plus five average annual flood events will be required.

b. Basins Downstream of Unstable Areas of Alluvial Fans.

i. Sediment Storage. Basin sediment storage may be estimated based on application of a sediment transport function to the upstream (supply) channels, in a manner similar to the collector channel described above.

8. Offsite Impact Assessment. The general goals of the offsite impact assessment include the following:
   a. Scour downstream of structures should not occur offsite (outside property limits), but may occur if it can be shown that scour will be contained within site boundaries.
   b. Channelization should not push fan processes downstream by conveying all apex sediment to downstream limit of site, nor should it push the fan apex upstream by creating backwater deposition.
   c. Grade control is unlikely to control downstream scour if scour is the result of a sediment deficit created by upstream improvements.
   d. If the peak discharge, flow volume, flow velocities and the bankfull sediment delivery rate are unchanged on off-site properties, it may be assumed that no adverse impacts occur.
   e. Impacts at culverts located at property lines must be addressed.
   f. For the purposes of assessing impacts, it may be assumed that sediment equilibrium conditions exist in the reach immediately upstream of the alluvial fan hydrologic apex.

support or confidential password related requests.

8. Each caller (or e-mail request) will be given a unique ticket number generated by the RARS after calling or e-mailing the *Technical Support Center*. These identifiers will be used within the agency and by the public to obtain information on the status of the problem, issue, or request.

9. Within the agency, the collection of TINs is minimized and access to TINs will be available only to those persons whose jobs require such access (*e.g.*, FCC staff and contractors responsible for password resets in the CORES system and/or requiring the information for licensing related issues). Whenever possible, the FRN will be used in place of the TIN when collecting information *on the caller or e-mail requestor.*

10. Data resident on network servers are backed-up daily to magnetic media. One week's worth of back-up tapes is stored on-site in fireproof safes. Each week, the previous week's backup tapes are sent to an off-site storage location. These tapes are kept for a minimum of eleven (11) years.

RETENTION AND DISPOSAL:

1. Records will be actively maintained as long as an individual utilizes the system or the records are purged and archived using date specific parameters.

2. Audits of inactive users in the system will occur regularly and, if no activity is shown for the contact person within eleven (11) years, the record will be purged and archived following FCC standard electronic record archiving procedures.

3. Paper records will be archived after being keyed or scanned into the system. The records are retained at the FCC and then destroyed in accordance with the appropriate records retention schedule.

4. Electronic records will be backed up on tape weekly and stored indefinitely at an off-site storage location.

SYSTEMS MANAGER(S) AND ADDRESS:

Chief, Wireless Telecommunications Bureau (WTB), Federal Communications Commission (FCC), 445 12th Street, SW., Washington, DC 20554.

NOTIFICATION PROCEDURE:

Address inquiries to the system manager. To identify a specific record please indicate first name and last name in addition to a unique identifier maintained in system, including, but not limited to telephone number, e-mail address, FRN and/or TIN for their record(s) to be located and identified. An individual requesting access must also follow FCC Privacy Act regulations regarding verification of identify and access records. *See* 47 CFR 0.554–0.555.

CONTESTING RECORD PROCEDURES:

Address inquiries to the system manager.

RECORD ACCESS PROCEDURES:

Only approved FCC personnel and/or contractors may access the records maintained in the system. Individuals who request access to records about themselves should contact the system *manager, as indicated above.* Individuals must furnish their first and last name in addition to a unique identifier maintained in system, including, but not limited to telephone number, e-mail address, FRN and/or TIN for their record(s) to be located and identified. An individual requesting access must also follow FCC Privacy Act regulations regarding verification of identify and access records. *See* 47 CFR 0.554–0.555.

RECORD SOURCE CATEGORIES:

WTB customers and their representatives requesting assistance with the WTB's Internet based computer licensing, auctions, and related systems and subsystems.

EXEMPTIONS CLAIMED FOR THE SYSTEM:

None.

Federal Communications Commission.

Marlene Dortch,

Secretary.

[FR Doc. 02–19470 Filed 7–31–02; 8:45 am]

BILLING CODE 6712–01–P

FEDERAL EMERGENCY MANAGEMENT AGENCY

Fee Schedule for Processing Requests for Map Changes, for Flood Insurance Study Backup Data, and for National Flood Insurance Map and Insurance Products

AGENCY: Federal Emergency Management Agency (FEMA).

ACTION: Notice.

SUMMARY: This notice contains the revised fee schedules for processing certain types of requests for changes to *National Flood Insurance Program* (NFIP) maps, for processing requests for Flood Insurance Study (FIS) technical and administrative support data, and for processing requests for particular NFIP map and insurance products. The changes in the fee schedules will allow FEMA to reduce further the expenses to the NFIP by recovering more fully the costs associated with processing conditional and final map change requests; retrieving, reproducing, and distributing technical and administrative support data related to FIS analyses and mapping; and producing, retrieving, and distributing particular NFIP map and insurance products.

DATES: The revised fee schedules are effective for all requests dated September 1, 2002, or later.

FOR FURTHER INFORMATION CONTACT: Matthew B. Miller, P.E., Chief, Hazards Study Branch, Federal Insurance and Mitigation Administration, 500 C Street SW., Washington, DC 20472; by telephone at (202) 646–3461 or by facsimile at (202) 646–4596 (not toll-free calls); or by email at *matthew.miller@fema.gov.*

SUPPLEMENTARY INFORMATION: This notice contains the revised fee schedules for processing certain types of requests for changes to NFIP maps, requests for FIS technical and administrative support data, and requests for particular NFIP map and insurance products.

Effective Dates. The revised fee schedule for map changes is effective for all requests dated September 1, 2002, or later. The revised fee schedule supersedes the current fee schedule, which was established on June 1, 2000.

The revised fee schedule for requests *for FIS backup data also is effective for* all requests dated September 1, 2002, or later. The revised fee schedule supersedes the current fee schedule, which was established on June 1, 2000.

The revised fee schedule for requests for particular NFIP map and insurance products, which are available through the FEMA Map Service Center (MSC), is effective for all written requests, on-line Internet requests made through the FEMA Flood Map Store, and all telephone requests received on or after September 1, 2002. The revised fee schedule supersedes the current fee schedule, which was established on May 1, 2002.

Evaluations Performed. To develop the revised fee schedule for conditional and final map change requests, FEMA evaluated the actual costs of reviewing and processing requests for Conditional Letters of Map Amendment (CLOMAs), *Conditional Letters of Map Revision* Based on Fill (CLOMR–Fs), Conditional Letters of Map Revision (CLOMRs), Letters of Map Revision Based on Fill (LOMR–Fs), Letters of Map Revision (LOMRs), and Physical Map Revisions (PMRs).

To develop the revised fee schedule requests for FIS technical and administrative support data, FEMA

evaluated the actual costs of retrieving, reproducing, and distributing archived data in seven categories. These categories are discussed in more detail below.

To develop the revised fee schedule for requests for particular NFIP map and insurance products, FEMA (1) evaluated the actual costs incurred at the MSC for producing, retrieving, and distributing those products; (2) analyzed historical sales, cost data, and product unit cost for unusual trends or anomalies; and (3) analyzed the effect of program changes, new products, technology investments, and other factors on future sales and product costs. The products covered by this notice are discussed in detail below.

Periodic Evaluations of Fees. A primary component of the fees is the prevailing private-sector rates charged to FEMA for labor and materials. Because these rates and the actual review and processing costs may vary from year to year, FEMA will evaluate the fees periodically and publish revised fee schedules, when needed, as notices in the **Federal Register**.

Fee Schedule for Requests for Conditional Letters of Map Amendment and Conditional and Final Letters of Map Revision Based on Fill

Based on a review of actual cost data for Fiscal Year 2000 and Fiscal Year 2001, FEMA established the following review and processing fees, which are to be submitted with all requests that are not otherwise exempted under 44 CFR 72.5:

Request for single-lot/single-structure CLOMA and CLOMR–F	$500
Request for single-lot/single-structure LOMR–F	425
Request for single-lot/single-structure LOMR–F based on as-built information (CLOMR–F previously issued by FEMA)	325
Request for multiple-lot/multiple-structure CLOMA	700
Request for multiple-lot/multiple-structure CLOMR–F and LOMR–F	800
Request for multiple-lot/multiple-structure LOMR–F based on as-built information (CLOMR–F previously issued by FEMA)	700

Fee Schedule for Requests for Conditional Map Revisions

Based on a review of actual cost data for Fiscal Year 2000 and Fiscal Year 2001, FEMA established the following review and processing fees, which are to be submitted with all requests that are not otherwise exempted under 44 CFR 72.5:

Request based on new hydrology, bridge, culvert, channel, or combination thereof	$4,000
Request based on levee, berm, or other structural measure	4,500

Fee Schedule for Requests for Map Revisions

Based on a review of actual cost data for Fiscal Year 2000 and Fiscal Year 2001, FEMA established the following review and processing fees, which are to be submitted with all requests. Unless the request is otherwise exempted under 44 CFR 72.5, requesters must submit the review and processing fees shown below with requests for LOMRs and PMRs dated September 1, 2002, or later, that are not based on structural measures on alluvial fans.

Request based on bridge, culvert, channel, or combination thereof	$4,200
Request based on levee, berm, or other structural measure	6,000
Request based on as-built information submitted as followup to CLOMR	3,800

Fees for Conditional and Final Map Revisions Based on Structural Measures on Alluvial Fans

FEMA has maintained $5,000 as the initial fee for requests for LOMRs and CLOMRs based on structural measures on alluvial fans. FEMA also will continue to recover the remainder of the review and processing costs by invoicing the requester before issuing a determination letter, consistent with current practice. The prevailing private-sector labor rate charged to FEMA ($50 per hour) will continue to be used to calculate the total reimbursable fees.

Fee Schedule for Requests for Flood Insurance Study Backup Data

Non-exempt requesters of FIS technical and administrative support data must submit fees shown below with requests dated September 1, 2002, or later. These fees are based on the complete recovery costs to FEMA for retrieving, reproducing, and distributing the data, as well as maintaining the library archives, and for collecting and depositing fees. FEMA maintains the current fee schedule, as indicated in the **Federal Register** notice published on May 3, 2000, at 65 FR 25726—25728.

All entities except the following will be charged for requests for FIS technical and administrative support data:

- Private architectural-engineering firms under contract to FEMA to perform or evaluate studies and restudies;
- Federal agencies involved in performing studies and restudies for FEMA (i.e., U.S. Army Corps of Engineers, U.S. Geological Survey, Natural Resources Conservation Service, and Tennessee Valley Authority);
- Communities that have supplied the Digital Line Graph base to FEMA and request the Digital Line Graph data (Category 6 below);
- Communities that request data during the statutory 90-day appeal period for an initial or revised FIS for that community;
- Mapped participating communities that request data at any time other than during the statutory 90-day appeal period, provided the data are requested for use by the community and not a third-party user; and
- State NFIP Coordinators, provided the data requested are for use by the State NFIP Coordinators and not a third-party user.

FEMA has established seven categories into which requests for FIS backup data are separated. These categories are:

Category 1—Paper copies, microfiche, or diskettes of hydrologic and hydraulic backup data for current or historical FISs;

Category 2—Paper or mylar copies of topographic mapping developed during FIS process;

Category 3—Paper copies or microfiche of survey notes developed during FIS process;

Category 4—Paper copies of individual Letters of Map Change (LOMCs);

Category 5—Paper copies of Preliminary Flood Insurance Rate Map or Flood Boundary and Floodway Map panels;

Category 6—Computer tapes or CD-ROMs of Digital Line Graph files; and

Category 7—Computer diskettes and user's manuals for FEMA computer programs.

Under the current fee schedule, a non-refundable fee of $120 is charged to initiate a request under Categories 1, 2, and 3 above. This fee covers the preliminary costs of research and retrieval. If the data requested are available and the request is not cancelled, the final fee is calculated as a sum of a standard per-product charge plus a per-case surcharge of $93, designed to recover the cost of library maintenance and archiving. The total costs of processing requests under Categories 1, 2, and 3 will vary, based on the complexity of the research involved in retrieving the data and the volume and medium of data to be reproduced and distributed. The initial fee will be applied against the total costs to process the request, and FEMA will invoice the requester for the balance before the data are provided. No data will be provided to a requester until all required fees have been paid.

No initial fee is required to initiate a request for data under Categories 4 through 7. Requesters will be notified by telephone about the availability of the data and the fees associated with requested data.

As with requests for data under Categories 1, 2, and 3, no data will be provided to requesters until all required fees are paid. A flat user fee for each of these categories of requests, shown below, will continue to be required.

Request Under Category 4 (First Letter)	$40
Request Under Category 4 (Each additional letter)	10
Request Under Category 5 (First panel)	35
Request Under Category 5 (Each additional panel)	2
Request Under Category 6 (per county)	150
Request Under Category 7 (per copy)	25

Fee Schedule for Requests for Map and Insurance Products

The MSC distributes a variety of NFIP map and insurance products to a broad range of customers, including Federal, State, and local government officials; real estate professionals; insurance providers; appraisers; builders; land developers; design engineers; surveyors; lenders; homeowners; and other private citizens. As established in the current fee schedule, made effective on May 1, 2002, the MSC distributes the following products:

- Paper (printed) copies of Flood Hazard Boundary Maps (FHBMs);
- Paper (printed) copies of Flood Insurance Rate Maps (FIRMs);
- Paper (printed) copies of Digital Flood Insurance Rate Maps (DFIRMs);
- Paper (printed) copies of Flood Insurance Studies (FISs), including the narrative report, tables, Flood Profiles, and other graphics;
- Paper (printed) copies of Flood Boundary and Floodway Maps (FBFMs), when they are included as an exhibit in the FIS;
- Digital Q3 Flood Data files on CD-ROM, which FEMA developed by scanning the published FIRM and vectorizing a thematic overlay of flood risks;
- Digital Q3 Flood Data files on CD-ROM for Coastal Barrier Resource Areas (CBRA Q3 Flood Data files);
- Community Status Book, which is a report generated by FEMA's Community Information System database that provides pertinent map status information for all identified communities;
- Flood Map Status Information Service (FMSIS), through which FEMA provides status information for effective NFIP maps on CD-ROM;
- Letter of Map Change (LOMC) Subscription Service, through which FEMA makes certain types of LOMCs available biweekly on CD-ROM;
- NFIP Insurance Manual (Full Manual), which provides vital NFIP information for insurance agents nationwide;
- NFIP Insurance Manual (Producer's Edition), which is used for reference and training purposes;
- Digital copies of Flood maps available on CD-ROM and downloadable from the web; which can be purchased by panel or in community, county or state kits;
- Digital copies of FISs, including the narrative report, tables, Flood Profiles, and other graphics, on CD-ROM and downloadable from the web;
- F-MIT Basic Version 1.0, which is a view tool for map images, on CD-ROM;
- F-MIT Basic Version 1.0, which is a view tool for map images, downloadable from the web; and
- FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* on CD-ROM.

For more information on the map and insurance products available from the MSC, interested parties are invited to visit the MSC Web site at *http://www.fema.gov/msc.*

There are no changes in the processing fees or shipping costs for any of the other products that the MSC distributes. Federal, State, and local governments continue to be exempt from paying fees for the map products. The fee schedule for the current and new products are shown in the table below.

Product or service	Fee	Shipping
Paper copies of FHBM, FIRM, DFIRM, or FBFM panels.	$2.00 per map panel	$0.37 per panel for the first 10 panels plus $0.03 for each additional panel.
Paper copies of FIS (not including FBFM panels that are included as exhibit).	$5.00 per FIS volume plus $2.00 per floodway map.	$4.00 for the first study volume plus $0.40 for each additional study.
On-line Flood maps downloaded from the FEMA web site.	$1.50 per map panel	None.
On-line FIS downloaded from the FEMA web site.	$4.00 per study plus $1.50 per floodway map	None.
F-MIT Basic Version 1.0 (view tool for map images) on the web.	Free	Not Applicable.
Flood maps available on CD-ROM	$1.50 per map panel	$3.65 for the first 4 CD-ROMs plus $0.10 for each additional CD-ROM.
FIS available on CD-ROM	$4.00 per FIS volume plus $1.50 per floodway map.	$3.65 for the first 4 CD-ROMs plus $0.10 for each additional CD-ROM.

Product or service	Fee	Shipping
Priority Handling Charge—added to regular charge.	$33.00 per order	Not Applicable.
F–MIT Basic Version 1.0 on CD–ROM (view tool for map images).	Free	$3.65.
Q3 Flood Data Files	$50.00 per CD–ROM	$3.65 for the first 4 CD–ROMs, plus $0.10 for each additional CD–ROM in the same order.
CBRA Q3 Flood Data Files	$50.00 per CD–ROM or $200.00 for all 5 Q3 CDs.	$3.65 for the first 4 CD–ROMs, plus $0.10 for each additional CD–ROM in the same order.
Community Status Book (Individual Orders)	$2.50 per state $20.50 for entire U.S	$1.00 per state $4.26 for entire U.S.
Community Status Book (Annual Subscription)	$50.00 per state $250.00 for entire U.S	Not applicable.
FMSIS (Individual Orders)	$13 per state $38 for entire U.S	$3.65 for the first 4 CD–ROMs, plus $0.10 for each additional CD–ROM in the same order.
FMSIS (Annual Subscription)	$148 per state $419 for entire U.S	Not applicable.
LOMC Subscription Service (Individual Orders)	$85 per issue	$3.65 for the first 4 CD–ROMs, plus $0.10 for each additional CD–ROM in the same order.
LOMC Subscription Service (Annual Subscription).	$2,000	Not applicable.
NFIP Insurance Manual (Full Manual)	$25.00 per subscription for complete manual	Not applicable.
NFIP Insurance Manual (Producer's Edition)	$15.00 per subscription	Not applicable.
FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* on CD–ROM.	$2.60	$3.65.

Payment Submission Requirements

Fee payments for non-exempt requests must be made in advance of services being rendered. These payments shall be made in the form of a check or money order or by credit card payment. Checks and money orders must be made payable, in U.S. funds, to the National Flood Insurance Program.

FEMA will deposit all fees collected to the National Flood Insurance Fund, which is the source of funding for providing these services.

Dated: July 25, 2002.

Howard Leikin,

Deputy Administrator, Federal Insurance and Mitigation Administration.

[FR Doc. 02–19450 Filed 7–31–02; 8:45 am]

BILLING CODE 6718–04–P

DEPARTMENT OF OF HEALTH AND HUMAN SERVICES

Agency for Healthcare Research and Quality

Notice of Meeting

In accordance with section 10(d) of the Federal Advisory Committee Act (5 U.S.C., Appendix 2), announcement is made of a Health Care Policy and Research Special Emphasis Panel (SEP) meeting.

The Health Care Policy and Research Special Emphasis Panel is a group of experts in fields related to health care research who are invited by the Agency for Healthcare Research and Quality (AHRQ), and agree to be available, to conduct, on an as needed basis, scientific reviews of applications for AHRQ support. Individual members of the Panel do not meet regularly and do not serve for fixed terms or long periods of time. Rather, they are asked to participate in particular review meetings which require their type of expertise.

Substantial segments of the upcoming SEP meeting listed below will be closed to the public in accordance with the Federal Advisory Committee Act, section 10(d) of 5 U.S.C., Appendix 2 and 5 U.S.C. 552b(c)(6). Grant applications for Assessing Impacts of HRSA Health Disparities Collaboratives Cooperative Agreement (U01) Grant Awards are to be reviewed and discussed at this meeting. These discussions are likely to include personal information concerning individuals associated with these applications. This information is exempt from mandatory disclosure under the above-cited statutes.

SEP Meeting on: Assessing Impacts of HRSA Health Disparities Collaboratives Cooperative Agreement Grant Projects.

Date: August 26, 2002 (Open on August 26, from 8 a.m. to 8:15 a.m. and closed for remainder of the meeting).

Place: Doubletree Hotel, 1750 Rockville Pike, Rockville, MD 20852.

Contact Person: Anyone wishing to obtain a roster of members or minutes of this meeting should contact Mrs. Bonnie Campbell, Committee Management Officer, Office of Research Review, Education and Policy, AHRQ, 2101 East Jefferson Street, Suite 400, Rockville, Maryland 20852, Telephone (301) 594–1846.

Agenda items for this meeting are subject to change as priorities dictate.

Dated: July 24, 2002.

Carolyn M. Clancy,

Acting Director.

[FR Doc. 02–19394 Filed 7–31–02; 8:45 am]

BILLING CODE 4160–90–M

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Disease Control and Prevention

[Program Announcement 02101]

Support for Epidemiology, Mathematical Modeling, and Tools for Monitoring the Impact of the Local Response to the HIV/AIDS Epidemic in Zimbabwe; Amendment I

A notice announcing the availability of Fiscal Year (FY) 2002 funds for cooperative agreements for Support for Epidemiology, Mathematical Modeling, and Tools for Monitoring the Impact of the Local Response to the HIV/AIDS Epidemic in Zimbabwe was published on June 21, 2002, (67 FR 42265–42268). The notice is amended as follows:

Page 42266, Column 3, Paragraph "E. Program Requirements, 1. Recipient Activities", change and replace with the following:

E. Program Requirements

In conducting activities to achieve the purpose of this program, the recipient will be responsible for the activities

Appendix B

Memorandum JE Fuller/ Hydrology & Geomorphology, Inc.

DATE: ~~August 5, 2006~~ February 24, 2005

TO: Jon Fuller, P.E.

FROM: Brian Iserman, P.E. DRAFT

RE: Analysis of Flow Splits & Junctions in Braided Systems Using HEC-RAS and HEC-2

CC: John Wallace, P.E.
Ted Lehman

The purpose of this memorandum is to document procedures which have been used in recent JEF floodplain delineation projects for evaluating certain types of flow splits and junctions found in braided or distributary flow systems in desert peidmonts. Because we have had so much recent experience with these types of systems, I felt like we should document what we have learned.

BACKGROUND

This memo refers primarily to flow splits and junctions typically encountered on desert piedmont surfaces; the area between the mountain front and a base level stream. For the purpose of this memorandum, a flow split refers to diverging flow paths, and a flow junction refers to converging flow paths. Average flow velocities and depths tend to be low in piedmont areas (i.e., typically less than approximately 7 feet per second and 2 feet deep respectively), and there tends to be a much higher percentage of overbank flow compared to channel flow than would be found in classic well-defined channels. Often, the sand-bed channel may not even be the lowest point on a cross section for short reaches were waves of sediment have deposited during large flow events.

Piedmont areas typically have alternating braided and confined reaches, with evidence of breakouts, splits/junctions and sheet flow areas. The channel beds are predominantly comprised of fine and coarse sand and gravel; even small cobbles are not typically present. Channel banks typically have gradual side slopes and are generally less than two feet high; brush and trees, and soils are often the better bank indicator than are slope breaks. Channel bottom widths typically vary between 10 feet and 20 feet; however, short reaches have been observed with bottom widths up to 50 feet.

Vegetation throughout the desert piedmont surfaces referred to in this memorandum are typical of the Upper Sonoran plant community found at elevations between approximately 1500 feet and 2,500 feet. This includes trees such as ironwood, mesquite, little leaf palo verde, creosote, various cactus such at saguaro, staghorn, pencil or christmas tree, and teddy bear cholla, various low-growing shrubs such as jojoba, mormon tea and brittle bush. Large, mature ironwood and paloverde trees occur primarily along the banks of the most well defined washes, and are often an indicator of dominant flow paths.

TWO APPROACHES

In the types of desert piedmont drainage systems described above, two types of flow splits (divergence) are observed; side "weir" flow and channel bifurcation. Weir type splits are usually characterized by flows which leave the main channel or flow path by overtopping a prominent overbank ridge. Bifurcation splits are usually characterized by flows which leave the main channel via another diverging flow path or channel which emanates from the main channel or flow path.

WEIR SPLITS

In desert piedmont areas, I have observed fewer true weir type splits than splits resulting from channel bifurcation because almost all splits seem to have a secondary channel associated with them, which physically connects to the main channel or flow path (i.e., sand bed channels join). When there is a secondary channel connection, then true weir flow is usually not expected.

Figure 1 depicts an example of a true weir split, which was analyzed in the Rio Verde South, Extension 1 Floodplain Delineation Study using the HEC-2 split flow routine. The HEC-2 split flow routine utilizes the weir equation to predict the amount of flow which is expected to leave a main channel via side-weir type flow. In addition to the weir calculation, this routine takes into consideration the loss of flow and the sloping water surface along the main flow path.

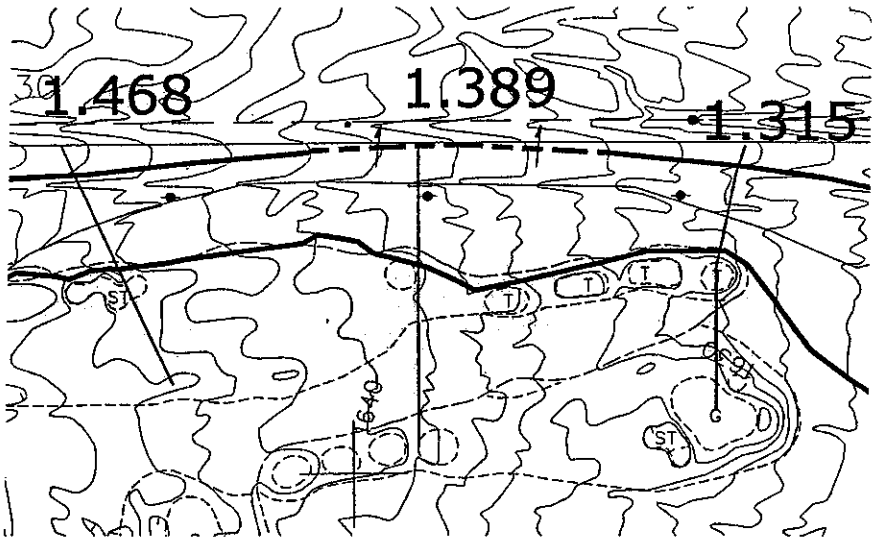

FIGURE 1

This split example is not typical of the type of weir splits encountered in desert piedmont drainages. The presence of Rio Verde Drive, a relatively stable, manmade ridge, precludes the formation of secondary connecting channels. Admittedly, the handfull of other weir-type splits identified in this 17.5 mile study, are not as clear cut as the example

provided here. Most side weir splits encountered in desert piedmont drainage surfaces tend to have complicating factors such as minor formation of secondary channels into the main channel (i.e. flow paths across the ridge controlling the weir), or multiple converging ridges which together may effectively form a controlling side weir ridge line.

The total weir overflow for this example is 227 cfs from a total flow of 430 cfs. Of the 227 cfs, 78 cfs is lost between cross sections 1.389 and 1.468, and 149 cfs is lost between cross sections 1.315 and 1.389.

CHANNEL BIFURCATIONS

By far, the most common flow split mechanism is controlled by bifurcating channels; when flow in the main flow path is intercepted or captured by a secondary channel which has a physical connection with the main flow path. Often, these connected secondary channels do not show up well by viewing topography alone, so it is helpful to be able to view the topography with a semi-rectified orthographic photo overlay. This is easily accomplished when there is recent new mapping which has both topography and aerial photography available digitally. Also, the value of analysis of stereo pairs of aerial photography using a magnifying stereo viewer cannot be overemphasized when modeling piedmont areas.

Figure 2 and Figure 3 to this memo show bifurcated flow splits analyzed in the Rio Verde South Extension 1 Floodplain Delineation Study using HEC-RAS v2.2. The first thing to determine is the downstream most point at which the flow is contained in the main channel or flow path without divided flow. It sometimes takes a couple tries by moving the cross-section to different locations. Next, the upstream-most cross sections for each new identified reach need to be located as close to the point of divergence as possible (i.e., hydraulically separate reaches can be identified).

Again, this may take a couple of iterations using different discharge splits and cross section locations to get the cross sections placed just right. The goal, when setting up a sub-critical HEC-RAS split flow analysis, is to place the bounding cross sections (on each side of the split) as close as possible to the true point of hydraulic divergence. Once the discharge split has been roughed out, it is wise to look at the flow distribution for the two cross sections located upstream of the flow split to make sure that the discharge split can actually occur given the upstream distribution.

Energy Method vs Momentum Method

HEC-RAS offers two methods for modeling sub-critical flow splits; momentum and energy. The momentum routine was developed for analysis of splits in well defined, relatively deep, engineered channels which are expected to carry high velocity flows. The momentum split flow routine has very limited criteria for use, and as such, should not be used to analyze splits in natural desert piedmont washes. Instead, the default energy balance split flow option offered by HEC-RAS should be used.

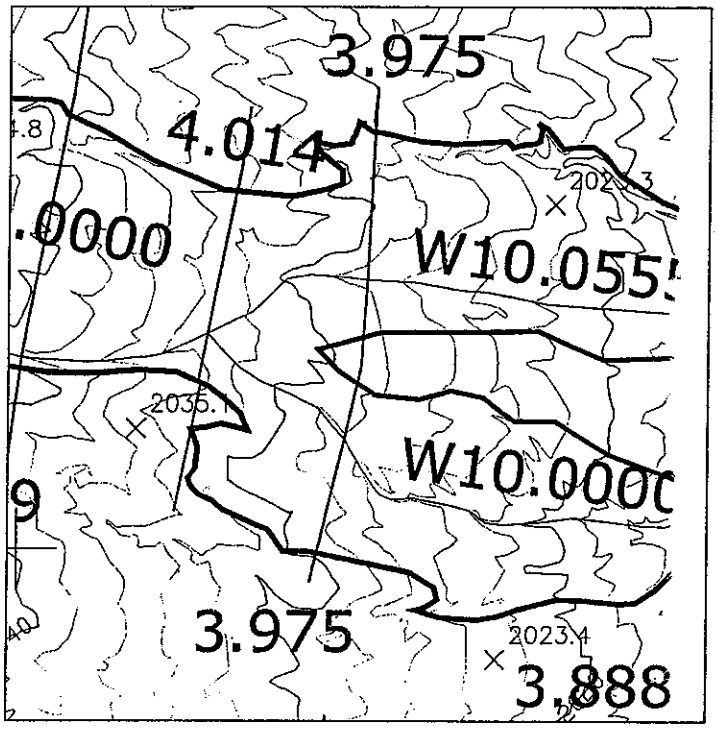

FIGURE 2

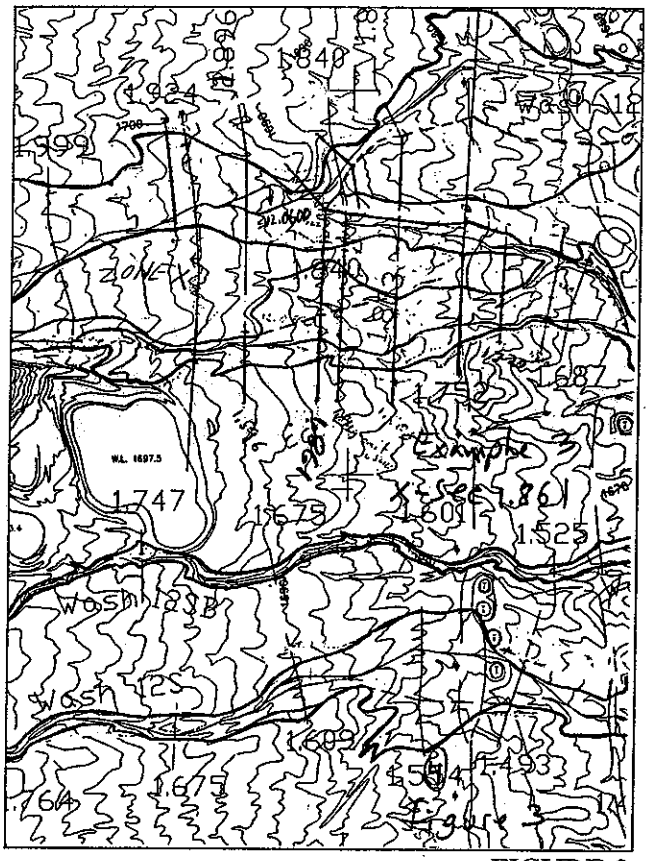

FIGURE 3

Balancing Energy vs Balancing Computed Water Surface Elevation

If the cross sections for each diverging flow path can be placed very close to the actual momentum split and close to one another, and if the channel characteristics of each split are similar (i.e., slope, width, depth, etc), then it is safe to assume that the actual computed water surface elevations will be approximately equal on each side of the split. The example shown in figure 2 falls under this category.

If, however, the diverging flow paths are contained in channels with significant geometric differences (i.e., slope, width, depth, etc), or if the channels bifurcate abruptly (i.e., an acute angle) then generally, it will be difficult to locate the upstream most cross sections for those diverging channels close to the split, and close to one another. In this case, an assumption of equal computed water surface elevations is probably not as correct as an assumption of equal, or nearly equal energy elevations. The example shown in Figure 3 falls under this category.

SUMMARY

Often, flow splits do not fall neatly into the categories discussed above (weirs, energy-balanced splits, elevation-balanced splits). In these cases, it may be necessary to model the split both ways (HEC-2 split and HEC-RAS energy/water surface balance split) in order to get a feel for the dominant forces. Also, there is the issue whether or not to treat a reach as two hydraulically separate flow paths or simply a short section of divided flow contained in one floodplain. When the divided flow spans only two or three cross sections spaced normally, and the flow distribution on each side of the divide remains relatively contiguous between cross sections, the best option may be to keep it simple by modeling the reach as one wide floodplain rather than two narrow floodplains with an island in between.

The split flow analyses described above should only be done for bifurcated reaches which would result in two or more hydraulically separate flow paths exhibiting significant computed water surface elevation differences if compared laterally.

This memo is not intended to be a detailed step by step description of modeling flow splits on desert piedmont surfaces using HEC-RAS, rather, the intent is to establish some general guidelines. As our understanding evolves through experience we should update this memo. I suggest that before starting a big project with lots of splits, staff should review the latest HEC-RAS Hydraulic Reference Manual (currently September 1998). Chapter 4 in that manual provides more detail on junction calculations and flow distribution calculations.

Ricardo Aguirre

From: Ricardo Aguirre
Sent: Thursday, February 24, 2005 4:23 PM
To: 'Kevin Kammerzell (kkammerzell@cmxinc.com)'
Cc: Gary Freeman; Doug Both
Subject: Phone Conversation

Hi Kevin,

I just wanted to send you a quick e-mail to document our conference call, and confirm the items discussed. If you find any discrepancies with items mentioned, then please let me know.

Both the Buckeye-Sun Valley ADMS hydrologic modeling report - HEC-1 models and the Stage I and II assessment has not been released by the District.

You e-mailed to us, both Analysis of Flow Splits & Junctions in Braided Systems and the corner sections in GIS format - thank you.

I inquired about how you determined the widths of your cross-sections and you refered to some draft report that defines the active parts of the thalwegs, and from there you extended your cross-section out further on each side to be conservative. Could you let me know the name of that draft report, and if you have it in electronic format could you please send it to me.

Thanks for your help. We look forward to meeting with you, Jon Fuller and Brian Iserman to review your submittal before sending it in mid-March.

Ricardo Aguirre

Ricardo Aguirre

From: Kevin Kammerzell [kkammerzell@cmxinc.com]
Sent: Friday, February 25, 2005 6:06 AM
To: Ricardo Aguirre
Cc: Gary Freeman; Doug Both
Subject: RE: Phone Conversation

We all have a draft copy of the Active and Inactive portions of the Alluvial fans as prepared by Ayres and the FCDMC. I am pretty sure you have a copy of the information as CVL used the information to define the thalwegs for Fan 38. If you do not have the shape files. I have them on our FTP site. They are also on the PBSJ team access site which Doug and your project PM have access to.

From: *Ricardo Aguirre [mailto:Raguirre@cvlci.com]*
Sent: Thu 2/24/2005 4:22 PM
To: Kevin Kammerzell
Cc: Gary Freeman; Doug Both
Subject: Phone Conversation

Hi Kevin,

I just wanted to send you a quick e-mail to document our conference call, and confirm the items discussed. If you find any discrepancies with items mentioned, then please let me know.

B[illegible]ne Buckeye-Sun Valley ADMS hydrologic modeling report - HEC-1 models and the Stage I and II assessment has not been released by the District.

You e-mailed to us, both Analysis of Flow Splits & Junctions in Braided Systems and the corner sections in GIS format - thank you.

I inquired about how you determined the widths of your cross-sections and you refered to some draft report that defines the active parts of the thalwegs, and from there you extended your cross-section out further on each side to be conservative. Could you let me know the name of that draft report, and if you have it in electronic format could you please send it to me.

Thanks for your help. We look forward to meeting with you, Jon Fuller and Brian Iserman to review your submittal before sending it in mid-March.

Ricardo Aguirre

Ricardo Aguirre

From: Doug Both
Sent: Monday, March 21, 2005 11:16 AM
To: Ricardo Aguirre
Subject: FW: Mtg follow up

-----Original Message-----
From: Jonathan Fuller [mailto:jon@jefuller.com]
Sent: Monday, March 21, 2005 9:26 AM
To: Valerie Swick (Valerie Swick - FCDX); Doug Both; Jack Moody; Kathryn Gross (Kathryn Gross - FCDX); Kevin Kammerzell; Ryan Weed; Teri George; 'Tami Norton'; Gary Freeman
Subject: Mtg follow up

Per our discussion on Friday:

1. I will deliver copies of our TDNs for White Tank Fan 36 & Tiger Wash to CMX. DEA, WRG, & CVL can coordinate with CMX on how their copies get made. There are lots of maps, color, 11x17, etc, so it won't be a cheap copy. In the original TDN we provided prints of the historical aerials, but I've removed those so they don't get lost in the shuffle. The aerials should be available from the District, or in the District's library copy of the TDN. Please copy and return the TDN asap. Thx.
2. If you don't have a copy of the PFHAM, let me know & I'll post it on our ftp site.
3. I've put in a call to Kathryn about releasing the draft Stage I, II, and existing conditions assessment documents by Ayres so that you can get an idea of what to expect from those documents.

If I don't hear from Kathryn about the Ayres reports by noon, I'll send the TDN's by runner at that time.

Jon Fuller, P.E., R.G., P.H., CFM, M.S.
JE Fuller/Hydrology & Geomorphology, Inc.
8400 South Kyrene Rd, Suite 201
Tempe, AZ 85284

480-752-2124 x210 (voice)
480-839-2193 (fax)
602-451-1992 (cell)
jon@jefuller.com (email)

Ricardo Aguirre

From: Doug Both
Sent: Monday, March 21, 2005 11:16 AM
To: Ricardo Aguirre
Subject: FW: TDN

-----Original Message-----
From: Jonathan Fuller [mailto:jon@jefuller.com]
Sent: Monday, March 21, 2005 10:53 AM
To: Valerie Swick (Valerie Swick - FCDX); Doug Both; Jack Moody; Kathryn Gross (Kathryn Gross - FCDX); Kevin Kammerzell; Ryan Weed; Teri George; 'Tami Norton'; Gary Freeman
Subject: TDN

Kathryn says she's making copies of the White Tank & Tiger Wash TDNs for you. She will let you or me (then I'll let you know) know when the copies are ready.

If you need the latest PFHAM, contact Kathryn directly.

I will send my copies of the Ayres Reports to CMX today via runner. Contact Kevin regarding making copies for yourselves. I'll need my copies back asap as we're relying on them for scoping the SVADMP. I'll get the Ayres GIS data posted on our FTP site by tomorrow.

Enjoy.

J. Fuller, P.E., R.G., P.H., CFM, M.S.
JE Fuller/Hydrology & Geomorphology, Inc.
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602-451-1992 (cell)
jon@jefuller.com (email)

Ricardo Aguirre

om: Doug Both
Sent: Tuesday, April 05, 2005 12:43 PM
To: Ricardo Aguirre
Subject: FW: Sun Valley HEC-1

-----Original Message-----
From: Jonathan Fuller [mailto:jon@jefuller.com]
Sent: Thursday, March 31, 2005 12:11 PM
To: 'Josh Hartmann'; 'Kevin Kammerzell'; Doug Both; Jack Moody; 'Teri George'; Gary Freeman
Subject: FW: Sun Valley HEC-1

Josh et. al:

Here's the latest update on deliverables for the White Tanks area.

Jon Fuller, P.E., R.G., P.H., CFM, M.S.
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6[illegible]51-1992 (cell)
j[illegible]jefuller.com (email)

-----Original Message-----
From: Kathryn Gross - FCDX [mailto:kag@mail.maricopa.gov]
Sent: Thursday, March 31, 2005 11:02 AM
To: Jonathan Fuller
Cc: Valerie Swick - FCDX; Julie Cox - FCDX
Subject: RE: Sun Valley HEC-1

Jon,

The hydrology for Area 3 is not done. I believe the clean up needed is the outstanding apex concentration points. I received a call on Tuesday from PBSJ, Denver confirming Julie's concentration point comments from December and the Ayre's apices so it appears they are now starting to update the hydrology.

Stage II should be completed in April. We had our meeting and discussed my concerns. On a few issues Bill was going to revisit their data. On some other issues, I need to go in the field first. We did agree that after the comments are addressed the next submittal will be the final.

Kathryn

-----Original Message-----
From: Jonathan Fuller [mailto:jon@jefuller.com]
Sent: Tuesday, March 29, 2005 4:45 PM
To: Kathryn Gross - FCDX
Subject: Sun Valley HEC-1

Kathryn:

I just had a call from Pulte – is the hydrology done and approved? I seem to recall that Julie said it was done and there was some minor clean up relating to additional concentration points.

Also, what was the fallout from last week's meeting on the Stage II with Ayres? A target date for finalization been set?

Jon Fuller, P.E., R.G., P.H., CFM, M.S.
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Tempe, AZ 85284

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480-839-2193 (fax)
602-451-1992 (cell)
jon@jefuller.com (email)

Ricardo Aguirre

From: Annette Griffin [annette@jefuller.com]

Sent: Tuesday, April 26, 2005 9:38 AM

To: Ricardo Aguirre; afa@mail.maricopa.gov; seth_ahrens@urscorp.com; leslie.ames@dhs.gov; ramon.arrowsmith@asu.edu; cedricbalozian@mail.maricopa.gov; abarry@rbf.com; dbenner@swiaz.com; abonner@watershedconcepts.com; Doug Both; sherrick.campbell@wrgdesign.com; lcapponi@land.az.gov; btcosson@azwater.gov; jrc@mail.maricopa.gov; peterdavidse@mail.maricopa.gov; djd@mail.maricopa.gov; ddial@buckeyeaz.gov; mdroz@acstempe.com; dmd@mail.maricopa.gov; sedelman@watershedconcepts.com; bob.eichinger@kimley-horn.com

Subject: AF Symposium presentations

On behalf of the Flood Control District of Maricopa County, thank you for attending the Alluvial Fan Flood Hazard Management Symposium. The final versions of the speakers' presentation have been posted to an FTP site. Download instructions are found below. In the next few weeks, the District will be compiling our notes and formulating an action plan based on the discussion, feedback, and recommendations made at the symposium.

Download instructions:
1. Click the following ftp link: Click Here
2. Copy and paste the folders from the ftp window to your computer, or
3. Drag and drop the folders from the ftp window to your computer.

Sincerely,

Jon Fuller, P.E., R.G., P.H., CFM, M.S.
JE Fuller/Hydrology & Geomorphology, Inc.
8[illegible] South Kyrene Rd, Suite 201
T[illegible]e, AZ 85284

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480-839-2193 (fax)
602-451-1992 (cell)
jon@jefuller.com (email)

Ricardo Aguirre

From: Doug Both
Sent: Monday, July 25, 2005 8:11 AM
To: Ricardo Aguirre
Subject: FW: Alluvial Fan Delineation

-----Original Message-----
From: Jonathan Fuller [mailto:jon@jefuller.com]
Sent: Thursday, July 21, 2005 3:44 PM
To: Valerie Swick (Valerie Swick - FCDX); Doug Both; Gary Freeman; Greg Schuelke; Jack Moody; Julie Cox; Kathryn Gross (Kathryn Gross - FCDX); Kevin Kammerzell; Lynn Thomas (Lynn Thomas - FCDX); Pat Quinn; Ted Lehman (Ted Lehman); Teri George; 'Tami Norton'
Cc: 'Pat Quinn'
Subject: Alluvial Fan Delineation

Group:

I'm working on the SVADMP alluvial fan stage 3 delineation, the first task of which is to review the Ayres Stage 1 & 2 delineations. I've identified a few issues I'd like to discuss before proceeding further. I'd also like to check in and see how far along any of you are on your delineations. How's next Tuesday afternoon at JEF, Inc. look for a "brief" meeting of engineers? If that's impossible, an email re. the status your delineations would suffice for now.

Thanks.

uller, PE, RG, PH, MS, CFM
uller/Hydrology & Geomorphology, Inc.
8400 S. Kyrene Rd, Suite 201
Tempe, AZ 85284

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602-451-1992 (cell)

Board of Directors
Fulton Brock, District 1
Don Stapley, District 2
Andrew Kunasek, District 3
Max Wilson, District 4
Mary Rose Wilcox, District 5

Flood Control District
of Maricopa County

www.fcd.maricopa.gov
2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
Fax: 602-506-4601
TT: 602-505-5897

RECEIVED
AUG 5 2005
COE & VAN LOO
PHOENIX, AZ

August 2, 2005

Doug Both
CVL
4550 N.12th Street
Phoenix, AZ 85014

Re: Sun Valley Area Drainage Master Plan
Stakeholder Working Group Meeting No. 1 Invitation
Tuesday, August 16, 2005
3:00 pm to 4:30 pm

Dear Mr. Both:

As you may know, the Flood Control District of Maricopa County (District) recently completed the Buckeye/Sun Valley Area Drainage Master Study (ADMS) in the western portion of Maricopa County. This area of the County and the Town of Buckeye are experiencing ongoing and rapid development and the need for proactive regional drainage planning is clear. One of the ADMS recommendations is to further build upon its products with an Area Drainage Master Plan (ADMP).

As a result of that recommendation, the District began work on the Sun Valley ADMP project. The goals of the ADMP are to assess current watershed conditions, address the impacts of future development on drainage and flooding characteristics in identified areas of concern and recommend an implementable flood mitigation alternative. The two ADMP project areas (3 & 4) and known master planned communities can be seen on the attached map. The project schedule is an aggressive one designed to produce quality drainage master planning results, in a timely manner.

As part of this undertaking, we would like to invite you to participate as a member of the Sun Valley ADMP Stakeholder Working Group for the Public Sector. Your participation as an interested stakeholder in the ADMP effort will help us to ensure a better product that will consider multiple interests while addressing drainage and flooding issues in the area. A meeting Agenda is attached for your use.

Invited to be members of the Stakeholder Working Groups are various public and private sector representatives who we believe have an interest in the results of the ADMP. We have separated the Stakeholder Working Groups by interest (public & private) and area (3&4). We will hold 3 meetings with the same general content presented to each of the Working Groups. Our first meeting for the public sector is scheduled as follows:

Sun Valley ADMP Stakeholder Working Group Meeting No.1
Tuesday, August 16, 2005, 3:00 pm to 4:30 pm
Flood Control District of Maricopa County
2801 West Durango Street, Phoenix, AZ 85009
Adobe Conference Room

Throughout the course of the 14-month project, our schedule calls for approximately three (3) Stakeholder Working Group meetings. These meetings will be held at milestone stages of the project. A detailed project overview will be provided to you at the first meeting and we will review future Stakeholder Working Group meeting schedules at that time.

If you are unable to attend this meeting, I would appreciate you sending a representative from your agency. I would also appreciate you bringing any planning documents you may have for the area. A copy for us to keep would be nice, but if you want it returned we will make a copy and return it to you.

I would like to thank you in advance for your interest in this important planning effort and I look forward to seeing you on August 16th. If you have any questions, please call me at (602) 506-2929, or email me at vas@mail.maricopa.gov.

Sincerely,

Valerie A. Swick

Valerie Swick, E.I.T., P.H., CFM
Project Manager

Enclosures

STAKEHOLDER WORKING GROUP MEETING AGENDA

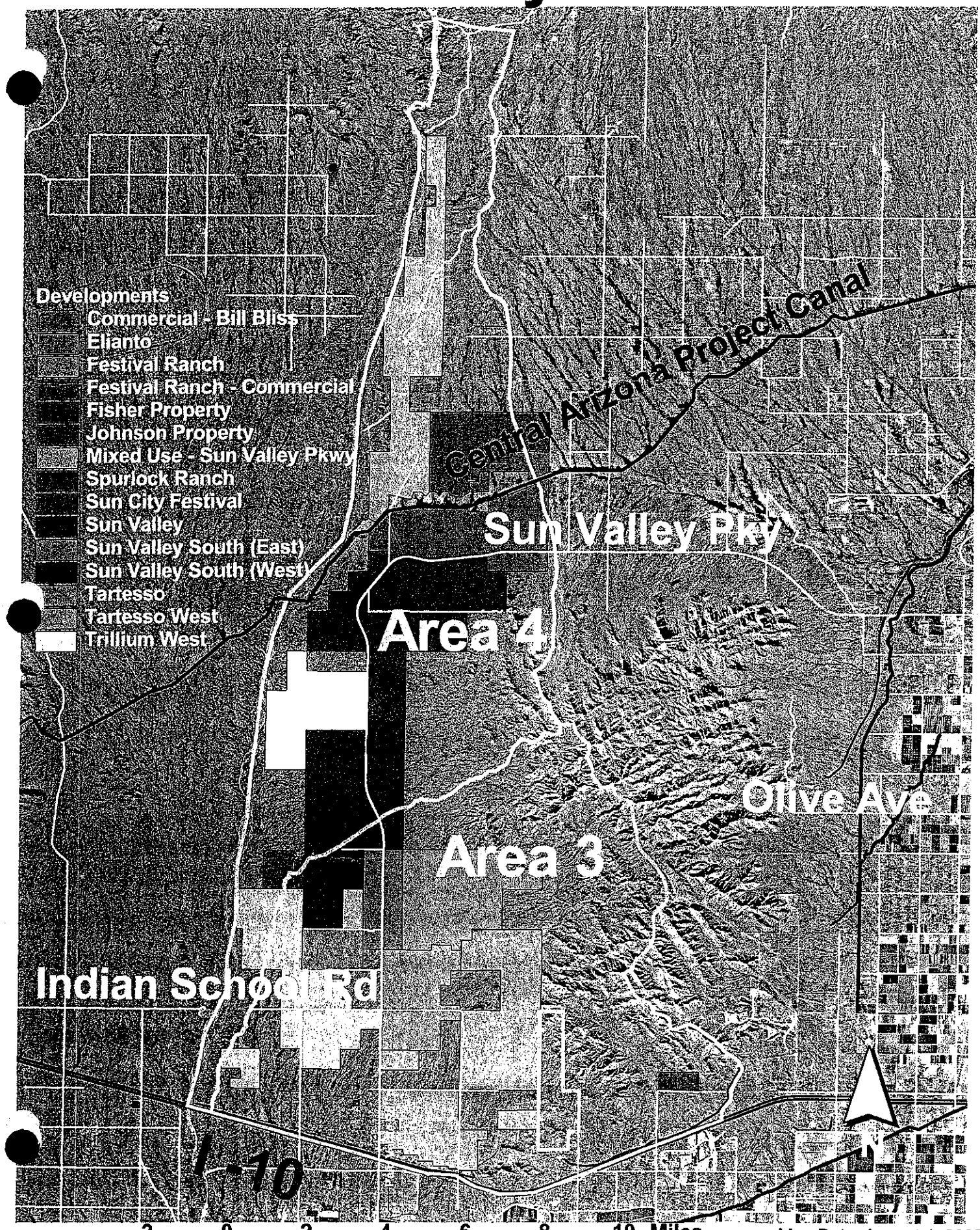
Area 4 Private Sector

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85051

DATE: Tuesday, August 16th, 2005
TIME: 3:00 pm – 4:30 pm

1. 3:00 pm	Introductions and Opening Comments ▪ FCDMC Staff ▪ Consultant Staff ▪ Stakeholder Working Group (SWG) Members	Valerie Swick District PM
2. 3:10 pm	Meeting Purpose ▪ Inform SWG of ADMP effort ▪ Include SWG issues and constraints in ADMP process ▪ Involve SWG in the ADMP results	Chuck Williams Stakeholder Coordinator
3. 3:20 pm	Project Scope and Overview ▪ Three Steps ▪ Schedule	Pat Quinn Consultant PM
4. 3:40 pm	Stakeholder Working Group Involvement ▪ SWG Individual Reaction and Comments ▪ SWG Individual and Group Issues	Chuck Williams Discussion Facilitator
5. 4:20 pm	Summary/Next Meeting	Valerie Swick District PM
6. 4:30 pm	Adjourn	

Sun Valley ADMP



Map Date: August 1, 2005

Aerial Date: 2004

Ricardo Aguirre

From: Jonathan Fuller [jon@jefuller.com]

Sent: Thursday, August 04, 2005 8:22 AM

To: Valerie Swick (Valerie Swick - FCDX); Doug Both; Michael Duncan (Michael Duncan - FCDX); Gary Freeman; Greg Schuelke; Jack Moody; Julie Cox; Kathryn Gross (Kathryn Gross - FCDX); Kevin Kammerzell; Lynn Thomas (Lynn Thomas - FCDX); Pat Quinn; Ricardo Aguirre; Ted Lehman (Ted Lehman); Teri George; 'Tami Norton'

Subject: Fan Delineations

I've gone through the Ayres Stage 1-2 in some detail, and am ready to begin my fan delineations with a target date of mid-October for delivery to the District.

So it's time to palaver. How do any of these dates sound, keeping in mind that sooner is better, for a meeting at JEF?

8/5 – any time
8/10 – morning
8/11 – afternoon
8/12 – any time

We don't need everyone, just someone from every firm/agency.

Jon Fuller, PE, RG, PH, MS, CFM
JE Fuller/Hydrology & Geomorphology, Inc.
8400 S. Kyrene Rd, Suite 201
Tempe, AZ 85284

4[illegible]22-5710 (voice)
[illegible]39-2193 (fax)
602-451-1992 (cell)

Palaver – 1) conference, discussion, 2) to talk profusely, 3) misleading or beguiling speech, 4) idle chat

Ricardo Aguirre

From: Jonathan Fuller [jon@jefuller.com]

Sent: Thursday, August 04, 2005 6:10 PM

To: Valerie Swick (Valerie Swick - FCDX); Doug Both; Michael Duncan (Michael Duncan - FCDX); Gary Freeman; Greg Schuelke; Jack Moody; Julie Cox; Kathryn Gross (Kathryn Gross - FCDX); Kevin Kammerzell; Lynn Thomas (Lynn Thomas - FCDX); Pat Quinn; Ricardo Aguirre; Ted Lehman (Ted Lehman); Teri George; 'Tami Norton'

Subject: Palaver

Consensus is for meeting at JEF Friday August 12 @ 8 a.m. No need to respond unless you can't attend. Thanks.

Jon Fuller, PE, RG, PH, MS, CFM
JE Fuller/Hydrology & Geomorphology, Inc.
8400 S. Kyrene Rd, Suite 201
Tempe, AZ 85284

480-222-5710 (voice)
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602-451-1992 (cell)

White Alluvial Fan TDN Outline
Section 6B: Geomorphology

6. Geomorphology
    6.1. Introduction
    6.2. Previous Reports By Others
        6.2.1. Technical Reports
            Fan 36 TDN — Pearthree/AZGS
            Field — Sarah Robinson/ASU
            CH2M HILL — Hjalmarson & Kemna
        6.2.2. Wittman ADMS – area of overlap
        6.2.3. Developer Reports – lateral tie-in
            6.2.3.1.CMX – Fan #
            6.2.3.2.DEA – Fan #
            6.2.3.3.CVL – Fan #
    6.3. Data Sources/Tools Available
        6.3.1. NRCS Soils Map Unit Interpretation — Soils Map
        6.3.2. AZGS Map Unit Interpretation — Geologic Map
        6.3.3. Field/Pearthree Flood Hazard Map Unit Interpretation — Flood Hazard Map
        6.3.4. Aerial Photography — Aerial Photo Map
        6.3.5. Topographic Mapping — Topo Map
    6.4. Method Description (steal from Fan 36)
        6.4.1. Definitions
            6.4.1.1.Alluvial Fan
            6.4.1.2.Alluvial Fan Flooding
            6.4.1.3.Stable/Unstable
        6.4.2. Stage 1: Landform Identification
            6.4.2.1.PFHAM Landforms vs. FEMA Landforms
            6.4.2.2.Landform Characteristics (Table?)
            6.4.2.3.Landform Map (Entire Study Area) — Landform Map
        6.4.3. Stage 2: Identification of Stable/Unstable Areas
            6.4.3.1.Stability/Instability Characteristics (Table?)
            6.4.3.2.Landform Implications
            6.4.3.3.Unstable Area Map (Entire Study Area) — Stable Area Map
        6.4.4. Stage 3: Floodplain Delineation — Key Map of Sites
            6.4.4.1.Alluvial Fans
                6.4.4.1.1. Unstable
                6.4.4.1.2. Stable
            6.4.4.2.Alluvial Plains
            6.4.4.3.Pediments
            6.4.4.4.Stable Distributary Areas Downstream of Fans
            6.4.4.5.Stable Tributary Areas Downstream of Fans
            6.4.4.6.Stable Riverine Areas Upstream of Fan Apexes
            6.4.4.7.Stable Distributary Areas (Not Fans) – OUT OF SCOPE
            6.4.4.8.Flood Hazard Zones
                6.4.4.8.1. PFHAM Zones

6.5. Limitations
- 6.5.1. Scale of Mapping
- 6.5.2. Accuracy of Mapping
- 6.5.3. Time Period of Historical Photo Record

6.6. Work Maps
- 6.6.1. Landform Number vs. Ayres ADMS
  - 6.6.1.1.Landform (Use STR Naming) – Active/Inactive (Use STR Naming)
    - 6.6.1.1.1. Landform – at topographic apex
    - 6.6.1.1.2. Active – at hydrographic apex

6.7. References

7. Appendixes: Alluvial Fan Floodplain Delineations

7.1. Landform # (repeat for each landform)
- 7.1.1. Stage 1: Recognizing and Characterizing Piedmont Landforms
  - 7.1.1.1.Composition
    - 7.1.1.1.1. Soils
    - 7.1.1.1.2. Geology
  - 7.1.1.2.Morphology – Present as a Table? Discuss key diagnostic features
    - 7.1.1.2.1. Landform/Contour Shape
    - 7.1.1.2.2. Slope
    - 7.1.1.2.3. Surface Texture
    - 7.1.1.2.4. Surface Color
    - 7.1.1.2.5. Channel Size
    - 7.1.1.2.6. Drainage Pattern
    - 7.1.1.2.7. Desert Pavement
    - 7.1.1.2.8. Desert Varnish
    - 7.1.1.2.9. Vegetation
  - 7.1.1.3.Location
  - 7.1.1.4.Boundaries
    - 7.1.1.4.1. Lateral Boundaries
    - 7.1.1.4.2. Toe
  - 7.1.1.5.Conclusion
- 7.1.2. Stage 2: Defining Active & Inactive Areas
  - 7.1.2.1.Introduction
  - 7.1.2.2.Identification of Active Areas
    - 7.1.2.2.1. NRCS Soil Surveys
    - 7.1.2.2.2. AZGS Surficial Geology
    - 7.1.2.2.3. Interpretation of Topography
    - 7.1.2.2.4. Aerial Photograph Interpretation
    - 7.1.2.2.5. Historical Aerial Photography – flow path movement
    - 7.1.2.2.6. Drainage Pattern
    - 7.1.2.2.7. Surficial Characteristics (varnish, pavement)
    - 7.1.2.2.8. Vegetation
    - 7.1.2.2.9. Sediment Delivery Potential
    - 7.1.2.2.10. Hjalmarson & Kemna Flood Hazard Potential
    - 7.1.2.2.11. Field & Pearthree Flood Hazard Maps

7.1.2.3.Identification of Inactive Areas
7.1.2.3.1. Inactive Areas Still Subject to Flooding
7.1.2.3.2. Summary of Active & Inactive Areas
7.1.2.4.Riverine Floodplain Hazards – Approximate Methods
7.1.2.5.Map of active/inactive w/ type of flooding (fan, sheet, stable channel, etc)
7.1.3. Stage 3: Defining the Approximate 100-Year Floodplain
7.1.3.1.Types of Flooding
7.1.3.1.1. Alluvial Fan
7.1.3.1.2. Sheet Flow
7.1.3.1.3. Stable Distributary
7.1.3.2.Description of Mapping Issues
7.1.3.3.Verification of Results
7.1.3.4.Floodplain Delineation Maps

Ricardo Aguirre

From: Jonathan Fuller [jon@jefuller.com]

Sent: Friday, August 12, 2005 9:47 AM

To: Valerie Swick (Valerie Swick - FCDX); Doug Both; Michael Duncan (Michael Duncan - FCDX); Gary Freeman; Greg Schuelke; Jack Moody; Julie Cox; Kathryn Gross (Kathryn Gross - FCDX); Kevin Kammerzell; Lynn Thomas (Lynn Thomas - FCDX); Pat Quinn; Ricardo Aguirre; Ted Lehman (Ted Lehman); Teri George; 'Tami Norton'

Subject: Fan Action Items

Thanks for your participation today. Here's the action items I recorded:

1. Create a "bajada line" establishing the delineation boundaries between landforms to be used as limit of study for each delineation (JEF – will be done by 8/19).
2. Determine if Fan #6 will be delineated as part of the Fan #5 landform (JEF-WGA)
3. *Distribute latest corridor and thalweg maps (TWL – done 8/12)*
4. Review corridor & thalweg alignments, as well as Q100 in attribute tables (Everyone)
5. Distribute Entellus Sun Valley Pkwy culvert report (TWL – done 8/12 – PDF format)
6. Distribute JEF TDN outline (JEF – done 8/12, attached)
7. *Consider needs for Stage 1-2 revisions for use by developer engineers in TDNs for Fan 37,38,39,7,8,12,6 (VAS)*

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Ricardo Aguirre

From: Ted Lehman [ted@jefuller.com]
Sent: Friday, August 12, 2005 10:00 AM
To: 'Valerie Swick (Valerie Swick - FCDX)'; Doug Both; 'Duncan, Mike (Michael Duncan - FCDX)'; 'Gary Freeman'; 'Greg Schuelke'; 'Jack Moody'; 'Julie Cox'; 'Kathryn Gross (Kathryn Gross - FCDX)'; 'Kevin Kammerzell'; 'Lynn Thomas (Lynn Thomas - FCDX)'; 'Pat Quinn'; Ricardo Aguirre; 'Ted Lehman (Ted Lehman)'; 'Teri George'; 'Tami Norton'
Subject: Corridors, thalwegs, and entellus report

A3-developer-combined-flowpath | thalwegs.ZIP (71 KB) | Entellus Sun Valley Parkway Ta

All,

As promised, I am sending you the corridors & thalwegs as shapefiles, and the Entellus report on Sun Valley Parkway culverts that Valerie mentioned. I've included the summary table here as an attachment. The full report is 56 Mb. I have placed it on our ftp site if you're interested. ("ftp://ftp.jefuller.com/outgoing/ Wittmann ADMSU Sun Valley Parkway Culvert Evaluation Report.pdf")

Enjoy!

Ted Lehman, P.E.
JE Fuller/ Hydrology & Geomorphology, Inc.
Tempe, AZ

Ricardo Aguirre

From: Jonathan Fuller [jon@jefuller.com]
Sent: Monday, August 15, 2005 1:28 PM
To: Ricardo Aguirre
Subject: Ayres Stage 1

Ricardo:

Stage 1 shape files attached. Stage 2 coming next.

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Ricardo Aguirre

om: Jonathan Fuller [jon@jefuller.com]
Sent: Monday, August 15, 2005 1:28 PM
To: Ricardo Aguirre
Subject: Ayres Shape Files

Ricardo:

Here's what I have for Ayres Stage 2. Call if you have questions.

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Ricardo Aguirre

From: Jonathan Fuller [jon@jefuller.com]
Sent: Monday, August 15, 2005 1:30 PM
To: Ricardo Aguirre
Subject: Ayres

Ricardo:

I'm not especially happy with Ayres Stage 1 and have found some potential problems with the Stage 2 delineation. You should review their Stage 2 carefully for your area before proceeding with Stage 3.

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Ricardo Aguirre

From: Jonathan Fuller [jon@jefuller.com]
Sent: Wednesday, August 17, 2005 6:35 PM
To: Ricardo Aguirre
Subject: RE: Ayres

Good question, and one of the issues I have with the Ayres work. Same applies to "conditionally unstable areas." Relict fans are supposed to be stable.

Basically, I've ignored their relict fan delineation and am calling it alluvial fan. FEMA doesn't distinguish between relict, pediment, and alluvial plain. They just use stage 1 to determine if piedmont or traditional riverine methods should be used.

I believe the unstable areas are somewhat larger than depicted by Ayres in some regions of the White Tank piedmont. Once you go through the FCD flood zone delineation section (AFFA, AFZA, etc) you start to get the picture.

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-----Original Message-----
From: Ricardo Aguirre [mailto:Raguirre@cvlci.com]
Sent: Wednesday, August 17, 2005 2:23 PM
To: Jonathan Fuller
Subject: RE: Ayres

What's the difference between Highly Unstable and Unstable? Also, Site 37 shows a Relict Fan landform delineation east of the Sun Valley Parkway where Stage 2 considers that area to be Highly Unstable. I thought that Relict Fans are considered stable according to the PFHAFM user's manual?

-----Original Message-----
From: Jonathan Fuller [mailto:jon@jefuller.com]
Sent: Monday, August 15, 2005 1:30 PM
To: Ricardo Aguirre
Subject: Ayres

Ricardo:

I'm not especially happy with Ayres Stage 1 and have found some potential problems with the Stage 2 delineation. You should review their Stage 2 carefully for your area before proceeding with Stage 3.

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Ricardo Aguirre

From: Teri George [tgeorge@deainc.com]
Sent: Tuesday, August 23, 2005 1:40 PM
To: Ricardo Aguirre
Cc: Doug Both
Subject: Re: Status of Stage III Analysis

Ricardo,

I've sent the Tartesso Unit 1 report out for copying. You should receive it tomorrow at the latest. Let me know if that doesn't happen.

This should give you a 'typical' cross section for your use in the hydraulic calcs for the piece of Fan 37 that goes through the project site. This should help you in determining the 'existing' conditions, which of course are different than the County's old topo and aerial show. There is no longer an 'uncertain fan' just west of Sun Valley Pkwy south of the Indian School Road alignment. It's a confined drainageway now.

Teri

>>> "Ricardo Aguirre" <Raguirre@cvlci.com> 8/23/2005 10:09 AM >>>
Stage III Consultants:

I just wanted to send out a brief e-mail to let you know my status on the Site 37 and Site 36 analysis, and to find out where you all are in your analyses.

Tomorrow, 08/24/05 I plan to complete the geomorphology floodplain delineation for Site 37 for areas east of Sun Valley Parkway. By Wednesday, 08/31/05, I plan to complete the hydrualic analysis and delineate the floodplain for the rest of Site 37 and Site 36. I have completed a rough draft of the TDN, but plan to revise it and complete the final draft for submittal by 09/07/05.

Teri, as we discussed yesterday, I will need to get both the flow information from Site 38 for that one stream coming into Site 37 and your improvement plans for Tartesso on the west side of Sun Valley Parkway. Perhaps we can follow up next week.

Please let me know where you all are at in your Stage III analysis.

Thank you,

Ricardo Aguirre

STAKEHOLDER WORKING GROUP MEETING SUMMARY

Area 3 Private Sector

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Tuesday, August 16th, 2005

TIME: 1:00 pm – 2:30 pm

The meeting was called to order by Valerie Swick, FCDMC PM at 1:10 pm and the attached agenda was followed throughout the meeting. An updated copy of the contact database and record of the attendees is also attached. A Stakeholder Workbook containing copies of handouts and the power point was also distributed to attendees. The workbook should be used to store updated information as it is provided tostakeholders. The following represents a summary of the key items discussed at the meeting.

1) **Josh Hartmann/ Pulte**
   - Status is that Sun Valley South on the east side of SVP is preparing their land plan. Submitting 404 permit for SV South.
   - Interested in knowing what is the ADMP interaction with 404 issues? The answer per VAS at FCDMC is that FCDMC intention is not to intervene or de-rail the developers' 404 process.

2) **Terri George/ DEA**
   - Question: If the Recommended Alternative includes retention basins, will FCD be getting 404 permits for area of impact? Answer: FCD response was that it would need to be discussed. Josh Hartmann raised possibility of a regional permit or Nationwide Permit 12. Is it Feasible? Will it be a part of Recommended Alternative? Answer from VAS is that it is unknown at this time what the Corps will require.

3) **Bob Spears/ Stardust**
   - They are West of SVP and have 3,075 lots.
   - To the East of SVP, is Amendment #1 – adding to Tartesso.
   - Also has ownership in SV South, which is presently in preliminary stages.
   - They have done and will continue to do their own 404. They will participate in a regional drainage solution but don't want a regional 404 permit. Better to deal with EPA and Corps on a one-to-one basis.
   - Regional plan may be good for drainage, but advocates 404 on individual project-by-project basis.

- There is a need for an implementation plan that accounts for timing of construction of various elements. The time for it is now when there are less owners to do deal with. Believes all developers will participate if proposals are fair.

4) **Bob Stevens/ FCDMC**
   - EPA prefers EIS with regional plans but may not always require one.

5) **Shawn Waters/ SunBelt**
   - Presently updating SV South drainage.

6) **Jack Moody/ WRG**
   - SV South west of SVP is presently in preliminary planning stages.
   - No 404 permit applications at this time.

7) **Brian Rosenbaum/ Lennar**
   - Elianto has their preliminary plat approved. It is 1,450 lots.
   - They have applied for their 404 permit.

8) **General Discussion**
   - Most of the Developers present agree that it is good to have a regional drainage master plan as a road map, but prefer to process projects on an individual basis.
   - There is a high amount of collaboration already between developers regarding drainage, sewer, water, etc.

9) **Dianne Thornburg/ Westpac/**
   - Johnson/ Montieve property has just completed 404 JD and it has not been submitted.

10) **Darrell Williams/ Fisher Property**
   - Skyline Wash - There is presently no engineering underway.

11) **Gil Gillenwater/ SDI**
   - They have property between Pulte to east and SV to west.
   - It is approximately 700 Ac. along SVP.

12) **Ian Dowdy/ Buckeye**
   - Joint coordination with Maricopa County on regional issues, including SVADMP. Buckeye has an interest in involving developers. Meeting scheduled September 9, 2005 with all parties.

13) **Bob Spears/ Stardust**
   - The Town is performing Impact Fee Study addressing area water/ sewer north of I-10 within Buckeye jurisdiction. SOQ is out now. W. Scoutten reported that it is on a 4-6 month schedule.
   - Stardust wants to propose drainage component be included in the impact fee analysis.

- Culvert enlargements along SVP
- Structural improvements

- Determine reasonable impact fee $ amount for drainage. Whoever develops first, builds improvement, and then gets paid back with impact fee credits.
- Structural improvements – He likes containment walls (more surgical), doesn't like channels and berms. They are harder to permit. Maintaining natural corridors with structural enhancements is better.
- They would like to have impact fees credits implemented. Credits may be able to be established from SVADMP cost estimates. C. Williams reported that the SVADMP is preliminary planning level work, not detailed engineer's cost estimates.
- Maintenance costs need to be accounted for **now,** not down the road. Possibly coordinate with FCD (Tim/Russ). The developer is willing to support maintenance impact fees, but needs to know the fees up front to calculate per unit $ basis. The earlier it is figured out, the more equitable it is.
- Options discussed: Apply as a closing mechanism a taxing district; BOD implements a regional assessment over Buckeye properties.
- Get funding mechanism in place now, then can focus on regional solution. Easier to solve technical issues once funding issues are solved.

14) General

- Cannot slow down ADMP, or it won't mesh schedule wise with Impact Fee Study. Explore how impact fees become part of the funding for the Implementation Plan.
- Implementation Plan needs to address county islands as well (Skyline Wash), not just Buckeye.
- The SVADMP needs to coordinate with towns, county, developers, public agencies, etc. JEF requests existing shape files that the developers have already planned/ constructed so that JEF can account for drainage plans in the SVADMP alternatives.
- Plans that have already been approved within the SVADMP area will need to be revisited by the FCD for possible opportunities/constraints as well as to make sure there are no fatal flaws within them

The meeting was adjourned at 11:30 am.

Sir Title	First Name	Last Name	Company/Agency	Title	Business Address	City	State	Postal Code	Business Fax	Business Phone	E-mail Address
Mr.	Max	Wilson	Maricopa County Board of Supervisors, District 5	Supervisor	301 West Jefferson Street, 10th Floor	Phoenix	AZ	85003	602-506-6362	602-506-7562	mwilson@mail.maricopa.gov
Mr.	Scott	Isham	Maricopa County Board of Supervisors, District 5	Assistant to Supervisor Max Wilson	301 West Jefferson Street, 10th Floor	Phoenix	AZ	85003	602-506-6362	602-506-7562	sisham@mail.maricopa.gov
Mr.	Michael	Sabatini	Maricopa County Department of Transportation	Planning Division Manager	2901 West Durango Street	Phoenix	AZ	85009-6357	602-506-4882	602-506-8628	MikeSabatini@mail.maricopa.gov
Ms.	Rene	Probst	Maricopa County Dept. of Transportation		2901 W. Durango St.	Phoenix	AZ	85009		602-506-8622	reneeprobst@mail.maricopa.gov
Mr.	Tom	Sonnemann	Maricopa County Dept. of Transportation	Bridge Engineer	2901 W. Durango St.	Phoenix	AZ	85009		602-506-4880	tomsonnemann@mail.maricopia.gov
Mr.	Mathew	Holm	Maricopa County Planning & Development Department	Principal Planner	411 North Central, 3rd Floor	Phoenix	AZ	85004-2191	602-506-8369	602-506-7162	matthewholm@mail.maricopa.gov
Mr.	Jimmie	Munoz	Maricopa County Planning & Zoning Commission Dist. 5	Commissioner	66455 S Central	Phoenix	AZ	85040		602-506-2364	
Mr.	Chris	Coover	Maricopa County	Trails Manager	411 N. Central , Suite 470	Phoenix	AZ	85004	602-506-4692	602-506-8719	ccoover@mail.maricopa.gov
Mr.	Randy	Randolph	Central Arizona Project	Civil Engineering Division Supervisor	23636 North 7th Street	Phoenix	AZ	85024	623-869-2598	623-869-2260	rrandolph@cap-az.com
Mr.	David	Gunn	Central Arizona Project	Engineering Manager	23636 North 7th Street	Phoenix	AZ	85024		623-869-2233	dgunn@cap-az.com
Mr.	Gordon	Taylor	Arizona State Land Department	Planning Section	1616 West Adams	Phoenix	AZ	85007	602-364-0272	602-542-2683	
Mr.	V. Ottozawa	Chatupron	Arizona State Land Department	Engineering Section	1616 West Adams	Phoenix	AZ	85007	602-364-0272	602-542-2683	ochatupr@land.az.gov

Sir Title	First Name	Last Name	Company/Agency	Title	Business Address	City	State	Postal Code	Business Fax	Business Phone	E-mail Address
Mr.	Rafael	Velazquez	Arizona State Land Department		1616 W. Adams	Phoenix	AZ	85003		602-364-2224	rvelazquez@land.az.gov
Mr.	Jeff	Beimer	Arizona Department of Transportation Drainage Section	Acting Chief Drainage Engineer	205 S. 17th Avenue, Maildrop 630 E	Phoenix	AZ	85007	602-712-8992	602-712-8485	jbeimer@azdot.gov
Mr.	Ian	Dowdy	Town of Buckeye - Planning & Engineering	Planner	110 E. Irwin Avenue	Buckeye	AZ	85326		623-386-8299	idowdy@buckeyeaz.gov
Mr.	Carroll	Reynolds	Town of Buckeye	Manager	100 N. Apache Road, Suite A	Buckeye	AZ	85326		623-386-4691	creynolds@buckeyeaz.com
Mr.	Jackie	Meck	Buckeye	Councilman	100 N Apache Road, Suite A	Buckeye	AZ	85326		623-386-2196	jmeck@bwcdd.com
Mr.	Will	Doyle	Bureau of Reclamation	Planner	PO Box 81169	Phoenix	AZ	85069-1169	602-216-4007	602-216-3928	wadoyle@lc.usbr.gov
Mr.	Michael	Martinez, Fish & Wildlife Biologist	U.S. Fish and Wildlife Service	Biologist	2321 W. Royal Palm Rd., Suite 103	Phoenix	AZ	85021		602-242-0210 x224	Mike_Martinez@fws.gov
Ms.	Rebecca	Davidson	Arizona Game & Fish - Habitat Branch		2221 W. Greenway Road	Phoenix	AZ	85023	602-789-3928	602-789-3602	rdavidson@azgfd.gov
Ms.	Evelyn	Erlandsen	AGFD	Project Specialist	2221 W. Greenway Road	Phoenix	AZ	85023		602-789-3486	eerlandsen@azgfd.gov
Ms.	Stephanie	Helgeson	NRCS	Soil Conservationist	12409 W. Indian School Rd, Suite B201	Avondale	AZ	85323		623-535-5055 x120	stephanie.helgeson@az.usda.gov
Mr.	John	Holt	Western Area Power Authority	Environmental Manager	12155 W. Alameda Parkway	Lakewood	CO	80228-8213		602-352-2592	holt@wapa.gov
Mr.	Randy	Butler	Palo Verde Power Plant (APS & SRP)		P.O. Box 52034	Phoenix	AZ	85072		623-393-3003	rbutler@apsc.com

Sir Title	First Name	Last Name	Company/Agency	Title	Business Address	City	State	Postal Code	Business Fax	Business Phone	E-mail Address
Mr.	Jim	Anderson	Bureau of Land Management		21605 N. 7th Avenue	Phoenix	AZ	85027		623-580-5570	
Mr.	Bill	Jenkins	Arizona Dept. of Water Resources	Engineer	500 N. Third Street	Phoenix	AZ	85004		602-417-2445	wcjenkins@adwr.state.az.us
Mr.	Brian	Cosson	Arizona Dept. of Water Resources	NFID Coordinator	500 N. Third Street	Phoenix	AZ	85004	602-417-2423	602-417-2445	btcosson@adwr.state.az.us
Ms.	Mollyann	Garrett	MC Parks & Rec.	Manager	14805 W. Vineyard Ave	Goodyear	AZ	85338	623-932-7718	623-932-3811	mollyanngarrett@mail.maricopa.gov
Ms.	Karyn	Moldenhauer	Arizona Department of Environmental Quality		1110 W. Washington Street	Phoenix	AZ	85007		602-771-4449	kdm@azdeq.gov
Ms.	Julie	Legg	Luke Air Force Base	Water Program	Luke AFB, 56 CES/CEV, Bldg. 302, 13970 W. Lightning Street	Luke AFB	AZ	85309		623-856-4024	julie.legg@luke.af.mil
Mr.	Doug	LaMont	Parsons Brinckerhoff Puade & Douglas, Inc.	Senior Supervising Engineer	1501 W Fountainhead Parkway, Suite 400	Tempe	AZ	85282	480-966-9234	480-966-8295	lamont@pbworld.com

Sir Title	First Name	Last Name	Company/Agency	Title	Development	Business Address	City	State	Postal Code	Business Fax	Business Phone	E-mail Address
Mr.	Alan	Jones	Lennar Communities		Elianto	1150 West Grove Parkway, Suite 109	Tempe	AZ	85243		480-345-0077	
Mr.	Scott	Switzer	Lennar Communities		Elianto	1150 West Grove Parkway, Suite 109	Tempe	AZ	85243		480-345-0077	
Mr.	Brian	Rosenbaum	Lennar Communities	Regional Vice President	Elianto	1150 West Grove Parkway, Suite 109	Tempe	AZ	85243	480-897-5588	480-345-0077	brain.rosenbam@lennar.com
Mr.	Mark	Bitteker	Lennar Communities		Elianto	1150 West Grove Parkway, Suite 109	Tempe	AZ	85243		480-345-0077	
Mr.	Doug	Both	CVL		Elianto	4550 N.12th Street	Phoenix	AZ	85014		602-264-6831	
Mr.	Ricardo	Aguirre	CVL, Inc.	Assistant Project Manager	Elianto	4550 N. 12th Street	Phoenix	AZ	85014-4291	602-264-0928	602-264-6831	raguirre@cvlci.com
Mr.	Charlie	Enochs	Pulte Homes		Sun Valley South (East)	3401 West Anthem Way	Anthem	AZ	85086		623-742-6006	
Mr.	Rick	Hurula	Stardust Companies		Tartesso	6730 N Scottsdale Road, Suite 230	Scottsdale	AZ	85253		480-607-5800	
Ms.	Terri	George	David Evans & Associates	P.E.,C.F.M.	Tartesso	2141 East Highland Ave., Suite 200	Phoenix	AZ	85016	602-678-5155	602-678-4691	tgeorge@deainc.com
Mr.	Michael	Weinberg	David Evans & Associates	PE	Johnson Property	2141 East Highland Ave., Suite 200	Phoenix	AZ	85016	602-678-5155	602-678-5151	miw@deainc.com
Mr.	Josh	Hartmann	West Valley Div.			15111 N Pima Rd, Suite 100	Scottsdale	AZ	85260		480-862-7853	josh.hartmann@pulte.com
Mr.	Mike	Johnson	Development Comp			80 E Rio Salado Pkwy, Suite 100	Tempe	AZ	85281		602-390-6812 480-317-6812	mike.johnson@suncoraz.com

Sir Title	First Name	Last Name	Company/Agency	Title	Development	Business Address	City	State	Postal Code	Business Fax	Business Phone	E-mail Address
Mr.	R.D.	Fisher	Landowner		Skyline Wash	11201 N. 23rd Ave., Suite 106	Phoenix	AZ	85029		602-861-5614	
Mr.	Darrell	Williams	Landowner		Skyline Wash	13541 W. Cypress St	Goodyear	AZ	85338		623-910-9136	wwilliams55@cox.net
Mr.	Greg	Schuelke	Project Design Consultants		Skyline Wash	3200 E Camelback Rd., Suite 275	Phoenix	AZ	85018		602-508-0700	gshuelke@projectsdesign.com
Mr.	Jackie	Meck	Buckeye	Councilman		100 N Apache Road, Suite A	Buckeye	AZ	85326		623-386-2196	jmeck@bwcdd.com
Mr.	Woody	Scoutten	W.C. Scoutten, Inc.	Engineer		1646 N. Litchfield Rd, #235	Goodyear	AZ	85338		623-547-4661	woody_scoutten@msn.com
Ms.	Jami	Schulman	Communities Southwest		Sun Valley South (West)	7720 North 16th Street, Suite 310	Phoenix	AZ	85020		602-265-1952	
Ms.	Michelle	Yerger	Communities Southwest		Sun Valley South (West)	7720 North 16th Street, Suite 310	Phoenix	AZ	85020			
Mr.	Jack	Moody	WRG Design		Sun Valley South (West)	9977 N. 90th St., Siute 350	Scottsdale	AZ	85258		602-997-8000	jkm@wrgd.com
Ms.	Dianne	Thornburg	WestPac Development		Montiere	8501 N. Scottsdale Rd., Suite 260	Scottsdale	AZ	85253			
Mr.	Roger	Smith	SDI, Inc		Sun Valley, South	15770 N. Greenway/Hayden Loop, Suite 104	Scottsdale	AZ	85260		480-348-7450	
Mr.	Gil	Gillenwater	SDI, Inc		Sun Valley, South	15770 N. Greenway/Hayden Loop, Suite 104	Scottsdale	AZ	85260		480-348-7450	gil@gillenwater.us
Mr.	Tony	Mortensen	Sunbelt Holdings	Project Manager	Sun Valley, South	6710 N. Scottsdale Rd., Suite 160	Scottsdale	AZ			602-574-5605	tmortensen@sunbeltholdings.com

Sir Title	First Name	Last Name	Company/Agency	Title	Development	Business Address	City	State	Postal Code	Business Fax	Business Phone	E-mail Address
Mr.	Sean	Walters	Sunbelt Holdings		Sun Valley, South	6720 N. Scottsdale, Suite 160	Scottsdale	AZ	85253	480-905-1419	602-574-5602	swalters@sunbeltholdings.com
Mr.	Gary	Freeman	River Research and Design, Inc.		Elianto	1158 E. Juanita Ave	Gilbert	AZ	85234	480-497-6390	480-275-5079	freeman@r2d.eng.com
Mr.	Kevin	Kammerzell	LMX		Sun Valley, South (Pulte)	7740 N. 16th Street	Phoenix	AZ	85048	602-567-1901	602-567-1900	kkammerzell@cmxinc.com

Sir Title	First Name	Last Name	Company/Agency	Title	Development	Business Address	City	State	Postal Code	Business Fax	Business Phone	E-mail Address
Ms	Cindy	Paddock	JF Properties, Inc	Platting and Entitlements Manager	Trillium	6720 N. Scottsdale Rd., Suite 250	Scottsdale	AZ	85253	480-422-6924	480-422-6900	cpaddock@jfcompanies.com
Mr.	Josh	Hartmann	West Valley Div.			15111 N Pima Rd, Suite 100	Scottsdale	AZ	85260		480-862-7853	josh.hartmann@pulte.com
Mr.	Glenn	Spurlock	Spurlock Land, L.L.C.		Spurlock Ranch	11039 S. 163rd St.	Gilbert	AZ	85296			
Mr.	Doug	Both	CVL		Sun City Festival	4550 N.12th Street	Phoenix	AZ	85014		602-264-6831	
Mr.	Charlie	Enochs	Pulte Homes		Sun City Festival	3401 West Anthem Way	Anthem	AZ	85086		623-742-6006	
Mr.	Jackie	Meck	Buckeye	Councilman		100 N Apache Road, Suite A	Buckeye	AZ	85326		623-386-2196	jmeck@bwcdd.com
Mr.	Woody	Scoutten	W.C. Scoutten, Inc.	Engineer		1646 N. Litchfield Rd, #235	Goodyear	AZ	85338		623-547-4661	woody@scoutten.com
Mr.	Toby	Block	The Lyle Anderson Company, Inc.	Vice President of Development - Festival	Festival Ranch	8777 N. Gainey Center Dr., Suite 205	Scottsdale	AZ	85258			
Mr.	Richard	Maes	WVSV Holdings., L.L.C.		Vistoso for Sun Valley	1121 W. Warner Rd., Suite 109	Tempe	AZ	85284			
			Lyle Anderson		Festival Ranch							
			Johnson Property		Trillium							
			Vistoso		Sun Valley							

SVADMP, AREA 4 DATA BASE

Sir Title	First Name	Last Name	Company/Agency	Title	Development	Business Address	City	State	Postal Code	Business Fax	Business Phone	E-mail Address
Mr.	Sherrick	Campbell	WRG Design, Inc	Project Manager	Festival Ranch	9977 N. 90th Street, Suite 350	Scottsdale	AZ	85258	602-977-2099	602-977-8000	sherrick.campbell@wrgdesign.com
Mr.	Phil	Miller	WestPac Development		Montiere		Scottsdale	AZ			480-889-8910	
Mr.	Michael	Weinberg	David Evans & Associates	PE	Trillium	2141 East Highland Ave., Suite 200	Phoenix	AZ	85016	602-678-5155	602-678-5151	miw@deainc.com

Board of Directors
Fulton Brock, District 1
Don Stapley, District 2
Andrew Kunasek, District 3
Max Wilson, District 4
Mary Rose Wilcox, District 5

Flood Control District
of Maricopa County

www.fcd.maricopa.gov
2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
Fax: 602-506-4601
TT: 602-505-5897

Mr. Ricardo Aguirre
CVL, Inc.
4550 N. 12th Street
Phoenix, AZ 85014-4291

August 26, 2005

RE: Sun Valley Area Drainage Master Plan (ADMP) - Digital Data Request

The Flood Control District of Maricopa County (District) is currently in the process of formulating preliminary alternatives to addresses identified drainage and flooding problems in the Sun Valley ADMP study area. You have been identified as a point of contact for the collection of hydrologic and hydraulic information for the master planned community developers in the study area. Information regarding the developers' existing and/or planned flow corridors and drainage design will help to ensure that the regional solutions advanced in the Sun Valley ADMP fully incorporate current and planned development. We request that you provide to the District any available digital data that may be useful for the purpose of incorporating planned drainage improvements within the footprints of the developments into the ADMP alternatives formulation. The following list identifies some of the digital data that might be useful:

- Master planned communities boundaries
- Planned/existing land use, parcel locations, and street alignments
- Drainage basin boundaries
- Planned/existing watercourse corridors
- Planned/existing drainage facilities, design data and/or models
- Planned/existing utility locations
- Planned/existing landscape, multi-use corridors, and outdoor recreation opportunities.

Please provide any of the above information, as available, to the District at your earliest convenience. Thank you for timely assistance in this matter.

Sincerely,

Valerie A Swick

Valerie Swick, E.I.T., CFM, P.H.
Project Manager

Ricardo Aguirre

From: Chuck Williams [chuck@clwilliams.net]

Sent: Saturday, September 03, 2005 1:29 PM

To: brain.rosenbam@lennar.com; Ricardo Aguirre; tgeorge@deainc.com; miw@deainc.com; josh.hartmann@pulte.com; wwilliams55@cox.net; woody_scoutten@msn.com; jkm@wrgd.com; gil@gillenwater.us; tmortensen@sunbeltholdings.com; swalters@sunbeltholdings.com; freeman@r2d.eng.com; kkammerzell@cmxinc.com

Cc: 'Valerie Swick - FCDX'; 'Pat Quinn'

Subject: Sun Valley ADMP Meeting Summary & Revised Database

Dear Area 3 Stakeholder,

Thank you for attending the Sun Valley Area Drainage Master Plan Stakeholder Workgroup Meeting on August 16th. Attached for your use is a meeting summary and revised database compiled from information exchanged at the meeting. We'll keep you apprised of progress as we move forward on the project. Please let me know if you have any questions or comments.

Thanks,

Chuck Williams
Stakeholder Coordinator

Thanks,

Chuck

C.L. Williams Consulting Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Ricardo Aguirre

From: Doug Both
Sent: Wednesday, September 07, 2005 7:41 AM
To: Ricardo Aguirre
Subject: FW: Updated: Stage III Update Meeting

-----Original Message-----
From: Teri George [mailto:tgeorge@deainc.com]
Sent: Tuesday, September 06, 2005 4:35 PM
To: kkammerzell@cmxinc.com; Doug Both; RHoppe@deipro.com; Josh.Hartmann@delwebb.com; freeman@r2d-eng.com; jack.moody@wrgdesign.com
Cc: jschulman@commsw.com; Brian.Rosenbaum@lennar.com; Mike.Brilz@Pulte.com; bspeirs@stardustco.com; SWalters@sunbeltholdings.com; tmortensen@sunbeltholdings.com
Subject: Re: Updated: Stage III Update Meeting

I don't know about the rest of you but the latest Ayers linework for the active vs inactive areas have greatly increased. I'm sorry Doug and Kevin. You both probably told me this already but I was under the impression it was just the width of the active area that changed, which we would fine tune out in the field. But whole new areas have been added, specifically between fans 37 & 38. Even Jon's marked-up exhibit didn't show these areas.

The shape file that I am seeing these increases is called "stability_assessment.shp" dated 8-23-05. If you all are using something else, please let me know so I will have a better understanding before we meet next Tuesday.

Teri

SUN VALLEY SOUTH
STAGE III DELINEATION MEETING AGENDA
September 13, 2005

I. Review of Stage III purpose and process

II. Outstanding information/data needs

   a. From FCDMC

   b. Between Consultants

III. Status of delineation for individual fans

IV. Submittal strategy

V. Schedule for completion and submittal

Ricardo Aguirre

From: Chuck Williams [chuck@clwilliams.net]

Sent: Wednesday, September 14, 2005 8:24 AM

To: brian.rosenbaum@lennar.com; Ricardo Aguirre; tgeorge@deainc.com; freeman@r2d.eng.com; kkammerzell@cmxinc.com; bspeirs@stardustco.com; josh.hartmann@pulte.com

Cc: 'Valerie Swick - FCDX'; 'Pat Quinn'

Subject: Sun Valley ADMP Coordination Meeting Request for the FRS#1 Sub area

Dear Stakeholder,

As we discussed at our August 16th Stakeholder Workgroup meeting the Flood Control District is conducting the Sun Valley Area Drainage Master Plan (ADMP) in an expedited mode in order to address the Flood & Drainage needs of this rapidly developing area in a timely manner. In order to do that in an effective and efficient way we have divided the 183 square mile ADMP watershed into 8 sub-areas or sub-watersheds which are named according to their drainage outfall. It is our intent to coordinate the recommended alternative with the needs and existing efforts of the development community to the fullest extent possible. Since the various developments are proceeding at differing rates of speed it is likely that the District will be developing alternatives for certain areas prior to development plans being finalized. We would like to make sure that our recommendations in these areas are compatible with the "works in progress". In order to do that we would like to schedule a sub-area coordination meeting with you and your engineer and other landowners and their engineers for the sub-area identified as FRS#1 (Flood Retarding Structure #1). In addition to the actual physical characteristics of the existing and proposed drainage system we would like to discuss your development schedule as well as further discuss implementation and maintenance strategies. A meeting agenda will be provided.

'[redacted]ave scheduled the meeting for:

FRS#1 Sub area

Friday, September 30th
9:30-11:30am
Flood Control District of Maricopa County Offices
2901 West Durango Street
Phoenix, AZ 85009
Conference Room to be Determined

We hope this time is compatible with your schedule, if it is not please send a representative. We intend this to be a more "hands on" meeting than our August 16th meeting so please brings any plans, reports, exhibits or documents that you feel would aid in communication and the exchange of information.

Many of the developments straddle sub area boundaries so you may get invited to multiple meetings to discuss your developments' drainage systems design in each sub area. We apologize for any inconvenience this may cause you but our purpose is to present a recommended alternative to the District that addresses a complete hydrologic and hydraulic system for each sub area therefore our approach is to meet with interested and affected parties as a sub area group.

Thank you for your interest in the ADMP and please let me or Valerie Swick, District Project Manager know if you have any questions,

Chuck Williams
ADMP Stakeholder Coordinator

C[redacted]. Williams Consulting Inc.
4720 West Maverick Lane

Suite 103
Lakeside, Arizona 85929

e 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Ricardo Aguirre

From: Teri George [tgeorge@deainc.com]
Sent: Friday, September 16, 2005 3:16 PM
To: Ricardo Aguirre
Cc: Doug Both; freeman@r2d-eng.com
Subject: RE: Updated: Stage III Update Meeting

Ricardo,

What exactly do you need from this drawing? The reason why I ask is that there are 7 or so drawings xref'd into it as well as images. I would have to xclip each of these xref's to put together a drawing for you. And if I dont' ultimately give you what you need, I've wasted a lot of time.

I would think all you need is the project boundary because we kept the exising topography except along the short stretch on the project's southern boundary. That's just a trap channel.

Let me know.

Teri

>>> "Ricardo Aguirre" <Raguirre@cvlci.com> 9/8/2005 11:43:29 AM >>>
Hi Teri,

I have been using Stability_Assessment.shp dated 8-16-05, which is about the same date that I got the file from Jon Fuller. Perhaps he made adjustments to the file and re-saved it before sending you your 8-23-05 version. I will forward to you the 8-16-05 version that I have been using so that you can compare.

Also, I reviewed your Tartesso report and I am interested in your "HEC-RAS Exhibit for Proposed Conditions 100-yr Flood Limits Tartesso Unit 1 Exhibit D" in electronic format. This would greatly help in precluding manual floodplain delineation.

Thanks,

Ricardo Aguirre

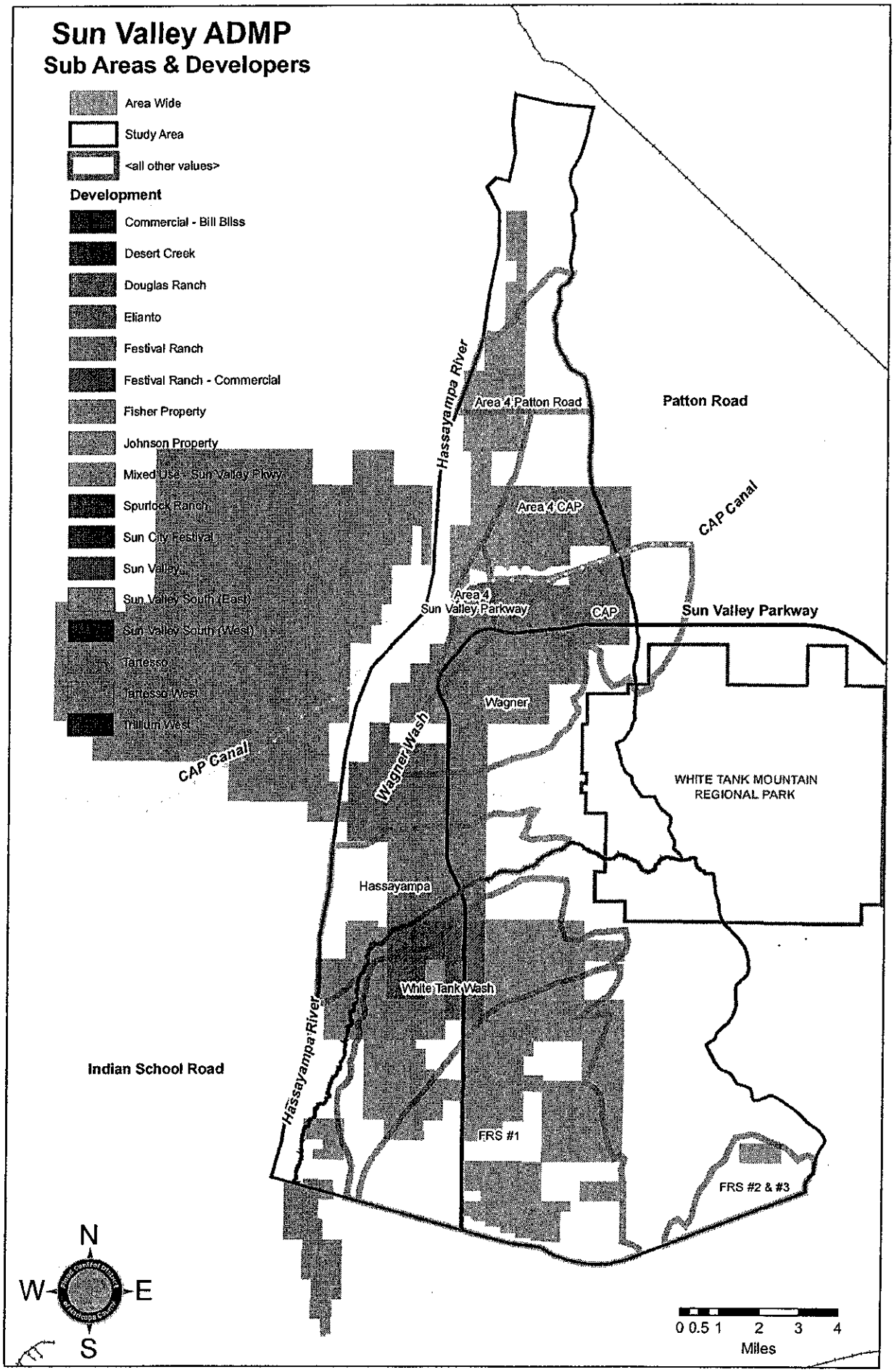
-----Original Message-----
From: Doug Both
Sent: Wednesday, September 07, 2005 7:41 AM
To: Ricardo Aguirre
Subject: FW: Updated: Stage III Update Meeting

-----Original Message-----
From: Teri George [mailto:tgeorge@deainc.com]
Sent: Tuesday, September 06, 2005 4:35 PM
To: kkammerzell@cmxinc.com; Doug Both; RHoppe@deipro.com; Josh.Hartmann@delwebb.com; freeman@r2d-eng.com; jack.moody@wrgdesign.com
Cc: jschulman@commsw.com; Brian.Rosenbaum@lennar.com; Mike.Brilz@Pulte.com; bspeirs@stardustco.com; SWalters@sunbeltholdings.com; tmortensen@sunbeltholdings.com
Subject: Re: Updated: Stage III Update Meeting

I don't know about the rest of you but the latest Ayers linework for the active vs inactive areas have greatly increased. I'm sorry Doug and Kevin. You both probably told me this already but I was under the impression it was just the width of the active area that changed, which we would fine tune out in the field. But whole new areas have been added, specifically between fans 37 & 38. Even Jon's marked-up exhibit didn't show these areas.

The shape file that I am seeing these increases is called "stability_assessment.shp" dated 8-23-05. If you all are using something else, please let me know so I will have a better understanding before we meet next Tuesday.

eri


Sun Valley ADMP
Sub Areas & Developers
Area Wide
Study Area
<all other values>
Development
Commercial - Bill Bliss
Desert Creek
Douglas Ranch
Elianto
Festival Ranch
Festival Ranch - Commercial
Fisher Property
Johnson Property
Mixed Use - Sun Valley Pkwy
Spurlock Ranch
Sun City Festival
Sun Valley
Sun Valley South (East)
Sun Valley South (West)
Tartesso
Tartesso West
Trillium West
Hassayampa River
Area 4 Patton Road
Patton Road
Area 4 CAP
CAP Canal
Area 4
Sun Valley Parkway
CAP
Sun Valley Parkway
Wagner
Wagner Wash
CAP Canal
WHITE TANK MOUNTAIN
REGIONAL PARK
Hassayampa
White Tank Wash
Hassayampa River
Indian School Road
FRS #1
FRS #2 & #3
N
W
E
S
0 0.5 1 2 3 4
Miles

Ricardo Aguirre

From: Doug Both
Sent: Tuesday, September 20, 2005 4:41 PM
To: Elisabeth Kahn; Ricardo Aguirre
Subject: FW: Sun Valley ADMP Coordination Meeting Request for the Area 4 Sun Valley Parkway Sub area

Let's discuss who should attend.

thanks
-----Original Message-----
From: Chuck Williams [mailto:chuck@clwilliams.net]
Sent: Tuesday, September 20, 2005 2:11 PM
To: Doug Both
Subject: RE: Sun Valley ADMP Coordination Meeting Request for the Area 4 Sun Valley Parkway Sub area

Doug,

Attached is a draft map showing the Areas, Sub areas and where we believe the developments are located. We think you are working on Sun City Festival which drains to the Cap more or less and Elianto which drains into the FRS #1. Let me know if you've more questions or can attend the October 3rd meeting for Sun City Festival or the September 30th meeting for Elianto. If you want to talk about it please give me a call.

Thanks,

Chuck

C.L. Williams Consulting Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

From: Doug Both [mailto:Dboth@cvlci.com]
Sent: Thursday, September 15, 2005 11:00 AM
To: chuck@clwilliams.net
Subject: RE: Sun Valley ADMP Coordination Meeting Request for the Area 4 Sun Valley Parkway Sub area

Chuck,
I have 2 projects in the Sun Valley area, 1 west of the parkway and 1 east of it.
What is the location of Area 4? Which fans are included in the area?

Thanks, Doug

-----Original Message-----
From: Chuck Williams [mailto:chuck@clwilliams.net]
Sent: Wednesday, September 14, 2005 8:50 AM
To: waterwiz@msn.com; sherrick.campbell@wrgdesign.com; Doug Both
Cc: 'Valerie Swick - FCDX'; 'Pat Quinn'

SUB AREA FRS#1 COORDINATION MEETING AGENDA

LOCATION: Buckhorn-Mesa Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Friday, September 30th, 2005

TIME: 9:30 am - 11:30 am

1. **9:30 - Introductions and Opening Comments**

2. **9:40 - Meeting Purpose-Coordination on:**

   - **Schedule of Developments & SVADMP**
   - **Drainage System Alternatives by Sub Area**
   - **Data Sharing between Development & SVADMP**
   - **Implementation Opportunities**

3. **9:50 – SVADMP Status**

   - **Sub Area Development**
   - **Schedule**

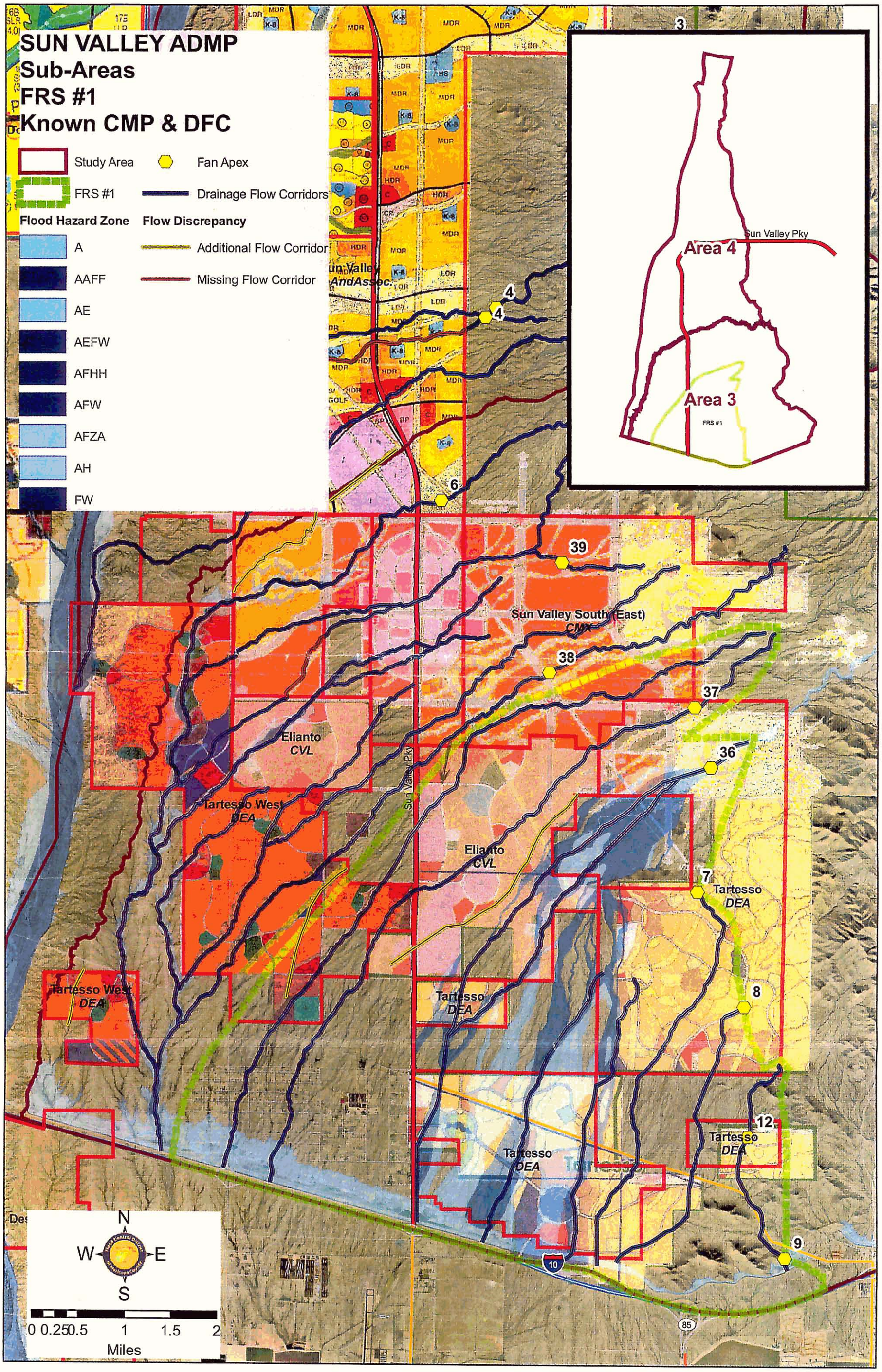
4. **10:00 – Open discussion by Development**

   - **Development Schedule & Status**
   - **Drainage System Approach/Status**
   - **Data Sharing Protocol**

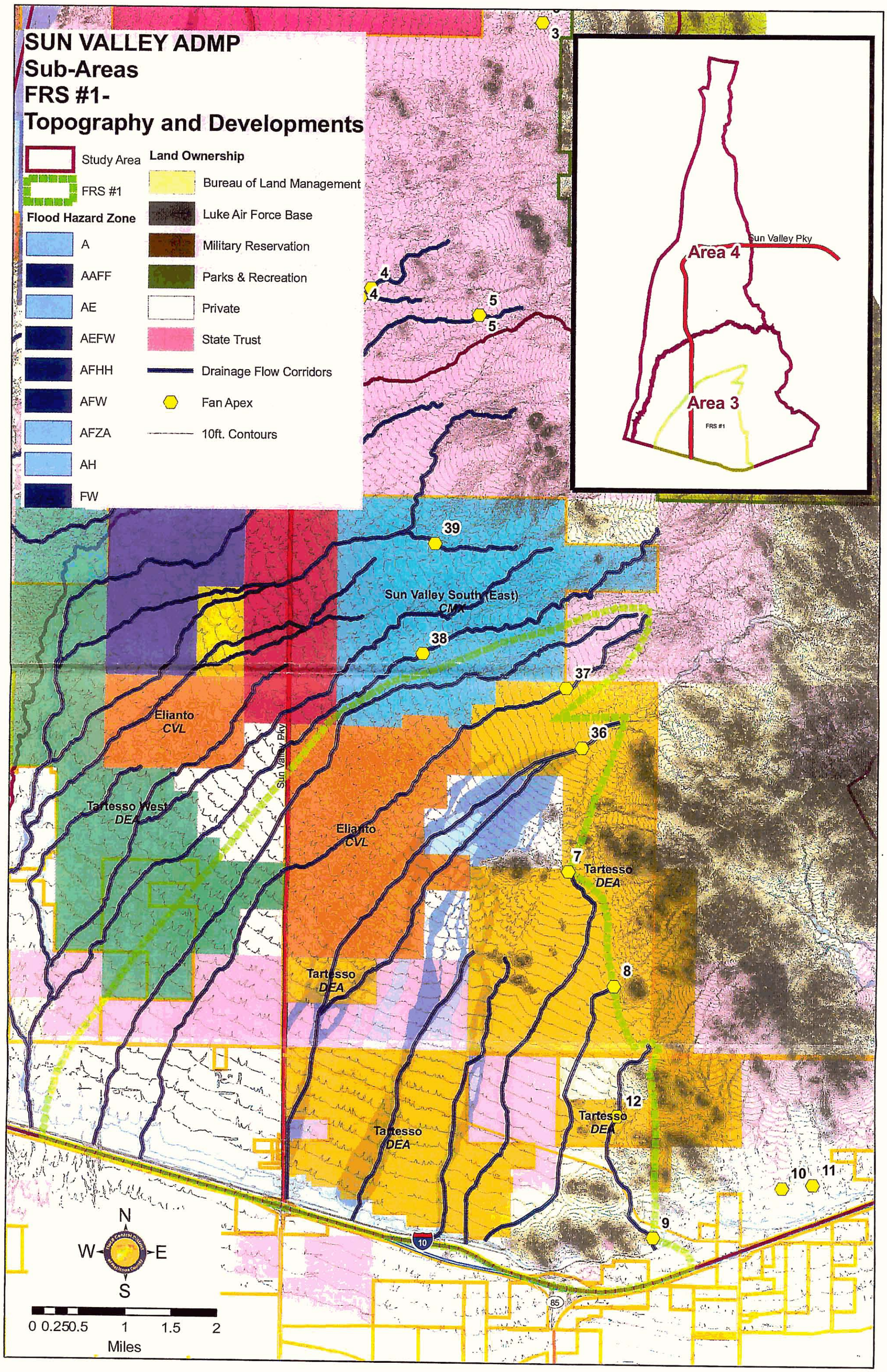
5. **11:00 – Implementation Opportunities**

6. **11:20 –Continued Coordination Methods**

7. **11:30- Adjourn**


SUN VALLEY ADMP
Sub-Areas
FRS #1
Known CMP & DFC
Study Area
FRS #1
Fan Apex
Drainage Flow Corridors
Flood Hazard Zone
A
AAFF
AE
AEFW
AFHH
AFW
AFZA
AH
FW
Flow Discrepancy
Additional Flow Corridor
Missing Flow Corridor
Sun Valley Pky
Area 4
Area 3
FRS #1
Sun Valley South (East)
CMX
Elianto
CVL
Tartesso West
DEA
Tartesso
DEA
N
W
E
S
0 0.25 0.5 1 1.5 2
Miles

SUN VALLEY ADMP
Sub-Areas
FRS #1-
Topography and Developments



Subject: Sun Valley ADMP Coordination Meeting Request for the Area 4 Sun Valley Parkway Sub area

Dear Stakeholder,

As we discussed at our August 16th Stakeholder Workgroup meeting the Flood Control District is conducting the Sun Valley Area Drainage Master Plan (ADMP) in an expedited mode in order to address the Flood & Drainage needs of this rapidly developing area in a timely manner. In order to do that in an effective and efficient way we have divided the 183 square mile ADMP watershed into 8 sub-areas or sub-watersheds which are named according to their drainage outfall. It is our intent to coordinate the recommended alternative with the needs and existing efforts of the development community to the fullest extent possible. Since the various developments are proceeding at differing rates of speed it is likely that the District will be developing alternatives for certain areas prior to development plans being finalized. We would like to make sure that our recommendations in these areas are compatible with the "works in progress". In order to do that we would like to schedule a sub-area coordination meeting with you and your engineer and other landowners and their engineers for the sub-area identified as Area 4 Sun Valley Parkway. In addition to the actual physical characteristics of the existing and proposed drainage system we would like to discuss your development schedule as well as further discuss implementation and maintenance strategies. A meeting agenda will be provided.

We have scheduled the meeting for:

Area 4 Sun Valley Parkway Sub area

Monday, October 3rd
1:30-3:00pm
Flood Control District of Maricopa County Offices
2901 West Durango Street
Phoenix, AZ 85009
Conference Room to be Determined

We hope this time is compatible with your schedule, if it is not please send a representative. We intend this to be a more "hands on" meeting than our August 16th meeting so please brings any plans, reports, exhibits or documents that you feel would aid in communication and the exchange of information.

Many of the developments straddle sub area boundaries so you may get invited to multiple meetings to discuss your developments' drainage systems design in each sub area. We apologize for any inconvenience this may cause you but our purpose is to present a recommended alternative to the District that addresses a complete hydrologic and hydraulic system for each sub area therefore our approach is to meet with interested and affected parties as a sub area group.

Thank you for your interest in the ADMP and please let me or Valerie Swick, District Project Manager know if you have any questions,

Chuck Williams
ADMP Stakeholder Coordinator

C.L. Williams Consulting Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Ricardo Aguirre

From: Chuck Williams [chuck@clwilliams.net]

Sent: Tuesday, October 04, 2005 1:52 PM

To: brian.rosenbaum@lennar.com; Doug Both; Ricardo Aguirre; tgeorge@deainc.com; myerger@commsw.com; jkm@wrgd.com; kkammerzell@cmxinc.com; bspeirs@stardustco.com; josh.hartmann@pulte.com; richardm@vistoso.net; duane.hunn@c-b.com

Cc: 'Valerie Swick - FCDX'; 'Pat Quinn'; Woody Scoutten; Ian Dowdy

Subject: Sun Valley ADMP Coordination Meeting Request for the White Tank Wash Sub area

Dear Stakeholder,

As we discussed at our August 16th Stakeholder Workgroup meeting the Flood Control District is conducting the Sun Valley Area Drainage Master Plan (ADMP) in an expedited mode in order to address the Flood & Drainage needs of this rapidly developing area in a timely manner. In order to do that in an effective and efficient way we have divided the 183 square mile ADMP watershed into 8 sub-areas or sub-watersheds which are named according to their drainage outfall. It is our intent to coordinate the recommended alternative with the needs and existing efforts of the development community to the fullest extent possible. Since the various developments are proceeding at differing rates of speed it is likely that the District will be developing alternatives for certain areas prior to development plans being finalized. We would like to make sure that our recommendations in these areas are compatible with the "works in progress". In order to do that we would like to schedule a sub-area coordination meeting with you and your engineer and other landowners and their engineers for the sub-area identified as "White Tank Wash". In addition to the actual physical characteristics of the existing and proposed drainage system we would like to discuss your development schedule as well as further discuss implementation and maintenance strategies. A meeting agenda will be provided.

We have scheduled the meeting for:

White Tank Wash Sub area

Thursday, October 18th
9:30-11:30pm
Flood Control District of Maricopa County Offices
2901 West Durango Street
Phoenix, AZ 85009
Conference Room to be Determined

We hope this time is compatible with your schedule, if it is not please send a representative. We intend this to be a more "hands on" meeting than our August 16th meeting so please brings any plans, reports, exhibits or documents that you feel would aid in communication and the exchange of information.

Many of the developments straddle sub area boundaries so you may get invited to multiple meetings to discuss your developments' drainage systems design in each sub area. We apologize for any inconvenience this may cause you but our purpose is to present a recommended alternative to the District that addresses a complete hydrologic and hydraulic system for each sub area therefore our approach is to meet with interested and affected parties as a sub area group.

Thank you for your interest in the ADMP and please let me or Valerie Swick, District Project Manager know if you have any questions,

Chuck Williams
ADMP Stakeholder Coordinator

C.L. Williams Consulting Inc.

4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Thanks,

Chuck

C.L. Williams Consulting, Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Thanks,

Chuck

C.L. Williams Consulting, Inc.
4720 West Maverick Lane
Suite 103
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Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Ricardo Aguirre

.om: Chuck Williams [chuck@clwilliams.net]

Sent: Tuesday, October 04, 2005 2:11 PM

To: 'Chuck Williams'; brian.rosenbaum@lennar.com; Doug Both; Ricardo Aguirre; tgeorge@deainc.com; myerger@commsw.com; jkm@wrgd.com; kkammerzell@cmxinc.com; bspeirs@stardustco.com; josh.hartmann@pulte.com; richardm@vistoso.net; duane.hunn@c-b.com

Cc: 'Valerie Swick - FCDX'; 'Pat Quinn'; Woody Scoutten; Ian Dowdy

Subject: RE: Sun Valley ADMP Coordination Meeting Request for the White Tank Wash Sub area

All,

I want to clarify that this meeting is on **Thursday, October 20th.** Sorry for the inconvenience.

Thanks,

Chuck

C.L. Williams Consulting, Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

F ıe 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

size=2 width="100%" align=center tabindex=-1>

From: Chuck Williams [mailto:chuck@clwilliams.net]
Sent: Tuesday, October 04, 2005 1:52 PM
To: 'brian.rosenbaum@lennar.com'; 'dboth@cvlci.com'; 'raguirre@cvlci.com'; 'tgeorge@deainc.com'; 'myerger@commsw.com'; 'jkm@wrgd.com'; 'kkammerzell@cmxinc.com'; 'bspeirs@stardustco.com'; 'josh.hartmann@pulte.com'; 'richardm@vistoso.net'; 'duane.hunn@c-b.com'
Cc: 'Valerie Swick - FCDX'; 'Pat Quinn'; Woody Scoutten (woody@scoutten.com); Ian Dowdy (idowdy@buckeyeaz.gov)
Subject: Sun Valley ADMP Coordination Meeting Request for the White Tank Wash Sub area

Dear Stakeholder,

As we discussed at our August 16th Stakeholder Workgroup meeting the Flood Control District is conducting the Sun Valley Area Drainage Master Plan (ADMP) in an expedited mode in order to address the Flood & Drainage needs of this rapidly developing area in a timely manner. In order to do that in an effective and efficient way we have divided the 183 square mile ADMP watershed into 8 sub-areas or sub-watersheds which are named according to their drainage outfall. It is our intent to coordinate the recommended alternative with the needs and existing efforts of the development community to the fullest extent possible. Since the various developments are proceeding at differing rates of speed it is likely that the District will be developing alternatives for ertain areas prior to development plans being finalized. We would like to make sure that our recommendations in these areas a mpatible with the "works in progress". In order to do that we would like to schedule a sub-area coordination meeting with yo .id your engineer and other landowners and their engineers for the sub-area identified as "White Tank Wash". In addition to the actual physical characteristics of the existing and proposed drainage system we would like to discuss your development schedule as well as further discuss implementation and maintenance strategies. A meeting agenda will be provided.

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9:30-11:30pm
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Conference Room to be Determined

We hope this time is compatible with your schedule, if it is not please send a representative. We intend this to be a more "hands on" meeting than our August 16th meeting so please brings any plans, reports, exhibits or documents that you feel would aid in communication and the exchange of information.

Many of the developments straddle sub area boundaries so you may get invited to multiple meetings to discuss your developments' drainage systems design in each sub area. We apologize for any inconvenience this may cause you but our purpose is to present a recommended alternative to the District that addresses a complete hydrologic and hydraulic system for each sub area therefore our approach is to meet with interested and affected parties as a sub area group.

Thank you for your interest in the ADMP and please let me or Valerie Swick, District Project Manager know if you have any questions,

Chuck Williams
ADMP Stakeholder Coordinator

C. Williams Consulting Inc.
West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Thanks,

Chuck

C.L. Williams Consulting, Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Thanks,

Chuck

C.L. Williams Consulting, Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Ricardo Aguirre

From: Doug Both
Sent: Wednesday, October 12, 2005 5:54 PM
To: Elisabeth Kahn; Ricardo Aguirre
Subject: FW: SVADMP Master Plan Communities Digital Data Upload Directions

-----Original Message-----
From: Cory Helton [mailto:cory@jefuller.com]
Sent: Wednesday, October 12, 2005 12:23 PM
To: kkammeriell@cmx.com; Doug Both; miw@deainc.com; tgeorge@deainc.com
Cc: 'Pat Quinn'
Subject: SVADMP Master Plan Communities Digital Data Upload Directions

As discussed in the September 30, 2005 meeting with Pat Quinn of JE Fuller/Hydrology & Geomorphology, Inc., the Flood Control District of Maricopa County is currently in the process of formulating preliminary alternatives to address identified drainage and flooding problems in the Sun Valley ADMP study area.

If it is more convenient to provide data and/or updates via our ftp site the directions are below.

If you choose to provide any data via our ftp site, please provide an index for each element of the digital data that you provide to us. Also, please provide the datum of the data which you provide us (the preferred datum is NAD '83, Arizona Central, and International Feet).

To upload to JEF's ftp site do the following:

1) Go to ftp.jefuller.com
2) Click on the **Pub** folder
3) Click on the **Incoming** folder
4) Click on the **SVADMP_MPC_DD** folder
5) Copy the data into the folder

To perform the above tasks you may need to verify that your **Use passive ftp** box in **Internet options** is **not** checked.
To do this, follow the following tasks.

1) On the ftp page click on **Tools**
2) Then click **Internet options**
3) Click the **Advanced** tab
4) Under Browsing make sure the **Use Passive FTP (for firewall and DSL modem compatibility)** box in **unchecked**
5) Exit the ftp site. Then renter the ftp site using the directions above.

The following list identifies some of the digital data that might be useful:

- Master planned communities boundaries
- Planned/existing land use, parcel locations, and street alignments
- Drainage basin boundaries
- Planned/existing watercourse corridors
- Planned/existing drainage facilities, design data and/or models
- Planned/existing utility locations
- Planned/existing landscape, multi-use corridors, and outdoor recreation opportunities.

If you have any questions please feel free to contact me.

Thanks,

Chelton, EIT
JEFuller Hydrology & Geomorphology, Inc.
8400 S. Kyrene Rd. Ste. 201
Tempe, AZ 85284
480-752-2124
480-222-5707 (Direct Line)
480-839-2193 (Fax)
www.jefuller.com

Ricardo Aguirre

From: Cory Helton [cory@jefuller.com]

Sent: Tuesday, November 01, 2005 1:01 PM

To: brian.rosenbaum@lennar.com; Doug Both; Ricardo Aguirre; hcc@deainc.com; miw@deainc.com; josh.hartmann@pulte.com; mike.johnson@suncoraz.com; wwilliams55@cox.net; gshuelke@projectsdesign.com; jmeck@bwcdd.com; woody@scoutten.com; myerger@commsw.com; jack.moody@wrgdesign.com; dthornburg@westpacdev.com; gil@gillenwater.us; tmortensen@sunbeltholdings.com; swalters@sunbeltholdings.com; freeman@r2d.eng.com; kkammerzell@cmxinc.com; bspeirs@stardustco.com; charlie.potter@cph-inc.com; cpaddock@jfcompanies.com; josh.hartmann@pulte.com; spurlock@direcway.com; spurlockland@cox.net; dboth@cvlic.com; jmeck@bwcdd.com; woody@scoutten.com; sherrick.campbell@wrgdesign.com; miw@deainc.com; waterwiz@msn.com; duane.hunn@c-b.com; raquirre@cvlci.com; ekann@cvci.com

Cc: 'Pat Quinn'; 'Valerie Swick - FCDX'

Subject: SVADMP Land Use and Flow Corridor Updates Request

JE Fuller/Hydrology & Geomorphology, Inc. is at a critical junction of the SVADMP project. Per our discussions at the stakeholder meetings early last month, we are requesting any updated **land use plans** and **flow corridors** at this time. If possible, please provide any data digitally. If you have already provided us with your most up to date information, please disregard this request.

If more convenient to provide data and/or updates via our ftp site the directions are below.

To upload to JEF's ftp site do the following:

1) Go to ftp.jefuller.com
2) Click on the **Pub** folder
3) Click on the **Incoming** folder
4) Click on the **SVADMP_MPC_DD** folder
5) Copy the data into the folder

To perform the above tasks you may need to verify that your **Use passive ftp** box in **Internet options** is **not** checked.
To do this, follow the following tasks.

1) On the ftp page click on **Tools**
2) Then click **Internet options**
3) Click the **Advanced** tab
4) Under Browsing make sure the **Use Passive FTP (for firewall and DSL modem compatibility)** box in **unchecked**
5) Exit the ftp site. Then renter the ftp site using the directions above.

If you have any questions please feel free to contact us.

Thanks,
Cory Helton, EIT
JE Fuller Hydrology & Geomorphology, Inc.
8[illegible] S. Kyrene Rd. Ste. 201
Tempe, AZ 85284
480-752-2124

480-222-5707 (Direct Line)
480-839-2193 (Fax)
v jefuller.com

STAKEHOLDER WORKING GROUP MEETING AGENDA

Private Sector

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Tuesday, November 29th, 2005

TIME: 1:00 pm - 4:00 pm

1. 1:00 – Introductions and Opening Comments — Valerie Swick, District PM

2. 1:10 – Meeting Purpose — Chuck Williams, Facilitator
   - Inform SWG of Proposed Alternatives
   - Receive input from SWG on Proposed Alternatives
   - Discuss issues

3. 1:20 – Project Status and Update — Pat Quinn, Consultant PM
   - Progress to Date
   - Schedule

4. 1:30– Proposed Alternatives Review — Pat Quinn

5. 2:40– Stakeholder Working Group Involvement — Chuck Williams
   - SWG Individual Reaction and Comments
   - SWG Individual and Group Issues Discussion

4. 3:40 - Summary/Next Meeting — Chuck Williams

6. 4:00 - Adjourn — Valerie Swick

Ricardo Aguirre

From: Chuck Williams [chuck@clwilliams.net]

Sent: Thursday, November 17, 2005 11:56 PM

To: brian.rosenbaum@lennar.com; Doug Both; Ricardo Aguirre; tgeorge@deainc.com; hcc@deainc.com; miw@deainc.com; josh.hartmann@pulte.com; mike.johnson@suncoraz.com; wwilliams55@cox.net; gshuelke@projectsdesign.com; jmeck@bwcdd.com; woody@scoutten.com; myerger@commsw.com; jack.moody@wrgdesign.com; dthornburg@westpacdev.com; rsmith@sdiinc.net; gil@gillenwater.us; freeman@r2d.eng.com; kkammerzell@cmxinc.com; bspeirs@stardustco.com; erie@waterwiz.net; charlie.potter@cph-inc.com; cpaddock@jfcompanies.com; spurlock@direcway.com; spurlockland@cox.net; tblock@andersonco.com; richardm@vistoso.net; don.willie@kimley-horn.com; sherrick.campbell@wrgdesign.com; duane.hunn@c-b.com; ekann@cvci.com; bbushfield@buckeyeaz.gov; idowdy@buckeyeaz.gov

Cc: 'Pat Quinn'; 'Valerie Swick - FCDX'

Subject: Sun Valley ADMP Stakeholder Workgroup Invitation

Dear Private Sector Stakeholder,

On behalf of the Flood Control District of Maricopa County I would like to invite you to a Stakeholder Workgroup meeting on the Sun Valley Area Drainage Master plan. The meeting is the second scheduled Workgroup meeting within the project schedule. The primary purposes of the meeting are to present the Preliminary Alternatives that have been developed by the consultant team and to receive input from you and other interested stakeholders regarding those Preliminary Alternatives. Attached for your information is the agenda for the meeting. Due to the size of the electronic files we have posted pdf's of the alternatives on the J.E. Fuller FTP site if you would like to download them for your review prior to the meeting. If you do not wish to download them hard copies will be available at the meeting. Also posted on the website is a copy of the current stakeholder database for your information. If you would review your information and provide any corrections either through a reply e-mail to me or at the meeting would be most appreciated.

The Private Sector meeting is scheduled for:

Tuesday, November 29th, 2005
1:00 pm-4:00pm
Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango St
Phoenix, AZ 85009

The directions to the FTP site if you would like to download the available information are:

Point your browser to:

ftp://ftp.jefuller.com/pub/outgoing/SVADMP/Alternatives

You will find pdf files containing the Step 2 alternatives as follows:

Alt_X_whole_studyarea.pdf - This is an overview map of the alternatives for the entire study area presented with land ownership information.

Alt_X_all_subareas.pdf - This is a set of maps with more detailed planimetric layouts by subarea of each of the alternatives. These are presented with topographic and hydrologic information.

To download the documents, right-click each file and select copy, then paste the file to your preferred location on your computer. Currently Alternatives B1, B2, B3, and C are on the ftp site. We will soon be adding Alternatives A and D, so be sure to check the

ftp site again.

If you have any questions please contact me at 480-688-2298 or Valerie Swick, Project Manager at 602-506-2[illegible].Thank you for your interest in this important project and I look forward to seeing you on the 29th.

Thanks,

Chuck

C.L. Williams Consulting, Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Thanks,

Chuck

C.L. Williams Consulting, Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

SUN VALLEY AREA DRAINAGE MASTER PLAN
PROPOSED ALTERNATIVES

FANS 36 & 37

Portions of the Elianto Master Planned Community (MPC) project east of Sun Valley Parkway between Thomas Road and Bethany Home Road are currently undergoing design, whereas the remaining portions are in the planning stage. The majority of the MPC falls within the boundaries of Fan 36 and Fan 37 and is downstream of the apices of both fans.

The approved *Conceptual Drainage Report for Elianto* was prepared to set the drainage concept for all of Elianto east of Sun Valley Parkway. Because the apices for each fan are off-site and upstream of the development, the measures to control drainage and flooding problems will be incorporated on-site.

These measures will include a large on-line detention basin/collector channel that will attenuate the peak flow and reduce the runoff volume and sediment volume. Large conveyance corridors will be utilized downstream of the detention basins to carry the attenuated full fan peak flow through the developed areas. Finished floor elevations are being designed to be a minimum of 12 inches above the 100-year water surface elevation along the corridors. On-site retention for a minimum of the first flush storm event has been designed or is proposed.

Other developments along these corridors will be required to accept the full fan peak flow to attenuate and convey it in a manner similar to what is proposed for Elianto. The preferred alternatives that closely represent these proposed drainage measures are Alternative A – No Measure (apex) and Alternative D – No Measure (whole fan).

Ricardo Aguirre

From: Doug Both
Sent: Tuesday, December 13, 2005 11:48 AM
To: 'Brian Rosenbaum (brian.rosenbaum@lennar.com)'
Cc: Ryan Weed; Sandy Elder; Ricardo Aguirre
Subject: FW:

Brian, this is a write-up that will go to the FCD ultimately to give them our preferred of their alternatives.
If it looks OK can you forward to Jamie at CSW.
Bob and Jamie are processing these write-ups before they go to FCD.

I will be out this afternoon and Wednesday so if you need modifications contact Sandy or Ricardo.
Thanks
-----Original Message-----
From: Sandy Elder
Sent: Monday, December 12, 2005 4:53 PM
To: Doug Both
Subject:

SANDY ELDER
Administrative Assistant - Ext. 4820
Human Resources Department
Direct 602-285-4820
Fax 602-285-4821

Ricardo Aguirre

From: Pat Quinn [pat@jefuller.com]

Sent: Friday, January 20, 2006 1:09 PM

To: bspeirs@stardustco.com; brian.rosenbaum@lennar.com; charlie.potter@cph-inc.com; myerger@commsw.com; josh.hartmann@pulte.com; tgeorge@deainc.com; Doug Both; Ricardo Aguirre; jack.moody@wrgdesign.com; kkammerzell@cmxinc.com; Valerie Swick - FCDX; Chuck Williams; Jon Fuller

Subject: Sun Valley ADMP proposed alternatives meeting

All,

I recently received a letter from Bob Speirs containing the collective feedback of the Sun Valley developers group regarding the District's ADMP Step 2 Proposed Alternatives. Thank you for your efforts in preparing and compiling this information.

We have reviewed the information you provided and would like to meet with you to better clarify our understanding of your comments and concerns. ***You are invited to attend a meeting at 10:00-11:30am, Thursday, Jan 26 at the Flood Control District of Maricopa County Adobe Conference Room.*** Given the short notice, we understand that all will not be able to attend the meeting. If at all possible, please send a representative if you are unavailable.

Please contact me or Valerie Swick if you have questions or need further information.

Thank you,

Pat

Patricia K. Quinn, PE, RLS
Jon Fuller/ Hydrology & Geomorphology, Inc.
8400 S. Kyrene Road, Suite 201
Tempe, AZ 85284
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
480-752-2124 office
480-222-5712 direct
480-839-2193 fax
pat@jefuller.com
www.jefuller.com
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Ricardo Aguirre

From: Chuck Williams [chuck@clwilliams.net]
Sent: Monday, March 06, 2006 9:42 AM
To: Doug Both
Cc: brian.rosenbaum@lennar.com; 'Valerie Swick - FCDX'; 'Pat Quinn'; Ricardo Aguirre
Subject: Sun Valley ADMP Meeting Request

Dear Doug,

As we discussed at the comment clarification meeting on January 26th at the District the SVADMP District team would like to meet individually with the engineers for the various developments. The primary purpose of the meeting is to make sure that we understand the latest development plans on your client's project(s) as we advance to the Recommended Alternative for the ADMP in order to minimize potential conflicts. We would come to your offices and my belief is we could be done in an hour or less. This is not intended to be a "presentation" meeting; rather a sit down at the table and review plans, information and schedules as they are available.

If you are willing and able to meet with us I'd like to suggest a few dates and times:

1) Wednesday, March 22nd in the morning
2) Thursday, March 23rd at 3pm
3) Tuesday March 28th, at 2pm

Please let me know if you have any questions or if these times don't work for you if you have an alternate time which is better for you.

Thanks,

Chuck

C.L. Williams Consulting, Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Ricardo Aguirre

From: Chuck Williams [chuck@clwilliams.net]
Sent: Monday, March 06, 2006 10:47 AM
To: Doug Both
Cc: charlie.potter@cph-inc.com; 'Valerie Swick - FCDX'; 'Pat Quinn'; Ricardo Aguirre
Subject: Sun Valley ADMP Meeting Request for Elianto West

Dear Doug,

As we discussed at the comment clarification meeting on January 26th at the District the SVADMP District team would like to meet individually with the engineers for the various developments. The primary purpose of the meeting is to make sure that we understand the latest development plans on your client's project(s) as we advance to the Recommended Alternative for the ADMP in order to minimize potential conflicts. We would come to your offices and my belief is we could be done in an hour or less. This is not intended to be a "presentation" meeting; rather a sit down at the table and review plans, information and schedules as they are available.

If you are willing and able to meet with us I'd like to suggest a few dates and times:

1) Wednesday, March 22nd in the morning
2) Thursday, March 23rd at 3pm
3) Thursday March 30th, in the morning

Please let me know if you have any questions or if these times don't work for you if you have an alternate time which is better for you.

Thanks,

Chuck

C.L. Williams Consulting, Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Ricardo Aguirre

From: Chuck Williams [chuck@clwilliams.net]

Sent: Wednesday, March 29, 2006 7:21 AM

To: brian.rosenbaum@lennar.com; Doug Both; Ricardo Aguirre; tgeorge@deainc.com; hcc@deainc.com; miw@deainc.com; josh.hartmann@pulte.com; mike.johnson@suncoraz.com; wwilliams55@cox.net; gshuelke@projectsdesign.com; jmeck@bwcdd.com; woody@scoutten.com; myerger@commsw.com; jack.moody@wrgdesign.com; dthornburg@westpacdev.com; rsmith@sdiinc.net; gil@gillenwater.us; freeman@r2d.eng.com; kkammerzell@cmxinc.com; bspeirs@stardustco.com; erie@waterwiz.net; charlie.potter@cph-inc.com; cpaddock@jfcompanies.com; josh.hartmann@pulte.com; spurlock@direcway.com; spurlockland@cox.net; dboth@cvlic.com; jmeck@bwcdd.com; woody@scoutten.com; tblock@andersonco.com; richardm@vistoso.net; don.willie@kimley-horn.com; sherrick.campbell@wrgdesign.com; miw@deainc.com; duane.hunn@c-b.com; raquirre@cvlci.com; *Elisabeth Kahn; tmortensen@sunbeltholdings.com;* nasir_raza@urscorp.com

Cc: 'Valerie Swick - FCDX'; 'Pat Quinn'

Subject: Sun Valley Area Drainage Master Plan stakeholder Meeting Invitation

All,

The Private Sector Stakeholder Workgroup meeting tentatively scheduled for April 4th **has been rescheduled** to:

Wednesday, May 17th
1:30-4:00 pm
Adobe Conference room
Flood Control District of Maricopa County
2[illegible] West Durango St.
Phoenix, AZ 85009

The general purpose of the meeting is to present the Recommended Alternative. An agenda will be sent out prior to the meeting. Please let me or Valerie Swick, Project Manager know if you have any questions.

Thanks,

Chuck Williams

C.L. Williams Consulting, Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

Ricardo Aguirre

From: Pat Quinn [pat@jefuller.com]

Sent: Thursday, May 11, 2006 3:05 PM

To: 'Chuck Williams'; brian.rosenbaum@lennar.com; Doug Both; Ricardo Aguirre; tgeorge@deainc.com; hcc@deainc.com; miw@deainc.com; josh.hartmann@pulte.com; mike.johnson@suncoraz.com; wwilliams55@cox.net; gshuelke@projectsdesign.com; jmeck@bwcdd.com; woody@scoutten.com; myerger@commsw.com; jack.moody@wrgdesign.com; dthornburg@westpacdev.com; rsmith@sdiinc.net; gil@gillenwater.us; freeman@r2d.eng.com; kkammerzell@cmxinc.com; bspeirs@stardustco.com; erie@waterwiz.net; charlie.potter@cph-inc.com; cpaddock@jfcompanies.com; josh.hartmann@pulte.com; spurlock@direcway.com; spurlockland@cox.net; dboth@cvlic.com; jmeck@bwcdd.com; woody@scoutten.com; tblock@andersonco.com; richardm@vistoso.net; don.willie@kimley-horn.com; sherrick.campbell@wrgdesign.com; miw@deainc.com; duane.hunn@c-b.com; raquirre@cvlci.com; Elisabeth Kahn; tmortensen@sunbeltholdings.com; nasir_raza@urscorp.com

Cc: 'Valerie Swick - FCDX'

Subject: RESCHEDULED Sun Valley Area Drainage Master Plan Stakeholder Meeting

All,

The Private Sector Stakeholder Workgroup meeting scheduled for May 17th is **postponed**. The meeting is **tentatively rescheduled** for 1:30-4:00pm, Wednesday, June 21, 2006 in the Adobe Conference Room at the Flood Control District of Maricopa County.

The general purpose of the meeting is to present the Recommended Alternative. The meeting is rescheduled so that we may also present the outcome of the planned Value Engineering review of the alternatives concept design.

You will receive an agenda to preview in advance of the meeting. Please contact me or Valerie Swick, Project Manager, if you have questions or need further information.

Thank you,

Pat

Patricia K. Quinn, PE, RLS
JE Fuller/ Hydrology & Geomorphology, Inc.
8400 S. Kyrene Road, Suite 201
Tempe, AZ 85284
~~~~~~
480-752-2124 office
480-222-5712 direct
480-839-2193 fax
pat@jefuller.com
www.jefuller.com
~~~~~~

Ricardo Aguirre

From: Valerie Swick - FCDX [vas@mail.maricopa.gov]

Sent: Wednesday, June 21, 2006 10:14 AM

To: brian.rosenbaum@lennar.com; Doug Both; Ricardo Aguirre; tgeorge@deainc.com; hcc@deainc.com; miw@deainc.com; josh.hartmann@pulte.com; mike.johnson@suncoraz.com; wwilliams55@cox.net; gshuelke@projectsdesign.com; jmeck@bwcdd.com; woody@scoutten.com; myerger@commsw.com; jack.moody@wrgdesign.com; dthornburg@westpacdev.com; rsmith@sdiinc.net; gil@gillenwater.us; freeman@r2d.eng.com; kkammerzell@cmxinc.com; bspeirs@stardustco.com; erie@waterwiz.net; charlie.potter@cph-inc.com; cpaddock@jfcompanies.com; spurlock@direcway.com; spurlockland@cox.net; tblock@andersonco.com; richardm@vistoso.net; don.willie@kimley-horn.com; sherrick.campbell@wrgdesign.com; duane.hunn@c-b.com; ekann@cvci.com; bbushfield@buckeyeaz.gov

Cc: jon@jefuller.com; chuck@clwilliams.net; Ted Lehman

Subject: SVADMP Stakeholder meeting today

The stakeholder meeting that was tentatively scheduled for this afternoon is cancelled. We apologize for the late notice. We will get back to you on a date for the rescheduled meeting.

Valerie A Swick, E.I.T., P.H., CFM

Project Manager

Flood Control District of Maricopa County

2[illegible] W. Durango St.

Phoenix, AZ 85009

(602) 506-2929

fax (602) 506-8561

vas@mail.maricopa.gov

Ricardo Aguirre

From: Valerie Swick - FCDX [vas@mail.maricopa.gov]

Sent: Thursday, June 29, 2006 4:34 PM

To: Aubrey Thomas; Bob Speirs; Brian Rosenbaum; Charlie Potter; Doug Both; Jack Moody; Jami Schulman; John Hartmann; Kevin Kammerzell; Ricardo Aguirre; Teri George; Tom Hill

Cc: Julie Cox - FCDX; Valerie Swick - FCDX; Lynn Thomas - FCDX; Kathryn Gross - FCDX; Tim Murphy - FCDX; Doug Williams - FCDX; Russ Miracle - FCDX

Subject: Ayres Geomorphology Report

I think we have a productive meeting yesterday. I will try everything in my power to get the answers you need.

We need to talk to Bill Spitz, the author of the subject report, to be able to answer the question of the final report. Unfortunately, he will not be in the office until next Wednesday. I have an urgent call into him to have him call me on Wed. morning.

Julie is working on the discrepancy between Q's. She plans on sending out an email tomorrow.

Please work with Kathryn, (602) 506-4837, to set up the individual meeting for questions about the TDNs.

Valerie A Swick, E.I.T., P.H., CFM

Project Manager

Flood Control District of Maricopa County

2801 W. Durango St.

Phoenix, AZ 85009

(602) 506-2929

fax (602) 506-8561

vas@mail.maricopa.gov

Comparison of Qs at key locations for Alluvial Fan Approximate Floodplain Delineation Studies by DEA/CMX/CVL

Station or Consultant	HEC-1 model 100-yr 6-hr dated 1/06	HEC-1 model 100-yr 6-hr dated 4/05	% difference		HEC-1 model 100-yr 24-hr dated 1/06	HEC-1 model 100-yr 24-hr dated 5/05	% difference
DEA							
K2BR	1858	1890	-1.7		1839	1858	-1.0
K2A	894	894	0.0		827	834	-0.8
K3RB	998	998	0.0		1206	1217	-0.9
L2C	754	754	0.0		692	692	0.0
J1	626	626	0.0		633	640	-1.1
CMX							
F3R	2573	2573	0.0		3030	3054	-0.8
E4RA	1978	1978	0.0		2205	2229	-1.1
E5R	3330	3323	0.2		4827	4860	-0.7
CVL							
L2BR	2391	2391	0.0		2519	2520	0.0
M1	2809	2809	0.0		3301	3302	0.0

Requested 6/28/06 1600
Completed 6/30/06 2000
Note 1: Units are cfs.
Note 2: Data source is the Buckeye/Sun Valley ADMS (PBSJ)

Ricardo Aguirre

om: Julie Cox - FCDX [jrc@mail.maricopa.gov]

Sent: Friday, June 30, 2006 7:47 PM

To: Valerie Swick - FCDX; Aubrey Thomas; Bob Speirs; Brian Rosenbaum; Charlie Potter; Doug Both; Jack Moody; Jami Schulman; John Hartmann; Kevin Kammerzell; Ricardo Aguirre; Teri George; Tom Hill

Cc: Lynn Thomas - FCDX; Kathryn Gross - FCDX; Tim Murphy - FCDX; Doug Williams - FCDX; Russ Miracle - FCDX; Amir Motamedi - FCDX; Ed Raleigh - FCDX; Julie Cox - FCDX

Subject: Alluvial Fan Approximate Floodplain Delineation Studies

To all interested parties:

Attached is an excel spreadsheet comparing the final Qs at key locations for the Alluvial Fan Approximate Floodplain Delineation Studies by DEA/CMX/CVL. The final Qs are dated January 2006. The previous Qs are dated April/May 2005.

The highest percent difference is at concentration point K2BR, which shows a 1.7% difference between 1890 and 1858 cfs.

Although I think 1.7% difference in Qs is insignificant and would not change the design, I believe it is acceptable to use the final Qs.

If you have questions or if I can provide additional information, please call or email. I will be returning to the office on Thursday, July 8.

Thank you

J Cox, Senior Hydrologist

Hydrology & Hydraulics Branch

Engineering Division

Flood Control District of Maricopa County

Phone 602-506-8401

Fax 602-506-4601

<<compareQ.xls>>

-----Original Message-----

From: Valerie Swick - FCDX

Sent: Thursday, June 29, 2006 4:34 PM

To: Aubrey Thomas; Bob Speirs; Brian Rosenbaum; Charlie Potter; Doug Both; Jack Moody; Jami Schulman; John Hartmann; Kevin Kammerzell; Ricardo Aguirre; Teri George; Tom Hill

Cc: Julie Cox - FCDX; Valerie Swick - FCDX; Lynn Thomas - FCDX; Kathryn Gross - FCDX; Tim Murphy - FCDX; Doug Williams - FCDX; Russ Miracle - FCDX

Subject: Ayres Geomorphology Report

I think we have a productive meeting yesterday. I will try everything in my power to get the answers you need.

We need to talk to Bill Spitz, the author of the subject report, to be able to answer the question of the final report. Unfortunately, he will not be in the office until next Wednesday. I have an urgent call into him to have him call me on Wed. morning.

Julie is working on the discrepancy between Q's. She plans on sending out an email tomorrow.

Please work with Kathryn, (602) 506-4837, to set up the individual meeting for questions about the TDNs.

Valerie A Swick, E.I.T., P.H., CFM

Project Manager

Flood Control District of Maricopa County

2801 W. Durango St.

Phoenix, AZ 85009

(602) 506-2929

fax (602) 506-8561

vas@mail.maricopa.gov

Ricardo Aguirre

From: Valerie Swick - FCDX [vas@mail.maricopa.gov]
Sent: Thursday, July 06, 2006 4:51 PM
To: Brian.Rosenbaum@lennar.com; Aubrey Thomas; Bob Speirs; Charlie Potter; Doug Both; Jack Moody; Jami Schulman; John Hartmann; Kevin Kammerzell; Ricardo Aguirre; Teri George; Tom Hill
Cc: Julie Cox - FCDX; Lynn Thomas - FCDX; Kathryn Gross - FCDX; Tim Murphy - FCDX; Doug Williams - FCDX; Russ Miracle - FCDX
Subject: RE: Ayres Geomorphology Report

I received an email just a few minutes ago from our front desk stating that I received a package from Ayers. Bill sent DVD copies of the reports and all the GIS maps. I will look at them tomorrow morning to make sure everything is there then make copies for everyone. They should be available early next week depending on how fast we can get the disks copied. I will send out a email when they are ready.

Valerie A Swick, E.I.T., P.H., CFM
Project Manager
Flood Control District of Maricopa County
2801 W. Durango St.
Phoenix, AZ 85009
(602) 506-2929
fax (602) 506-8561
vas@mail.maricopa.gov

From: Brian.Rosenbaum@lennar.com [mailto:Brian.Rosenbaum@lennar.com]
Sent: Thursday, July 06, 2006 4:08 PM
To: Valerie Swick - FCDX; Aubrey Thomas; Bob Speirs; Charlie Potter; Doug Both; Jack Moody; Jami Schulman; John Hartmann; Kevin Kammerzell; Ricardo Aguirre; Teri George; Tom Hill
Cc: Julie Cox - FCDX; Lynn Thomas - FCDX; Kathryn Gross - FCDX; Tim Murphy - FCDX; Doug Williams - FCDX; Russ Miracle - FCDX
Subject: Re: Ayres Geomorphology Report

Valerie
Any word from bill? We are very anxious to see the information. Please let us know. Thanks.

Sent from my BlackBerry Wireless Handheld

----- Original Message -----
From: "Valerie Swick - FCDX" [vas@mail.maricopa.gov]
Sent: 06/29/2006 04:33 PM
To: Aubrey Thomas" <athomas@cmxinc.com>; Bob Speirs" <bspeirs@stardustco.com>; Brian Rosenbaum; Charlie Potter" <charlie.potter@cph-inc.com>; Doug Both" <dboth@cvlci.com>; Jack Moody" <jack.moody@wrgdesign.com>; Jami Schulman" <jschulman@commsw.com>; John Hartmann" <josh.hartmann@pulte.com>; Kevin Kammerzell" <kkammerzell@cmxinc.com>; Ricardo Aguirre" <[illegible]irre@cvlci.com>; Teri George" <tgeorge@deainc.com>; Tom Hill" <tom.hill@cph-inc.com> [illegible] Julie Cox - FCDX" <jrc@mail.maricopa.gov>; Valerie Swick - FCDX" <vas@mail.maricopa.gov>; Lynn Thomas - FCDX" <lmt@mail.maricopa.gov>; Kathryn Gross - FCDX" <kag@mail.maricopa.gov>; Tim Murphy - FCDX" <tmm@mail.maricopa.gov>; Doug Williams - FCDX" <daw@mail.maricopa.gov>; Russ

Miracle - FCDX" <rum@mail.maricopa.gov>
Subject: Ayres Geomorphology Report

I think we have a productive meeting yesterday. I will try everything in my power to get the answers you need.

We need to talk to Bill Spitz, the author of the subject report, to be able to answer the question of the final report. Unfortunately, he will not be in the office until next Wednesday. I have an urgent call into him to have him call me on Wed. morning.

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Please work with Kathryn, (602) 506-4837, to set up the individual meeting for questions about the TDNs.

Valerie A Swick, E.I.T., P.H., CFM

Project Manager

Flood Control District of Maricopa County

2801 W. Durango St.

Phoenix, AZ 85009

(, 506-2929

fax (602) 506-8561

vas@mail.maricopa.gov

Ricardo Aguirre

From: Chuck Williams [chuck@clwilliams.net]

Sent: Friday, July 07, 2006 10:46 AM

To: 'Chuck Williams'; brian.rosenbaum@lennar.com; Doug Both; Ricardo Aguirre; tgeorge@deainc.com; hcc@deainc.com; miw@deainc.com; josh.hartmann@pulte.com; mike.johnson@suncoraz.com; wwilliams55@cox.net; gshuelke@projectsdesign.com; jmeck@bwcdd.com; woody@scoutten.com; myerger@commsw.com; jack.moody@wrgdesign.com; dthornburg@westpacdev.com; rsmith@sdiinc.net; gil@gillenwater.us; freeman@r2d.eng.com; kkammerzell@cmxinc.com; bspeirs@stardustco.com; erie@waterwiz.net; charlie.potter@cph-inc.com; cpaddock@jfcompanies.com; josh.hartmann@pulte.com; spurlock@direcway.com; spurlockland@cox.net; dboth@cvlic.com; tblock@andersonco.com; richardm@vistoso.net; don.willie@kimley-horn.com; sherrick.campbell@wrgdesign.com; miw@deainc.com; duane.hunn@c-b.com; raquirre@cvlci.com; Elisabeth Kahn; tmortensen@sunbeltholdings.com; nasir_raza@urscorp.com

Cc: 'Valerie Swick - FCDX'; 'Jonathan Fuller'; ted@jefuller.com

Subject: RE: Sun Valley Area Drainage Master Plan stakeholder Meeting Invitation for August 1st

All,

A Private Sector Stakeholder Workgroup meeting has been scheduled for:

Tuesday, August 1st
1:30-4:00 pm
Adobe Conference Room
Flood Control District of Maricopa County
2[illegible] West Durango St.
P[illegible]nix, AZ 85009

The general purpose of the meeting is to present the Draft Recommended Alternative. Additional topics to be discussed include Alluvial Fan Delineation and Levee Freeboard policy. Please let me or Valerie Swick, Project Manager know if you have any questions.

Thanks,

Chuck

C.L. Williams Consulting, Inc.
4720 West Maverick Lane
Suite 103
Lakeside, Arizona 85929

Phone 928-368-2248
Fax 928-368-8704
Cell 480-688-2298

size=2 width="100%" align=center tabindex=-1>

Ricardo Aguirre

From: Kathryn Gross - FCDX [kag@mail.maricopa.gov]
Sent: Wednesday, July 12, 2006 2:23 PM
To: Ricardo Aguirre
Subject: RE: Community Offical

I need to check with Tim Murphy but based on the info in the FEMA forms being filled out by Jon Fuller, The first signature under D appears to be District reviewer which would be me. The next signature box is the community which for the District is Timothy S. Phillips, P.E. and whoever I find out for Buckeye. The next signature is the registered engineer which is where your signature goes.

If you haven't already it may be best to check for updated forms on FEMA's website. I did not get the opportunity to check if there have been any updates lately. It appears the expiration on the previous submitted forms was Sept. 05 but that does not mean FEMA has provided updates yet or that they won't be superceded prior to getting the package sent to FEMA.

Kathryn

-----Original Message-----
From: Ricardo Aguirre [mailto:Raguirre@cvlci.com]
Sent: Wednesday, July 12, 2006 1:52 PM
To: Kathryn Gross - FCDX
Subject: RE: Community Offical

John suggested putting down Tim Phillips name and not Mike Duncan, but he did not seem sure. Is that okay?

-----Original Message-----
From: Kathryn Gross - FCDX [mailto:kag@mail.maricopa.gov]
Sent: Wednesday, July 12, 2006 1:48 PM
To: Ricardo Aguirre
Subject: RE: Community Offical

I will have to get back to you on who the official floodplain administrator is at Buckeye. I will check with Valerie and Lynn. The Fan 37 delineation also affects portions of unincorporated Maricopa County so a signature form for the county is still needed. Pretty much for all fans we are delineating we are including signatures from both us and Buckeye.

Kathryn

-----Original Message-----
From: Ricardo Aguirre [mailto:Raguirre@cvlci.com]
Sent: Wednesday, July 12, 2006 1:38 PM
To: Kathryn Gross - FCDX
Cc: Doug Both; Chie Kondo
Subject: Community Offical

Hi Kathryn,

Thank you for your response and offering your availability to answer questions as I work through these comments. I will likely have several more before I am finished. My next question is: if the Town of Buckeye is the entity signing the FEMA forms, then what is the name of the engineer in Buckeye that I should use on the forms. And just to clarify, only Buckeye will be signing, therefore I can remove the form I provided for the FCD?

Thanks

Ricardo

-----Original Message-----
From: Kathryn Gross - FCDX [mailto:kag@mail.maricopa.gov]
Sent: Wednesday, July 12, 2006 12:00 PM
To: Ricardo Aguirre
Cc: Valerie Swick - FCDX
Subject: RE: Approved Thalwegs

Ricardo,

The thalwegs were essentially the major flow corridors that started above each fan and distributed through the fan surface. I believe the original intent was to provide a starting point for the Stage 3 delineation to ensure the full fan surface would be analyzed and that no major corridor would be missed during the delineation. The identification of the thalwegs also provided a framework ensuring the continuity of flow through the different developments. The District (myself and Valerie) agreed that the thalwegs determined by the engineers seemed reasonable and would provide the basis to begin the Stage 3 delineations.

Let me know if I have answered your questions. If you have a concern related to any of the delineation comments please feel free to let me know and we can discuss it.

Thanks,

Kathryn

-----Original Message-----
From: Ricardo Aguirre [mailto:Raguirre@cvlci.com]
Sent: Tuesday, July 11, 2006 5:39 PM
To: Kathryn Gross - FCDX
Cc: Valerie Swick - FCDX; Brian Rosenbaum; Charlie Potter; Doug Both; Chie Kondo
Subject: Approved Thalwegs

Hi Kathryn,

I am currently working through my response to JEFuller's comments, and I need you to provide me with information on the approved thalwegs. Specifically, I need to know how they are defined, who approved them, and the purpose of the thalweg delineation.

Please let me know as soon as you can.

Thanks,

Ricardo Aguirre, P.E.
Assistant Project Manager
Water Resources Department

Coe & Van Loo Consultants, Inc.
4550 North 12th Street
Phoenix, Arizona 85014

Office (602) 264-6831
Direct (602) 285-4788
FAX (602) 264-0928

Ricardo Aguirre

From: Kathryn Gross - FCDX [kag@mail.maricopa.gov]
Sent: Friday, July 21, 2006 4:17 PM
To: Ricardo Aguirre
Cc: Doug Both
Subject: RE: Contract number and TDN project manager

Since the fan delineations are being performed under the Sun Valley ADMP that is the information you need. FCD Contract number: FCD2004C049. Valerie Swick is the project manager.

-----Original Message-----
From: Ricardo Aguirre [mailto:Raguirre@cvlci.com]
Sent: Thursday, July 20, 2006 11:35 AM
To: Kathryn Gross - FCDX
Cc: Doug Both
Subject: Contract number and TDN project manager

Hi Kathryn,

I hope that you received all that you needed for Elianto Village 4.

Do you know if there is a FCD contract number for the TDNs? Also, who is the project manager for the Stage 3 TDN?

Thanks,

Ricardo Aguirre, P.E.
Assistant Project Manager
Water Resources Department

Coe & Van Loo Consultants, Inc.
4550 North 12th Street
Phoenix, Arizona 85014

Office (602) 264-6831
Direct (602) 285-4788
FAX (602) 264-0928

Ricardo Aguirre

From: Julie Cox - FCDX [jrc@mail.maricopa.gov]
Sent: Tuesday, July 25, 2006 9:24 AM
To: Ricardo Aguirre
Subject: RE: BSV ADMS

Ricardo,
I will check and advise.

Thank you
Julie

-----Original Message-----
From: Ricardo Aguirre [mailto:Raguirre@cvlci.com]
Sent: Monday, July 24, 2006 4:53 PM
To: Julie Cox - FCDX
Cc: Doug Both; Ryan Weed
Subject: RE: BSV ADMS

Julie,

I not sure if we are writing about the same thing. I am referring to the Hydrology submittal. The title of which you sent me is "Buckeye/Sun Valley Area Drainage Master Study Technical Data Notebook Volumes V-A1and V-A2: Area 3 Hydrology Report, PBS&J January 2006"

The Stage 3 Floodplain delineation is not what I am referring to.

When is the Hydrology going to be submitted? Or has it been submitted already? JE Fuller was wondering the answer to my question, too.

Please let me know.

Sorry if my e-mail was confusing.

Thanks for your help.

Ricardo

-----Original Message-----
From: Julie Cox - FCDX [mailto:jrc@mail.maricopa.gov]
Sent: Monday, July 24, 2006 4:42 PM
To: Ricardo Aguirre
Subject: RE: BSV ADMS

Ricardo,
There were no floodplains delineated in Area 3 as part of the ADMS. So those reports will not be submitted to FEMA.

Stage 3 Floodplain Delineations are being performed as part of the Sun Valley ADMP (JE Fuller 2006). These floodplains will be submitted to FEMA. I suggest you talk to Kathryn Gross about the timeline.

Thank you
Julie

-----Original Message-----
From: Ricardo Aguirre [mailto:Raguirre@cvlci.com]
Sent: Monday, July 24, 2006 3:35 PM
To: Julie Cox - FCDX
Subject: RE: BSV ADMS

Hi Julie,

I know that this report shows the date of January 2006. So does that mean that it has been submitted to FEMA? If not, please update me with the intended submittal date.

Thanks,

Ricardo

> -----Original Message-----
> **From:** Julie Cox - FCDX [mailto:jrc@mail.maricopa.gov]
> **Sent:** Wednesday, July 19, 2006 2:54 PM
> **To:** Ricardo Aguirre
> **Cc:** Kathryn Gross - FCDX
> **Subject:** BSV ADMS
>
> Ricardo,
> The title is as follows:
>
> Buckeye/Sun Valley Area Drainage Master Study Technical Data Notebook Volumes V-A1and V-A2: Area 3 Hydrology Report, PBS&J January 2006.
>
> Let me know if you need anything else.
>
> Thank you
> Julie 506-8401
>
>> -----Original Message-----
>> **From:** Kathryn Gross - FCDX
>> **Sent:** Wednesday, July 19, 2006 2:37 PM
>> **To:** Julie Cox - FCDX
>> **Subject:** FW: Community Offical
>>
>> Julie,
>>
>> It is the full hydrology report title from the study....Could you get that for him..
>>
>> Thanks,
>>
>> Kathryn
>> -----Original Message-----
>> **From:** Ricardo Aguirre [mailto:Raguirre@cvlci.com]
>> **Sent:** Wednesday, July 19, 2006 2:37 PM
>> **To:** Kathryn Gross - FCDX
>> **Subject:** RE: Community Offical
>>
>> Kathryn,

I'm sorry, I wasn't specific. I am looking for the formal title of the BSVADMS Hydrology report that JE Fuller told me will be sent to FEMA from the District. I did receive those e-mails you are referring to. Even though you and Julie aren't ready with the Area 3, can you still provide me with the report title.

Also, attached, please find the digital files that you requested in dgn format. If you need anything else, then please let me know.

Thanks

Ricardo

-----Original Message-----
From: Kathryn Gross - FCDX [mailto:kag@mail.maricopa.gov]
Sent: Wednesday, July 19, 2006 1:05 PM
To: Ricardo Aguirre
Cc: Valerie Swick - FCDX; Julie Cox - FCDX
Subject: RE: Community Offical

Ricardo,

Which reports are you specifically referring to? I presume it is all the BSVADMS products you need for support of Fan 37 (Piedmont Assessment and the Hydrology).

Regarding the report with the Piedmont Assessment, Valerie sent a message out on 7/11 stating that the digital version of the final report on cd (I think it might be a DVD) was ready for pick up. I noticed that the CVL copy has not been picked up. The signature across the seal was not included on that cd. I have since had Ayres send a signed and sealed title page. Valerie should be sending that email out soon but I can attach them to this email as well. We may still have some issues on the landform and stage 2 exhibits. We have recieved signed and sealed exhibits but they do not copy well.

The formal report name is: Buckeye/Sun Valley Area Drainage Master Study Technical Data Notebook Volume VII: Geomorphology Studies , Geomorphic Evaluation, and Landform Stability Assessments.

Regarding the Area 3 hydrology, based on a message I saw from Julie we are looking for a signed and sealed Area 3 to copy.

Julie, did we send them a cd with models and digital report?

Kathryn

-----Original Message-----
From: Ricardo Aguirre [mailto:Raguirre@cvlci.com]
Sent: Wednesday, July 19, 2006 11:43 AM
To: Kathryn Gross - FCDX
Cc: Julie Cox - FCDX; Doug Both; Charlie Potter; Brian Rosenbaum; Jonathan Fuller
Subject: RE: Community Offical

Hi Kathryn,

I will be sending you a digital file of your request some time today. In the mean time, I would like to know if their is a BSV ADMS final report (stamped by PE) available for me to reference in my Fan 37 TDN. If so, what is the correct title of the report, and can I pick up a copy?

Let me know.

Thanks,

Ricardo

-----Original Message-----
From: Kathryn Gross - FCDX [mailto:kag@mail.maricopa.gov]
Sent: Wednesday, July 12, 2006 4:42 PM
To: Ricardo Aguirre
Subject: RE: Community Offical

Thanks!

-----Original Message-----
From: Ricardo Aguirre [mailto:Raguirre@cvlci.com]
Sent: Wednesday, July 12, 2006 4:41 PM
To: Kathryn Gross - FCDX
Subject: RE: Community Offical

No problem. I will get working on it and let you know when it is ready.

-----Original Message-----
From: Kathryn Gross - FCDX [mailto:kag@mail.maricopa.gov]

Sent: Wednesday, July 12, 2006 4:32 PM
To: Ricardo Aguirre
Subject: RE: Community Offical

Richardo,

I am trying to develop a map for Lynn so she can get an idea where the fans are located and the associated clomrs that are coming in. If you could provide me with the digital limits for Village 4 and the clomr you have I believe on Fan 36 that would be great. I do not know which Village or phase that one is. Are there multiple phases per Village?

Let me know if you could provide anything.

Thanks,

Kathryn

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To: Kathryn Gross - FCDX
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Ricardo

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To: Ricardo Aguirre
Cc: Valerie Swick - FCDX
Subject: RE: Approved Thalwegs

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Sent: Tuesday, July 11, 2006 5:39 PM
To: Kathryn Gross - FCDX
Cc: Valerie Swick - FCDX; Brian Rosenbaum; Charlie Potter; Doug Both; Chie Kondo
Subject: Approved Thalwegs

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Thanks,

Ricardo Aguirre, P.E.
Assistant Project Manager
Water Resources
Department

Coe & Van Loo
Consultants, Inc.
4550 North 12th Street
Phoenix, Arizona 85014

Office (602) 264-6831
Direct (602) 285-4788
FAX (602) 264-0928

Federal Emergency Management Agency

Washington, D.C. 20472

MAR 3 0 2007

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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

Community: Maricopa County, AZ
Community No.: 040037

Dear Mr. Wilson:

This is in regard to a Letter of Map Revision (LOMR) request dated January 5, 2007, from Mr. Ricardo E. Aguirre, P.E., Coe & Van Loo Consultants, Inc., that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) evaluate the effects that updated flood hazard data for White Tank Mountains Fan Site 37A would have on the flood hazard information shown on the effective Flood Insurance Rate Map (FIRM) for your community. This LOMR request is referred to as Case No. 07-09-0574P and will affect FIRM panel 04013C1565 F for Maricopa County and Incorporated Areas, with the effective date of September 30, 2005. This letter is based on the best available flood hazard information and is intended to improve upon that shown on the effective FIRM.

We reviewed the submitted data enclosed in the application package (with appendixes) entitled "Approximate Flood Hazard Assessment for White Tank Fans – Alluvial Fan Site 37A (East of Sun Valley Parkway) – Technical Data Notebook," prepared for the Flood Control District of Maricopa County by Coe & Van Loo Consultants, Inc., dated October 12, 2006. We have determined that the submitted data meet the minimum floodplain management criteria of the National Flood Insurance Program (NFIP), but FEMA cannot issue a LOMR or Physical Map Revision at this time.

In accordance with Paragraph 60.3(b)(4) of the NFIP regulations (copy enclosed), we encourage your community to use the draft work map entitled "Figure 6B.12 – Stage 3 Floodplain Delineation Map," dated October 12, 2006, as the best available data for floodplain management purposes until such time as FEMA can physically revise the FIRM or issue a LOMR.

This letter is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the Special Flood Hazard Area, the area subject to inundation by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

If you have questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by calling the Director, Federal Insurance and Mitigation Division of FEMA in Oakland, California, at (510) 627-7175. If you have questions regarding this letter, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Engineering Management Section
Mitigation Division

For: William R. Blanton Jr., CFM, Chief
Engineering Management Section
Mitigation Division

Enclosure

cc: The Honorable David W. Wilcox
Mayor, Town of Buckeye

Mr. Timothy S. Phillips, P.E.
Chief Engineer and General Manager
Flood Control District of Maricopa County

Ms. Lynn M. Thomas, P.E., CFM
Technical Supervisor
Flood Control District of Maricopa County

Mr. Ted Collins, CFM
Principal Floodplain Coordinator
Flood Control District of Maricopa County

Mr. Scott Lowe, P.E.
Public Works Director
Town of Buckeye

Mr. Brian Cosson, CFM
NFIP Coordinator
Office of Dam Safety and Flood Mitigation
Arizona Department of Water Resources

Mr. Ricardo E. Aguirre, P.E.
Coe & Van Loo Consultants, Inc.

Federal Emergency Management Agency

Washington, D.C. 20472

MAR 3 0 2007

FLOOD CONTROL DISTRICT
RECEIVED
APR 0 5 '07

CH & GM	FINANCE
PIO	LANDS
ADMIN	O & M
REG	P & PM
ENG	FILE
CONTRACTS	

ROUTING LMT

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable David W. Wilcox
Mayor, Town of Buckeye
100 North Apache Road
Buckeye, AZ 85326

Community: Town of Buckeye, AZ
Community No.: 040039

Dear Mayor Wilcox:

This is in regard to a Letter of Map Revision (LOMR) request dated January 5, 2007, from Mr. Ricardo E. Aguirre, P.E., Coe & Van Loo Consultants, Inc., that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) evaluate the effects that updated flood hazard data for White Tank Mountains Fan Site 37A, would have on the flood hazard information shown on the effective Flood Insurance Rate Map (FIRM) for your community. This LOMR request is referred to as Case No. 07-09-0574P and will affect FIRM panels 04013C1545 H, 1565 F, and 2010 H, for Maricopa County and Incorporated Areas, with the effective date of September 30, 2005. This letter is based on the best available flood hazard information and is intended to improve upon that shown on the effective FIRM.

We reviewed the submitted data enclosed in the application package (with appendixes) entitled "Approximate Flood Hazard Assessment for White Tank Fans – Alluvial Fan Site 37A (East of Sun Valley Parkway) – Technical Data Notebook," prepared for the Flood Control District of Maricopa County by Coe & Van Loo Consultants, Inc., dated October 12, 2006. We have determined that the submitted data meet the minimum floodplain management criteria of the National Flood Insurance Program (NFIP), but FEMA cannot issue a LOMR or Physical Map Revision at this time.

In accordance with Paragraph 60.3(b)(4) of the NFIP regulations (copy enclosed), we encourage your community to use the draft work map entitled "Figure 6B.12 – Stage 3 Floodplain Delineation Map," dated October 12, 2006, as the best available data for floodplain management purposes until such time as FEMA can physically revise the FIRM or issue a LOMR.

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

If you have questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by calling the Director, Federal Insurance and Mitigation Division of FEMA in Oakland, California, at (510) 627-7175.

If you have questions regarding this letter, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Engineering Management Section
Mitigation Division

For: William R. Blanton Jr., CFM, Chief
Engineering Management Section
Mitigation Division

cc: The Honorable Max Wilson
Chairman, Maricopa County
Board of Supervisors

Mr. Timothy S. Phillips, P.E.
Chief Engineer and General Manager
Flood Control District of Maricopa County

Ms. Lynn M. Thomas, P.E., CFM
Technical Supervisor
Flood Control District of Maricopa County

Mr. Ted Collins, CFM
Principal Floodplain Coordinator
Flood Control District of Maricopa County

Mr. Scott Lowe, P.E.
Public Works Director
Town of Buckeye

Mr. Brian Cosson, CFM
NFIP Coordinator
Office of Dam Safety and Flood Mitigation
Arizona Department of Water Resources

Mr. Ricardo E. Aguirre, P.E.
Coe & Van Loo Consultants, Inc.

NATIONAL FLOOD INSURANCE PROGRAM

FEMA NATIONAL SERVICE PROVIDER

FLOOD CONTROL DISTRICT
RECEIVED
FEB 12 '07
CH & GM | FINANCE
PIO | LANDS
ADMIN | O & M
Maricopa | P & PM
ENG | FLE
CONTRACTS
ROUTING

February 7, 2007

Mr. Ricardo Aguirre, P.E.
Assistant Project Manager
Cow & Van Loo Consultants, Inc.
4550 North 12th Street
Phoenix, AZ 85014-4291

IN REPLY REFER TO:
Case No.: 07-09-0574P
Communities: Town of Buckeye and Maricopa County, AZ
Community Nos.: 040039 and 040037

316-ACK

Dear Mr. Aguirre:

This responds to your request dated January 2, 2007, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	White Tanks Piedmont
Flooding Source:	White Tank Mountains Fan 37
FIRM Panel(s) Affected:	04013C2010H, 1545H, and 1565H

We have completed an inventory of the items you submitted. Our review of the submitted data indicates we have the minimum data required to perform a detailed technical review of your request. If additional data are required or if delays are encountered, we will inform you within 60 days of the date of this letter.

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 is 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.

Please direct questions concerning your request to us at the address shown at the bottom of this page. For identification purposes, please include the case number referenced above on all correspondence.

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).

3601 Eisenhower Avenue, Alexandria, VA 22304-6425 PH:1-877-FEMA MAP FX: 703.960.9125

If you have specific questions concerning your request, please call the Revisions Coordinator for your State, Mounir Boudjemaa, M.S., who may be reached at (703) 960-8800, ext. 3012.

Sincerely,

Sheila M. Norlin, CFM
National LOMC Manager
Michael Baker Jr., Inc.

cc: Mr. Timothy S. Phillips, P.E.
Chief Engineer and General Manager
Flood Control District of Maricopa County

Ms. Lynn M. Thomas, P.E., C.F.M.
Technical Supervisor
Flood Control District of Maricopa County

Mr. Ted Collins, CFM
Principal Floodplain Coordinator
Flood Control District of Maricopa County

Mr. Scott Lowe, P.E.
Public Works Director
Town of Buckeye

Mr. Brian Cosson, CFM
NFIP Coordinator
Arizona Department of Water Resources

Flood Control District
of Maricopa County

www.fcd.maricopa.gov
2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
Fax: 602-506-4601
TT: 602-505-5897

Board of Directors
Fulton Brock, District 1
Don Stapley, District 2
Andrew Kunasek, District 3
Max Wilson, District 4
Mary Rose Wilcox, District 5

November 27, 2006

Mr. Scott W. Lowe, P.E.
Public Works Director
Town of Buckeye
508 East Monroe
Buckeye, Arizona 85326

SUBJECT: FAC06-033 (Floodplain Delineation Study for White Tanks Fan #37a - Buckeye, AZ)

Dear Mr. Lowe:

We have completed our review of the Technical Data Notebook prepared by Coe & Van Loo Consultants, Inc. dated October 2006 for request of a Letter of Map Revision to publish the floodplain delineation study results on the effective Flood Insurance Rate Maps and we believe the information is ready to submit to the Federal Emergency Management Agency (FEMA) to begin their review.

In addition, we have attached the required "Community Overview and Concurrence Form" for processing the request for the Letter of Map Revision from FEMA. We would ask for your assistance in signing the form or designate the community official who will act as the Floodplain Administrator for the Town of Buckeye. In order to expedite the FEMA review process, both the Flood Control assuming the Floodplain Management on behalf of the Town and the Town as the Floodplain Administrator must sign the Form prior to the submittal of a Letter of Map Revision, LOMR request to the Federal Emergency Management Agency. You may forward the Application for LOMR report or request that the applicant forward the report directly to the Federal Emergency Management Agency. We appreciate your assistance in maintaining both the Town's and the District's good standing in the National Flood Insurance Program.

If you have any questions or if I can be of further assistance, please feel free to contact me at (602) 506-4779.

Sincerely,

Lynn M. Thomas

Lynn M. Thomas, P.E., CFM
Principal Engineer
Floodplain Management Branch, Regulatory Division

Copy to: Ricardo Aguirre, Coe & Van Loo Consultants, Inc.
Brian Rosenbaum, Lennar Communities Development
Woodrow C. Scoutten, W. C. Scoutten Inc.

APPENDIX C

Survey Field Notes

APPENDIX C: SURVEY FIELD NOTES

C.1 Survey field notes for aerial mapping control

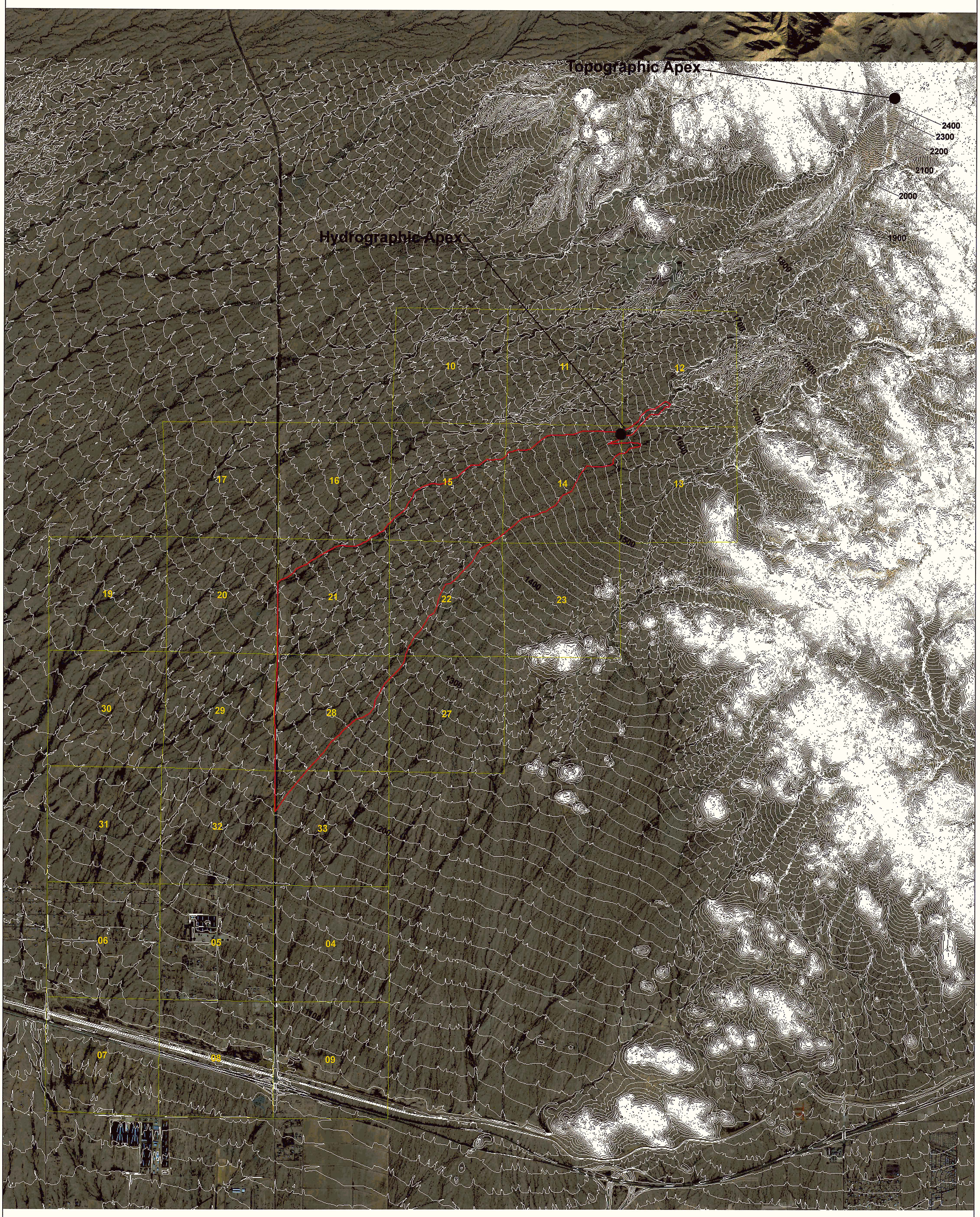
No survey field notes have been provided. The topographic mapping and aerial photography was provided by Landata Airborne Systems of Irvine California, under contract with the FCDMC in 2000/2001. The flight dates for the mapping were 12-16-00, 12-17-00, and 12-27-00. The topographic mapping was prepared by photogrammetric methods to national map accuracy standards for 1-inch equals 500 feet with a 10-foot contour interval.

C.2 Survey field notes for hydrologic modeling

No topographic survey data was collected for hydrologic modeling.

C.3 Survey field notes for hydraulic modeling

No topographic survey data was collected for hydraulic modeling. Cross-sections were taken using the 10-foot contour intervals mentioned in C.1 of this Appendix.



Topography on Aerial Photograph

COE & VAN LOO
PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE

4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264 - 6831

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

ALLUVIAL FAN SITE 37A (East of Sun Valley Parkway)

LEGEND

- Topography (10ft interval)
- Fan 37A (Outline)
- 14 Section

NOTE

Aerial Photography: Flood Control District of Maricopa County (2004)

Topography: Flood Control District of Maricopa County (2000/2001)

N

0 2,000 4,000 6,000 8,000 Feet

N:\720001\hydro\ArcMap\GIS projects\comment response\Fan37 AIA Figure 24x36 contour.mxd (10/10/06)

APPENDIX D

Hydrologic Analysis Supporting Documentation

CVL

The following information are excerpts from the Buckeye/Sun Valley Area Drainage Master Study Technical Data Notebook Volumes V-A1 and V-A2: Area 3 Hydrology Report, PBS&J, January 2006

FINAL REPORT

Geomorphic Evaluation and Landform Stability Assessment
Buckeye/Sun Valley Area Drainage Master Study

Contract No. FCD 2002C027

Prepared for:

Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Prepared by:
AYRES ASSOCIATES
3665 JFK Parkway
Building 2, Suite 200
Fort Collins, Colorado 80525

Electronic copy of final document, original sealed document with

REGISTERED GEOLOGIST
CERTIFICATE NO
39950
WILLIAM J. SPITZ
Date Signed
ARIZONA, U.S.A.

May 2005

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****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*            VERSION 4.1               *
*                                      *
*  RUN DATE   12OCT06  TIME  10:42:25  *
*                                      *
****************************************
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****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
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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
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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

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

  1           ID  Buckeye/Sun Valley ADMS - May 2005
  2           ID  Michael Baker Jr., Inc. - Modeler: Jacob Lesue
  3           ID  100-year 24-hour
  4           ID  Existing Conditions
  5           ID  Area 3 - Sub-basins L-R (Aluvial Fan updates)
  6           ID  Rainfall Loss Method - Green & Ampt
  7           ID  Unit Hydrograph Method - FCDMC S-Graph
  8           ID  Channel Routing Method - Normal Depth
  9           ID  Land Use - FCDMC GIS Data: mag_landuse (2000)
 10           ID  Soil Data - USDA SCS Soil Survey (1972 & 1981)
 11           ID  Units - L(mi)   Lca(mi)   S(ft/mi)   LAG(min)
              *DIAGRAM
 12           IT       5 01JAN94       0    2000
 13           IO       3
 14           IN      15 01JAN94       0
 15           JD    4.16    0.01
              * 24-hour distribution
 16           PC     0.0   0.002   0.005   0.008   0.011   0.014   0.017    0.02   0.023   0.026
 17           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056    0.06
 18           PC   0.064   0.068   0.072   0.076    0.08   0.085    0.09   0.095     0.1   0.105
 19           PC    0.11   0.115    0.12   0.126   0.133    0.14   0.147   0.155   0.163   0.172
 20           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 21           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 22           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 23           PC   0.913   0.918   0.922   0.926    0.93   0.934   0.938   0.942   0.946    0.95
 24           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977    0.98
 25           PC   0.983   0.986   0.989   0.992   0.995   0.998     1.0
 26           IN      15 01JAN94       0
 27           JD   3.952    10.0
              * 24-hour distribution
 28           PC     0.0   0.002   0.005   0.008   0.011   0.014   0.017    0.02   0.023   0.026
 29           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056    0.06
 30           PC   0.064   0.068   0.072   0.076    0.08   0.085    0.09   0.095     0.1   0.105
 31           PC    0.11   0.115    0.12   0.126   0.133    0.14   0.147   0.155   0.163   0.172
 32           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 33           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 34           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 35           PC   0.913   0.918   0.922   0.926    0.93   0.934   0.938   0.942   0.946    0.95
 36           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977    0.98
 37           PC   0.983   0.986   0.989   0.992   0.995   0.998     1.0
 38           IN      15 01JAN94       0
 39           JD   3.819    20.0
              * 24-hour distribution
 40           PC     0.0   0.002   0.005   0.008   0.011   0.014   0.017    0.02   0.023   0.026
 41           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056    0.06
 42           PC   0.064   0.068   0.072   0.076    0.08   0.085    0.09   0.095     0.1   0.105
 43           PC    0.11   0.115    0.12   0.126   0.133    0.14   0.147   0.155   0.163   0.172
 44           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 45           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 46           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 47           PC   0.913   0.918   0.922   0.926    0.93   0.934   0.938   0.942   0.946    0.95
 48           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977    0.98
 49           PC   0.983   0.986   0.989   0.992   0.995   0.998     1.0
 50           IN      15 01JAN94       0
 51           JD    3.69    40.0
              * 24-hour distribution
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  52          PC      0.0   0.002   0.005   0.008   0.011   0.014   0.017    0.02   0.023   0.026
  53          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056    0.06
  54          PC    0.064   0.068   0.072   0.076    0.08   0.085    0.09   0.095     0.1   0.105
  55          PC     0.11   0.115    0.12   0.126   0.133    0.14   0.147   0.155   0.163   0.172
  56          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
  57          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
  58          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
  59          PC    0.913   0.918   0.922   0.926    0.93   0.934   0.938   0.942   0.946    0.95
  60          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977    0.98
  61          PC    0.983   0.986   0.989   0.992   0.995   0.998     1.0
  62          IN       15 01JAN94       0
  63          JD    3.565    80.0
              * 24-hour distribution
  64          PC      0.0   0.002   0.005   0.008   0.011   0.014   0.017    0.02   0.023   0.026
  65          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056    0.06
  66          PC    0.064   0.068   0.072   0.076    0.08   0.085    0.09   0.095     0.1   0.105
  67          PC     0.11   0.115    0.12   0.126   0.133    0.14   0.147   0.155   0.163   0.172
  68          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
  69          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
  70          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
  71          PC    0.913   0.918   0.922   0.926    0.93   0.934   0.938   0.942   0.946    0.95
  72          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977    0.98
  73          PC    0.983   0.986   0.989   0.992   0.995   0.998     1.0
  74          IN       15 01JAN94       0
  75          JD    3.499   120.0
              * 24-hour distribution
  76          PC      0.0   0.002   0.005   0.008   0.011   0.014   0.017    0.02   0.023   0.026
  77          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056    0.06
  78          PC    0.064   0.068   0.072   0.076    0.08   0.085    0.09   0.095     0.1   0.105
  79          PC     0.11   0.115    0.12   0.126   0.133    0.14   0.147   0.155   0.163   0.172
  80          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
  81          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
  82          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
  83          PC    0.913   0.918   0.922   0.926    0.93   0.934   0.938   0.942   0.946    0.95
  84          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977    0.98
  85          PC    0.983   0.986   0.989   0.992   0.995   0.998     1.0

  86          KK       R1
  87          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
  88          KM    L=1.01      Lca=0.46      S=213.31      Kn=0.050      LAG=18.8
  89          KM    S-GRAPH TYPE=PHX MNT
  90          KO        0        0     0.0        1       22
  91          BA    0.284
  92          LG     0.35     0.35   4.358   0.374   8.387
              * R1
  93          UI      0.0    62.14  236.01  401.85  464.97  281.72   216.1  150.63  113.71   76.28
  94          UI    57.55    39.69   27.53   24.54    9.63    9.63    9.63    9.63     0.0

  95          KK      13R    CNAME       R
  96          KO        0        0     0.0        0       22
  97          RN      13R
```

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

 98           KK      M1
 99           KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
100           KM   L=5.19      Lca=2.41      S=230.06      Kn=0.050      LAG=66.8
101           KM   S-GRAPH TYPE=PHX MNT
102           KO       0        0     0.0        1       22
103           BA   5.686
104           LG    0.35     0.35   4.297     0.35   16.637
              * M1
105           UI     0.0   285.74   285.74   285.74   777.57 1062.36 1436.64 1746.69   1963.2   2166.6
106           UI  2402.0  2950.38  3432.01  2399.97  1965.75  1755.17  1651.21  1526.96   1413.1  1330.61
107           UI  1198.5  1122.73  1012.84   904.53   777.77   717.96   682.12   653.26   597.45   521.66
108           UI  469.43   394.74   365.11   349.25   312.95   312.95   266.95   219.07   219.07   219.07
109           UI  181.82   139.83   139.83   139.83   139.83   139.83    125.2    54.77    54.77    54.77
110           UI   54.77    54.77    54.77    54.77    54.77    54.77    54.77    54.77    54.77    54.77
111           UI   54.77    54.77      0.0

112           KK   M1-M2    CNAME      M2R
113           KO       0        0      0.0        0       22
114           RS      23     FLOW      0.0      0.0
115           RC    0.04     0.04   0.04534769.89   0.0133      0.0
              * M1-M2
116           RX     0.0    961.0   1028.0   1051.0   1136.0   1153.0   1193.0   1900.0
117           RY    15.5     12.0     11.8     10.3     10.0     11.0     11.2     15.5

118           KK      M2
119           KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
120           KM   L=6.59      Lca=3.00      S=71.62      Kn=0.050      LAG=100.2
121           KM   S-GRAPH TYPE=DES RNGLND
122           KO       0        0      0.0        1       22
123           BA   7.436
124           LG    0.35     0.35   3.959    0.445    0.291
              * M2
125           UI     0.0   250.38   250.38   250.38   250.38   438.17   719.85   924.82  1114.75  1312.86
126           UI  1497.2   1700.9  1779.05  2056.71  2161.12  2246.81  2290.07  2399.49  2399.49  2399.49
127           UI  2351.5  2259.21  2219.84  2074.04  1858.21  1745.08  1567.89  1438.64  1323.61  1214.96
128           UI  1118.4  1022.47   940.03   874.15   767.84   718.48   685.57   569.22    559.1   484.22
129           UI  472.03   435.02   383.92   383.92   334.13   265.38   265.38   265.38   257.86   171.39
130           UI  171.39   171.39   171.39   171.39   171.39   131.63    60.94    60.94    60.94    60.94
131           UI   60.94    60.94    60.94    60.94    60.94    60.94    60.94    60.94    60.94    60.94
132           UI   60.94    60.94    60.94    60.94      0.0

133           KK       M    CNAME       5R
134           KO       0        0      0.0        0       22
135           HC       2

136           KK      5R    CNAME        M
137           KO       0        0      0.0        0       22
138           RN      5R
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 139          KK      N1
 140          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 141          KM   L=2.79      Lca=1.44      S=340.38      Kn=0.050      LAG=39.7
 142          KM   S-GRAPH TYPE=PHX MNT
 143          KO       0        0      0.0        1       22
 144          BA   1.524
 145          LG    0.35     0.35    4.075    0.419     8.38
              * N1
 146          UI     0.0   128.28   166.77   436.68   697.63   885.37 1048.86 1439.85 1097.59   811.01
 147          UI  717.89   633.24   554.41   482.34   398.71   327.22   300.33   268.08   210.75   167.66
 148          UI  152.68    140.5   106.78    98.35    84.12    62.78    62.78    62.78    38.34    24.59
 149          UI   24.59    24.59    24.59    24.59    24.59    24.59    24.59      0.0

 150          KK   N1-N2    CNAME     N2R
 151          KO       0        0      0.0        0       22
 152          RS      20     FLOW      0.0      0.0
 153          RC    0.05    0.047    0.0525647.52   0.0115      0.0
              * N1-N2
 154          RX     0.0    280.0    350.0    358.0    367.0    381.0    451.0    730.0
 155          RY    17.0     13.0     11.5     10.0     10.0     11.5     13.0     17.0

 156          KK      N2
 157          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 158          KM   L=5.64      Lca=3.27      S=170.14      Kn=0.055      LAG=90.7
 159          KM   S-GRAPH TYPE=PHX MNT
 160          KO       0        0      0.0        1       22
 161          BA   3.325
 162          LG    0.35     0.35    4.117    0.405     2.67
              * N2
 163          UI     0.0   123.04   123.04   123.04   123.04   310.82   395.95   496.74   616.35   730.85
 164          UI  796.45   869.05   928.56   990.24  1125.95  1316.06  1517.94  1186.36   925.57   834.34
 165          UI  764.31   726.51   694.11   654.42    619.9   586.86   557.14   517.77   491.74    466.8
 166          UI  422.37   387.25    352.0   325.27   302.29   296.75   282.99   272.23   257.26   234.33
 167          UI  202.13   202.13   163.14   157.22   157.22   143.92   134.76   134.76   134.76   103.63
 168          UI   94.33    94.33    94.33    94.33    83.75    60.21    60.21    60.21    60.21    60.21
 169          UI   60.21    60.21    60.21    32.52    23.58    23.58    23.58    23.58    23.58    23.58
 170          UI   23.58    23.58    23.58    23.58    23.58    23.58    23.58    23.58    23.58    23.58
 171          UI   23.58    23.58    23.58    23.58    23.58

 172          KK       N    CNAME      8R
 173          KO       0        0      0.0        0       22
 174          HC       2

 175          KK      8R    CNAME       N
 176          KO       0        0      0.0        0       22
 177          RN      8R

 178          KK     P1A
 179          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 180          KM   L=2.28      Lca=1.41      S=461.40      Kn=0.055      LAG=37.8
 181          KM   S-GRAPH TYPE=PHX MNT
 182          KO       0        0      0.0        1       22
 183          BA     0.5
 184          LG    0.35     0.35    3.987    0.405   16.364
              * P1A
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 185          UI      0.0   44.27   65.19   161.0  254.76  318.08  389.84  500.04  319.07  264.12
 186          UI   232.17  203.71  176.98  147.14  118.21  105.19   95.13   74.96   59.42   52.89
 187          UI    48.49   35.98   33.94   26.82   21.67   21.67   21.56    8.49    8.49    8.49
 188          UI     8.49    8.49    8.49    8.49    8.49    8.49

 189          KK  P1A-1B   CNAME    P1BR
 190          KO       0       0     0.0       0      22
 191          RS      19    FLOW     0.0     0.0
 192          RC    0.05   0.047    0.0520102.87  0.0111     0.0
              * P1A-P1B
 193          RX     0.0   280.0   350.0   358.0   367.0   381.0   451.0   730.0
 194          RY    17.0    13.0    11.5    10.0    10.0    11.5    13.0    17.0

 195          KK     P1B
 196          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 197          KM   L=4.39     Lca=2.32     S=70.84     Kn=0.055     LAG=85.3
 198          KM   S-GRAPH TYPE=PHX MNT
 199          KO       0       0     0.0       1      22
 200          BA   1.937
 201          LG    0.35    0.35    4.23   0.393   4.667
              * P1B
 202          UI     0.0   76.72   76.72   76.72   89.67  220.58  274.25  335.86  432.98  478.15
 203          UI  527.91  570.85  609.55  688.62  814.07   942.3  716.43   568.2  506.83  467.32
 204          UI   446.8  421.86  394.79  374.39  356.44  329.11  309.33  293.98  263.37  241.82
 205          UI  216.83  200.89  187.72  181.75  176.46  163.15  160.42  127.42  126.04   109.8
 206          UI   98.03   98.03   90.75   84.03   84.03   84.03   60.08   58.82   58.82   58.82
 207          UI   58.82   40.74   37.54   37.54   37.54   37.54   37.54   37.54   37.54    17.9
 208          UI   14.71   14.71   14.71   14.71   14.71   14.71   14.71   14.71   14.71   14.71
 209          UI   14.71   14.71   14.71   14.71   14.71   14.71   14.71   14.71   14.71     0.0

 210          KK       P   CNAME     12R
 211          KO       0       0     0.0       0      22
 212          HC       2

 213          KK     12R   CNAME       P
 214          KO       0       0     0.0       0      22
 215          RN     12R

 216          KK      O1
 217          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 218          KM   L=5.20     Lca=2.79     S=64.07     Kn=0.055     LAG=99.9
 219          KM   S-GRAPH TYPE=PHX MNT
 220          KO       0       0     0.0       1      22
 221          BA   3.088
 222          LG    0.35    0.35   4.191   0.393   2.105
              * O1
 223          UI     0.0  103.98  103.98  103.98  103.98  181.97  298.95  378.66  446.43  550.06
 224          UI  624.46  676.83  731.54  781.25  824.52  905.38 1042.04 1204.77  1242.7  887.05
 225          UI   765.3   690.9  643.35  614.88  590.49  558.55  530.78  506.48  485.09  454.93
 226          UI  429.36  410.34   388.6  356.95  326.56   302.9  274.89  260.97  254.42  242.21
 227          UI  239.16  221.76  217.42  189.46  170.83  170.83  140.46  132.86  132.86  129.07
 228          UI  113.88  113.88  113.88  113.88   79.72   79.72   79.72   79.72   79.72   79.72
 229          UI   50.88   50.88   50.88   50.88   50.88   50.88   50.88   50.88   50.88   32.31
 230          UI   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93
 231          UI   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 232          UI   19.93   19.93   19.93     0.0

 233          KK      7R   CNAME       O
 234          KO       0       0     0.0       0      22
 235          RN      7R

 236          KK     Q1A
 237          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 238          KM   L=3.13     Lca=1.52     S=256.86     Kn=0.055     LAG=49.3
 239          KM   S-GRAPH TYPE=PHX MNT
 240          KO       0       0     0.0       1      22
 241          BA   1.297
 242          LG    0.35    0.35   4.127     0.4    11.2
              * Q1A
 243          UI     0.0   89.12   89.12  213.78  363.94  517.41  613.88  697.52  873.62 1020.97
 244          UI  663.18  556.48  506.64  454.84  413.29  367.46  326.01  281.03  232.04  214.37
 245          UI  199.35   177.4  146.41  118.69  112.45   97.61   96.73   68.33   68.33    66.1
 246          UI   43.61   43.61   43.61   43.61   30.77   17.08   17.08   17.08   17.08   17.08
 247          UI   17.08   17.08   17.08   17.08   17.08   17.08     0.0

 248          KK  Q1A-1B   CNAME    Q1BR
 249          KO       0       0     0.0       0      22
 250          RS       8    FLOW     0.0     0.0
 251          RC    0.05   0.047    0.05 9170.53  0.0117     0.0
              * Q1A-Q1B
 252          RX     0.0   280.0   350.0   358.0   367.0   381.0   451.0   730.0
 253          RY    17.0    13.0    11.5    10.0    10.0    11.5    13.0    17.0

 254          KK     Q1B
 255          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 256          KM   L=2.35     Lca=1.14     S=141.40     Kn=0.055     LAG=44.3
 257          KM   S-GRAPH TYPE=PHX MNT
 258          KO       0       0     0.0       1      22
 259          BA   0.937
 260          LG    0.35    0.35    4.32   0.373  14.815
              * Q1B
 261          UI     0.0   71.67   71.67  221.51  340.68  455.79   538.5  651.95  833.61  538.15
 262          UI  443.72  398.92  355.79  316.26  280.46  235.89  196.37  173.35  160.17  138.81
 263          UI  114.82   91.58   84.67    78.5   62.48   54.95   54.15   35.07   35.07   35.07
 264          UI   35.07   15.79   13.74   13.74   13.74   13.74   13.74   13.74   13.74   13.74
 265          UI   13.74     0.0

 266          KK       Q   CNAME     14R
 267          KO       0       0     0.0       0      22
 268          HC       2

 269          KK     14R   CNAME       Q
 270          KO       0       0     0.0       0      22
 271          RN     14R
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 272          KK      L1
 273          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 274          KM   L=4.93     Lca=2.29     S=308.27     Kn=0.050     LAG=60.6
 275          KM   S-GRAPH TYPE=PHX MNT
 276          KO       0       0     0.0       1      22
 277          BA   3.546
 278          LG   0.271   0.318   4.363   0.351  16.279
              * L1
 279          UI     0.0  195.74  195.74  266.93  603.63  823.25 1120.55 1287.08 1452.32 1611.07
 280          UI  1991.3 2326.76 1575.06 1312.31 1173.43 1097.39 1002.28  929.54   850.5  775.66
 281          UI  701.22  620.51  525.99  484.91  458.87  430.63  397.34  321.57  290.98  250.11
 282          UI  241.82  214.38  214.38  171.29  150.06  150.06  149.52   95.79   95.79   95.79
 283          UI   95.79   95.79    79.7   37.52   37.52   37.52   37.52   37.52   37.52   37.52
 284          UI   37.52   37.52   37.52   37.52   37.52   37.52   37.52     0.0

 285          KK  L1-L2A   CNAME    L2AR
 286          KO       0       0     0.0       0      22
 287          RS       3    FLOW     0.0     0.0
 288          RC   0.046   0.045   0.046 7078.75  0.0174     0.0
              * L1-L2A
 289          RX     0.0    80.0   165.0   200.0   215.0   255.0   340.0   420.0
 290          RY    19.0    17.0    14.0    10.0    10.0    14.0    18.0    22.0

 291          KK     L2A
 292          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 293          KM   L=2.46     Lca=1.12     S=136.18     Kn=0.055     LAG=45.0
 294          KM   S-GRAPH TYPE=DES RNGLND
 295          KO       0       0     0.0       1      22
 296          BA   0.693
 297          LG    0.35   0.384   5.641   0.202     0.0
              * L2A
 298          UI     0.0   51.83   51.83  153.34  242.24  330.72  404.46  460.56  494.88  492.21
 299          UI  461.36  394.37  327.78  266.87  221.69  182.72  150.08  121.91  100.64   84.23
 300          UI   69.92   54.93   46.45   35.48   35.48   26.06   12.61   12.61   12.61   12.61
 301          UI   12.61   12.61   12.61   12.61

 302          KK    L2BR   CNAME  L2A-2B
 303          KO       0       0     0.0       0      22
 304          HC       2

 305          KK  L2A-2B   CNAME    L2BR
 306          KO       0       0     0.0       0      22
 307          RS       7    FLOW     0.0     0.0
 308          RC   0.046   0.045   0.04620743.37  0.0147     0.0
              * L2A-L2B
 309          RX     0.0    80.0   165.0   200.0   215.0   255.0   340.0   420.0
 310          RY    19.0    17.0    14.0    10.0    10.0    14.0    18.0    22.0

 311          KK     L2B
 312          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 313          KM   L=5.13     Lca=1.82     S=93.37     Kn=0.055     LAG=78.1
 314          KM   S-GRAPH TYPE=DES RNGLND
 315          KO       0       0     0.0       1      22
 316          BA   4.077
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 317          LG    0.35    0.35   4.179   0.399     0.0
              * L2B
 318          UI     0.0  175.97  175.97  175.97  311.91  535.45  724.28   902.8 1071.35 1224.63
 319          UI  1376.8 1511.61 1580.95 1658.53 1686.39 1686.39 1632.48 1568.59 1460.56 1278.33
 320          UI  1172.5 1030.99  927.32  829.82  742.49   663.7  594.61  529.93  481.83   405.6
 321          UI   377.6  331.75  310.22  269.82  269.19  186.51  186.51  186.51   145.4  120.46
 322          UI  120.46  120.46  120.46    90.9   42.83   42.83   42.83   42.83   42.83   42.83
 323          UI   42.83   42.83   42.83   42.83   42.83   42.83   42.83   42.83     0.0

 324          KK     L3R   CNAME  L2B-L3
 325          KO       0       0     0.0       0      22
 326          HC       2

 327          KK  L2B-L3   CNAME     L3R
 328          KO       0       0     0.0       0      22
 329          RS      18    FLOW     0.0     0.0
 330          RC    0.05    0.04    0.0619942.62  0.0089     0.0
              * L2B-L3
 331          RX     0.0  1093.0  1210.0  1215.0  1225.0  1232.0  1372.0  2000.0
 332          RY    18.0    11.8    11.7    10.0    10.0    11.7    11.8    18.0

 333          KK     L2C
 334          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 335          KM   L=3.20     Lca=1.55     S=91.31     Kn=0.055     LAG=61.2
 336          KM   S-GRAPH TYPE=DES RNGLND
 337          KO       0       0     0.0       1      22
 338          BA   1.328
 339          LG    0.35    0.35   4.189   0.422     0.0
              * L2C
 340          UI     0.0   73.31   73.31   99.98  227.13  318.43   414.0  500.47   577.1  643.23
 341          UI  678.82  702.58  699.63  666.25  621.66  533.29  468.31  402.86  351.31  303.79
 342          UI   266.7  226.83  200.74  164.03  144.98  131.86  112.41   97.97    77.7    77.7
 343          UI   56.55   50.18   50.18   50.18   28.53   17.84   17.84   17.84   17.84   17.84
 344          UI   17.84   17.84   17.84   17.84   17.84     0.0

 345          KK  L2C-2D   CNAME    L2DR
 346          KO       0       0     0.0       0      22
 347          RS       6    FLOW     0.0     0.0
 348          RC   0.046   0.045   0.046 9752.35  0.0122     0.0
              * L2C-L2D
 349          RX     0.0    80.0   165.0   200.0   215.0   255.0   340.0   420.0
 350          RY    19.0    17.0    14.0    10.0    10.0    14.0    18.0    22.0

 351          KK     L2D
 352          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 353          KM   L=2.77     Lca=1.24     S=74.13     Kn=0.055     LAG=55.4
 354          KM   S-GRAPH TYPE=DES RNGLND
 355          KO       0       0     0.0       1      22
 356          BA   1.232
 357          LG    0.35    0.35   3.578   0.544     0.0
              * L2D
 358          UI     0.0   75.42   75.42  141.88  262.35  378.71  482.07  569.62  651.08   696.0
 359          UI  722.74  714.79  677.77  607.49  518.22  439.07   376.3  322.28  277.17  232.67
 360          UI  200.55   167.8  142.18   124.1  114.53   79.93   79.93    61.7   51.62   51.62
 361          UI   51.62   20.09   18.36   18.36   18.36   18.36   18.36   18.36   18.36   18.36
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 362          UI   18.36     0.0

 363          KK    L3RB   CNAME  L2D-L3
 364          KO       0       0     0.0       0      22
 365          HC       2

 366          KK  L2D-L3   CNAME    L3RB
 367          KO       0       0     0.0       0      22
 368          RS      39    FLOW     0.0     0.0
 369          RC    0.05    0.04    0.06 27374.0  0.0077     0.0
              * L2D-L3
 370          RX     0.0  1093.0  1210.0  1215.0  1225.0  1232.0  1372.0  2000.0
 371          RY    18.0    11.8    11.7    10.0    10.0    11.7    11.8    18.0

 372          KK      L3
 373          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 374          KM   L=4.75     Lca=2.00     S=44.27     Kn=0.055     LAG=91.0
 375          KM   S-GRAPH TYPE=DES RNGLND
 376          KO       0       0     0.0       1      22
 377          BA   5.852
 378          LG   0.341   0.328    3.98   0.419    1.05
              * L3
 379          UI     0.0  216.51  216.51  216.51  216.51  546.97   701.8  899.01 1098.32 1266.32
 380          UI  1460.0  1557.8 1786.11 1888.64 1950.18 2034.93 2074.93 2074.93 2053.76  1965.5
 381          UI  1920.6 1789.17 1583.49 1486.07 1313.64 1207.78 1091.43  994.63  909.22  825.03
 382          UI   759.9  663.98  614.46  574.55  483.48  461.45  408.18  402.68  331.99  331.99
 383          UI  296.91  229.48  229.48  229.48  197.56  148.21  148.21  148.21  148.21  148.21
 384          UI  121.69    52.7    52.7    52.7    52.7    52.7    52.7    52.7    52.7    52.7
 385          UI    52.7    52.7    52.7    52.7    52.7    52.7    52.7     0.0

 386          KK       L   CNAME      1R
 387          KO       0       0     0.0       0      22
 388          HC       3

 389          KK      1R   CNAME       L
 390          KO       0       0     0.0       0      22
 391          RN      1R

 392          KK      Z1
 393          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 394          KM   L=1.70     Lca=0.66     S=47.00     Kn=0.055     LAG=39.1
 395          KM   S-GRAPH TYPE=DES RNGLND
 396          KO       0       0     0.0       1      22
 397          BA   0.664
 398          LG   0.321   0.292   4.004    0.43   2.909
              * Z1
 399          UI     0.0   57.36   79.52  205.33  321.78  424.03  504.07   545.2  540.96  493.73
 400          UI  399.49  319.19  256.28   205.1  164.91  127.66  104.64   87.86    60.8    54.1
 401          UI   39.27   39.27    21.8   13.96   13.96   13.96   13.96   13.96   13.96     0.0
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 402          KK      4R   CNAME       Z
 403          KO       0       0     0.0       0      22
 404          RN      4R
 405          ZZ
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SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW
  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   86          R1
                V
                V
    5          13R
                .
                .
   98           .          M1
                .           V
                .           V
  112           .       M1-M2
                .           .
                .           .
  118           .           .          M2
                .           .           .
                .           .           .
  133           .           M............
                .           V
                .           V
  136           .          5R
                .           .
                .           .
  139           .           .          N1
                .           .           V
                .           .           V
  150           .           .       N1-N2
                .           .           .
                .           .           .
  156           .           .           .          N2
                .           .           .           .
                .           .           .           .
  172           .           .           N............
                .           .           V
                .           .           V
  175           .           .          8R
                .           .           .
                .           .           .
  178           .           .           .         P1A
                .           .           .           V
                .           .           .           V
  189           .           .           .      P1A-1B
                .           .           .           .
                .           .           .           .
  195           .           .           .           .         P1B
                .           .           .           .           .
                .           .           .           .           .
   10           .           .           .           P............
                .           .           .           V
                .           .           .           V
  213           .           .           .         12R
                .           .           .           .
                .           .           .           .
  216           .           .           .           .          O1
                .           .           .           .           V
                .           .           .           .           V
  233           .           .           .           .          7R
                .           .           .           .           .
                .           .           .           .           .
  236           .           .           .           .           .         Q1A
                .           .           .           .           .           V
                .           .           .           .           .           V
  248           .           .           .           .           .      Q1A-1B
                .           .           .           .           .           .
                .           .           .           .           .           .
  254           .           .           .           .           .           .         Q1B
                .           .           .           .           .           .           .
                .           .           .           .           .           .           .
  266           .           .           .           .           .           Q............
                .           .           .           .           .           V
                .           .           .           .           .           V
  269           .           .           .           .           .         14R
                .           .           .           .           .           .
                .           .           .           .           .           .
  272           .           .           .           .           .           .          L1
                .           .           .           .           .           .           V
                .           .           .           .           .           .           V
  285           .           .           .           .           .           .      L1-L2A
                .           .           .           .           .           .           .
                .           .           .           .           .           .           .
  291           .           .           .           .           .           .           .         L2A
                .           .           .           .           .           .           .           .
                .           .           .           .           .           .           .           .
  302           .           .           .           .           .           .       L2BR............
                .           .           .           .           .           .           V
                .           .           .           .           .           .           V
    5           .           .           .           .           .           .      L2A-2B
                .           .           .           .           .           .           .
                .           .           .           .           .           .           .
  311           .           .           .           .           .           .           .         L2B
                .           .           .           .           .           .           .           .
                .           .           .           .           .           .           .           .
  324           .           .           .           .           .           .         L3R............
                .           .           .           .           .           .           V
                .           .           .           .           .           .           V
  327           .           .           .           .           .           .      L2B-L3
                .           .           .           .           .           .           .
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333                                                  L2C
                                                       V
                                                       V
345                                               L2C-2D
                                                       .
                                                       .
351                                                    .          L2D
                                                       .            .
                                                       .            .
3                                                 L3RB............
                                                       V
                                                       V
366                                               L2D-L3
                                                       .
                                                       .
372                                                    .           L3
                                                       .            .
                                                       .            .
386                                                  L.......................
                                                     V
                                                     V
389                                                  1R
                                                       .
                                                       .
392                                                    .         Z1
                                                       .          V
                                                       .          V
402                                                    .         4R
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN  1998               *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   12OCT06  TIME  10:42:25  *
*                                      *
****************************************
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****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
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                    Buckeye/Sun Valley ADMS - May 2005
                    Michael Baker Jr., Inc. - Modeler: Jacob Lesue
                    100-year 24-hour
                    Existing Conditions
                    Area 3 - Sub-basins L-R (Aluvial Fan updates)
                    Rainfall Loss Method - Green & Ampt
                    Unit Hydrograph Method - FCDMC S-Graph
                    Channel Routing Method - Normal Depth
                    Land Use - FCDMC GIS Data: mag_landuse (2000)
                    Soil Data - USDA SCS Soil Survey (1972 & 1981)
                    Units - L(mi)   Lca(mi)   S(ft/mi)   LAG(min)

13 IO        OUTPUT CONTROL VARIABLES
                IPRNT          3  PRINT CONTROL
                IPLOT          0  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE

14 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN         15  TIME INTERVAL IN MINUTES
               JXDATE     1JAN94  STARTING DATE
               JXTIME          0  STARTING TIME

26 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN         15  TIME INTERVAL IN MINUTES
               JXDATE     1JAN94  STARTING DATE
               JXTIME          0  STARTING TIME

38 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN         15  TIME INTERVAL IN MINUTES
               JXDATE     1JAN94  STARTING DATE
               JXTIME          0  STARTING TIME

50 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN         15  TIME INTERVAL IN MINUTES
               JXDATE     1JAN94  STARTING DATE
               JXTIME          0  STARTING TIME

   IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN         15  TIME INTERVAL IN MINUTES
               JXDATE     1JAN94  STARTING DATE
               JXTIME          0  STARTING TIME

74 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN         15  TIME INTERVAL IN MINUTES
               JXDATE     1JAN94  STARTING DATE
               JXTIME          0  STARTING TIME

   IT        HYDROGRAPH TIME DATA
                 NMIN          5  MINUTES IN COMPUTATION INTERVAL
                IDATE     1JAN94  STARTING DATE
                ITIME       0000  STARTING TIME
                   NQ       2000  NUMBER OF HYDROGRAPH ORDINATES
               NDDATE     7JAN94  ENDING DATE
               NDTIME       2235  ENDING TIME
               ICENT         19  CENTURY MARK

             COMPUTATION INTERVAL     .08 HOURS
                  TOTAL TIME BASE  166.58 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

15 JD        INDEX STORM NO. 1
                STRM        4.16  PRECIPITATION DEPTH
                TRDA         .01  TRANSPOSITION DRAINAGE AREA

16 PI          PRECIPITATION PATTERN
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
               .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
               .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
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.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

27 JD INDEX STORM NO. 2

STRM 3.95 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

28 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

JD INDEX STORM NO. 3

STRM 3.82 PRECIPITATION DEPTH

TRDA 20.00 TRANSPOSITION DRAINAGE AREA

40 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

51 JD INDEX STORM NO. 4

STRM 3.69 PRECIPITATION DEPTH

TRDA 40.00 TRANSPOSITION DRAINAGE AREA

52 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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                .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00
63 JD         INDEX STORM NO. 5
                STRM        3.57  PRECIPITATION DEPTH
                TRDA       80.00  TRANSPOSITION DRAINAGE AREA

64 PI           PRECIPITATION PATTERN
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00
75 JD         INDEX STORM NO. 6
                STRM        3.50  PRECIPITATION DEPTH
                TRDA      120.00  TRANSPOSITION DRAINAGE AREA

76 PI           PRECIPITATION PATTERN
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00
*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
86 KK         *         R1 *
              *            *
              **************
                        THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                        L=1.01     Lca=0.46     S=213.31     Kn=0.050     LAG=18.8
                        S-GRAPH TYPE=PHX MNT
```

```
 90 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

 91 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .28  SUBBASIN AREA

 92 LG          GREEN AND AMPT LOSS RATE
                     STRTL         .35  STARTING LOSS
                       DTH         .35  MOISTURE DEFICIT
                      PSIF        4.36  WETTING FRONT SUCTION
                     XKSAT         .37  HYDRAULIC CONDUCTIVITY
                     RTIMP        8.39  PERCENT IMPERVIOUS AREA

 91 UI          INPUT UNITGRAPH,  18 ORDINATES,  VOLUME = 1.00
                      .0      62.1     236.0     401.9     465.0     281.7     216.1     150.6     113.7      76.3
                    57.5      39.7      27.5      24.5       9.6       9.6       9.6       9.6

                                                                  ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       R1
                    TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    2.78, TOTAL EXCESS =    1.38

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   401.     12.25        (CFS)       39.         10.          3.           2.
                      (INCHES)     1.271       1.371       1.372        1.372
                       (AC-FT)       19.         21.         21.          21.

                      CUMULATIVE AREA =     .28 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       R1
                    TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.68, TOTAL EXCESS =    1.27

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   372.     12.25        (CFS)       36.         10.          3.           1.
                      (INCHES)     1.173       1.269       1.269        1.269
                       (AC-FT)       18.         19.         19.          19.

                      CUMULATIVE AREA =     .28 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       R1
                    TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.61, TOTAL EXCESS =    1.21

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   354.     12.25        (CFS)       34.          9.          3.           1.
                      (INCHES)     1.110       1.203       1.203        1.203
                       (AC-FT)       17.         18.         18.          18.

                      CUMULATIVE AREA =     .28 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       R1
                    TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.55, TOTAL EXCESS =    1.14

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   336.     12.25        (CFS)       32.          9.          3.           1.
                      (INCHES)     1.049       1.138       1.138        1.138
                       (AC-FT)       16.         17.         17.          17.

                      CUMULATIVE AREA =     .28 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       R1
                    TRANSPOSITION AREA     80.0 SQ MI

   TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.49, TOTAL EXCESS =    1.08

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
```

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 318.     12.25        (CFS)        30.          8.          3.          1.
                     (INCHES)      .988       1.075       1.075       1.075
                      (AC-FT)       15.         16.         16.         16.

                     CUMULATIVE AREA =     .28 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       R1
                   TRANSPOSITION AREA    120.0 SQ MI

  TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.45, TOTAL EXCESS =    1.05

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   309.     12.25        (CFS)        29.          8.          3.          1.
                     (INCHES)      .956       1.041       1.041       1.041
                      (AC-FT)       14.         16.         16.         16.

                     CUMULATIVE AREA =     .28 SQ MI

   ***            ***            ***            ***            ***


                     INTERPOLATED HYDROGRAPH AT       R1

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   387.     12.25        (CFS)        37.         10.          3.          1.
                     (INCHES)     1.223       1.322       1.322       1.322
                      (AC-FT)       19.         20.         20.         20.

                     CUMULATIVE AREA =     .28 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 95 KK    *      13R   *        CNAME       R
          *            *
          **************

 96 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

 97 RN          NO ROUTING

                                                                  ***

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      13R
                   TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   401.     12.25        (CFS)        39.         10.          3.          2.
                     (INCHES)     1.271       1.371       1.372       1.372
                      (AC-FT)       19.         21.         21.         21.

                     CUMULATIVE AREA =     .28 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      13R
                   TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   372.     12.25        (CFS)        36.         10.          3.          1.
                     (INCHES)     1.173       1.269       1.269       1.269
                      (AC-FT)       18.         19.         19.         19.

                     CUMULATIVE AREA =     .28 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      13R
                   TRANSPOSITION AREA     20.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   354.     12.25        (CFS)        34.          9.          3.          1.
                     (INCHES)     1.110       1.203       1.203       1.203
```

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                    (AC-FT)        17.          18.          18.          18.

                    CUMULATIVE AREA =      .28 SQ MI

    ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      13R
                    TRANSPOSITION AREA     40.0 SQ MI

 K FLOW     TIME                          MAXIMUM AVERAGE FLOW
(CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  336.     12.25       (CFS)       32.          9.          3.           1.
                    (INCHES)     1.049       1.138       1.138        1.138
                    (AC-FT)       16.         17.         17.          17.

                    CUMULATIVE AREA =      .28 SQ MI

    ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      13R
                    TRANSPOSITION AREA     80.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  318.      12.25       (CFS)       30.          8.          3.           1.
                    (INCHES)      .988       1.075       1.075        1.075
                    (AC-FT)       15.         16.         16.          16.

                    CUMULATIVE AREA =      .28 SQ MI

    ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      13R
                    TRANSPOSITION AREA    120.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  309.      12.25       (CFS)       29.          8.          3.           1.
                    (INCHES)      .956       1.041       1.041        1.041
                    (AC-FT)       14.         16.         16.          16.

                    CUMULATIVE AREA =      .28 SQ MI

    ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT      13R

 AK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  387.      12.25       (CFS)       37.         10.          3.           1.
                    (INCHES)     1.223       1.322       1.322        1.322
                    (AC-FT)       19.         20.         20.          20.

                    CUMULATIVE AREA =      .28 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 98 KK    *        M1  *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=5.19     Lca=2.41     S=230.06     Kn=0.050     LAG=66.8
                    S-GRAPH TYPE=PHX MNT

102 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

103 BA          SUBBASIN CHARACTERISTICS
                     TAREA        5.69  SUBBASIN AREA

 LG             GREEN AND AMPT LOSS RATE
                     STRTL         .35  STARTING LOSS
                       DTH         .35  MOISTURE DEFICIT
                      PSIF        4.30  WETTING FRONT SUCTION
                     XKSAT         .35  HYDRAULIC CONDUCTIVITY
                     RTIMP       16.64  PERCENT IMPERVIOUS AREA

103 UI          INPUT UNITGRAPH,  62 ORDINATES,  VOLUME = 1.00
                      .0     285.7     285.7     285.7     777.6    1062.4    1436.6    1746.7    1963.2    2166.6
                   2402.0    2950.4    3432.0    2400.0    1965.8    1755.2    1651.2    1527.0    1413.1    1330.6
                   1198.5    1122.7    1012.8     904.5     777.8     718.0     682.1     653.3     597.5     521.7
```

469.4	394.7	365.1	349.3	313.0	313.0	267.0	219.1	219.1	219.1
181.8	139.8	139.8	139.8	139.8	139.8	125.2	54.8	54.8	54.8
54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8	54.8
54.8	54.8								

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*** *** *** *** ***

HYDROGRAPH AT STATION M1
TRANSPOSITION AREA .0 SQ MI

TOTAL RAINFALL = 4.16, TOTAL LOSS = 2.51, TOTAL EXCESS = 1.65

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3529.	12.83	(CFS)	882.	252.	84.	36.
		(INCHES)	1.442	1.646	1.651	1.651
		(AC-FT)	437.	499.	501.	501.

CUMULATIVE AREA = 5.69 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M1
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.95, TOTAL LOSS = 2.41, TOTAL EXCESS = 1.54

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3281.	12.83	(CFS)	820.	235.	78.	34.
		(INCHES)	1.341	1.534	1.539	1.539
		(AC-FT)	407.	465.	467.	467.

CUMULATIVE AREA = 5.69 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M1
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 3.82, TOTAL LOSS = 2.35, TOTAL EXCESS = 1.47

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3122.	12.83	(CFS)	780.	224.	75.	32.
		(INCHES)	1.275	1.462	1.467	1.467
		(AC-FT)	387.	443.	445.	445.

CUMULATIVE AREA = 5.69 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M1
TRANSPOSITION AREA 40.0 SQ MI

TOTAL RAINFALL = 3.69, TOTAL LOSS = 2.29, TOTAL EXCESS = 1.40

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2966.	12.83	(CFS)	741.	213.	71.	31.
		(INCHES)	1.211	1.392	1.396	1.396
		(AC-FT)	367.	422.	423.	423.

CUMULATIVE AREA = 5.69 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M1
TRANSPOSITION AREA 80.0 SQ MI

TOTAL RAINFALL = 3.57, TOTAL LOSS = 2.24, TOTAL EXCESS = 1.33

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2815.	12.83	(CFS)	703.	202.	68.	29.
		(INCHES)	1.149	1.324	1.328	1.328
		(AC-FT)	348.	401.	403.	403.

CUMULATIVE AREA = 5.69 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M1
TRANSPOSITION AREA 120.0 SQ MI

TOTAL RAINFALL = 3.50, TOTAL LOSS = 2.21, TOTAL EXCESS = 1.29

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2734.	12.83	(CFS)	682.	197.	66.	28.
		(INCHES)	1.116	1.287	1.291	1.291
		(AC-FT)	338.	390.	392.	392.

CUMULATIVE AREA = 5.69 SQ MI

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***             ***             ***             ***             ***


                    INTERPOLATED HYDROGRAPH AT       M1

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   3301.      12.83        (CFS)     825.        236.         79.          34.
                         (INCHES)   1.349       1.543       1.548       1.548
                          (AC-FT)    409.        468.        469.        469.

                    CUMULATIVE AREA =    5.69 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 112 KK     *     M1-M2  *        CNAME     M2R
            *            *
            **************

 113 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

 114 RS          STORAGE ROUTING
                      NSTPS          23  NUMBER OF SUBREACHES
                       ITYP        FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

 115 RC          NORMAL DEPTH CHANNEL
                        ANL        .040  LEFT OVERBANK N-VALUE
                       ANCH        .040  MAIN CHANNEL N-VALUE
                        ANR        .045  RIGHT OVERBANK N-VALUE
                      RLNTH      34770.  REACH LENGTH
                        SEL       .0133  ENERGY SLOPE
                      ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
 117 RY        ELEVATION     15.50     12.00     11.80     10.30     10.00     11.00     11.20     15.50
 116 RX        DISTANCE        .00    961.00   1028.00   1051.00   1136.00   1153.00   1193.00   1900.00

                                                   ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00     10.04     31.85     55.84     83.80    124.04    176.33    247.15    348.50    479.21
          OUTFLOW        .00     14.90     93.45    224.24    409.05    667.47   1015.19   1494.80   2155.84   3041.09
        ELEVATION      10.00     10.29     10.58     10.87     11.16     11.45     11.74     12.03     12.32     12.61

          STORAGE     639.28    828.72   1047.51   1295.67   1573.20   1880.08   2216.32   2581.93   2976.90   3401.24
          OUTFLOW    4191.29   5643.45   7432.01   9589.48  12146.85  15133.83  18579.05  22510.24  26954.29  31937.40
        ELEVATION      12.89     13.18     13.47     13.76     14.05     14.34     14.63     14.92     15.21     15.50


    ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION    M1-M2
                  TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   2565.      14.67        (CFS)     877.        250.         84.          36.
                         (INCHES)   1.435       1.637       1.651       1.651
                          (AC-FT)    435.        497.        501.        501.

PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
     18.      14.67                    7.          2.          1.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
  (FEET)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   12.45      14.67                  11.41       10.64       10.23       10.10

                    CUMULATIVE AREA =    5.69 SQ MI


    ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION    M1-M2
                  TRANSPOSITION AREA     10.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   2377.      14.67        (CFS)     815.        233.         78.          34.
                         (INCHES)   1.332       1.526       1.539       1.539
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		(AC-FT)	404.	463.	467.	467.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
17.	14.67	6.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.39	14.67	11.37	10.63	10.22	10.10

CUMULATIVE AREA = 5.69 SQ MI

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HYDROGRAPH AT STATION M1-M2
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW	6-HR	24-HR	72-HR	166.58-HR
2256.	14.67	(CFS)	775.	222.	75.	32.
		(INCHES)	1.267	1.454	1.467	1.467
		(AC-FT)	384.	441.	445.	445.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
16.	14.67	6.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.35	14.67	11.34	10.62	10.22	10.09

CUMULATIVE AREA = 5.69 SQ MI

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HYDROGRAPH AT STATION M1-M2
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW	6-HR	24-HR	72-HR	166.58-HR
2135.	14.67	(CFS)	735.	212.	71.	31.
		(INCHES)	1.203	1.384	1.396	1.396
		(AC-FT)	365.	420.	423.	423.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
15.	14.67	6.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.31	14.67	11.31	10.61	10.21	10.09

CUMULATIVE AREA = 5.69 SQ MI

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HYDROGRAPH AT STATION M1-M2
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW	6-HR	24-HR	72-HR	166.58-HR
2022.	14.75	(CFS)	697.	201.	68.	29.
		(INCHES)	1.140	1.316	1.328	1.328
		(AC-FT)	346.	399.	403.	403.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
14.	14.75	6.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.26	14.75	11.28	10.60	10.21	10.09

CUMULATIVE AREA = 5.69 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M1-M2
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW	6-HR	24-HR	72-HR	166.58-HR
1963.	14.75	(CFS)	677.	196.	66.	28.
		(INCHES)	1.107	1.280	1.291	1.291
		(AC-FT)	336.	388.	392.	392.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
14.	14.75	5.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.23	14.75	11.27	10.59	10.21	10.09

CUMULATIVE AREA = 5.69 SQ MI

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                    INTERPOLATED HYDROGRAPH AT    M1-M2

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2392.     14.67        (CFS)      820.        235.         79.         34.
                       (INCHES)    1.341       1.535       1.548       1.548
                        (AC-FT)     407.        465.        469.        469.

                    CUMULATIVE AREA =    5.69 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
118 KK    *        M2  *
          *            *
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                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=6.59     Lca=3.00     S=71.62     Kn=0.050     LAG=100.2
                    S-GRAPH TYPE=DES RNGLND

122 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

123 BA          SUBBASIN CHARACTERISTICS
                      TAREA        7.44  SUBBASIN AREA

124 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .35  STARTING LOSS
                        DTH         .35  MOISTURE DEFICIT
                       PSIF        3.96  WETTING FRONT SUCTION
                      XKSAT         .44  HYDRAULIC CONDUCTIVITY
                      RTIMP         .29  PERCENT IMPERVIOUS AREA

 UI             INPUT UNITGRAPH,  74 ORDINATES,  VOLUME = 1.00
                        .0     250.4     250.4     250.4     250.4     438.2     719.8     924.8    1114.8    1312.9
                     1497.2    1700.9    1779.1    2056.7    2161.1    2246.8    2290.1    2399.5    2399.5    2399.5
                     2351.5    2259.2    2219.8    2074.0    1858.2    1745.1    1567.9    1438.6    1323.6    1215.0
                     1118.4    1022.5     940.0     874.2     767.8     718.5     685.6     569.2     559.1     484.2
                      472.0     435.0     383.9     383.9     334.1     265.4     265.4     265.4     257.9     171.4
                      171.4     171.4     171.4     171.4     171.4     131.6      60.9      60.9      60.9      60.9
                       60.9      60.9      60.9      60.9      60.9      60.9      60.9      60.9      60.9      60.9
                       60.9      60.9      60.9      60.9

                                                                  ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       M2
                    TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    3.08, TOTAL EXCESS =    1.08

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2558.     13.42        (CFS)      858.        216.         72.         31.
                       (INCHES)    1.072       1.079       1.080       1.080
                        (AC-FT)     425.        428.        428.        428.

                    CUMULATIVE AREA =    7.44 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       M2
                    TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.97, TOTAL EXCESS =     .99

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2337.     13.42        (CFS)      783.        197.         66.         28.
                       (INCHES)     .979        .985        .985        .985
                        (AC-FT)     388.        391.        391.        391.

                    CUMULATIVE AREA =    7.44 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       M2
                    TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.89, TOTAL EXCESS =     .93

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
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 (CFS)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
 2194.     13.42       (CFS)      735.        185.         62.          27.
                     (INCHES)     .918        .925        .925         .925
                      (AC-FT)     364.        367.        367.         367.

                   CUMULATIVE AREA =    7.44 SQ MI


   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       M2
                  TRANSPOSITION AREA     40.0 SQ MI

  TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.82, TOTAL EXCESS =     .87

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2054.     13.42       (CFS)      687.        173.         58.          25.
                     (INCHES)     .859        .865        .865         .865
                      (AC-FT)     341.        343.        343.         343.

                   CUMULATIVE AREA =    7.44 SQ MI


   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       M2
                  TRANSPOSITION AREA     80.0 SQ MI

  TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.76, TOTAL EXCESS =     .81

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1917.     13.42       (CFS)      641.        161.         54.          23.
                     (INCHES)     .801        .807        .807         .807
                      (AC-FT)     318.        320.        320.         320.

                   CUMULATIVE AREA =    7.44 SQ MI


   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       M2
                  TRANSPOSITION AREA    120.0 SQ MI

  TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.72, TOTAL EXCESS =     .78

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1844.     13.42       (CFS)      616.        155.         52.          22.
                     (INCHES)     .770        .776        .776         .776
                      (AC-FT)     306.        308.        308.         308.

                   CUMULATIVE AREA =    7.44 SQ MI

   ***            ***            ***            ***            ***


                  INTERPOLATED HYDROGRAPH AT       M2

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2347.     13.42       (CFS)      786.        198.         66.          29.
                     (INCHES)     .983        .989        .990         .990
                      (AC-FT)     390.        392.        392.         392.

                   CUMULATIVE AREA =    7.44 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
133 KK    *          M *        CNAME      5R
          *            *
          **************

134 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS

 HC         HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                          ***

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        M
                  TRANSPOSITION AREA       .0 SQ MI
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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3542.	14.50	(CFS)	1715.	466.	156.	67.
		(INCHES)	1.215	1.321	1.327	1.327
		(AC-FT)	850.	924.	929.	929.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3260.	14.50	(CFS)	1578.	430.	144.	62.
		(INCHES)	1.118	1.219	1.225	1.225
		(AC-FT)	783.	853.	857.	857.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3075.	14.58	(CFS)	1491.	407.	136.	59.
		(INCHES)	1.056	1.154	1.160	1.160
		(AC-FT)	739.	807.	811.	811.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2899.	14.58	(CFS)	1405.	384.	129.	56.
		(INCHES)	.995	1.090	1.095	1.095
		(AC-FT)	697.	763.	767.	767.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2734.	14.58	(CFS)	1321.	362.	121.	52.
		(INCHES)	.936	1.027	1.032	1.032
		(AC-FT)	655.	719.	723.	723.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2647.	14.58	(CFS)	1276.	351.	118.	51.
		(INCHES)	.904	.994	.999	.999
		(AC-FT)	633.	695.	699.	699.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT M

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3187.	14.50	(CFS)	1544.	421.	141.	61.
		(INCHES)	1.094	1.193	1.199	1.199
		(AC-FT)	766.	835.	839.	839.

CUMULATIVE AREA = 13.12 SQ MI

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          *            *
136 KK    *        5R  *        CNAME       M
          *            *
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137 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

138 RN          NO ROUTING

                                                                  ***

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       5R
                      TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  3542.     14.50        (CFS)     1715.        466.        156.         67.
                      (INCHES)     1.215       1.321       1.327        1.327
                       (AC-FT)      850.        924.        929.         929.

                      CUMULATIVE AREA =   13.12 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       5R
                      TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  3260.     14.50        (CFS)     1578.        430.        144.         62.
                      (INCHES)     1.118       1.219       1.225        1.225
                       (AC-FT)      783.        853.        857.         857.

                      CUMULATIVE AREA =   13.12 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       5R
                      TRANSPOSITION AREA     20.0 SQ MI

K FLOW        TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  3075.     14.58        (CFS)     1491.        407.        136.         59.
                      (INCHES)     1.056       1.154       1.160        1.160
                       (AC-FT)      739.        807.        811.         811.

                      CUMULATIVE AREA =   13.12 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       5R
                      TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2899.     14.58        (CFS)     1405.        384.        129.         56.
                      (INCHES)      .995       1.090       1.095        1.095
                       (AC-FT)      697.        763.        767.         767.

                      CUMULATIVE AREA =   13.12 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       5R
                      TRANSPOSITION AREA     80.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2734.     14.58        (CFS)     1321.        362.        121.         52.
                      (INCHES)      .936       1.027       1.032        1.032
                       (AC-FT)      655.        719.        723.         723.

                      CUMULATIVE AREA =   13.12 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       5R
                      TRANSPOSITION AREA    120.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2647.     14.58        (CFS)     1276.        351.        118.         51.
                      (INCHES)      .904        .994        .999         .999
                       (AC-FT)      633.        695.        699.         699.

                      CUMULATIVE AREA =   13.12 SQ MI
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***             ***             ***             ***             ***


                    INTERPOLATED HYDROGRAPH AT       5R

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  3187.     14.50        (CFS)     1544.        421.        141.          61.
                       (INCHES)    1.094       1.193       1.199        1.199
                        (AC-FT)     766.        835.        839.         839.

                    CUMULATIVE AREA =   13.12 SQ MI


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          *            *
139 KK    *        N1  *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=2.79     Lca=1.44     S=340.38     Kn=0.050     LAG=39.7
                    S-GRAPH TYPE=PHX MNT

143 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

144 BA          SUBBASIN CHARACTERISTICS
                      TAREA        1.52  SUBBASIN AREA

145 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .35  STARTING LOSS
                        DTH         .35  MOISTURE DEFICIT
                       PSIF        4.07  WETTING FRONT SUCTION
                      XKSAT         .42  HYDRAULIC CONDUCTIVITY
                      RTIMP        8.38  PERCENT IMPERVIOUS AREA

    UI          INPUT UNITGRAPH,  37 ORDINATES,  VOLUME = 1.00
                       .0     128.3     166.8     436.7     697.6     885.4    1048.9    1439.8    1097.6     811.0
                   717.9     633.2     554.4     482.3     398.7     327.2     300.3     268.1     210.8     167.7
                   152.7     140.5     106.8      98.3      84.1      62.8      62.8      62.8      38.3      24.6
                    24.6      24.6      24.6      24.6      24.6      24.6      24.6
                                                                   ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       N1
                    TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    2.81, TOTAL EXCESS =    1.35

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1282.     12.50        (CFS)      204.         55.         18.           8.
                       (INCHES)    1.243       1.344       1.345        1.345
                        (AC-FT)     101.        109.        109.         109.

                    CUMULATIVE AREA =    1.52 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       N1
                    TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.71, TOTAL EXCESS =    1.24

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1185.     12.50        (CFS)      188.         51.         17.           7.
                       (INCHES)    1.145       1.241       1.242        1.242
                        (AC-FT)      93.        101.        101.         101.

                    CUMULATIVE AREA =    1.52 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       N1
                    TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.64, TOTAL EXCESS =    1.18

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1122.     12.50        (CFS)      177.         48.         16.           7.
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                    (INCHES)      1.082       1.175       1.176       1.176
                     (AC-FT)       88.         95.         96.         96.

                    CUMULATIVE AREA =    1.52 SQ MI


    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       N1
                   TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.58, TOTAL EXCESS =    1.11

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1061.     12.50        (CFS)      167.         45.         15.          7.
                       (INCHES)     1.020       1.110       1.111       1.111
                        (AC-FT)      83.         90.         90.         90.

                    CUMULATIVE AREA =    1.52 SQ MI


    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       N1
                   TRANSPOSITION AREA     80.0 SQ MI

   TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.52, TOTAL EXCESS =    1.05

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1002.     12.50        (CFS)      157.         43.         14.          6.
                       (INCHES)      .960       1.046       1.047       1.047
                        (AC-FT)      78.         85.         85.         85.

                    CUMULATIVE AREA =    1.52 SQ MI


    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       N1
                   TRANSPOSITION AREA    120.0 SQ MI

   TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.48, TOTAL EXCESS =    1.02

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    970.     12.50        (CFS)      152.         41.         14.          6.
                       (INCHES)      .928       1.012       1.013       1.013
                        (AC-FT)      75.         82.         82.         82.

                    CUMULATIVE AREA =    1.52 SQ MI


    ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       N1

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1211.     12.50        (CFS)      192.         52.         17.          7.
                       (INCHES)     1.172       1.269       1.270       1.270
                        (AC-FT)      95.        103.        103.        103.

                    CUMULATIVE AREA =    1.52 SQ MI


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          *            *
150 KK    *     N1-N2  *        CNAME     N2R
          *            *
          **************

151 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

RS              STORAGE ROUTING
                      NSTPS          20  NUMBER OF SUBREACHES
                       ITYP        FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

153 RC          NORMAL DEPTH CHANNEL
                        ANL        .050  LEFT OVERBANK N-VALUE
                       ANCH        .047  MAIN CHANNEL N-VALUE
                        ANR        .050  RIGHT OVERBANK N-VALUE
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	RLNTH	25648.	REACH LENGTH
	SEL	.0115	ENERGY SLOPE
	ELMAX	.0	MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

CROSS-SECTION DATA

		--- LEFT OVERBANK ---		+ ------ MAIN CHANNEL		------- +	--- RIGHT OVERBANK ---		
155 RY	ELEVATION	17.00	13.00	11.50	10.00	10.00	11.50	13.00	17.00
154 RX	DISTANCE	.00	280.00	350.00	358.00	367.00	381.00	451.00	730.00

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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	2.54	6.25	11.13	17.19	27.12	44.50	69.34	101.64	142.76
OUTFLOW	.00	6.54	23.72	52.83	95.68	169.86	286.37	461.11	707.80	1024.91
ELEVATION	10.00	10.37	10.74	11.11	11.47	11.84	12.21	12.58	12.95	13.32
STORAGE	195.01	258.43	333.02	418.78	515.70	623.79	743.06	873.49	1015.09	1167.85
OUTFLOW	1452.39	2010.36	2715.16	3582.35	4626.84	5862.90	7304.30	8964.33	10855.88	12991.49
ELEVATION	13.68	14.05	14.42	14.79	15.16	15.53	15.89	16.26	16.63	17.00

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HYDROGRAPH AT STATION N1-N2
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
808.	14.08	(CFS)	204.	55.	18.	8.
		(INCHES)	1.242	1.342	1.345	1.345
		(AC-FT)	101.	109.	109.	109.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
6.	14.08	2.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.06	14.08	11.48	10.59	10.20	10.09

CUMULATIVE AREA = 1.52 SQ MI

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HYDROGRAPH AT STATION N1-N2
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
740.	14.17	(CFS)	188.	51.	17.	7.
		(INCHES)	1.144	1.239	1.242	1.242
		(AC-FT)	93.	101.	101.	101.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
5.	14.17	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.99	14.17	11.43	10.57	10.19	10.08

CUMULATIVE AREA = 1.52 SQ MI

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HYDROGRAPH AT STATION N1-N2
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
698.	14.17	(CFS)	177.	48.	16.	7.
		(INCHES)	1.081	1.172	1.176	1.176
		(AC-FT)	88.	95.	96.	96.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
5.	14.17	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.93	14.17	11.41	10.56	10.19	10.08

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1-N2
TRANSPOSITION AREA 40.0 SQ MI

K FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
656.	14.17	(CFS)	167.	45.	15.	7.
		(INCHES)	1.019	1.108	1.111	1.111
		(AC-FT)	83.	90.	90.	90.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
5.	14.17	1.	0.	0.	0.

```
 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                   6-HR       24-HR       72-HR     166.58-HR
    12.87     14.17                  11.38       10.54       10.18        10.08

                        CUMULATIVE AREA =    1.52 SQ MI


     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION    N1-N2
                      TRANSPOSITION AREA     80.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR     166.58-HR
     615.     14.17       (CFS)      157.         43.         14.            6.
                        (INCHES)     .959       1.044       1.047        1.047
                         (AC-FT)      78.         85.         85.          85.

PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                   6-HR       24-HR       72-HR     166.58-HR
       4.     14.17                     1.          0.          0.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                   6-HR       24-HR       72-HR     166.58-HR
    12.81     14.17                  11.35       10.53       10.18        10.08

                        CUMULATIVE AREA =    1.52 SQ MI


     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION    N1-N2
                      TRANSPOSITION AREA    120.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR     166.58-HR
     594.     14.17       (CFS)      152.         41.         14.            6.
                        (INCHES)     .927       1.010       1.013        1.013
                         (AC-FT)      75.         82.         82.          82.

PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                   6-HR       24-HR       72-HR     166.58-HR
       4.     14.17                     1.          0.          0.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                   6-HR       24-HR       72-HR     166.58-HR
    12.78     14.17                  11.33       10.52       10.18        10.08

                        CUMULATIVE AREA =    1.52 SQ MI

     ***             ***             ***             ***             ***


                        INTERPOLATED HYDROGRAPH AT    N1-N2

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR     166.58-HR
     758.     14.08       (CFS)      192.         52.         17.            7.
                        (INCHES)    1.171       1.267       1.270        1.270
                         (AC-FT)      95.        103.        103.         103.

                        CUMULATIVE AREA =    1.52 SQ MI


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            *            *
156 KK      *        N2  *
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                        THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                        L=5.64     Lca=3.27     S=170.14     Kn=0.055     LAG=90.7
                        S-GRAPH TYPE=PHX MNT

160 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

 BA           SUBBASIN CHARACTERISTICS
                      TAREA        3.33  SUBBASIN AREA

162 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .35  STARTING LOSS
                        DTH         .35  MOISTURE DEFICIT
                       PSIF        4.12  WETTING FRONT SUCTION
                      XKSAT         .41  HYDRAULIC CONDUCTIVITY
                      RTIMP        2.67  PERCENT IMPERVIOUS AREA
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161 UI          INPUT UNITGRAPH,  85 ORDINATES,  VOLUME = 1.00
                     .0     123.0     123.0     123.0     123.0     310.8     396.0     496.7     616.3     730.8
                  796.5     869.0     928.6     990.2    1125.9    1316.1    1517.9    1186.4     925.6     834.3
                  764.3     726.5     694.1     654.4     619.9     586.9     557.1     517.8     491.7     466.8
                  422.4     387.3     352.0     325.3     302.3     296.8     283.0     272.2     257.3     234.3
                  202.1     202.1     163.1     157.2     157.2     143.9     134.8     134.8     134.8     103.6
                   94.3      94.3      94.3      94.3      83.8      60.2      60.2      60.2      60.2      60.2
                   60.2      60.2      60.2      32.5      23.6      23.6      23.6      23.6      23.6      23.6
                   23.6      23.6      23.6      23.6      23.6      23.6      23.6      23.6      23.6      23.6
                   23.6      23.6      23.6      23.6      23.6
                                                                   ***

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION       N2
                   TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    2.98, TOTAL EXCESS =    1.18

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1426.     13.17        (CFS)      406.        106.         35.         15.
                       (INCHES)    1.135       1.183       1.184       1.184
                        (AC-FT)     201.        210.        210.        210.

                     CUMULATIVE AREA =    3.33 SQ MI

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION       N2
                   TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.86, TOTAL EXCESS =    1.09

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1313.     13.17        (CFS)      373.         97.         32.         14.
                       (INCHES)    1.042       1.087       1.088       1.088
                        (AC-FT)     185.        193.        193.        193.

                     CUMULATIVE AREA =    3.33 SQ MI

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION       N2
                   TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.79, TOTAL EXCESS =    1.03

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1240.     13.17        (CFS)      351.         92.         31.         13.
                       (INCHES)     .981       1.025       1.026       1.026
                        (AC-FT)     174.        182.        182.        182.

                     CUMULATIVE AREA =    3.33 SQ MI

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION       N2
                   TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.73, TOTAL EXCESS =     .96

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1169.     13.25        (CFS)      330.         86.         29.         12.
                       (INCHES)     .922        .964        .965        .965
                        (AC-FT)     164.        171.        171.        171.

                     CUMULATIVE AREA =    3.33 SQ MI

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION       N2
                   TRANSPOSITION AREA     80.0 SQ MI

   TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.66, TOTAL EXCESS =     .90

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1102.     13.25        (CFS)      309.         81.         27.         12.
                       (INCHES)     .864        .904        .905        .905
                        (AC-FT)     153.        160.        160.        160.

                     CUMULATIVE AREA =    3.33 SQ MI

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION       N2
                   TRANSPOSITION AREA    120.0 SQ MI

   TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.63, TOTAL EXCESS =     .87

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
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 (CFS)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1066.     13.25       (CFS)      298.         78.         26.          11.
                     (INCHES)     .833        .872        .873         .873
                      (AC-FT)     148.        155.        155.         155.

                     CUMULATIVE AREA =    3.33 SQ MI

   ***            ***            ***            ***            ***


                     INTERPOLATED HYDROGRAPH AT       N2

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1331.     13.17       (CFS)      378.         99.         33.          14.
                     (INCHES)    1.057       1.102       1.103        1.103
                      (AC-FT)     187.        195.        196.         196.

                     CUMULATIVE AREA =    3.33 SQ MI


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          *            *
172 KK    *         N  *        CNAME      8R
          *            *
          **************

173 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


174 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

   ***            ***            ***            ***            ***


                       HYDROGRAPH AT STATION        N
                     TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1495.     13.25       (CFS)      609.        161.         54.          23.
                     (INCHES)    1.168       1.231       1.235        1.235
                      (AC-FT)     302.        318.        319.         319.

                     CUMULATIVE AREA =    4.85 SQ MI

   ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION        N
                     TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1372.     13.25       (CFS)      560.        148.         49.          21.
                     (INCHES)    1.073       1.133       1.136        1.136
                      (AC-FT)     277.        293.        294.         294.

                     CUMULATIVE AREA =    4.85 SQ MI

   ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION        N
                     TRANSPOSITION AREA     20.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1293.     13.25       (CFS)      528.        139.         47.          20.
                     (INCHES)    1.012       1.069       1.073        1.073
                      (AC-FT)     262.        277.        277.         277.

                     CUMULATIVE AREA =    4.85 SQ MI

   ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION        N
                     TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1217.     13.25       (CFS)      496.        131.         44.          19.
                     (INCHES)     .952       1.007       1.010        1.010
                      (AC-FT)     246.        260.        261.         261.
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                    CUMULATIVE AREA =    4.85 SQ MI

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION        N
                   TRANSPOSITION AREA     80.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1142.     13.25        (CFS)      466.        123.         41.         18.
                         (INCHES)    .893        .946        .950        .950
                          (AC-FT)    231.        245.        246.        246.

                    CUMULATIVE AREA =    4.85 SQ MI

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION        N
                   TRANSPOSITION AREA    120.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1102.     13.25        (CFS)      449.        119.         40.         17.
                         (INCHES)    .862        .914        .917        .917
                          (AC-FT)    223.        236.        237.        237.

                    CUMULATIVE AREA =    4.85 SQ MI

   ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT        N

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1385.     13.25        (CFS)      565.        149.         50.         22.
                         (INCHES)   1.083       1.143       1.147       1.147
                          (AC-FT)    280.        296.        297.        297.

                    CUMULATIVE AREA =    4.85 SQ MI


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          *            *
   KK     *     8R     *        CNAME       N
          *            *
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176 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       .083  TIME INTERVAL IN HOURS

            HYDROGRAPH ROUTING DATA

177 RN          NO ROUTING

                                                                  ***

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       8R
                   TRANSPOSITION AREA        .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1495.     13.25        (CFS)      609.        161.         54.         23.
                         (INCHES)   1.168       1.231       1.235       1.235
                          (AC-FT)    302.        318.        319.        319.

                    CUMULATIVE AREA =    4.85 SQ MI

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       8R
                   TRANSPOSITION AREA     10.0 SQ MI

   FLOW        TIME                          MAXIMUM AVERAGE FLOW
   FS)         (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1372.     13.25        (CFS)      560.        148.         49.         21.
                         (INCHES)   1.073       1.133       1.136       1.136
                          (AC-FT)    277.        293.        294.        294.

                    CUMULATIVE AREA =    4.85 SQ MI

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                    HYDROGRAPH AT STATION       8R
                  TRANSPOSITION AREA     20.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1293.     13.25        (CFS)      528.        139.        47.          20.
                        (INCHES)    1.012       1.069       1.073        1.073
                         (AC-FT)     262.        277.        277.         277.

                     CUMULATIVE AREA =    4.85 SQ MI

    ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       8R
                  TRANSPOSITION AREA     40.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1217.     13.25        (CFS)      496.        131.        44.          19.
                        (INCHES)     .952       1.007       1.010        1.010
                         (AC-FT)     246.        260.        261.         261.

                     CUMULATIVE AREA =    4.85 SQ MI

    ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       8R
                  TRANSPOSITION AREA     80.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1142.     13.25        (CFS)      466.        123.        41.          18.
                        (INCHES)     .893        .946        .950         .950
                         (AC-FT)     231.        245.        246.         246.

                     CUMULATIVE AREA =    4.85 SQ MI

    ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       8R
                  TRANSPOSITION AREA    120.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1102.     13.25        (CFS)      449.        119.        40.          17.
                        (INCHES)     .862        .914        .917         .917
                         (AC-FT)     223.        236.        237.         237.

                     CUMULATIVE AREA =    4.85 SQ MI

    ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       8R

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1385.     13.25        (CFS)      565.        149.        50.          22.
                        (INCHES)    1.083       1.143       1.147        1.147
                         (AC-FT)     280.        296.        297.         297.

                     CUMULATIVE AREA =    4.85 SQ MI


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          *            *
178 KK    *      P1A   *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=2.28     Lca=1.41     S=461.40     Kn=0.055     LAG=37.8
                    S-GRAPH TYPE=PHX MNT

182 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

183 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .50  SUBBASIN AREA

184 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .35  STARTING LOSS
                        DTH         .35  MOISTURE DEFICIT
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                    PSIF        3.99  WETTING FRONT SUCTION
                   XKSAT         .41  HYDRAULIC CONDUCTIVITY
                   RTIMP       16.36  PERCENT IMPERVIOUS AREA

183 UI          INPUT UNITGRAPH,  36 ORDINATES,  VOLUME = 1.00
                     .0      44.3      65.2     161.0     254.8     318.1     389.8     500.0     319.1     264.1
                  232.2     203.7     177.0     147.1     118.2     105.2      95.1      75.0      59.4      52.9
                   48.5      36.0      33.9      26.8      21.7      21.7      21.6       8.5       8.5       8.5
                    8.5       8.5       8.5       8.5       8.5       8.5
                                                                   ***

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    2.55, TOTAL EXCESS =    1.61

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   460.      12.42       (CFS)       76.         22.          7.           3.
                       (INCHES)    1.409       1.606       1.608        1.608
                        (AC-FT)     38.         43.         43.          43.

                     CUMULATIVE AREA =     .50 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.45, TOTAL EXCESS =    1.50

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   427.      12.42       (CFS)       70.         20.          7.           3.
                       (INCHES)    1.307       1.494       1.496        1.496
                        (AC-FT)     35.         40.         40.          40.

                     CUMULATIVE AREA =     .50 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.39, TOTAL EXCESS =    1.43

K FLOW        TIME                          MAXIMUM AVERAGE FLOW
(CFS)         (HR)                  6-HR       24-HR       72-HR    166.58-HR
   405.      12.42       (CFS)       67.         19.          6.           3.
                       (INCHES)    1.242       1.422       1.424        1.424
                        (AC-FT)     33.         38.         38.          38.

                     CUMULATIVE AREA =     .50 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.33, TOTAL EXCESS =    1.36

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   384.      12.42       (CFS)       63.         18.          6.           3.
                       (INCHES)    1.177       1.352       1.354        1.354
                        (AC-FT)     31.         36.         36.          36.

                     CUMULATIVE AREA =     .50 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA     80.0 SQ MI

   TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.28, TOTAL EXCESS =    1.29

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   364.      12.42       (CFS)       60.         17.          6.           2.
                       (INCHES)    1.115       1.283       1.285        1.285
                        (AC-FT)     30.         34.         34.          34.

                     CUMULATIVE AREA =     .50 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA    120.0 SQ MI

   TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.25, TOTAL EXCESS =    1.25

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   353.      12.42       (CFS)       58.         17.          6.           2.
```

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                    (INCHES)      1.081       1.247       1.249       1.249
                     (AC-FT)       29.         33.         33.         33.

                    CUMULATIVE AREA =     .50 SQ MI

    ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT      P1A

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    441.      12.42        (CFS)      73.         21.          7.          3.
                        (INCHES)    1.351       1.542       1.545       1.545
                         (AC-FT)     36.         41.         41.         41.

                    CUMULATIVE AREA =     .50 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
189 KK    *   P1A-1B   *        CNAME    P1BR
          *            *
          **************

190 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

191 RS          STORAGE ROUTING
                      NSTPS         19  NUMBER OF SUBREACHES
                       ITYP       FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC        .00  INITIAL CONDITION
                          X        .00 WORKING R AND D COEFFICIENT

    RC          NORMAL DEPTH CHANNEL
                        ANL       .050  LEFT OVERBANK N-VALUE
                       ANCH       .047  MAIN CHANNEL N-VALUE
                        ANR       .050  RIGHT OVERBANK N-VALUE
                      RLNTH     20103.  REACH LENGTH
                        SEL      .0111  ENERGY SLOPE
                      ELMAX         .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
194 RY        ELEVATION    17.00     13.00     11.50     10.00     10.00     11.50     13.00     17.00
193 RX        DISTANCE       .00    280.00    350.00    358.00    367.00    381.00    451.00    730.00

                                                  ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00      1.99      4.90      8.72     13.47     21.26     34.88     54.35     79.67    111.90
          OUTFLOW        .00      6.43     23.30     51.90     94.00    166.88    281.35    453.02    695.38   1006.93
        ELEVATION      10.00     10.37     10.74     11.11     11.47     11.84     12.21     12.58     12.95     13.32

          STORAGE     152.85    202.56    261.02    328.24    404.21    488.94    582.42    684.65    795.64    915.38
          OUTFLOW    1426.90   1975.09   2667.52   3519.50   4545.66   5760.03   7176.14   8807.04  10665.41  12763.55
        ELEVATION      13.68     14.05     14.42     14.79     15.16     15.53     15.89     16.26     16.63     17.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN     7176. TO    12764.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

    ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION   P1A-1B
                  TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    309.      13.92        (CFS)      76.         22.          7.          3.
                        (INCHES)    1.405       1.602       1.608       1.608
                         (AC-FT)     37.         43.         43.         43.

  STORAGE     TIME                          MAXIMUM AVERAGE STORAGE
   -FT)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
     2.      13.92                    1.          0.          0.          0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
   12.27     13.92                  11.02       10.41       10.14       10.06

                    CUMULATIVE AREA =     .50 SQ MI
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HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
286.	13.92	(CFS)	70.	20.	7.	3.
		(INCHES)	1.303	1.491	1.496	1.496
		(AC-FT)	35.	40.	40.	40.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
2.	13.92	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.22	13.92	10.99	10.39	10.13	10.06

CUMULATIVE AREA = .50 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
271.	13.92	(CFS)	67.	19.	6.	3.
		(INCHES)	1.237	1.419	1.424	1.424
		(AC-FT)	33.	38.	38.	38.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
2.	13.92	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.18	13.92	10.97	10.38	10.13	10.06

CUMULATIVE AREA = .50 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
257.	13.92	(CFS)	63.	18.	6.	3.
		(INCHES)	1.173	1.349	1.354	1.354
		(AC-FT)	31.	36.	36.	36.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
2.	13.92	0.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.13	13.92	10.95	10.37	10.13	10.05

CUMULATIVE AREA = .50 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
243.	13.92	(CFS)	60.	17.	6.	2.
		(INCHES)	1.110	1.280	1.285	1.285
		(AC-FT)	30.	34.	34.	34.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
2.	13.92	0.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.09	13.92	10.93	10.36	10.12	10.05

CUMULATIVE AREA = .50 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
236.	13.92	(CFS)	58.	17.	6.	2.
		(INCHES)	1.077	1.244	1.249	1.249
		(AC-FT)	29.	33.	33.	33.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
2.	13.92	0.	0.	0.	0.

```
 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
   12.06      13.92                 10.92       10.36       10.12        10.05

                        CUMULATIVE AREA =     .50 SQ MI

     ***             ***             ***             ***             ***


                        INTERPOLATED HYDROGRAPH AT   P1A-1B

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    296.      13.92       (CFS)       72.         21.          7.           3.
                        (INCHES)     1.347       1.539       1.545        1.545
                         (AC-FT)      36.         41.         41.          41.

                        CUMULATIVE AREA =     .50 SQ MI



*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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            *            *
 195 KK     *       P1B  *
            *            *
            **************
                          THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                          L=4.39     Lca=2.32     S=70.84     Kn=0.055     LAG=85.3
                          S-GRAPH TYPE=PHX MNT

 199 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           3  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

 200 BA          SUBBASIN CHARACTERISTICS
                       TAREA        1.94  SUBBASIN AREA

 LG              GREEN AND AMPT LOSS RATE
                       STRTL         .35  STARTING LOSS
                         DTH         .35  MOISTURE DEFICIT
                        PSIF        4.23  WETTING FRONT SUCTION
                       XKSAT         .39  HYDRAULIC CONDUCTIVITY
                       RTIMP        4.67  PERCENT IMPERVIOUS AREA

 200 UI          INPUT UNITGRAPH,  79 ORDINATES,  VOLUME = 1.00
                      .0      76.7      76.7      76.7      89.7     220.6     274.3     335.9     433.0     478.1
                   527.9     570.8     609.5     688.6     814.1     942.3     716.4     568.2     506.8     467.3
                   446.8     421.9     394.8     374.4     356.4     329.1     309.3     294.0     263.4     241.8
                   216.8     200.9     187.7     181.8     176.5     163.1     160.4     127.4     126.0     109.8
                    98.0      98.0      90.8      84.0      84.0      84.0      60.1      58.8      58.8      58.8
                    58.8      40.7      37.5      37.5      37.5      37.5      37.5      37.5      37.5      17.9
                    14.7      14.7      14.7      14.7      14.7      14.7      14.7      14.7      14.7      14.7
                    14.7      14.7      14.7      14.7      14.7      14.7      14.7      14.7      14.7
                                                                      ***

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      P1B
                      TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    2.91, TOTAL EXCESS =    1.25

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    895.      13.08       (CFS)      246.         65.         22.           9.
                        (INCHES)     1.181       1.249       1.250        1.250
                         (AC-FT)      122.        129.        129.         129.

                        CUMULATIVE AREA =    1.94 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      P1B
                      TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.80, TOTAL EXCESS =    1.15
 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    826.      13.08       (CFS)      226.         60.         20.           9.
                        (INCHES)     1.086       1.150       1.152        1.152
                         (AC-FT)      112.        119.        119.         119.

                        CUMULATIVE AREA =    1.94 SQ MI
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***            ***            ***            ***            ***

                HYDROGRAPH AT STATION      P1B
               TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.73, TOTAL EXCESS =    1.09

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   781.       13.08       (CFS)      213.         57.         19.          8.
                         (INCHES)    1.024       1.086       1.088       1.088
                          (AC-FT)    106.        112.        112.        112.

                        CUMULATIVE AREA =    1.94 SQ MI


***            ***            ***            ***            ***

                HYDROGRAPH AT STATION      P1B
               TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.66, TOTAL EXCESS =    1.03

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   737.       13.08       (CFS)      201.         53.         18.          8.
                         (INCHES)     .964       1.024       1.026       1.026
                          (AC-FT)    100.        106.        106.        106.

                        CUMULATIVE AREA =    1.94 SQ MI


***            ***            ***            ***            ***

                HYDROGRAPH AT STATION      P1B
               TRANSPOSITION AREA     80.0 SQ MI

   TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.60, TOTAL EXCESS =     .97

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   694.       13.08       (CFS)      189.         50.         17.          7.
                         (INCHES)     .906        .963        .965        .965
                          (AC-FT)     94.         99.        100.        100.

                        CUMULATIVE AREA =    1.94 SQ MI


***            ***            ***            ***            ***

                HYDROGRAPH AT STATION      P1B
               TRANSPOSITION AREA    120.0 SQ MI

   TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.57, TOTAL EXCESS =     .93

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   671.       13.17       (CFS)      182.         48.         16.          7.
                         (INCHES)     .874        .931        .932        .932
                          (AC-FT)     90.         96.         96.         96.

                        CUMULATIVE AREA =    1.94 SQ MI

***            ***            ***            ***            ***


               INTERPOLATED HYDROGRAPH AT      P1B

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   842.       13.08       (CFS)      231.         61.         20.          9.
                         (INCHES)    1.108       1.174       1.175       1.175
                          (AC-FT)    114.        121.        121.        121.

                        CUMULATIVE AREA =    1.94 SQ MI


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          **************
          *            *
210 KK    *          P *        CNAME     12R
          *            *
          **************

211 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


212 HC          HYDROGRAPH COMBINATION
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ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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*** *** *** *** ***

HYDROGRAPH AT STATION P
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
953.	13.17	(CFS)	321.	86.	29.	12.
		(INCHES)	1.226	1.319	1.324	1.324
		(AC-FT)	159.	171.	172.	172.

CUMULATIVE AREA = 2.44 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
875.	13.17	(CFS)	296.	80.	27.	12.
		(INCHES)	1.129	1.218	1.222	1.222
		(AC-FT)	147.	158.	159.	159.

CUMULATIVE AREA = 2.44 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
825.	13.17	(CFS)	280.	76.	25.	11.
		(INCHES)	1.067	1.152	1.157	1.157
		(AC-FT)	139.	150.	150.	150.

CUMULATIVE AREA = 2.44 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
776.	13.17	(CFS)	264.	71.	24.	10.
		(INCHES)	1.006	1.088	1.093	1.093
		(AC-FT)	131.	141.	142.	142.

CUMULATIVE AREA = 2.44 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
728.	13.17	(CFS)	248.	67.	23.	10.
		(INCHES)	.946	1.026	1.030	1.030
		(AC-FT)	123.	133.	134.	134.

CUMULATIVE AREA = 2.44 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
703.	13.17	(CFS)	240.	65.	22.	9.
		(INCHES)	.915	.993	.997	.997
		(AC-FT)	119.	129.	130.	130.

CUMULATIVE AREA = 2.44 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT P

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
891.	13.17	(CFS)	301.	81.	27.	12.
		(INCHES)	1.149	1.238	1.243	1.243
		(AC-FT)	149.	161.	162.	162.

CUMULATIVE AREA = 2.44 SQ MI

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              **************
              *            *
 213 KK       *     12R    *        CNAME       P
              *            *
              **************

 214 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


               HYDROGRAPH ROUTING DATA

 215 RN          NO ROUTING

                                                                  ***

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      12R
                     TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    953.     13.17        (CFS)      321.         86.         29.          12.
                        (INCHES)    1.226       1.319       1.324        1.324
                         (AC-FT)     159.        171.        172.         172.

                      CUMULATIVE AREA =    2.44 SQ MI

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      12R
                     TRANSPOSITION AREA     10.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    875.     13.17        (CFS)      296.         80.         27.          12.
                        (INCHES)    1.129       1.218       1.222        1.222
                         (AC-FT)     147.        158.        159.         159.

                      CUMULATIVE AREA =    2.44 SQ MI

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      12R
                     TRANSPOSITION AREA     20.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    825.     13.17        (CFS)      280.         76.         25.          11.
                        (INCHES)    1.067       1.152       1.157        1.157
                         (AC-FT)     139.        150.        150.         150.

                      CUMULATIVE AREA =    2.44 SQ MI

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      12R
                     TRANSPOSITION AREA     40.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    776.     13.17        (CFS)      264.         71.         24.          10.
                        (INCHES)    1.006       1.088       1.093        1.093
                         (AC-FT)     131.        141.        142.         142.

                      CUMULATIVE AREA =    2.44 SQ MI

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      12R
                     TRANSPOSITION AREA     80.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    728.     13.17        (CFS)      248.         67.         23.          10.
                        (INCHES)     .946       1.026       1.030        1.030
                         (AC-FT)     123.        133.        134.         134.

                      CUMULATIVE AREA =    2.44 SQ MI

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      12R
                     TRANSPOSITION AREA    120.0 SQ MI
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 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    703.     13.17        (CFS)      240.         65.         22.          9.
                        (INCHES)     .915        .993        .997         .997
                         (AC-FT)     119.        129.        130.         130.

                       CUMULATIVE AREA =    2.44 SQ MI

   ***             ***             ***             ***             ***


                       INTERPOLATED HYDROGRAPH AT      12R

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    891.     13.17        (CFS)      301.         81.         27.         12.
                        (INCHES)    1.149       1.238       1.243        1.243
                         (AC-FT)     149.        161.        162.         162.

                       CUMULATIVE AREA =    2.44 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
216 KK    *        O1  *
          *            *
          **************
                       THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                       L=5.20     Lca=2.79     S=64.07     Kn=0.055     LAG=99.9
                       S-GRAPH TYPE=PHX MNT

220 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

BA              SUBBASIN CHARACTERISTICS
                      TAREA        3.09  SUBBASIN AREA

222 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .35  STARTING LOSS
                        DTH         .35  MOISTURE DEFICIT
                       PSIF        4.19  WETTING FRONT SUCTION
                      XKSAT         .39  HYDRAULIC CONDUCTIVITY
                      RTIMP        2.10  PERCENT IMPERVIOUS AREA

221 UI          INPUT UNITGRAPH,  93 ORDINATES,  VOLUME = 1.00
                       .0     104.0     104.0     104.0     104.0     182.0     299.0     378.7     446.4     550.1
                    624.5     676.8     731.5     781.3     824.5     905.4    1042.0    1204.8    1242.7     887.0
                    765.3     690.9     643.3     614.9     590.5     558.5     530.8     506.5     485.1     454.9
                    429.4     410.3     388.6     357.0     326.6     302.9     274.9     261.0     254.4     242.2
                    239.2     221.8     217.4     189.5     170.8     170.8     140.5     132.9     132.9     129.1
                    113.9     113.9     113.9     113.9      79.7      79.7      79.7      79.7      79.7      79.7
                     50.9      50.9      50.9      50.9      50.9      50.9      50.9      50.9      50.9      32.3
                     19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9
                     19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9
                     19.9      19.9      19.9
                                                                  ***

   ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION       O1
                     TRANSPOSITION AREA       .0 SQ MI

  TOTAL RAINFALL =    4.16, TOTAL LOSS =    2.98, TOTAL EXCESS =    1.18

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1244.     13.33        (CFS)      374.         97.         33.         14.
                        (INCHES)    1.127       1.174       1.175        1.175
                         (AC-FT)     186.        193.        194.         194.

                       CUMULATIVE AREA =    3.09 SQ MI

   ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION       O1
                     TRANSPOSITION AREA     10.0 SQ MI

  TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.87, TOTAL EXCESS =    1.08

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1147.     13.33        (CFS)      344.         90.         30.         13.
                        (INCHES)    1.034       1.078       1.079        1.079
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                    (AC-FT)      170.        178.        178.        178.

                    CUMULATIVE AREA =    3.09 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       01
                   TRANSPOSITION AREA     20.0 SQ MI

  TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.80, TOTAL EXCESS =    1.02

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1084.      13.33        (CFS)     324.         84.         28.         12.
                         (INCHES)    .974       1.017       1.017       1.017
                          (AC-FT)    160.        167.        168.        168.

                    CUMULATIVE AREA =    3.09 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       01
                   TRANSPOSITION AREA     40.0 SQ MI

  TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.73, TOTAL EXCESS =     .96

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1023.      13.33        (CFS)     304.         79.         26.         11.
                         (INCHES)    .916        .956        .957        .957
                          (AC-FT)    151.        157.        158.        158.

                    CUMULATIVE AREA =    3.09 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       01
                   TRANSPOSITION AREA     80.0 SQ MI

  TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.67, TOTAL EXCESS =     .90

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    963.      13.33        (CFS)     285.         74.         25.         11.
                         (INCHES)    .858        .897        .897        .897
                          (AC-FT)    141.        148.        148.        148.

                    CUMULATIVE AREA =    3.09 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       01
                   TRANSPOSITION AREA    120.0 SQ MI

  TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.63, TOTAL EXCESS =     .87

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    931.      13.33        (CFS)     275.         72.         24.         10.
                         (INCHES)    .828        .865        .866        .866
                          (AC-FT)    136.        142.        143.        143.

                    CUMULATIVE AREA =    3.09 SQ MI

    ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       01

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1163.      13.33        (CFS)     349.         91.         30.         13.
                         (INCHES)   1.050       1.095       1.096       1.096
                          (AC-FT)    173.        180.        180.        180.

                    CUMULATIVE AREA =    3.09 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
233 KK    *        7R  *        CNAME       O
          *            *
          **************

234 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
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TIMINT .083 TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

235 RN NO ROUTING

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*** *** *** *** ***

HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1244.	13.33	(CFS)	374.	97.	33.	14.
		(INCHES)	1.127	1.174	1.175	1.175
		(AC-FT)	186.	193.	194.	194.

CUMULATIVE AREA = 3.09 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1147.	13.33	(CFS)	344.	90.	30.	13.
		(INCHES)	1.034	1.078	1.079	1.079
		(AC-FT)	170.	178.	178.	178.

CUMULATIVE AREA = 3.09 SQ MI

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HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1084.	13.33	(CFS)	324.	84.	28.	12.
		(INCHES)	.974	1.017	1.017	1.017
		(AC-FT)	160.	167.	168.	168.

CUMULATIVE AREA = 3.09 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1023.	13.33	(CFS)	304.	79.	26.	11.
		(INCHES)	.916	.956	.957	.957
		(AC-FT)	151.	157.	158.	158.

CUMULATIVE AREA = 3.09 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
963.	13.33	(CFS)	285.	74.	25.	11.
		(INCHES)	.858	.897	.897	.897
		(AC-FT)	141.	148.	148.	148.

CUMULATIVE AREA = 3.09 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
931.	13.33	(CFS)	275.	72.	24.	10.
		(INCHES)	.828	.865	.866	.866
		(AC-FT)	136.	142.	143.	143.

CUMULATIVE AREA = 3.09 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT 7R

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1163.	13.33	(CFS)	349.	91.	30.	13.
		(INCHES)	1.050	1.095	1.096	1.096

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                    (AC-FT)      173.        180.        180.        180.

                    CUMULATIVE AREA =    3.09 SQ MI


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          *            *
236 KK    *     Q1A    *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=3.13     Lca=1.52     S=256.86     Kn=0.055     LAG=49.3
                    S-GRAPH TYPE=PHX MNT

240 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

241 BA          SUBBASIN CHARACTERISTICS
                     TAREA        1.30  SUBBASIN AREA

242 LG          GREEN AND AMPT LOSS RATE
                     STRTL         .35  STARTING LOSS
                       DTH         .35  MOISTURE DEFICIT
                      PSIF        4.13  WETTING FRONT SUCTION
                     XKSAT         .40  HYDRAULIC CONDUCTIVITY
                     RTIMP       11.20  PERCENT IMPERVIOUS AREA

241 UI          INPUT UNITGRAPH,  46 ORDINATES,  VOLUME = 1.00
                      .0      89.1      89.1     213.8     363.9     517.4     613.9     697.5     873.6    1021.0
                   663.2     556.5     506.6     454.8     413.3     367.5     326.0     281.0     232.0     214.4
                   199.4     177.4     146.4     118.7     112.4      97.6      96.7      68.3      68.3      66.1
                    43.6      43.6      43.6      43.6      30.8      17.1      17.1      17.1      17.1      17.1
                    17.1      17.1      17.1      17.1      17.1      17.1
                                                                    ***

  ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      Q1A
                  TRANSPOSITION AREA        .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    2.71, TOTAL EXCESS =    1.45

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   966.     12.58        (CFS)      183.         50.         17.           7.
                       (INCHES)    1.312       1.446       1.449       1.449
                        (AC-FT)     91.        100.        100.        100.

                    CUMULATIVE AREA =    1.30 SQ MI

  ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      Q1A
                  TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.61, TOTAL EXCESS =    1.34

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   894.     12.58        (CFS)      169.         47.         16.           7.
                       (INCHES)    1.212       1.340       1.342       1.342
                        (AC-FT)     84.         93.         93.         93.

                    CUMULATIVE AREA =    1.30 SQ MI

  ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      Q1A
                  TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.54, TOTAL EXCESS =    1.27

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   848.     12.58        (CFS)      160.         44.         15.           6.
                       (INCHES)    1.148       1.272       1.274       1.274
                        (AC-FT)     79.         88.         88.         88.

                    CUMULATIVE AREA =    1.30 SQ MI

  ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      Q1A
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                    TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.48, TOTAL EXCESS =    1.21

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    802.     12.58        (CFS)      151.         42.         14.          6.
                        (INCHES)    1.086       1.205       1.207        1.207
                         (AC-FT)     75.         83.         83.          83.

                     CUMULATIVE AREA =    1.30 SQ MI

     ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION      Q1A
                    TRANSPOSITION AREA     80.0 SQ MI

   TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.42, TOTAL EXCESS =    1.14

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    758.     12.58        (CFS)      143.         40.         13.          6.
                        (INCHES)    1.024       1.140       1.142        1.142
                         (AC-FT)     71.         79.         79.          79.

                     CUMULATIVE AREA =    1.30 SQ MI

     ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION      Q1A
                    TRANSPOSITION AREA    120.0 SQ MI

   TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.39, TOTAL EXCESS =    1.11

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    735.     12.58        (CFS)      138.         39.         13.          6.
                        (INCHES)     .992       1.105       1.107        1.107
                         (AC-FT)     69.         76.         77.          77.

                     CUMULATIVE AREA =    1.30 SQ MI

     ***             ***             ***             ***             ***


                     INTERPOLATED HYDROGRAPH AT      Q1A

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    915.     12.58        (CFS)      173.         48.         16.          7.
                        (INCHES)    1.242       1.372       1.374        1.374
                         (AC-FT)     86.         95.         95.          95.

                     CUMULATIVE AREA =    1.30 SQ MI


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          *            *
248 KK    *   Q1A-1B   *        CNAME    Q1BR
          *            *
          **************

249 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

250 RS          STORAGE ROUTING
                     NSTPS          8  NUMBER OF SUBREACHES
                      ITYP       FLOW  TYPE OF INITIAL CONDITION
                    RSVRIC        .00  INITIAL CONDITION
                         X        .00 WORKING R AND D COEFFICIENT

251 RC          NORMAL DEPTH CHANNEL
                       ANL       .050  LEFT OVERBANK N-VALUE
                      ANCH       .047  MAIN CHANNEL N-VALUE
                       ANR       .050  RIGHT OVERBANK N-VALUE
                     RLNTH      9171.  REACH LENGTH
                       SEL      .0117  ENERGY SLOPE
                     ELMAX         .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
253 RY        ELEVATION    17.00     13.00     11.50     10.00     10.00     11.50     13.00     17.00
252 RX        DISTANCE       .00    280.00    350.00    358.00    367.00    381.00    451.00    730.00
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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.91	2.23	3.98	6.15	9.70	15.91	24.79	36.34	51.05
OUTFLOW	.00	6.60	23.92	53.28	96.51	171.33	288.85	465.10	713.93	1033.79
ELEVATION	10.00	10.37	10.74	11.11	11.47	11.84	12.21	12.58	12.95	13.32
STORAGE	69.73	92.40	119.07	149.74	184.39	223.04	265.69	312.32	362.95	417.58
OUTFLOW	1464.96	2027.77	2738.67	3613.37	4666.90	5913.66	7367.54	9041.94	10949.87	13103.98
ELEVATION	13.68	14.05	14.42	14.79	15.16	15.53	15.89	16.26	16.63	17.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 9042. TO 13104.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

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HYDROGRAPH AT STATION Q1A-1B
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
800.	13.17	(CFS)	183.	50.	17.	7.
		(INCHES)	1.311	1.445	1.449	1.449
		(AC-FT)	91.	100.	100.	100.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
5.	13.17	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.05	13.17	11.42	10.60	10.20	10.09

CUMULATIVE AREA = 1.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1A-1B
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
738.	13.17	(CFS)	169.	47.	16.	7.
		(INCHES)	1.212	1.339	1.342	1.342
		(AC-FT)	84.	93.	93.	93.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
5.	13.17	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.98	13.17	11.38	10.58	10.20	10.08

CUMULATIVE AREA = 1.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1A-1B
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
698.	13.17	(CFS)	160.	44.	15.	6.
		(INCHES)	1.147	1.271	1.274	1.274
		(AC-FT)	79.	88.	88.	88.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	13.17	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.92	13.17	11.36	10.57	10.19	10.08

CUMULATIVE AREA = 1.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1A-1B
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
659.	13.17	(CFS)	151.	42.	14.	6.
		(INCHES)	1.085	1.204	1.207	1.207
		(AC-FT)	75.	83.	83.	83.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	13.17	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.87	13.17	11.33	10.55	10.19	10.08

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                    CUMULATIVE AREA =    1.30 SQ MI

     ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION   Q1A-1B
                  TRANSPOSITION AREA     80.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   620.      13.17        (CFS)      143.         40.         13.           6.
                        (INCHES)    1.024       1.139       1.142        1.142
                         (AC-FT)     71.         79.         79.          79.

 PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
     4.       13.17                    1.          0.          0.           0.

 PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
  (FEET)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   12.81      13.17                  11.30       10.54       10.18        10.08

                    CUMULATIVE AREA =    1.30 SQ MI

     ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION   Q1A-1B
                  TRANSPOSITION AREA    120.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   599.      13.17        (CFS)      138.         39.         13.           6.
                        (INCHES)     .991       1.104       1.107        1.107
                         (AC-FT)     69.         76.         77.          77.

 PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
     4.       13.17                    1.          0.          0.           0.

 PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
  (FEET)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   12.78      13.17                  11.28       10.53       10.18        10.08

                    CUMULATIVE AREA =    1.30 SQ MI

     ***            ***            ***            ***            ***

                    INTERPOLATED HYDROGRAPH AT   Q1A-1B

 K FLOW        TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   757.      13.17        (CFS)      173.         48.         16.           7.
                        (INCHES)    1.241       1.371       1.374        1.374
                         (AC-FT)     86.         95.         95.          95.

                    CUMULATIVE AREA =    1.30 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
254 KK    *     Q1B    *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=2.35     Lca=1.14     S=141.40     Kn=0.055     LAG=44.3
                    S-GRAPH TYPE=PHX MNT

258 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

259 BA          SUBBASIN CHARACTERISTICS
                     TAREA        .94  SUBBASIN AREA

   LG           GREEN AND AMPT LOSS RATE
                     STRTL        .35  STARTING LOSS
                       DTH        .35  MOISTURE DEFICIT
                      PSIF       4.32  WETTING FRONT SUCTION
                     XKSAT        .37  HYDRAULIC CONDUCTIVITY
                     RTIMP      14.81  PERCENT IMPERVIOUS AREA

259 UI          INPUT UNITGRAPH,  41 ORDINATES,  VOLUME = 1.00
                      .0      71.7      71.7     221.5     340.7     455.8     538.5     652.0     833.6     538.2
                   443.7     398.9     355.8     316.3     280.5     235.9     196.4     173.4     160.2     138.8
                   114.8      91.6      84.7      78.5      62.5      55.0      54.2      35.1      35.1      35.1
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35.1 15.8 13.7 13.7 13.7 13.7 13.7 13.7 13.7 13.7
13.7

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HYDROGRAPH AT STATION Q1B
TRANSPOSITION AREA .0 SQ MI

TOTAL RAINFALL = 4.16, TOTAL LOSS = 2.59, TOTAL EXCESS = 1.57

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
777.	12.50	(CFS)	140.	40.	13.	6.
		(INCHES)	1.392	1.570	1.572	1.572
		(AC-FT)	70.	78.	79.	79.

CUMULATIVE AREA = .94 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1B
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.95, TOTAL LOSS = 2.49, TOTAL EXCESS = 1.46

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
721.	12.50	(CFS)	130.	37.	12.	5.
		(INCHES)	1.291	1.460	1.462	1.462
		(AC-FT)	65.	73.	73.	73.

CUMULATIVE AREA = .94 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1B
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 3.82, TOTAL LOSS = 2.43, TOTAL EXCESS = 1.39

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
685.	12.50	(CFS)	124.	35.	12.	5.
		(INCHES)	1.226	1.389	1.391	1.391
		(AC-FT)	61.	69.	70.	70.

CUMULATIVE AREA = .94 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1B
TRANSPOSITION AREA 40.0 SQ MI

TOTAL RAINFALL = 3.69, TOTAL LOSS = 2.37, TOTAL EXCESS = 1.32

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
649.	12.50	(CFS)	117.	33.	11.	5.
		(INCHES)	1.162	1.320	1.322	1.322
		(AC-FT)	58.	66.	66.	66.

CUMULATIVE AREA = .94 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1B
TRANSPOSITION AREA 80.0 SQ MI

TOTAL RAINFALL = 3.57, TOTAL LOSS = 2.31, TOTAL EXCESS = 1.26

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
615.	12.50	(CFS)	111.	32.	11.	5.
		(INCHES)	1.100	1.252	1.254	1.254
		(AC-FT)	55.	63.	63.	63.

CUMULATIVE AREA = .94 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1B
TRANSPOSITION AREA 120.0 SQ MI

TOTAL RAINFALL = 3.50, TOTAL LOSS = 2.28, TOTAL EXCESS = 1.22

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
596.	12.50	(CFS)	107.	31.	10.	4.
		(INCHES)	1.067	1.216	1.218	1.218
		(AC-FT)	53.	61.	61.	61.

CUMULATIVE AREA = .94 SQ MI

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                    INTERPOLATED HYDROGRAPH AT      Q1B

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    740.      12.50        (CFS)     134.         38.         13.           5.
                         (INCHES)   1.325       1.498       1.500        1.500
                          (AC-FT)     66.         75.         75.          75.

                    CUMULATIVE AREA =     .94 SQ MI


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          *            *
266 KK    *         Q  *        CNAME     14R
          *            *
          **************

267 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


268 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        Q
                     TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1128.      13.08        (CFS)     323.         90.         30.          13.
                         (INCHES)   1.343       1.495       1.500        1.500
                          (AC-FT)    160.        178.        179.         179.

                     CUMULATIVE AREA =    2.23 SQ MI

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        Q
                     TRANSPOSITION AREA     10.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1041.      13.08        (CFS)     299.         83.         28.          12.
                         (INCHES)   1.243       1.387       1.393        1.393
                          (AC-FT)    148.        165.        166.         166.

                     CUMULATIVE AREA =    2.23 SQ MI

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        Q
                     TRANSPOSITION AREA     20.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    984.      13.08        (CFS)     283.         79.         26.          11.
                         (INCHES)   1.178       1.318       1.323        1.323
                          (AC-FT)    140.        157.        158.         158.

                     CUMULATIVE AREA =    2.23 SQ MI

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        Q
                     TRANSPOSITION AREA     40.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    929.      13.08        (CFS)     268.         75.         25.          11.
                         (INCHES)   1.115       1.250       1.255        1.255
                          (AC-FT)    133.        149.        150.         150.

                     CUMULATIVE AREA =    2.23 SQ MI

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        Q
                     TRANSPOSITION AREA     80.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
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 (CFS)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
  874.     13.08       (CFS)      253.         71.         24.         10.
                     (INCHES)    1.054       1.184       1.189       1.189
                      (AC-FT)    126.         141.        142.        142.

                     CUMULATIVE AREA =    2.23 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION        Q
                   TRANSPOSITION AREA    120.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
  845.     13.08       (CFS)      245.         69.         23.         10.
                     (INCHES)    1.021       1.149       1.154       1.154
                      (AC-FT)    122.         137.        137.        137.

                     CUMULATIVE AREA =    2.23 SQ MI

   ***            ***            ***            ***            ***


                     INTERPOLATED HYDROGRAPH AT        Q

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1059.     13.08       (CFS)      304.         85.         28.         12.
                     (INCHES)    1.264       1.411       1.416       1.416
                      (AC-FT)    151.         168.        169.        169.

                     CUMULATIVE AREA =    2.23 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
269 KK    *       14R  *        CNAME       Q
          *            *
          **************

270 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

271 RN          NO ROUTING

                                                                  ***

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      14R
                   TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1128.     13.08       (CFS)      323.         90.         30.         13.
                     (INCHES)    1.343       1.495       1.500       1.500
                      (AC-FT)    160.         178.        179.        179.

                     CUMULATIVE AREA =    2.23 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      14R
                   TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1041.     13.08       (CFS)      299.         83.         28.         12.
                     (INCHES)    1.243       1.387       1.393       1.393
                      (AC-FT)    148.         165.        166.        166.

                     CUMULATIVE AREA =    2.23 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      14R
                   TRANSPOSITION AREA     20.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
  984.     13.08       (CFS)      283.         79.         26.         11.
                     (INCHES)    1.178       1.318       1.323       1.323
                      (AC-FT)    140.         157.        158.        158.
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                    CUMULATIVE AREA =    2.23 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      14R
                  TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
  929.       13.08        (CFS)     268.         75.         25.          11.
                        (INCHES)   1.115       1.250       1.255        1.255
                         (AC-FT)    133.        149.        150.         150.

                    CUMULATIVE AREA =    2.23 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      14R
                  TRANSPOSITION AREA     80.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
  874.       13.08        (CFS)     253.         71.         24.          10.
                        (INCHES)   1.054       1.184       1.189        1.189
                         (AC-FT)    126.        141.        142.         142.

                    CUMULATIVE AREA =    2.23 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      14R
                  TRANSPOSITION AREA    120.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
  845.       13.08        (CFS)     245.         69.         23.          10.
                        (INCHES)   1.021       1.149       1.154        1.154
                         (AC-FT)    122.        137.        137.         137.

                    CUMULATIVE AREA =    2.23 SQ MI

   ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT      14R

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1059.       13.08        (CFS)     304.         85.         28.          12.
                        (INCHES)   1.264       1.411       1.416        1.416
                         (AC-FT)    151.        168.        169.         169.

                    CUMULATIVE AREA =    2.23 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
272 KK    *        L1  *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=4.93     Lca=2.29     S=308.27     Kn=0.050     LAG=60.6
                    S-GRAPH TYPE=PHX MNT

276 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

277 BA          SUBBASIN CHARACTERISTICS
                      TAREA        3.55  SUBBASIN AREA

278 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .27  STARTING LOSS
                        DTH         .32  MOISTURE DEFICIT
                       PSIF        4.36  WETTING FRONT SUCTION
                      XKSAT         .35  HYDRAULIC CONDUCTIVITY
                      RTIMP       16.28  PERCENT IMPERVIOUS AREA

277 UI          INPUT UNITGRAPH,  57 ORDINATES,  VOLUME = 1.00
                        .0     195.7     195.7     266.9     603.6     823.3    1120.6    1287.1    1452.3    1611.1
                     1991.3    2326.8    1575.1    1312.3    1173.4    1097.4    1002.3     929.5     850.5     775.7
                      701.2     620.5     526.0     484.9     458.9     430.6     397.3     321.6     291.0     250.1
                      241.8     214.4     214.4     171.3     150.1     150.1     149.5      95.8      95.8      95.8
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                    95.8      95.8      79.7      37.5      37.5      37.5      37.5      37.5      37.5      37.5
                    37.5      37.5      37.5      37.5      37.5      37.5      37.5
                                                                   ***

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       L1
                   TRANSPOSITION AREA        .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    2.49, TOTAL EXCESS =    1.67

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2412.      12.75       (CFS)      562.        159.         53.         23.
                       (INCHES)    1.472       1.670       1.674       1.674
                        (AC-FT)     278.        316.        317.        317.

                     CUMULATIVE AREA =    3.55 SQ MI

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       L1
                   TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.39, TOTAL EXCESS =    1.56

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2242.      12.75       (CFS)      521.        148.         50.         21.
                       (INCHES)    1.367       1.554       1.558       1.558
                        (AC-FT)     258.        294.        295.        295.

                     CUMULATIVE AREA =    3.55 SQ MI

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       L1
                   TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.33, TOTAL EXCESS =    1.49

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2137.      12.75       (CFS)      497.        141.         47.         20.
                       (INCHES)    1.302       1.484       1.488       1.488
                        (AC-FT)     246.        281.        281.        281.

                     CUMULATIVE AREA =    3.55 SQ MI

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       L1
                   TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.27, TOTAL EXCESS =    1.42

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2035.      12.75       (CFS)      473.        135.         45.         19.
                       (INCHES)    1.240       1.415       1.419       1.419
                        (AC-FT)     234.        268.        268.        268.

                     CUMULATIVE AREA =    3.55 SQ MI

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       L1
                   TRANSPOSITION AREA     80.0 SQ MI

   TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.21, TOTAL EXCESS =    1.35

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1935.      12.75       (CFS)      450.        129.         43.         19.
                       (INCHES)    1.179       1.348       1.352       1.352
                        (AC-FT)     223.        255.        256.        256.

                     CUMULATIVE AREA =    3.55 SQ MI

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       L1
                   TRANSPOSITION AREA    120.0 SQ MI

   TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.18, TOTAL EXCESS =    1.32

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1882.      12.75       (CFS)      437.        125.         42.         18.
                       (INCHES)    1.147       1.313       1.316       1.316
                        (AC-FT)     217.        248.        249.        249.

                     CUMULATIVE AREA =    3.55 SQ MI

   ***            ***            ***            ***            ***
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                    INTERPOLATED HYDROGRAPH AT       L1

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   2267.     12.75        (CFS)      527.        150.         50.         22.
                        (INCHES)    1.382       1.572       1.576       1.576
                         (AC-FT)     261.        297.        298.        298.

                    CUMULATIVE AREA =    3.55 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 285 KK   *   L1-L2A   *        CNAME    L2AR
          *            *
          **************

 286 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

 287 RS          STORAGE ROUTING
                      NSTPS           3  NUMBER OF SUBREACHES
                       ITYP        FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

 288 RC          NORMAL DEPTH CHANNEL
                        ANL        .046  LEFT OVERBANK N-VALUE
                       ANCH        .045  MAIN CHANNEL N-VALUE
                        ANR        .046  RIGHT OVERBANK N-VALUE
                      RLNTH       7079.  REACH LENGTH
                        SEL       .0174  ENERGY SLOPE
                      ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                      CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
 290 RY        ELEVATION     19.00     17.00     14.00     10.00     10.00     14.00     18.00     22.00
 289 RX        DISTANCE        .00     80.00    165.00    200.00    215.00    255.00    340.00    420.00

                                                          ***

                                      COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00      2.15      5.51     10.09     15.88     22.89     31.11     41.00     53.99     70.19
          OUTFLOW        .00     35.92    135.31    310.20    574.19    940.29   1420.82   2127.41   3068.20   4246.30
        ELEVATION      10.00     10.63     11.26     11.89     12.53     13.16     13.79     14.42     15.05     15.68

          STORAGE      89.60    112.23    138.39    168.52    202.55    239.74    278.31    318.17    359.34    401.79
          OUTFLOW    5700.67   7465.85   9545.37  12023.62  14941.79  18538.68  22670.75  27260.26  32304.19  37801.64
        ELEVATION      16.32     16.95     17.58     18.21     18.84     19.47     20.11     20.74     21.37     22.00


*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN    18539. TO    37802.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION   L1-L2A
                    TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   2295.     12.92        (CFS)      561.        159.         53.         23.
                        (INCHES)    1.471       1.669       1.674       1.674
                         (AC-FT)     278.        316.        317.        317.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
     14.     12.92                     5.          2.          1.          0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
   14.53     12.92                    12.06       10.84       10.28       10.12

                    CUMULATIVE AREA =    3.55 SQ MI

     ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION   L1-L2A
                    TRANSPOSITION AREA     10.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
```

2129.	12.92	(CFS)	521.	148.	50.	21.
		(INCHES)	1.365	1.554	1.558	1.558
		(AC-FT)	258.	294.	295.	295.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
14.	12.92	4.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.42	12.92	11.99	10.81	10.27	10.12

CUMULATIVE AREA = 3.55 SQ MI

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HYDROGRAPH AT STATION L1-L2A
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2028.	12.92	(CFS)	496.	141.	47.	20.
		(INCHES)	1.301	1.483	1.488	1.488
		(AC-FT)	246.	280.	281.	281.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
13.	12.92	4.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.33	12.92	11.95	10.79	10.27	10.11

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1-L2A
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1929.	12.92	(CFS)	472.	135.	45.	19.
		(INCHES)	1.239	1.415	1.419	1.419
		(AC-FT)	234.	268.	268.	268.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
13.	12.92	4.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.24	12.92	11.91	10.77	10.26	10.11

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1-L2A
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1832.	12.92	(CFS)	449.	128.	43.	19.
		(INCHES)	1.178	1.348	1.352	1.352
		(AC-FT)	223.	255.	256.	256.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
12.	12.92	4.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.16	12.92	11.87	10.75	10.25	10.11

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1-L2A
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1781.	12.92	(CFS)	437.	125.	42.	18.
		(INCHES)	1.146	1.312	1.316	1.316
		(AC-FT)	217.	248.	249.	249.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
12.	12.92	4.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.11	12.92	11.85	10.74	10.25	10.11

CUMULATIVE AREA = 3.55 SQ MI

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***             ***             ***             ***             ***


                    INTERPOLATED HYDROGRAPH AT   L1-L2A

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   2154.      12.92        (CFS)     527.        150.         50.          22.
                         (INCHES)   1.381       1.571       1.576       1.576
                          (AC-FT)    261.        297.        298.        298.

                    CUMULATIVE AREA =    3.55 SQ MI



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          *            *
 291 KK   *       L2A  *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=2.46     Lca=1.12     S=136.18     Kn=0.055     LAG=45.0
                    S-GRAPH TYPE=DES RNGLND

 295 KO         OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

 296 BA         SUBBASIN CHARACTERISTICS
                      TAREA        .69  SUBBASIN AREA

 297 LG         GREEN AND AMPT LOSS RATE
                      STRTL        .35  STARTING LOSS
                        DTH        .38  MOISTURE DEFICIT
                       PSIF       5.64  WETTING FRONT SUCTION
                      XKSAT        .20  HYDRAULIC CONDUCTIVITY
                      RTIMP        .00  PERCENT IMPERVIOUS AREA

   UI           INPUT UNITGRAPH,  34 ORDINATES,  VOLUME = 1.00
                       .0      51.8      51.8     153.3     242.2     330.7     404.5     460.6     494.9     492.2
                    461.4     394.4     327.8     266.9     221.7     182.7     150.1     121.9     100.6      84.2
                     69.9      54.9      46.5      35.5      35.5      26.1      12.6      12.6      12.6      12.6
                     12.6      12.6      12.6      12.6
                                                                  ***

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      L2A
                     TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    2.86, TOTAL EXCESS =    1.30

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    598.      12.58        (CFS)      97.         24.          8.           3.
                         (INCHES)   1.300       1.300       1.300       1.300
                          (AC-FT)     48.         48.         48.         48.

                    CUMULATIVE AREA =     .69 SQ MI


     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      L2A
                     TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.76, TOTAL EXCESS =    1.20

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    552.      12.58        (CFS)      89.         22.          7.           3.
                         (INCHES)   1.196       1.196       1.196       1.196
                          (AC-FT)     44.         44.         44.         44.

                    CUMULATIVE AREA =     .69 SQ MI


     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      L2A
                     TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.69, TOTAL EXCESS =    1.13

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    523.      12.58        (CFS)      84.         21.          7.           3.
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                    (INCHES)      1.128       1.128       1.128       1.128
                     (AC-FT)       42.         42.         42.         42.

                    CUMULATIVE AREA =     .69 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      L2A
                   TRANSPOSITION AREA     40.0 SQ MI

  TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.63, TOTAL EXCESS =    1.06

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   494.     12.58        (CFS)       79.         20.          7.          3.
                    (INCHES)      1.063       1.063       1.063       1.063
                     (AC-FT)       39.         39.         39.         39.

                    CUMULATIVE AREA =     .69 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      L2A
                   TRANSPOSITION AREA     80.0 SQ MI

  TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.57, TOTAL EXCESS =    1.00

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   466.     12.58        (CFS)       74.         19.          6.          3.
                    (INCHES)       .998        .998        .998        .998
                     (AC-FT)       37.         37.         37.         37.

                    CUMULATIVE AREA =     .69 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      L2A
                   TRANSPOSITION AREA    120.0 SQ MI

  TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.53, TOTAL EXCESS =     .97

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   451.     12.58        (CFS)       72.         18.          6.          3.
                    (INCHES)       .964        .964        .964        .964
                     (AC-FT)       36.         36.         36.         36.

                    CUMULATIVE AREA =     .69 SQ MI

   ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT      L2A

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   570.     12.58        (CFS)       92.         23.          8.          3.
                    (INCHES)      1.236       1.236       1.236       1.236
                     (AC-FT)       46.         46.         46.         46.

                    CUMULATIVE AREA =     .69 SQ MI


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          *            *
302 KK    *     L2BR   *        CNAME  L2A-2B
          *            *
          **************

303 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


304 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                  ***

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION     L2BR
                   TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
```

2692.	12.92	(CFS)	658.	183.	61.	26.
		(INCHES)	1.443	1.609	1.613	1.613
		(AC-FT)	326.	364.	365.	365.

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2BR
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2495.	12.92	(CFS)	610.	170.	57.	25.
		(INCHES)	1.338	1.495	1.499	1.499
		(AC-FT)	302.	338.	339.	339.

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2BR
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2373.	12.92	(CFS)	580.	162.	54.	23.
		(INCHES)	1.273	1.425	1.429	1.429
		(AC-FT)	288.	322.	323.	323.

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2BR
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2254.	12.92	(CFS)	552.	155.	52.	22.
		(INCHES)	1.210	1.357	1.361	1.361
		(AC-FT)	274.	307.	308.	308.

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2BR
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2138.	12.92	(CFS)	524.	147.	49.	21.
		(INCHES)	1.148	1.291	1.294	1.294
		(AC-FT)	260.	292.	293.	293.

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2BR
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2076.	12.92	(CFS)	509.	143.	48.	21.
		(INCHES)	1.116	1.255	1.259	1.259
		(AC-FT)	252.	284.	285.	285.

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT L2BR

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2519.	12.92	(CFS)	616.	172.	57.	25.
		(INCHES)	1.351	1.509	1.513	1.513
		(AC-FT)	305.	341.	342.	342.

CUMULATIVE AREA = 4.24 SQ MI

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              *            *
305 KK        *   L2A-2B   *        CNAME    L2BR
              *            *
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306 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

307 RS          STORAGE ROUTING
                      NSTPS          7  NUMBER OF SUBREACHES
                       ITYP       FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC        .00  INITIAL CONDITION
                          X        .00 WORKING R AND D COEFFICIENT

308 RC          NORMAL DEPTH CHANNEL
                        ANL       .046  LEFT OVERBANK N-VALUE
                       ANCH       .045  MAIN CHANNEL N-VALUE
                        ANR       .046  RIGHT OVERBANK N-VALUE
                      RLNTH     20743.  REACH LENGTH
                        SEL      .0147  ENERGY SLOPE
                      ELMAX         .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                        --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
310 RY      ELEVATION    19.00     17.00     14.00     10.00     10.00     14.00     18.00     22.00
309 RX      DISTANCE       .00     80.00    165.00    200.00    215.00    255.00    340.00    420.00

                                                  ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

        STORAGE        .00      6.29     16.15     29.56     46.54     67.08     91.18    120.14    158.20    205.67
        OUTFLOW        .00     33.02    124.37    285.11    527.77    864.27   1305.94   1955.40   2820.12   3902.96
      ELEVATION      10.00     10.63     11.26     11.89     12.53     13.16     13.79     14.42     15.05     15.68

        STORAGE     262.57    328.88    405.54    493.81    593.54    702.53    815.55    932.37   1052.99   1177.41
        OUTFLOW    5239.75   6862.20   8773.58  11051.45  13733.67  17039.73  20837.71  25056.13  29692.23  34745.19
      ELEVATION      16.32     16.95     17.58     18.21     18.84     19.47     20.11     20.74     21.37     22.00

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION   L2A-2B
                  TRANSPOSITION AREA        .0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  2392.     13.42        (CFS)     656.        183.         61.         26.
                       (INCHES)   1.439       1.607       1.613       1.613
                        (AC-FT)    325.        363.        365.        365.

PEAK STORAGE  TIME                        MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                 6-HR       24-HR       72-HR    166.58-HR
     20.    13.42                    7.          2.          1.          0.

PEAK STAGE    TIME                        MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
   14.74    13.42                 12.35       10.94       10.32       10.14

                    CUMULATIVE AREA =    4.24 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION   L2A-2B
                  TRANSPOSITION AREA      10.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  2205.     13.42        (CFS)     608.        170.         57.         25.
                       (INCHES)   1.334       1.493       1.499       1.499
                        (AC-FT)    302.        338.        339.        339.

PEAK STORAGE  TIME                        MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                 6-HR       24-HR       72-HR    166.58-HR
     19.    13.42                    7.          2.          1.          0.

PEAK STAGE    TIME                        MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
   14.60    13.42                 12.28       10.90       10.31       10.13

                    CUMULATIVE AREA =    4.24 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION   L2A-2B
                  TRANSPOSITION AREA      20.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  2087.     13.42        (CFS)     579.        162.         54.         23.
                       (INCHES)   1.270       1.423       1.429       1.429
                        (AC-FT)    287.        322.        323.        323.

PEAK STORAGE  TIME                        MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                 6-HR       24-HR       72-HR    166.58-HR
```

18.	13.42	6.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.52	13.42	12.23	10.88	10.30	10.13

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2A-2B
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1970.	13.42	(CFS)	550.	154.	52.	22.
		(INCHES)	1.207	1.355	1.361	1.361
		(AC-FT)	273.	306.	308.	308.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
17.	13.42	6.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.43	13.42	12.18	10.86	10.29	10.13

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2A-2B
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1854.	13.42	(CFS)	522.	147.	49.	21.
		(INCHES)	1.145	1.289	1.294	1.294
		(AC-FT)	259.	291.	293.	293.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
17.	13.42	6.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.32	13.42	12.14	10.84	10.28	10.12

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2A-2B
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1793.	13.50	(CFS)	507.	143.	48.	21.
		(INCHES)	1.113	1.254	1.259	1.259
		(AC-FT)	252.	283.	285.	285.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
16.	13.50	6.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.26	13.50	12.11	10.83	10.28	10.12

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT L2A-2B

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2228.	13.42	(CFS)	614.	172.	57.	25.
		(INCHES)	1.347	1.507	1.513	1.513
		(AC-FT)	305.	341.	342.	342.

CUMULATIVE AREA = 4.24 SQ MI

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              *            *
311 KK        *     L2B    *
              *            *
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THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
L=5.13 Lca=1.82 S=93.37 Kn=0.055 LAG=78.1
S-GRAPH TYPE=DES RNGLND

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315 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

316 BA          SUBBASIN CHARACTERISTICS
                      TAREA       4.08  SUBBASIN AREA

317 LG          GREEN AND AMPT LOSS RATE
                      STRTL        .35  STARTING LOSS
                        DTH        .35  MOISTURE DEFICIT
                       PSIF       4.18  WETTING FRONT SUCTION
                      XKSAT        .40  HYDRAULIC CONDUCTIVITY
                      RTIMP        .00  PERCENT IMPERVIOUS AREA

316 UI          INPUT UNITGRAPH,  58 ORDINATES,  VOLUME = 1.00
                     .0     176.0     176.0     176.0     311.9     535.5     724.3     902.8    1071.3    1224.6
                  1376.8    1511.6    1580.9    1658.5    1686.4    1686.4    1632.5    1568.6    1460.6    1278.3
                  1172.5    1031.0     927.3     829.8     742.5     663.7     594.6     529.9     481.8     405.6
                   377.6     331.8     310.2     269.8     269.2     186.5     186.5     186.5     145.4     120.5
                   120.5     120.5     120.5      90.9      42.8      42.8      42.8      42.8      42.8      42.8
                    42.8      42.8      42.8      42.8      42.8      42.8      42.8      42.8
                                                                   ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      L2B
                    TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    3.05, TOTAL EXCESS =    1.11

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1832.     13.08        (CFS)      484.        121.         40.         17.
                       (INCHES)    1.105       1.105       1.105       1.105
                        (AC-FT)    240.        240.        240.        240.

                     CUMULATIVE AREA =    4.08 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      L2B
                    TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.94, TOTAL EXCESS =    1.01

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1680.     13.08        (CFS)      443.        111.         37.         16.
                       (INCHES)    1.011       1.011       1.011       1.011
                        (AC-FT)    220.        220.        220.        220.

                     CUMULATIVE AREA =    4.08 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      L2B
                    TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.87, TOTAL EXCESS =     .95

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1581.     13.08        (CFS)      417.        104.         35.         15.
                       (INCHES)     .951        .951        .951        .951
                        (AC-FT)    207.        207.        207.        207.

                     CUMULATIVE AREA =    4.08 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      L2B
                    TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.80, TOTAL EXCESS =     .89

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1484.     13.08        (CFS)      391.         98.         33.         14.
                       (INCHES)     .892        .892        .892        .892
                        (AC-FT)    194.        194.        194.        194.

                     CUMULATIVE AREA =    4.08 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      L2B
                    TRANSPOSITION AREA     80.0 SQ MI
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    TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.73, TOTAL EXCESS =     .83

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   1390.     13.08        (CFS)       366.         91.         30.          13.
                        (INCHES)      .834        .834        .834         .834
                         (AC-FT)      181.        181.        181.         181.

                        CUMULATIVE AREA =    4.08 SQ MI

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      L2B
                     TRANSPOSITION AREA    120.0 SQ MI

    TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.70, TOTAL EXCESS =     .80

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   1339.     13.08        (CFS)       352.         88.         29.          13.
                        (INCHES)      .803        .803        .803         .803
                         (AC-FT)      175.        175.        175.         175.

                        CUMULATIVE AREA =    4.08 SQ MI.

     ***             ***             ***             ***             ***


                       INTERPOLATED HYDROGRAPH AT      L2B

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   1700.     13.08        (CFS)       449.        112.         37.          16.
                        (INCHES)     1.024       1.024       1.024        1.024
                         (AC-FT)      223.        223.        223.         223.

                        CUMULATIVE AREA =    4.08 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
324 KK      *       L3R  *        CNAME  L2B-L3
            *            *
            **************

325 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


326 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      L3R
                     TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   3995.     13.33        (CFS)      1138.        304.        102.          44.
                        (INCHES)     1.272       1.361       1.364        1.364
                         (AC-FT)      564.        603.        605.         605.

                        CUMULATIVE AREA =    8.32 SQ MI

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      L3R
                     TRANSPOSITION AREA     10.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   3667.     13.33        (CFS)      1049.        281.         94.          41.
                        (INCHES)     1.173       1.257       1.260        1.260
                         (AC-FT)      520.        557.        559.         559.

                        CUMULATIVE AREA =    8.32 SQ MI

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                       HYDROGRAPH AT STATION      L3R
                     TRANSPOSITION AREA     20.0 SQ MI
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 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   3457.     13.33        (CFS)      993.        266.         89.         38.
                        (INCHES)    1.110       1.192       1.195       1.195
                         (AC-FT)     492.        529.        530.        530.

                       CUMULATIVE AREA =    8.32 SQ MI


   ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      L3R
                     TRANSPOSITION AREA     40.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   3246.     13.33        (CFS)      939.        252.         84.         36.
                        (INCHES)    1.049       1.128       1.131       1.131
                         (AC-FT)     465.        500.        502.        502.

                       CUMULATIVE AREA =    8.32 SQ MI


   ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      L3R
                     TRANSPOSITION AREA     80.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   3039.     13.33        (CFS)      885.        238.         80.         34.
                        (INCHES)     .990       1.066       1.068       1.068
                         (AC-FT)     439.        473.        474.        474.

                       CUMULATIVE AREA =    8.32 SQ MI


   ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      L3R
                     TRANSPOSITION AREA    120.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   2926.     13.33        (CFS)      857.        231.         77.         33.
                        (INCHES)     .958       1.033       1.035       1.035
                         (AC-FT)     425.        458.        459.        459.

                       CUMULATIVE AREA =    8.32 SQ MI

   ***             ***             ***             ***             ***


                       INTERPOLATED HYDROGRAPH AT      L3R

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   3676.     13.33        (CFS)     1051.        282.         94.         41.
                        (INCHES)    1.175       1.260       1.263       1.263
                         (AC-FT)     521.        559.        560.        560.

                       CUMULATIVE AREA =    8.32 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
327 KK    *   L2B-L3   *        CNAME     L3R
          *            *
          **************

328 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

329 RS          STORAGE ROUTING
                      NSTPS          18  NUMBER OF SUBREACHES
                       ITYP        FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

330 RC          NORMAL DEPTH CHANNEL
                        ANL        .050  LEFT OVERBANK N-VALUE
                       ANCH        .040  MAIN CHANNEL N-VALUE
                        ANR        .060  RIGHT OVERBANK N-VALUE
                      RLNTH      19943.  REACH LENGTH
                        SEL      .0089  ENERGY SLOPE
                      ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION
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CROSS-SECTION DATA

		--- LEFT OVERBANK ---		+ ------ MAIN CHANNEL		------- +	--- RIGHT OVERBANK ---		
332 RY	ELEVATION	18.00	11.80	11.70	10.00	10.00	11.70	11.80	18.00
331 RX	DISTANCE	.00	1093.00	1210.00	1215.00	1225.00	1232.00	1372.00	2000.00

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	2.21	5.00	8.36	12.29	64.26	145.64	249.55	375.99	524.96
OUTFLOW	.00	8.75	29.54	61.91	106.59	295.10	751.21	1485.94	2533.00	3927.79
ELEVATION	10.00	10.42	10.84	11.26	11.68	12.11	12.53	12.95	13.37	13.79
STORAGE	696.46	890.49	1107.05	1346.14	1607.76	1891.90	2198.58	2527.79	2879.53	3253.80
OUTFLOW	5705.10	7898.66	10541.13	13664.13	17298.39	21473.76	26219.33	31563.50	37534.01	44158.04
ELEVATION	14.21	14.63	15.05	15.47	15.89	16.32	16.74	17.16	17.58	18.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 26219. TO 44158.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

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HYDROGRAPH AT STATION L2B-L3
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3294.	14.75	(CFS)	1124.	304.	102.	44.
		(INCHES)	1.256	1.360	1.364	1.364
		(AC-FT)	557.	603.	605.	605.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
25.	14.75	10.	3.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.60	14.75	12.61	11.24	10.43	10.18

CUMULATIVE AREA = 8.32 SQ MI

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HYDROGRAPH AT STATION L2B-L3
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2996.	14.75	(CFS)	1037.	281.	94.	41.
		(INCHES)	1.159	1.256	1.260	1.260
		(AC-FT)	514.	557.	559.	559.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
24.	14.75	10.	3.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.51	14.75	12.56	11.21	10.42	10.18

CUMULATIVE AREA = 8.32 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B-L3
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2797.	14.75	(CFS)	982.	266.	89.	38.
		(INCHES)	1.098	1.191	1.195	1.195
		(AC-FT)	487.	528.	530.	530.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
22.	14.75	9.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.45	14.75	12.53	11.19	10.41	10.18

CUMULATIVE AREA = 8.32 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B-L3
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2612.	14.83	(CFS)	928.	252.	84.	36.
		(INCHES)	1.037	1.127	1.131	1.131
		(AC-FT)	460.	500.	502.	502.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR

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     21.     14.83                    9.          2.          1.          0.

 PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                     6-HR       24-HR       72-HR    166.58-HR
   13.39     14.83                     12.50       11.18       10.40       10.17

                        CUMULATIVE AREA =    8.32 SQ MI

   ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   L2B-L3
                      TRANSPOSITION AREA     80.0 SQ MI

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                     6-HR       24-HR       72-HR    166.58-HR
   2435.     14.92        (CFS)        875.        238.         80.         34.
                        (INCHES)       .979       1.065       1.068       1.068
                         (AC-FT)       434.        472.        474.        474.

PEAK STORAGE   TIME                              MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                     6-HR       24-HR       72-HR    166.58-HR
     20.     14.92                       8.          2.          1.          0.

 PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                     6-HR       24-HR       72-HR    166.58-HR
   13.33     14.92                     12.47       11.16       10.40       10.17

                        CUMULATIVE AREA =    8.32 SQ MI

   ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   L2B-L3
                      TRANSPOSITION AREA    120.0 SQ MI

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                     6-HR       24-HR       72-HR    166.58-HR
   2347.     14.92        (CFS)        847.        231.         77.         33.
                        (INCHES)       .947       1.032       1.035       1.035
                         (AC-FT)       420.        458.        459.        459.

PEAK STORAGE   TIME                              MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                     6-HR       24-HR       72-HR    166.58-HR
     20.     14.92                       8.          2.          1.          0.

 PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                     6-HR       24-HR       72-HR    166.58-HR
   13.29     14.92                     12.46       11.15       10.39       10.17

                        CUMULATIVE AREA =    8.32 SQ MI

   ***             ***             ***             ***             ***


                        INTERPOLATED HYDROGRAPH AT   L2B-L3

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                     6-HR       24-HR       72-HR    166.58-HR
   3004.     14.75        (CFS)       1039.        282.         94.         41.
                        (INCHES)      1.161       1.259       1.263       1.263
                         (AC-FT)       515.        558.        560.        560.

                        CUMULATIVE AREA =    8.32 SQ MI


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          *            *
333 KK    *       L2C  *
          *            *
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                        THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                        L=3.20     Lca=1.55     S=91.31     Kn=0.055     LAG=61.2
                        S-GRAPH TYPE=DES RNGLND

337 KO          OUTPUT CONTROL VARIABLES
                      IPRNT            3  PRINT CONTROL
                      IPLOT            0  PLOT CONTROL
                      QSCAL           0.  HYDROGRAPH PLOT SCALE
                      IPNCH            1  PUNCH COMPUTED HYDROGRAPH
                       IOUT           22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1            1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT         .083  TIME INTERVAL IN HOURS

          SUBBASIN RUNOFF DATA

338 BA          SUBBASIN CHARACTERISTICS
                      TAREA         1.33  SUBBASIN AREA

339 LG          GREEN AND AMPT LOSS RATE
                      STRTL          .35  STARTING LOSS
                        DTH          .35  MOISTURE DEFICIT
                       PSIF         4.19  WETTING FRONT SUCTION
                      XKSAT          .42  HYDRAULIC CONDUCTIVITY
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                    RTIMP          .00  PERCENT IMPERVIOUS AREA

338 UI          INPUT UNITGRAPH,  45 ORDINATES,  VOLUME = 1.00
                     .0      73.3      73.3     100.0     227.1     318.4     414.0     500.5     577.1     643.2
                   678.8     702.6     699.6     666.3     621.7     533.3     468.3     402.9     351.3     303.8
                   266.7     226.8     200.7     164.0     145.0     131.9     112.4      98.0      77.7      77.7
                    56.5      50.2      50.2      50.2      28.5      17.8      17.8      17.8      17.8      17.8
                    17.8      17.8      17.8      17.8      17.8

                                                                  ***

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2C
                  TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    3.08, TOTAL EXCESS =    1.08

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   736.     12.83        (CFS)      154.         39.         13.          6.
                       (INCHES)    1.079       1.079       1.079       1.079
                        (AC-FT)     76.         76.         76.         76.

                    CUMULATIVE AREA =    1.33 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2C
                  TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.97, TOTAL EXCESS =     .99

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   673.     12.83        (CFS)      141.         35.         12.          5.
                       (INCHES)     .985        .985        .985        .985
                        (AC-FT)     70.         70.         70.         70.

                    CUMULATIVE AREA =    1.33 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2C
                  TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.89, TOTAL EXCESS =     .93

K FLOW        TIME                          MAXIMUM AVERAGE FLOW
CFS)          (HR)                  6-HR       24-HR       72-HR    166.58-HR
   633.     12.83        (CFS)      132.         33.         11.          5.
                       (INCHES)     .925        .925        .925        .925
                        (AC-FT)     65.         65.         65.         65.

                    CUMULATIVE AREA =    1.33 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2C
                  TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.82, TOTAL EXCESS =     .87

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   594.     12.83        (CFS)      124.         31.         10.          4.
                       (INCHES)     .865        .865        .865        .865
                        (AC-FT)     61.         61.         61.         61.

                    CUMULATIVE AREA =    1.33 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2C
                  TRANSPOSITION AREA     80.0 SQ MI

   TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.76, TOTAL EXCESS =     .81

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   555.     12.83        (CFS)      115.         29.         10.          4.
                       (INCHES)     .807        .807        .807        .807
                        (AC-FT)     57.         57.         57.         57.

                    CUMULATIVE AREA =    1.33 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2C
                  TRANSPOSITION AREA    120.0 SQ MI

   TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.72, TOTAL EXCESS =     .78

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   535.     12.83        (CFS)      111.         28.          9.          4.
                       (INCHES)     .776        .776        .776        .776
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                    (AC-FT)        55.         55.         55.         55.

                    CUMULATIVE AREA =    1.33 SQ MI

     ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT      L2C

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   692.       12.83       (CFS)      145.         36.         12.          5.
                        (INCHES)    1.013       1.013       1.013       1.013
                         (AC-FT)     72.         72.         72.         72.

                    CUMULATIVE AREA =    1.33 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 345 KK   *   L2C-2D   *        CNAME    L2DR
          *            *
          **************

 346 KO         OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

 347 RS         STORAGE ROUTING
                      NSTPS           6  NUMBER OF SUBREACHES
                       ITYP        FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

 348 RC         NORMAL DEPTH CHANNEL
                        ANL        .046  LEFT OVERBANK N-VALUE
                       ANCH        .045  MAIN CHANNEL N-VALUE
                        ANR        .046  RIGHT OVERBANK N-VALUE
                      RLNTH       9752.  REACH LENGTH
                        SEL      .0122  ENERGY SLOPE
                      ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
 350 RY        ELEVATION     19.00     17.00     14.00     10.00     10.00     14.00     18.00     22.00
 349 RX        DISTANCE        .00     80.00    165.00    200.00    215.00    255.00    340.00    420.00

                                                   ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00      2.96      7.59     13.90     21.88     31.54     42.87     56.48     74.38     96.70
          OUTFLOW        .00     30.08    113.30    259.74    480.80    787.35   1189.72   1781.38   2569.15   3555.62
        ELEVATION      10.00     10.63     11.26     11.89     12.53     13.16     13.79     14.42     15.05     15.68

          STORAGE     123.44    154.62    190.66    232.16    279.05    330.29    383.42    438.35    495.06    553.55
          OUTFLOW    4773.44   6251.50   7992.78  10067.93  12511.46  15523.30  18983.28  22826.29  27049.80  31653.07
        ELEVATION      16.32     16.95     17.58     18.21     18.84     19.47     20.11     20.74     21.37     22.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN     7993. TO    31653.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION   L2C-2D
                    TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   693.       13.17       (CFS)      154.         39.         13.          6.
                        (INCHES)    1.079       1.079       1.079       1.079
                         (AC-FT)     76.         76.         76.         76.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
     5.       13.17                    1.          0.          0.          0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
  (FEET)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  12.96       13.17                  11.03      10.26       10.09       10.04

                    CUMULATIVE AREA =    1.33 SQ MI

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HYDROGRAPH AT STATION L2C-2D
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
634.	13.25	(CFS)	141.	35.	12.	5.
		(INCHES)	.985	.985	.985	.985
		(AC-FT)	70.	70.	70.	70.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	13.25	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.84	13.25	10.98	10.25	10.08	10.04

CUMULATIVE AREA = 1.33 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2C-2D
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
596.	13.25	(CFS)	132.	33.	11.	5.
		(INCHES)	.925	.925	.925	.925
		(AC-FT)	65.	65.	65.	65.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	13.25	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.76	13.25	10.95	10.24	10.08	10.03

CUMULATIVE AREA = 1.33 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2C-2D
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
558.	13.25	(CFS)	124.	31.	10.	4.
		(INCHES)	.865	.865	.865	.865
		(AC-FT)	61.	61.	61.	61.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	13.25	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.68	13.25	10.92	10.23	10.08	10.03

CUMULATIVE AREA = 1.33 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2C-2D
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
520.	13.25	(CFS)	115.	29.	10.	4.
		(INCHES)	.807	.807	.807	.807
		(AC-FT)	57.	57.	57.	57.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	13.25	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.61	13.25	10.89	10.22	10.07	10.03

CUMULATIVE AREA = 1.33 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2C-2D
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
499.	13.25	(CFS)	111.	28.	9.	4.
		(INCHES)	.776	.776	.776	.776
		(AC-FT)	55.	55.	55.	55.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	13.25	1.	0.	0.	0.

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 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
    12.56     13.25                 10.87       10.22       10.07        10.03

                        CUMULATIVE AREA =    1.33 SQ MI

     ***             ***             ***             ***             ***


                        INTERPOLATED HYDROGRAPH AT   L2C-2D

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
     651.     13.25       (CFS)      145.         36.         12.           5.
                        (INCHES)    1.013       1.013       1.013        1.013
                         (AC-FT)     72.         72.         72.          72.

                        CUMULATIVE AREA =    1.33 SQ MI


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            *            *
 351 KK     *       L2D  *
            *            *
            **************
                          THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                          L=2.77     Lca=1.24     S=74.13     Kn=0.055     LAG=55.4
                          S-GRAPH TYPE=DES RNGLND

 355 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           3  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                        IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


               SUBBASIN RUNOFF DATA

 356 BA          SUBBASIN CHARACTERISTICS
                       TAREA        1.23  SUBBASIN AREA

     LG          GREEN AND AMPT LOSS RATE
                       STRTL         .35  STARTING LOSS
                         DTH         .35  MOISTURE DEFICIT
                        PSIF        3.58  WETTING FRONT SUCTION
                       XKSAT         .54  HYDRAULIC CONDUCTIVITY
                       RTIMP         .00  PERCENT IMPERVIOUS AREA

 356 UI          INPUT UNITGRAPH,  41 ORDINATES,  VOLUME = 1.00
                        .0      75.4      75.4     141.9     262.4     378.7     482.1     569.6     651.1     696.0
                    722.7     714.8     677.8     607.5     518.2     439.1     376.3     322.3     277.2     232.7
                    200.6     167.8     142.2     124.1     114.5      79.9      79.9      61.7      51.6      51.6
                     51.6      20.1      18.4      18.4      18.4      18.4      18.4      18.4      18.4      18.4
                     18.4

                                                                  ***

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      L2D
                       TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    3.16, TOTAL EXCESS =    1.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
     699.     12.75       (CFS)      132.         33.         11.           5.
                        (INCHES)    1.000       1.000       1.000        1.000
                         (AC-FT)     66.         66.         66.          66.

                        CUMULATIVE AREA =    1.23 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      L2D
                       TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    3.05, TOTAL EXCESS =     .91

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
     636.     12.75       (CFS)      120.         30.         10.           4.
                        (INCHES)     .906        .906        .906         .906
                         (AC-FT)     60.         60.         60.          60.

                        CUMULATIVE AREA =    1.23 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      L2D
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                    TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.97, TOTAL EXCESS =     .85

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   595.     12.75        (CFS)      112.         28.          9.           4.
                      (INCHES)      .845        .845        .845         .845
                       (AC-FT)       55.         55.         55.          55.

                    CUMULATIVE AREA =    1.23 SQ MI

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION      L2D
                    TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.90, TOTAL EXCESS =     .79

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   555.     12.75        (CFS)      104.         26.          9.           4.
                      (INCHES)      .785        .785        .785         .785
                       (AC-FT)       52.         52.         52.          52.

                    CUMULATIVE AREA =    1.23 SQ MI

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION      L2D
                    TRANSPOSITION AREA     80.0 SQ MI

   TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.84, TOTAL EXCESS =     .73

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   516.     12.75        (CFS)       96.         24.          8.           3.
                      (INCHES)      .728        .728        .728         .728
                       (AC-FT)       48.         48.         48.          48.

                    CUMULATIVE AREA =    1.23 SQ MI

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION      L2D
                    TRANSPOSITION AREA    120.0 SQ MI

   TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.80, TOTAL EXCESS =     .70

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   496.     12.75        (CFS)       93.         23.          8.           3.
                      (INCHES)      .699        .699        .699         .699
                       (AC-FT)       46.         46.         46.          46.

                    CUMULATIVE AREA =    1.23 SQ MI

    ***             ***             ***             ***             ***


                    INTERPOLATED HYDROGRAPH AT      L2D

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   655.     12.75        (CFS)      124.         31.         10.           4.
                      (INCHES)      .934        .934        .934         .934
                       (AC-FT)       61.         61.         61.          61.

                    CUMULATIVE AREA =    1.23 SQ MI


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          *            *
363 KK    *     L3RB   *        CNAME  L2D-L3
          *            *
          **************

364 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS

365 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION L3RB
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1195.	13.00	(CFS)	287.	72.	24.	10.
		(INCHES)	1.041	1.041	1.041	1.041
		(AC-FT)	142.	142.	142.	142.

CUMULATIVE AREA = 2.56 SQ MI

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HYDROGRAPH AT STATION L3RB
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1082.	13.00	(CFS)	261.	65.	22.	9.
		(INCHES)	.947	.947	.947	.947
		(AC-FT)	129.	129.	129.	129.

CUMULATIVE AREA = 2.56 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3RB
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1003.	13.00	(CFS)	244.	61.	20.	9.
		(INCHES)	.886	.886	.886	.886
		(AC-FT)	121.	121.	121.	121.

CUMULATIVE AREA = 2.56 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3RB
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
928.	13.00	(CFS)	228.	57.	19.	8.
		(INCHES)	.826	.827	.827	.827
		(AC-FT)	113.	113.	113.	113.

CUMULATIVE AREA = 2.56 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3RB
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
857.	13.00	(CFS)	212.	53.	18.	8.
		(INCHES)	.769	.769	.769	.769
		(AC-FT)	105.	105.	105.	105.

CUMULATIVE AREA = 2.56 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3RB
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
820.	13.00	(CFS)	203.	51.	17.	7.
		(INCHES)	.739	.739	.739	.739
		(AC-FT)	101.	101.	101.	101.

CUMULATIVE AREA = 2.56 SQ MI

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INTERPOLATED HYDROGRAPH AT L3RB

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1104.	13.00	(CFS)	266.	66.	22.	10.
		(INCHES)	.965	.965	.965	.965
		(AC-FT)	132.	132.	132.	132.

CUMULATIVE AREA = 2.56 SQ MI

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                *            *
366 KK          *   L2D-L3   *        CNAME    L3RB
                *            *
                **************

367 KO            OUTPUT CONTROL VARIABLES
                       IPRNT          3  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE
                       IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                        IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT       .083  TIME INTERVAL IN HOURS


                HYDROGRAPH ROUTING DATA

368 RS            STORAGE ROUTING
                       NSTPS         39  NUMBER OF SUBREACHES
                        ITYP       FLOW  TYPE OF INITIAL CONDITION
                      RSVRIC        .00  INITIAL CONDITION
                           X        .00 WORKING R AND D COEFFICIENT

369 RC            NORMAL DEPTH CHANNEL
                         ANL       .050  LEFT OVERBANK N-VALUE
                        ANCH       .040  MAIN CHANNEL N-VALUE
                         ANR       .060  RIGHT OVERBANK N-VALUE
                       RLNTH     27374.  REACH LENGTH
                         SEL      .0077  ENERGY SLOPE
                       ELMAX         .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
371 RY        ELEVATION    18.00     11.80     11.70     10.00     10.00     11.70     11.80     18.00
370 RX        DISTANCE       .00   1093.00   1210.00   1215.00   1225.00   1232.00   1372.00   2000.00

                                                  ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00      3.04      6.86     11.48     16.88     88.20    199.91    342.54    516.10    720.58
          OUTFLOW        .00      8.14     27.48     57.58     99.15    274.49    698.74   1382.13   2356.05   3653.42
        ELEVATION      10.00     10.42     10.84     11.26     11.68     12.11     12.53     12.95     13.37     13.79

          STORAGE     955.98   1222.32   1519.58   1847.76   2206.87   2596.90   3017.86   3469.74   3952.55   4466.29
          OUTFLOW    5306.57   7346.90   9804.77  12709.62  16090.00  19973.70  24387.77  29358.61  34912.05  41073.35
        ELEVATION      14.21     14.63     15.05     15.47     15.89     16.32     16.74     17.16     17.58     18.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN       58. TO    41073.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION   L2D-L3
                    TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
    781.     16.00          (CFS)     284.         72.         24.          10.
                         (INCHES)    1.031       1.041       1.041        1.041
                          (AC-FT)     141.        142.        142.        142.

PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
      6.     16.00                     2.          1.          0.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
   12.58     16.00                   11.81       10.49       10.16        10.07

                      CUMULATIVE AREA =    2.56 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION   L2D-L3
                    TRANSPOSITION AREA     10.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
    694.     16.25          (CFS)     258.         65.         22.           9.
                         (INCHES)     .937        .947        .947         .947
                          (AC-FT)     128.        129.        129.        129.

PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
      5.     16.25                     2.          0.          0.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
   12.52     16.25                   11.77       10.48       10.16        10.07

                      CUMULATIVE AREA =    2.56 SQ MI

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HYDROGRAPH AT STATION L2D-L3
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
654.	16.33	(CFS)	241.	61.	20.	9.
		(INCHES)	.876	.886	.886	.886
		(AC-FT)	120.	121.	121.	121.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
5.	16.33	2.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.48	16.33	11.74	10.47	10.16	10.07

CUMULATIVE AREA = 2.56 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2D-L3
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
610.	16.42	(CFS)	225.	57.	19.	8.
		(INCHES)	.817	.827	.827	.827
		(AC-FT)	112.	113.	113.	113.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
5.	16.42	2.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.44	16.42	11.71	10.46	10.15	10.07

CUMULATIVE AREA = 2.56 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2D-L3
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
564.	16.42	(CFS)	209.	53.	18.	8.
		(INCHES)	.760	.769	.769	.769
		(AC-FT)	104.	105.	105.	105.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	16.42	2.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.39	16.42	11.67	10.45	10.15	10.06

CUMULATIVE AREA = 2.56 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2D-L3
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
539.	16.50	(CFS)	201.	51.	17.	7.
		(INCHES)	.730	.739	.739	.739
		(AC-FT)	100.	101.	101.	101.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	16.50	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.37	16.50	11.66	10.45	10.15	10.06

CUMULATIVE AREA = 2.56 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT L2D-L3

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
705.	16.17	(CFS)	263.	66.	22.	10.
		(INCHES)	.956	.965	.965	.965
		(AC-FT)	130.	132.	132.	132.

CUMULATIVE AREA = 2.56 SQ MI

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            *            *
372 KK      *        L3  *
            *            *
            **************
                          THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                          L=4.75     Lca=2.00     S=44.27     Kn=0.055     LAG=91.0
                          S-GRAPH TYPE=DES RNGLND

376 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


              SUBBASIN RUNOFF DATA

377 BA          SUBBASIN CHARACTERISTICS
                      TAREA       5.85  SUBBASIN AREA

378 LG          GREEN AND AMPT LOSS RATE
                      STRTL        .34  STARTING LOSS
                        DTH        .33  MOISTURE DEFICIT
                       PSIF       3.98  WETTING FRONT SUCTION
                      XKSAT        .42  HYDRAULIC CONDUCTIVITY
                      RTIMP       1.05  PERCENT IMPERVIOUS AREA

377 UI          INPUT UNITGRAPH,  67 ORDINATES,  VOLUME = 1.00
                       .0     216.5     216.5     216.5     216.5     547.0     701.8     899.0    1098.3    1266.3
                  1460.0    1557.8    1786.1    1888.6    1950.2    2034.9    2074.9    2074.9    2053.8    1965.5
                  1920.6    1789.2    1583.5    1486.1    1313.6    1207.8    1091.4     994.6     909.2     825.0
                   759.9     664.0     614.5     574.5     483.5     461.5     408.2     402.7     332.0     332.0
                   296.9     229.5     229.5     229.5     197.6     148.2     148.2     148.2     148.2     148.2
                   121.7      52.7      52.7      52.7      52.7      52.7      52.7      52.7      52.7      52.7
                    52.7      52.7      52.7      52.7      52.7      52.7      52.7
                                                                   ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       L3
                    TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    3.01, TOTAL EXCESS =    1.15

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2303.     13.25        (CFS)      712.        180.         60.         26.
                       (INCHES)    1.131       1.144       1.145       1.145
                        (AC-FT)     353.        357.        357.        357.

                     CUMULATIVE AREA =    5.85 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       L3
                    TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.90, TOTAL EXCESS =    1.05

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2115.     13.25        (CFS)      654.        165.         55.         24.
                       (INCHES)    1.038       1.051       1.051       1.051
                        (AC-FT)     324.        328.        328.        328.

                     CUMULATIVE AREA =    5.85 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       L3
                    TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.83, TOTAL EXCESS =     .99

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1993.     13.25        (CFS)      616.        156.         52.         22.
                       (INCHES)     .978        .990        .990        .990
                        (AC-FT)     305.        309.        309.        309.

                     CUMULATIVE AREA =    5.85 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       L3
                    TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.76, TOTAL EXCESS =     .93

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
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 (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1873.      13.25       (CFS)      579.        146.         49.          21.
                      (INCHES)     .919        .931        .931         .931
                       (AC-FT)     287.        291.        291.         291.

                     CUMULATIVE AREA =    5.85 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       L3
                   TRANSPOSITION AREA     80.0 SQ MI

  TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.69, TOTAL EXCESS =     .87

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1757.      13.25       (CFS)      542.        137.         46.          20.
                      (INCHES)     .862        .873        .873         .873
                       (AC-FT)     269.        272.        273.         273.

                     CUMULATIVE AREA =    5.85 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       L3
                   TRANSPOSITION AREA    120.0 SQ MI

  TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.66, TOTAL EXCESS =     .84

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1695.      13.25       (CFS)      523.        132.         44.          19.
                      (INCHES)     .831        .842        .842         .842
                       (AC-FT)     259.        263.        263.         263.

                     CUMULATIVE AREA =    5.85 SQ MI

   ***            ***            ***            ***            ***


                     INTERPOLATED HYDROGRAPH AT       L3

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2129.      13.25       (CFS)      658.        166.         56.          24.
                      (INCHES)    1.045       1.058       1.058        1.058
                       (AC-FT)     326.        330.        330.         330.

                     CUMULATIVE AREA =    5.85 SQ MI


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          *            *
386 KK    *          L *        CNAME      1R
          *            *
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387 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS

388 HC          HYDROGRAPH COMBINATION
                     ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       L
                   TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  3997.      14.67       (CFS)     2023.        555.        186.          80.
                      (INCHES)    1.125       1.235       1.238        1.238
                       (AC-FT)    1003.       1102.       1104.        1104.

                     CUMULATIVE AREA =   16.73 SQ MI

   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       L
                   TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
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   3615.     14.67        (CFS)      1857.        511.        171.          74.
                       (INCHES)      1.032       1.136       1.139        1.139
                        (AC-FT)       921.        1014.       1016.        1016.

                       CUMULATIVE AREA =   16.73 SQ MI


    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        L
                     TRANSPOSITION AREA     20.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   3378.     14.75        (CFS)      1751.        483.        161.          70.
                       (INCHES)       .973       1.073       1.076        1.076
                        (AC-FT)       868.         958.        960.         960.

                       CUMULATIVE AREA =   16.73 SQ MI


    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        L
                     TRANSPOSITION AREA     40.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   3127.     14.75        (CFS)      1648.        455.        152.          66.
                       (INCHES)       .916       1.012       1.014        1.014
                        (AC-FT)       817.         903.        905.         905.

                       CUMULATIVE AREA =   16.73 SQ MI


    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        L
                     TRANSPOSITION AREA     80.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   2901.     14.83        (CFS)      1547.        428.        143.          62.
                       (INCHES)       .860        .952        .954         .954
                        (AC-FT)       767.         849.        851.         851.

                       CUMULATIVE AREA =   16.73 SQ MI


    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        L
                     TRANSPOSITION AREA    120.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   2793.     14.92        (CFS)      1494.        414.        138.          60.
                       (INCHES)       .830        .920        .922         .922
                        (AC-FT)       741.         821.        823.         823.

                       CUMULATIVE AREA =   16.73 SQ MI

    ***             ***             ***             ***             ***


                       INTERPOLATED HYDROGRAPH AT        L

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   3437.     14.75        (CFS)      1778.        490.        164.          71.
                       (INCHES)       .988       1.090       1.092        1.092
                        (AC-FT)       882.         972.        974.         974.

                       CUMULATIVE AREA =   16.73 SQ MI


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          *            *
389 KK    *        1R  *        CNAME       L
          *            *
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390 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


             HYDROGRAPH ROUTING DATA

391 RN          NO ROUTING
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HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3997.	14.67	(CFS)	2023.	555.	186.	80.
		(INCHES)	1.125	1.235	1.238	1.238
		(AC-FT)	1003.	1102.	1104.	1104.

CUMULATIVE AREA = 16.73 SQ MI

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HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3615.	14.67	(CFS)	1857.	511.	171.	74.
		(INCHES)	1.032	1.136	1.139	1.139
		(AC-FT)	921.	1014.	1016.	1016.

CUMULATIVE AREA = 16.73 SQ MI

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HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3378.	14.75	(CFS)	1751.	483.	161.	70.
		(INCHES)	.973	1.073	1.076	1.076
		(AC-FT)	868.	958.	960.	960.

CUMULATIVE AREA = 16.73 SQ MI

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HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3127.	14.75	(CFS)	1648.	455.	152.	66.
		(INCHES)	.916	1.012	1.014	1.014
		(AC-FT)	817.	903.	905.	905.

CUMULATIVE AREA = 16.73 SQ MI

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HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2901.	14.83	(CFS)	1547.	428.	143.	62.
		(INCHES)	.860	.952	.954	.954
		(AC-FT)	767.	849.	851.	851.

CUMULATIVE AREA = 16.73 SQ MI

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HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2793.	14.92	(CFS)	1494.	414.	138.	60.
		(INCHES)	.830	.920	.922	.922
		(AC-FT)	741.	821.	823.	823.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT 1R

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3437.	14.75	(CFS)	1778.	490.	164.	71.
		(INCHES)	.988	1.090	1.092	1.092
		(AC-FT)	882.	972.	974.	974.

CUMULATIVE AREA = 16.73 SQ MI

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
392 KK      *        Z1  *
            *            *
            **************
                          THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                          L=1.70     Lca=0.66     S=47.00     Kn=0.055     LAG=39.1
                          S-GRAPH TYPE=DES RNGLND

396 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

397 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .66  SUBBASIN AREA

398 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .32  STARTING LOSS
                        DTH         .29  MOISTURE DEFICIT
                       PSIF        4.00  WETTING FRONT SUCTION
                      XKSAT         .43  HYDRAULIC CONDUCTIVITY
                      RTIMP        2.91  PERCENT IMPERVIOUS AREA

397 UI          INPUT UNITGRAPH,  29 ORDINATES,  VOLUME = 1.00
                        .0      57.4      79.5     205.3     321.8     424.0     504.1     545.2     541.0     493.7
                     399.5     319.2     256.3     205.1     164.9     127.7     104.6      87.9      60.8      54.1
                      39.3      39.3      21.8      14.0      14.0      14.0      14.0      14.0      14.0
                                                                          ***

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION       Z1
                     TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    4.16, TOTAL LOSS =    2.94, TOTAL EXCESS =    1.22

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   585.     12.50        (CFS)       84.         22.          7.           3.
                       (INCHES)     1.183       1.218       1.218        1.218
                        (AC-FT)      42.         43.         43.          43.

                      CUMULATIVE AREA =     .66 SQ MI

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION       Z1
                     TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.95, TOTAL LOSS =    2.83, TOTAL EXCESS =    1.13

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   540.     12.50        (CFS)       78.         20.          7.           3.
                       (INCHES)     1.090       1.123       1.124        1.124
                        (AC-FT)      39.         40.         40.          40.

                      CUMULATIVE AREA =     .66 SQ MI

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION       Z1
                     TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    3.82, TOTAL LOSS =    2.76, TOTAL EXCESS =    1.06

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   511.     12.50        (CFS)       74.         19.          6.           3.
                       (INCHES)     1.030       1.062       1.063        1.063
                        (AC-FT)      36.         38.         38.          38.

                      CUMULATIVE AREA =     .66 SQ MI

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION       Z1
                     TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    3.69, TOTAL LOSS =    2.69, TOTAL EXCESS =    1.00

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   483.     12.50        (CFS)       69.         18.          6.           3.
                       (INCHES)      .972       1.003       1.003        1.003
```

```
                    (AC-FT)        34.         36.         36.         36.

                    CUMULATIVE AREA =      .66 SQ MI


    ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       Z1
                    TRANSPOSITION AREA     80.0 SQ MI

   TOTAL RAINFALL =    3.57, TOTAL LOSS =    2.62, TOTAL EXCESS =     .95

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    456.     12.50        (CFS)       65.         17.          6.           2.
                       (INCHES)      .914        .944        .945         .945
                        (AC-FT)       32.         33.         33.          33.

                    CUMULATIVE AREA =      .66 SQ MI


    ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       Z1
                    TRANSPOSITION AREA    120.0 SQ MI

   TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.58, TOTAL EXCESS =     .91

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    441.     12.50        (CFS)       63.         16.          5.           2.
                       (INCHES)      .884        .913        .913         .913
                        (AC-FT)       31.         32.         32.          32.

                    CUMULATIVE AREA =      .66 SQ MI

    ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       Z1

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    558.     12.50        (CFS)       80.         21.          7.           3.
                       (INCHES)     1.127       1.161       1.161        1.161
                        (AC-FT)       40.         41.         41.          41.

                    CUMULATIVE AREA =      .66 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
402 KK    *        4R  *        CNAME       Z
          *            *
          **************

403 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

404 RN          NO ROUTING

                                                                  ***

    ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       4R
                    TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    585.     12.50        (CFS)       84.         22.          7.           3.
                       (INCHES)     1.183       1.218       1.218        1.218
                        (AC-FT)       42.         43.         43.          43.

                    CUMULATIVE AREA =      .66 SQ MI

    ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       4R
                    TRANSPOSITION AREA     10.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    540.     12.50        (CFS)       78.         20.          7.           3.
                       (INCHES)     1.090       1.123       1.124        1.124
```

		(AC-FT)	39.	40.	40.	40.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 4R
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
511.	12.50	(CFS)	74.	19.	6.	3.
		(INCHES)	1.030	1.062	1.063	1.063
		(AC-FT)	36.	38.	38.	38.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 4R
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
483.	12.50	(CFS)	69.	18.	6.	3.
		(INCHES)	.972	1.003	1.003	1.003
		(AC-FT)	34.	36.	36.	36.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 4R
TRANSPOSITION AREA 80.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
456.	12.50	(CFS)	65.	17.	6.	2.
		(INCHES)	.914	.944	.945	.945
		(AC-FT)	32.	33.	33.	33.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 4R
TRANSPOSITION AREA 120.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
441.	12.50	(CFS)	63.	16.	5.	2.
		(INCHES)	.884	.913	.913	.913
		(AC-FT)	31.	32.	32.	32.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT 4R

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
558.	12.50	(CFS)	80.	21.	7.	3.
		(INCHES)	1.127	1.161	1.161	1.161
		(AC-FT)	40.	41.	41.	41.

CUMULATIVE AREA = .66 SQ MI

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	R1	387.	12.25	37.	10.	3.	.28		
ROUTED TO	13R	387.	12.25	37.	10.	3.	.28		
HYDROGRAPH AT	M1	3301.	12.83	825.	236.	79.	5.69		
ROUTED TO	M1-M2	2392.	14.67	820.	235.	79.	5.69		
HYDROGRAPH AT	M2	2347.	13.42	786.	198.	66.	7.44		
2 COMBINED AT	M	3187.	14.50	1544.	421.	141.	13.12		
ROUTED TO	5R	3187.	14.50	1544.	421.	141.	13.12		
HYDROGRAPH AT	N1	1211.	12.50	192.	52.	17.	1.52		
ROUTED TO	N1-N2	758.	14.08	192.	52.	17.	1.52		
HYDROGRAPH AT	N2	1331.	13.17	378.	99.	33.	3.33		
2 COMBINED AT	N	1385.	13.25	565.	149.	50.	4.85		
ROUTED TO	8R	1385.	13.25	565.	149.	50.	4.85		
HYDROGRAPH AT	P1A	441.	12.42	73.	21.	7.	.50		
ROUTED TO	P1A-1B	296.	13.92	72.	21.	7.	.50		
HYDROGRAPH AT	P1B	842.	13.08	231.	61.	20.	1.94		
2 COMBINED AT	P	891.	13.17	301.	81.	27.	2.44		
ROUTED TO	12R	891.	13.17	301.	81.	27.	2.44		
HYDROGRAPH AT	O1	1163.	13.33	349.	91.	30.	3.09		
ROUTED TO	7R	1163.	13.33	349.	91.	30.	3.09		
HYDROGRAPH AT	Q1A	915.	12.58	173.	48.	16.	1.30		
ROUTED TO	Q1A-1B	757.	13.17	173.	48.	16.	1.30		
HYDROGRAPH AT	Q1B	740.	12.50	134.	38.	13.	.94		
2 COMBINED AT	Q	1059.	13.08	304.	85.	28.	2.23		
ROUTED TO	14R	1059.	13.08	304.	85.	28.	2.23		
HYDROGRAPH AT	L1	2267.	12.75	527.	150.	50.	3.55		
ROUTED TO	L1-L2A	2154.	12.92	527.	150.	50.	3.55		
HYDROGRAPH AT	L2A	570.	12.58	92.	23.	8.	.69		
2 COMBINED AT	L2BR	2519.	12.92	616.	172.	57.	4.24		
ROUTED TO	L2A-2B	2228.	13.42	614.	172.	57.	4.24		
HYDROGRAPH AT	L2B	1700.	13.08	449.	112.	37.	4.08		
2 COMBINED AT	L3R	3676.	13.33	1051.	282.	94.	8.32		
ROUTED TO	L2B-L3	3004.	14.75	1039.	282.	94.	8.32		
HYDROGRAPH AT	L2C	692.	12.83	145.	36.	12.	1.33		
ROUTED TO	L2C-2D	651.	13.25	145.	36.	12.	1.33		
HYDROGRAPH AT	L2D	655.	12.75	124.	31.	10.	1.23		
2 COMBINED AT	L3RB	1104.	13.00	266.	66.	22.	2.56		
ROUTED TO	L2D-L3	705.	16.17	263.	66.	22.	2.56		
HYDROGRAPH AT	L3	2129.	13.25	658.	166.	56.	5.85		
3 COMBINED AT	L	3437.	14.75	1778.	490.	164.	16.73		
ROUTED TO	1R	3437.	14.75	1778.	490.	164.	16.73		
HYDROGRAPH AT	Z1	558.	12.50	80.	21.	7.	.66		
ROUTED TO	4R	558.	12.50	80.	21.	7.	.66		

*** NORMAL END OF HEC-1 ***

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****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*            VERSION 4.1               *
*                                      *
*  RUN DATE   12OCT06  TIME  10:46:15  *
*                                      *
****************************************
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****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
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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
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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

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

  1           ID  Buckeye/Sun Valley ADMS - May 2005
  2           ID  Michael Baker Jr., Inc. - Modeler: Jacob Lesue
  3           ID  100-year 6-hour
  4           ID  Existing Conditions
  5           ID  Area 3 - Sub-basins L-R (Aluvial Fan updates)
  6           ID  Rainfall Loss Method - Green & Ampt
  7           ID  Unit Hydrograph Method - FCDMC S-Graph
  8           ID  Channel Routing Method - Normal Depth
  9           ID  Land Use - FCDMC GIS Data: mag_landuse (2000)
 10           ID  Soil Data - USDA SCS Soil Survey (1972 & 1981)
 11           ID  Units - L(mi)   Lca(mi)   S(ft/mi)   LAG(min)
              *DIAGRAM
 12           IT       5 01JAN94       0    2000
 13           IO       3
 14           IN      15 01JAN94       0
 15           JD    3.23    0.01
              * 6-hour distribution, pattern 1.0
 16           PC     0.0   0.008   0.016   0.025   0.033   0.041    0.05   0.058   0.066   0.074
 17           PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931    0.95
 18           PC   0.962   0.972   0.983   0.991     1.0
 19           IN      15 01JAN94       0
 20           JD   3.211     0.5
              * 6-hour distribution, pattern 1.0
 21           PC     0.0   0.008   0.016   0.025   0.033   0.041    0.05   0.058   0.066   0.074
 22           PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931    0.95
 23           PC   0.962   0.972   0.983   0.991     1.0
 24           IN      15 01JAN94       0
 25           JD   3.188     1.0
              * 6-hour distribution, pattern 1.4
 26           PC     0.0  0.0084   0.016   0.025  0.0334  0.0414  0.0504  0.0584  0.0664  0.0748
 27           PC   0.087  0.0994  0.1188   0.148  0.2304  0.4067  0.7778  0.8813  0.9186  0.9452
 28           PC  0.9572  0.9684  0.9798  0.9898     1.0
 29           IN      15 01JAN94       0
 30           JD   3.101     5.0
              * 6-hour distribution, pattern 2.3
 31           PC     0.0   0.011  0.0173  0.0267  0.0387   0.049  0.0593  0.0693  0.0797  0.0903
 32           PC   0.103  0.1173  0.1383  0.1827  0.2693   0.458   0.686  0.8233  0.8893  0.9293
 33           PC  0.9487   0.962  0.9743  0.9877     1.0
 34           IN      15 01JAN94       0
 35           JD   3.036    10.0
              * 6-hour distribution, pattern 2.7
 36           PC     0.0  0.0134  0.0189  0.0287  0.0443  0.0574  0.0694  0.0818  0.0949  0.1076
 37           PC  0.1223  0.1382  0.1604  0.2063  0.2902  0.4664  0.6764  0.8069  0.8765  0.9189
 38           PC  0.9471  0.9608  0.9735  0.9873     1.0
 39           IN      15 01JAN94       0
 40           JD   2.939    20.0
              * 6-hour distribution, pattern 3.1
 41           PC     0.0  0.0158   0.022  0.0329  0.0511  0.0663  0.0799  0.0948  0.1102  0.1246
 42           PC   0.141  0.1587  0.1828    0.23  0.3122  0.4758  0.6684  0.7929  0.8643  0.9087
 43           PC  0.9434   0.958  0.9718  0.9863     1.0
 44           IN      15 01JAN94       0
 45           JD   2.875    30.0
              * 6-hour distribution, pattern 3.4
 46           PC     0.0  0.0172  0.0256  0.0378  0.0565  0.0719  0.0868   0.103  0.1191  0.1342
 47           PC  0.1513  0.1702  0.1961  0.2439  0.3263  0.4824  0.6655  0.7875   0.858  0.9031
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 48           PC   0.939  0.9544  0.9697  0.9851     1.0
 49           IN      15 01JAN94       0
 50           JD    2.81    40.0
              * 6-hour distribution, pattern 3.5
 51           PC     0.0  0.0182  0.0281  0.0413  0.0604  0.0759  0.0916  0.1088  0.1254   0.141
 52           PC  0.1586  0.1783  0.2056  0.2537  0.3362   0.487  0.6636  0.7836  0.8535  0.8991
 53           PC  0.9358  0.9519  0.9682  0.9843     1.0

 54           KK      R1
 55           KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 56           KM   L=1.01     Lca=0.46     S=213.31     Kn=0.050     LAG=18.8
 57           KM   S-GRAPH TYPE=PHX MNT
 58           KO       0       0     0.0       1      22
 59           BA   0.284
 60           LG    0.35    0.35   4.358   0.374   8.387
              * R1
 61           UI     0.0   62.14  236.01  401.85  464.97  281.72   216.1  150.63  113.71   76.28
 62           UI   57.55   39.69   27.53   24.54    9.63    9.63    9.63    9.63     0.0

 63           KK     13R   CNAME       R
 64           KO       0       0     0.0       0      22
 65           RN     13R

 66           KK      M1
 67           KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 68           KM   L=5.19     Lca=2.41     S=230.06     Kn=0.050     LAG=66.8
 69           KM   S-GRAPH TYPE=PHX MNT
 70           KO       0       0     0.0       1      22
 71           BA   5.686
 72           LG    0.35    0.35   4.297    0.35  16.637
              * M1
 73           UI     0.0  285.74  285.74  285.74  777.57 1062.36 1436.64 1746.69  1963.2  2166.6
 74           UI  2402.0 2950.38 3432.01 2399.97 1965.75 1755.17 1651.21 1526.96  1413.1 1330.61
 75           UI  1198.5 1122.73 1012.84  904.53  777.77  717.96  682.12  653.26  597.45  521.66
 76           UI  469.43  394.74  365.11  349.25  312.95  312.95  266.95  219.07  219.07  219.07
 77           UI  181.82  139.83  139.83  139.83  139.83  139.83   125.2   54.77   54.77   54.77
 78           UI   54.77   54.77   54.77   54.77   54.77   54.77   54.77   54.77   54.77   54.77
 79           UI   54.77   54.77     0.0

 80           KK   M1-M2   CNAME     M2R
 81           KO       0       0     0.0       0      22
 82           RS      24    FLOW     0.0     0.0
 83           RC    0.04    0.04   0.04534769.89  0.0133     0.0
              * M1-M2
 84           RX     0.0   961.0  1028.0  1051.0  1136.0  1153.0  1193.0  1900.0
 85           RY    15.5    12.0    11.8    10.3    10.0    11.0    11.2    15.5

 86           KK      M2
 87           KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 88           KM   L=6.59     Lca=3.00     S=71.62     Kn=0.050     LAG=100.2
 89           KM   S-GRAPH TYPE=DES RNGLND
 90           KO       0       0     0.0       1      22
 91           BA   7.436
 92           LG    0.35    0.35   3.959   0.445   0.291
              * M2
```

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

  93          UI     0.0  250.38  250.38  250.38  250.38  438.17  719.85  924.82 1114.75 1312.86
  94          UI  1497.2  1700.9 1779.05 2056.71 2161.12 2246.81 2290.07 2399.49 2399.49 2399.49
  95          UI  2351.5 2259.21 2219.84 2074.04 1858.21 1745.08 1567.89 1438.64 1323.61 1214.96
  96          UI  1118.4 1022.47  940.03  874.15  767.84  718.48  685.57  569.22   559.1  484.22
  97          UI  472.03  435.02  383.92  383.92  334.13  265.38  265.38  265.38  257.86  171.39
  98          UI  171.39  171.39  171.39  171.39  171.39  131.63   60.94   60.94   60.94   60.94
  99          UI   60.94   60.94   60.94   60.94   60.94   60.94   60.94   60.94   60.94   60.94
 100          UI   60.94   60.94   60.94   60.94     0.0

 101          KK       M   CNAME      5R
 102          KO       0       0     0.0       0      22
 103          HC       2

 104          KK      5R   CNAME       M
 105          KO       0       0     0.0       0      22
 106          RN      5R

 107          KK      N1
 108          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 109          KM   L=2.79      Lca=1.44      S=340.38      Kn=0.050      LAG=39.7
 110          KM   S-GRAPH TYPE=PHX MNT
 111          KO       0       0     0.0       1      22
 112          BA   1.524
 113          LG    0.35    0.35   4.075   0.419    8.38
              * N1
 114          UI     0.0  128.28  166.77  436.68  697.63  885.37 1048.86 1439.85 1097.59  811.01
 115          UI  717.89  633.24  554.41  482.34  398.71  327.22  300.33  268.08  210.75  167.66
 116          UI  152.68   140.5  106.78   98.35   84.12   62.78   62.78   62.78   38.34   24.59
 117          UI   24.59   24.59   24.59   24.59   24.59   24.59   24.59     0.0

 118          KK   N1-N2   CNAME     N2R
 119          KO       0       0     0.0       0      22
 120          RS      21    FLOW     0.0     0.0
 121          RC    0.05   0.047    0.0525647.52  0.0115     0.0
              * N1-N2
 122          RX     0.0   280.0   350.0   358.0   367.0   381.0   451.0   730.0
 123          RY    17.0    13.0    11.5    10.0    10.0    11.5    13.0    17.0

 124          KK      N2
 125          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 126          KM   L=5.64      Lca=3.27      S=170.14      Kn=0.055      LAG=90.7
 127          KM   S-GRAPH TYPE=PHX MNT
 128          KO       0       0     0.0       1      22
 129          BA   3.325
 130          LG    0.35    0.35   4.117   0.405    2.67
              * N2
 131          UI     0.0  123.04  123.04  123.04  123.04  310.82  395.95  496.74  616.35  730.85
 132          UI  796.45  869.05  928.56  990.24 1125.95 1316.06 1517.94 1186.36  925.57  834.34
 133          UI  764.31  726.51  694.11  654.42   619.9  586.86  557.14  517.77  491.74   466.8
 134          UI  422.37  387.25   352.0  325.27  302.29  296.75  282.99  272.23  257.26  234.33
 135          UI  202.13  202.13  163.14  157.22  157.22  143.92  134.76  134.76  134.76  103.63
 136          UI   94.33   94.33   94.33   94.33   83.75   60.21   60.21   60.21   60.21   60.21
 137          UI   60.21   60.21   60.21   32.52   23.58   23.58   23.58   23.58   23.58   23.58
 138          UI   23.58   23.58   23.58   23.58   23.58   23.58   23.58   23.58   23.58   23.58
 139          UI   23.58   23.58   23.58   23.58   23.58
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 140          KK       N   CNAME      8R
 141          KO       0       .0     0.0       0      22
 142          HC       2

 143          KK      8R   CNAME       N
 144          KO       0       0     0.0       0      22
 145          RN      8R

 146          KK     P1A
 147          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 148          KM   L=2.28     Lca=1.41     S=461.40     Kn=0.055     LAG=37.8
 149          KM   S-GRAPH TYPE=PHX MNT
 150          KO       0       0     0.0       1      22
 151          BA     0.5
 152          LG    0.35    0.35   3.987   0.405  16.364
              * P1A
 153          UI     0.0   44.27   65.19   161.0  254.76  318.08  389.84  500.04  319.07  264.12
 154          UI  232.17  203.71  176.98  147.14  118.21  105.19   95.13   74.96   59.42   52.89
 155          UI   48.49   35.98   33.94   26.82   21.67   21.67   21.56    8.49    8.49    8.49
 156          UI    8.49    8.49    8.49    8.49    8.49    8.49

 157          KK  P1A-1B   CNAME    P1BR
 158          KO       0       0     0.0       0      22
 159          RS      18    FLOW     0.0     0.0
 160          RC    0.05   0.047    0.0520102.87  0.0111     0.0
              * P1A-P1B
 161          RX     0.0   280.0   350.0   358.0   367.0   381.0   451.0   730.0
 162          RY    17.0    13.0    11.5    10.0    10.0    11.5    13.0    17.0

 163          KK     P1B
 164          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 165          KM   L=4.39     Lca=2.32     S=70.84     Kn=0.055     LAG=85.3
 166          KM   S-GRAPH TYPE=PHX MNT
 167          KO       0       0     0.0       1      22
 168          BA   1.937
 169          LG    0.35    0.35    4.23   0.393   4.667
              * P1B
 170          UI     0.0   76.72   76.72   76.72   89.67  220.58  274.25  335.86  432.98  478.15
 171          UI  527.91  570.85  609.55  688.62  814.07   942.3  716.43   568.2  506.83  467.32
 172          UI   446.8  421.86  394.79  374.39  356.44  329.11  309.33  293.98  263.37  241.82
 173          UI  216.83  200.89  187.72  181.75  176.46  163.15  160.42  127.42  126.04   109.8
 174          UI   98.03   98.03   90.75   84.03   84.03   84.03   60.08   58.82   58.82   58.82
 175          UI   58.82   40.74   37.54   37.54   37.54   37.54   37.54   37.54   37.54    17.9
 176          UI   14.71   14.71   14.71   14.71   14.71   14.71   14.71   14.71   14.71   14.71
 177          UI   14.71   14.71   14.71   14.71   14.71   14.71   14.71   14.71   14.71     0.0

 178          KK       P   CNAME     12R
 179          KO       0       0     0.0       0      22
 180          HC       2
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 181          KK     12R   CNAME       P
 182          KO       0       0     0.0       0      22
 183          RN     12R

 184          KK      O1
 185          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 186          KM   L=5.20     Lca=2.79     S=64.07     Kn=0.055     LAG=99.9
 187          KM   S-GRAPH TYPE=PHX MNT
 188          KO       0       0     0.0       1      22
 189          BA   3.088
 190          LG    0.35    0.35   4.191   0.393   2.105
              * O1
 191          UI     0.0  103.98  103.98  103.98  103.98  181.97  298.95  378.66  446.43  550.06
 192          UI  624.46  676.83  731.54  781.25  824.52  905.38 1042.04 1204.77  1242.7  887.05
 193          UI   765.3   690.9  643.35  614.88  590.49  558.55  530.78  506.48  485.09  454.93
 194          UI  429.36  410.34   388.6  356.95  326.56   302.9  274.89  260.97  254.42  242.21
 195          UI  239.16  221.76  217.42  189.46  170.83  170.83  140.46  132.86  132.86  129.07
 196          UI  113.88  113.88  113.88  113.88   79.72   79.72   79.72   79.72   79.72   79.72
 197          UI   50.88   50.88   50.88   50.88   50.88   50.88   50.88   50.88   50.88   32.31
 198          UI   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93
 199          UI   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93   19.93
 200          UI   19.93   19.93   19.93     0.0

 201          KK      7R   CNAME       O
 202          KO       0       0     0.0       0      22
 203          RN      7R

 204          KK     Q1A
 205          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 206          KM   L=3.13     Lca=1.52     S=256.86     Kn=0.055     LAG=49.3
 207          KM   S-GRAPH TYPE=PHX MNT
 208          KO       0       0     0.0       1      22
 209          BA   1.297
 210          LG    0.35    0.35   4.127     0.4    11.2
              * Q1A
 211          UI     0.0   89.12   89.12  213.78  363.94  517.41  613.88  697.52  873.62 1020.97
 212          UI  663.18  556.48  506.64  454.84  413.29  367.46  326.01  281.03  232.04  214.37
 213          UI  199.35   177.4  146.41  118.69  112.45   97.61   96.73   68.33   68.33    66.1
 214          UI   43.61   43.61   43.61   43.61   30.77   17.08   17.08   17.08   17.08   17.08
 215          UI   17.08   17.08   17.08   17.08   17.08   17.08     0.0

 216          KK  Q1A-1B   CNAME    Q1BR
 217          KO       0       0     0.0       0      22
 218          RS       8    FLOW     0.0     0.0
 219          RC    0.05   0.047    0.05 9170.53  0.0117     0.0
              * Q1A-Q1B
 220          RX     0.0   280.0   350.0   358.0   367.0   381.0   451.0   730.0
 221          RY    17.0    13.0    11.5    10.0    10.0    11.5    13.0    17.0
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 222          KK     Q1B
 223          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 224          KM   L=2.35      Lca=1.14      S=141.40      Kn=0.055      LAG=44.3
 225          KM   S-GRAPH TYPE=PHX MNT
 226          KO       0        0      0.0        1       22
 227          BA   0.937
 228          LG    0.35     0.35     4.32    0.373   14.815
              * Q1B
 229          UI     0.0    71.67    71.67   221.51   340.68   455.79    538.5   651.95   833.61   538.15
 230          UI  443.72   398.92   355.79   316.26   280.46   235.89   196.37   173.35   160.17   138.81
 231          UI  114.82    91.58    84.67     78.5    62.48    54.95    54.15    35.07    35.07    35.07
 232          UI   35.07    15.79    13.74    13.74    13.74    13.74    13.74    13.74    13.74    13.74
 233          UI   13.74      0.0

 234          KK       Q    CNAME      14R
 235          KO       0        0      0.0        0       22
 236          HC       2

 237          KK     14R    CNAME        Q
 238          KO       0        0      0.0        0       22
 239          RN     14R

 240          KK      L1
 241          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 242          KM   L=4.93      Lca=2.29      S=308.27      Kn=0.050      LAG=60.6
 243          KM   S-GRAPH TYPE=PHX MNT
 244          KO       0        0      0.0        1       22
 245          BA   3.546
 246          LG   0.271    0.318    4.363    0.351   16.279
              * L1
 247          UI     0.0   195.74   195.74   266.93   603.63   823.25  1120.55  1287.08  1452.32  1611.07
 248          UI  1991.3  2326.76  1575.06  1312.31  1173.43  1097.39  1002.28   929.54    850.5   775.66
 249          UI  701.22   620.51   525.99   484.91   458.87   430.63   397.34   321.57   290.98   250.11
 250          UI  241.82   214.38   214.38   171.29   150.06   150.06   149.52    95.79    95.79    95.79
 251          UI   95.79    95.79     79.7    37.52    37.52    37.52    37.52    37.52    37.52    37.52
 252          UI   37.52    37.52    37.52    37.52    37.52    37.52    37.52      0.0

 253          KK  L1-L2A   CNAME    L2AR
 254          KO       0        0      0.0        0       22
 255          RS       3     FLOW      0.0      0.0
 256          RC   0.046    0.045    0.046  7078.75   0.0174      0.0
              * L1-L2A
 257          RX     0.0     80.0    165.0    200.0    215.0    255.0    340.0    420.0
 258          RY    19.0     17.0     14.0     10.0     10.0     14.0     18.0     22.0

 259          KK     L2A
 260          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 261          KM   L=2.46      Lca=1.12      S=136.18      Kn=0.055      LAG=45.0
 262          KM   S-GRAPH TYPE=DES RNGLND
 263          KO       0        0      0.0        1       22
 264          BA   0.693
 265          LG    0.35    0.384    5.641    0.202      0.0
              * L2A
 266          UI     0.0    51.83    51.83   153.34   242.24   330.72   404.46   460.56   494.88   492.21
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 267          UI  461.36  394.37  327.78  266.87  221.69  182.72  150.08  121.91  100.64   84.23
 268          UI   69.92   54.93   46.45   35.48   35.48   26.06   12.61   12.61   12.61   12.61
 269          UI   12.61   12.61   12.61   12.61

 270          KK    L2BR   CNAME  L2A-2B
 271          KO       0       0     0.0       0      22
 272          HC       2

 273          KK  L2A-2B   CNAME    L2BR
 274          KO       0       0     0.0       0      22
 275          RS       7    FLOW     0.0     0.0
 276          RC   0.046   0.045   0.04620743.37  0.0147     0.0
              * L2A-L2B
 277          RX     0.0    80.0   165.0   200.0   215.0   255.0   340.0   420.0
 278          RY    19.0    17.0    14.0    10.0    10.0    14.0    18.0    22.0

 279          KK     L2B
 280          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 281          KM   L=5.13     Lca=1.82     S=93.37     Kn=0.055     LAG=78.1
 282          KM   S-GRAPH TYPE=DES RNGLND
 283          KO       0       0     0.0       1      22
 284          BA   4.077
 285          LG    0.35    0.35   4.179   0.399     0.0
              * L2B
 286          UI     0.0  175.97  175.97  175.97  311.91  535.45  724.28   902.8 1071.35 1224.63
 287          UI  1376.8 1511.61 1580.95 1658.53 1686.39 1686.39 1632.48 1568.59 1460.56 1278.33
 288          UI  1172.5 1030.99  927.32  829.82  742.49   663.7  594.61  529.93  481.83   405.6
 289          UI   377.6  331.75  310.22  269.82  269.19  186.51  186.51  186.51   145.4  120.46
 290          UI  120.46  120.46  120.46    90.9   42.83   42.83   42.83   42.83   42.83   42.83
 291          UI   42.83   42.83   42.83   42.83   42.83   42.83   42.83   42.83     0.0

 292          KK     L3R   CNAME  L2B-L3
 293          KO       0       0     0.0       0      22
 294          HC       2

 295          KK  L2B-L3   CNAME     L3R
 296          KO       0       0     0.0       0      22
 297          RS      19    FLOW     0.0     0.0
 298          RC    0.05    0.04    0.0619942.62  0.0089     0.0
              * L2B-L3
 299          RX     0.0  1093.0  1210.0  1215.0  1225.0  1232.0  1372.0  2000.0
 300          RY    18.0    11.8    11.7    10.0    10.0    11.7    11.8    18.0

 301          KK     L2C
 302          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 303          KM   L=3.20     Lca=1.55     S=91.31     Kn=0.055     LAG=61.2
 304          KM   S-GRAPH TYPE=DES RNGLND
 305          KO       0       0     0.0       1      22
 306          BA   1.328
 307          LG    0.35    0.35   4.189   0.422     0.0
              * L2C
 308          UI     0.0   73.31   73.31   99.98  227.13  318.43   414.0  500.47   577.1  643.23
 309          UI  678.82  702.58  699.63  666.25  621.66  533.29  468.31  402.86  351.31  303.79
 310          UI   266.7  226.83  200.74  164.03  144.98  131.86  112.41   97.97    77.7    77.7
 311          UI   56.55   50.18   50.18   50.18   28.53   17.84   17.84   17.84   17.84   17.84
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 312          UI   17.84   17.84   17.84   17.84   17.84     0.0

 313          KK  L2C-2D   CNAME    L2DR
 314          KO       0       0     0.0       0      22
 315          RS       6    FLOW     0.0     0.0
 316          RC   0.046   0.045   0.046 9752.35  0.0122     0.0
              * L2C-L2D
 317          RX     0.0    80.0   165.0   200.0   215.0   255.0   340.0   420.0
 318          RY    19.0    17.0    14.0    10.0    10.0    14.0    18.0    22.0

 319          KK     L2D
 320          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 321          KM   L=2.77     Lca=1.24     S=74.13     Kn=0.055     LAG=55.4
 322          KM   S-GRAPH TYPE=DES RNGLND
 323          KO       0       0     0.0       1      22
 324          BA   1.232
 325          LG    0.35    0.35   3.578   0.544     0.0
              * L2D
 326          UI     0.0   75.42   75.42  141.88  262.35  378.71  482.07  569.62  651.08   696.0
 327          UI  722.74  714.79  677.77  607.49  518.22  439.07   376.3  322.28  277.17  232.67
 328          UI  200.55   167.8  142.18   124.1  114.53   79.93   79.93    61.7   51.62   51.62
 329          UI   51.62   20.09   18.36   18.36   18.36   18.36   18.36   18.36   18.36   18.36
 330          UI   18.36     0.0

 331          KK    L3RB   CNAME  L2D-L3
 332          KO       0       0     0.0       0      22
 333          HC       2

 334          KK  L2D-L3   CNAME    L3RB
 335          KO       0       0     0.0       0      22
 336          RS      40    FLOW     0.0     0.0
 337          RC    0.05    0.04    0.06 27374.0  0.0077     0.0
              * L2D-L3
 338          RX     0.0  1093.0  1210.0  1215.0  1225.0  1232.0  1372.0  2000.0
 339          RY    18.0    11.8    11.7    10.0    10.0    11.7    11.8    18.0

 340          KK      L3
 341          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 342          KM   L=4.75     Lca=2.00     S=44.27     Kn=0.055     LAG=91.0
 343          KM   S-GRAPH TYPE=DES RNGLND
 344          KO       0       0     0.0       1      22
 345          BA   5.852
 346          LG   0.341   0.328    3.98   0.419    1.05
              * L3
 347          UI     0.0  216.51  216.51  216.51  216.51  546.97   701.8  899.01 1098.32 1266.32
 348          UI  1460.0  1557.8 1786.11 1888.64 1950.18 2034.93 2074.93 2074.93 2053.76  1965.5
 349          UI  1920.6 1789.17 1583.49 1486.07 1313.64 1207.78 1091.43  994.63  909.22  825.03
 350          UI   759.9  663.98  614.46  574.55  483.48  461.45  408.18  402.68  331.99  331.99
 351          UI  296.91  229.48  229.48  229.48  197.56  148.21  148.21  148.21  148.21  148.21
 352          UI  121.69    52.7    52.7    52.7    52.7    52.7    52.7    52.7    52.7    52.7
 353          UI    52.7    52.7    52.7    52.7    52.7    52.7    52.7     0.0
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 354          KK       L   CNAME      1R
 355          KO       0       0     0.0       0      22
 356          HC       3

 357          KK      1R   CNAME       L
 358          KO       0       0     0.0       0      22
 359          RN      1R

 360          KK      Z1
 361          KM   THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 362          KM   L=1.70     Lca=0.66     S=47.00     Kn=0.055     LAG=39.1
 363          KM   S-GRAPH TYPE=DES RNGLND
 364          KO       0       0     0.0       1      22
 365          BA   0.664
 366          LG   0.321   0.292   4.004    0.43   2.909
              * Z1
 367          UI     0.0   57.36   79.52  205.33  321.78  424.03  504.07   545.2  540.96  493.73
 368          UI  399.49  319.19  256.28   205.1  164.91  127.66  104.64   87.86    60.8    54.1
 369          UI   39.27   39.27    21.8   13.96   13.96   13.96   13.96   13.96   13.96     0.0

 370          KK      4R   CNAME       Z
 371          KO       0       0     0.0       0      22
 372          RN      4R
 373          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   54          R1
                V
                V
   63         13R
                .
                .
   66           .          M1
                .           V
                .           V
   80           .       M1-M2
                .           .
                .           .
   86           .           .          M2
                .           .           .
                .           .           .
  101           .           M............
                .           V
                .           V
  104           .          5R
                .           .
                .           .
  107           .           .          N1
                .           .           V
                .           .           V
  118           .           .       N1-N2
                .           .           .
                .           .           .
  124           .           .           .          N2
                .           .           .           .
                .           .           .           .
  140           .           .           N............
                .           .           V
                .           .           V
  143           .           .          8R
                .           .           .
                .           .           .
  146           .           .           .         P1A
                .           .           .           V
                .           .           .           V
  157           .           .           .      P1A-1B
                .           .           .           .
                .           .           .           .
  163           .           .           .           .         P1B
                .           .           .           .           .
                .           .           .           .           .
  178           .           .           .           P............
                .           .           .           V
                .           .           .           V
  181           .           .           .         12R
                .           .           .           .
                .           .           .           .
  184           .           .           .           .          O1
                .           .           .           .           V
                .           .           .           .           V
  201           .           .           .           .          7R
                .           .           .           .           .
                .           .           .           .           .
  204           .           .           .           .           .        Q1A
                .           .           .           .           .         V
                .           .           .           .           .         V
  216           .           .           .           .           .     Q1A-1B
                .           .           .           .           .           .
                .           .           .           .           .           .
  222           .           .           .           .           .           .        Q1B
                .           .           .           .           .           .         .
                .           .           .           .           .           .         .
  234           .           .           .           .           .           Q............
                .           .           .           .           .           V
                .           .           .           .           .           V
  237           .           .           .           .           .        14R
                .           .           .           .           .           .
                .           .           .           .           .           .
  240           .           .           .           .           .           .         L1
                .           .           .           .           .           .          V
                .           .           .           .           .           .          V
  253           .           .           .           .           .           .     L1-L2A
                .           .           .           .           .           .           .
                .           .           .           .           .           .           .
  259           .           .           .           .           .           .           .         L2A
                .           .           .           .           .           .           .           .
                .           .           .           .           .           .           .           .
  270           .           .           .           .           .           .       L2BR............
                .           .           .           .           .           .          V
                .           .           .           .           .           .          V
  273           .           .           .           .           .           .     L2A-2B
                .           .           .           .           .           .           .
                .           .           .           .           .           .           .
  279           .           .           .           .           .           .           .         L2B
                .           .           .           .           .           .           .           .
                .           .           .           .           .           .           .           .
  292           .           .           .           .           .           .         L3R............
                .           .           .           .           .           .          V
                .           .           .           .           .           .          V
  295           .           .           .           .           .           .     L2B-L3
                .           .           .           .           .           .           .
```

```
301                                                  L2C
                                                      V
                                                      V
313                                               L2C-2D
                                                      .
                                                      .
319                                                   .          L2D
                                                      .            .
                                                      .            .
1                                                  L3RB............
                                                      V
                                                      V
334                                               L2D-L3
                                                      .
                                                      .
340                                                   .           L3
                                                      .            .
                                                      .            .
354                                                   L.......................
                                                      V
                                                      V
357                                                  1R
                                                      .
                                                      .
360                                                   .           Z1
                                                      .            V
                                                      .            V
370                                                   .           4R
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN  1998               *
*            VERSION 4.1               *
*                                      *
*  RUN DATE   12OCT06  TIME  10:46:15  *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
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```
                    Buckeye/Sun Valley ADMS - May 2005
                    Michael Baker Jr., Inc. - Modeler: Jacob Lesue
                    100-year 6-hour
                    Existing Conditions
                    Area 3 - Sub-basins L-R (Aluvial Fan updates)
                    Rainfall Loss Method - Green & Ampt
                    Unit Hydrograph Method - FCDMC S-Graph
                    Channel Routing Method - Normal Depth
                    Land Use - FCDMC GIS Data: mag_landuse (2000)
                    Soil Data - USDA SCS Soil Survey (1972 & 1981)
                    Units - L(mi)   Lca(mi)   S(ft/mi)   LAG(min)

 13 IO        OUTPUT CONTROL VARIABLES
                    IPRNT          3  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

 14 IN        TIME DATA FOR INPUT TIME SERIES
                     JXMIN         15  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

 19 IN        TIME DATA FOR INPUT TIME SERIES
                     JXMIN         15  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

 24 IN        TIME DATA FOR INPUT TIME SERIES
                     JXMIN         15  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

 29 IN        TIME DATA FOR INPUT TIME SERIES
                     JXMIN         15  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

    IN        TIME DATA FOR INPUT TIME SERIES
                     JXMIN         15  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

 39 IN        TIME DATA FOR INPUT TIME SERIES
                     JXMIN         15  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

 44 IN        TIME DATA FOR INPUT TIME SERIES
                     JXMIN         15  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

 49 IN        TIME DATA FOR INPUT TIME SERIES
                     JXMIN         15  TIME INTERVAL IN MINUTES
                    JXDATE     1JAN94  STARTING DATE
                    JXTIME          0  STARTING TIME

    IT        HYDROGRAPH TIME DATA
                      NMIN          5  MINUTES IN COMPUTATION INTERVAL
                     IDATE     1JAN94  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ       2000  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE     7JAN94  ENDING DATE
                    NDTIME       2235  ENDING TIME
                     ICENT         19  CENTURY MARK

                COMPUTATION INTERVAL     .08 HOURS
                     TOTAL TIME BASE  166.58 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

    JD        INDEX STORM NO. 1
                     STRM        3.23  PRECIPITATION DEPTH
                     TRDA         .01  TRANSPOSITION DRAINAGE AREA

 16 PI          PRECIPITATION PATTERN
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .01       .01       .01       .01       .01       .01       .03
                    .03       .03       .05       .05       .05       .15       .15       .15       .03       .03
```

```
          .03       .01       .01       .01       .01       .01       .01       .00       .00       .00
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00

20 JD   INDEX STORM NO. 2
          STRM        3.21  PRECIPITATION DEPTH
          TRDA         .50  TRANSPOSITION DRAINAGE AREA

21 PI     PRECIPITATION PATTERN
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00       .00       .01       .01       .01       .01       .01       .01       .03
          .03       .03       .05       .05       .05       .15       .15       .15       .03       .03
          .03       .01       .01       .01       .01       .01       .01       .00       .00       .00
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00

25 JD   INDEX STORM NO. 3
          STRM        3.19  PRECIPITATION DEPTH
          TRDA        1.00  TRANSPOSITION DRAINAGE AREA

26 PI     PRECIPITATION PATTERN
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00       .00       .01       .01       .01       .01       .01       .01       .03
          .03       .03       .06       .06       .06       .12       .12       .12       .03       .03
          .03       .01       .01       .01       .01       .01       .01       .00       .00       .00
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00

30 JD   INDEX STORM NO. 4
          STRM        3.10  PRECIPITATION DEPTH
          TRDA        5.00  TRANSPOSITION DRAINAGE AREA

31 PI     PRECIPITATION PATTERN
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00       .00       .01       .01       .01       .01       .01       .01       .03
          .03       .03       .06       .06       .06       .08       .08       .08       .05       .05
          .05       .02       .02       .02       .01       .01       .01       .01       .01       .01
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00

35 JD   INDEX STORM NO. 5
          STRM        3.04  PRECIPITATION DEPTH
          TRDA       10.00  TRANSPOSITION DRAINAGE AREA

   PI     PRECIPITATION PATTERN
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .01
          .01       .01       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .01       .01       .01       .01       .01       .01       .02       .02       .02       .03
          .03       .03       .06       .06       .06       .07       .07       .07       .04       .04
          .04       .02       .02       .02       .01       .01       .01       .01       .01       .01
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00

40 JD   INDEX STORM NO. 6
          STRM        2.94  PRECIPITATION DEPTH
          TRDA       20.00  TRANSPOSITION DRAINAGE AREA

41 PI     PRECIPITATION PATTERN
          .01       .01       .01       .00       .00       .00       .00       .00       .00       .01
          .01       .01       .01       .01       .01       .00       .00       .00       .00       .00
          .00       .01       .01       .01       .00       .00       .00       .01       .01       .01
          .01       .01       .01       .01       .01       .01       .02       .02       .02       .03
          .03       .03       .05       .05       .05       .06       .06       .06       .04       .04
          .04       .02       .02       .02       .01       .01       .01       .01       .01       .01
          .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
          .00       .00

45 JD   INDEX STORM NO. 7
          STRM        2.88  PRECIPITATION DEPTH
          TRDA       30.00  TRANSPOSITION DRAINAGE AREA

46 PI     PRECIPITATION PATTERN
          .01       .01       .01       .00       .00       .00       .00       .00       .00       .01
          .01       .01       .01       .01       .01       .00       .00       .00       .01       .01
          .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
          .01       .01       .01       .01       .01       .01       .02       .02       .02       .03
          .03       .03       .05       .05       .05       .06       .06       .06       .04       .04
          .04       .02       .02       .02       .02       .02       .02       .01       .01       .01
          .01       .01       .01       .01       .01       .01       .01       .01       .01       .00
          .00       .00

50 JD   INDEX STORM NO. 8
          STRM        2.81  PRECIPITATION DEPTH
          TRDA       40.00  TRANSPOSITION DRAINAGE AREA

   PI     PRECIPITATION PATTERN
          .01       .01       .01       .00       .00       .00       .00       .00       .00       .01
          .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
          .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
          .01       .01       .01       .01       .01       .01       .02       .02       .02       .03
          .03       .03       .05       .05       .05       .06       .06       .06       .04       .04
          .04       .02       .02       .02       .02       .02       .02       .01       .01       .01
          .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
          .01       .01
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
 54 KK    *        R1  *
          *            *
          **************
                         THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                         L=1.01     Lca=0.46     S=213.31     Kn=0.050     LAG=18.8
                         S-GRAPH TYPE=PHX MNT

 58 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

 59 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .28  SUBBASIN AREA

 60 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .35  STARTING LOSS
                        DTH         .35  MOISTURE DEFICIT
                       PSIF        4.36  WETTING FRONT SUCTION
                      XKSAT         .37  HYDRAULIC CONDUCTIVITY
                      RTIMP        8.39  PERCENT IMPERVIOUS AREA

 59 UI          INPUT UNITGRAPH,  18 ORDINATES,  VOLUME = 1.00
                        .0      62.1     236.0     401.9     465.0     281.7     216.1     150.6     113.7      76.3
                      57.5      39.7      27.5      24.5       9.6       9.6       9.6       9.6
                                                                                  ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       R1
                     TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.68, TOTAL EXCESS =    1.55

  K FLOW     TIME                          MAXIMUM AVERAGE FLOW
  CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   510.      4.25        (CFS)      47.         12.          4.           2.
                       (INCHES)    1.539       1.540       1.540        1.540
                        (AC-FT)     23.         23.         23.          23.

                      CUMULATIVE AREA =     .28 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       R1
                     TRANSPOSITION AREA       .5 SQ MI

   TOTAL RAINFALL =    3.21, TOTAL LOSS =    1.68, TOTAL EXCESS =    1.53

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   506.       4.25        (CFS)      47.         12.          4.           2.
                       (INCHES)    1.523       1.525       1.525        1.525
                        (AC-FT)     23.         23.         23.          23.

                      CUMULATIVE AREA =     .28 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       R1
                     TRANSPOSITION AREA      1.0 SQ MI

   TOTAL RAINFALL =    3.19, TOTAL LOSS =    1.78, TOTAL EXCESS =    1.41

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   416.       4.25        (CFS)      43.         11.          4.           2.
                       (INCHES)    1.399       1.401       1.401        1.401
                        (AC-FT)     21.         21.         21.          21.

                      CUMULATIVE AREA =     .28 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       R1
                     TRANSPOSITION AREA      5.0 SQ MI

   TOTAL RAINFALL =    3.10, TOTAL LOSS =    1.98, TOTAL EXCESS =    1.12

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   256.       4.25        (CFS)      34.          9.          3.           1.
                       (INCHES)    1.118       1.120       1.120        1.120
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                    (AC-FT)        17.          17.          17.          17.

                    CUMULATIVE AREA =      .28 SQ MI


     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       R1
                    TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.04, TOTAL LOSS =    2.03, TOTAL EXCESS =    1.01

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
    222.       4.25        (CFS)       31.          8.          3.           1.
                         (INCHES)    1.003       1.005       1.005        1.005
                          (AC-FT)       15.         15.         15.          15.

                    CUMULATIVE AREA =      .28 SQ MI


     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       R1
                    TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    2.94, TOTAL LOSS =    2.07, TOTAL EXCESS =     .87

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
    186.       4.25        (CFS)       26.          7.          2.           1.
                         (INCHES)     .866        .869        .869         .869
                          (AC-FT)       13.         13.         13.          13.

                    CUMULATIVE AREA =      .28 SQ MI


     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       R1
                    TRANSPOSITION AREA     30.0 SQ MI

   TOTAL RAINFALL =    2.87, TOTAL LOSS =    2.09, TOTAL EXCESS =     .79

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
    166.       4.25        (CFS)       24.          6.          2.           1.
                         (INCHES)     .784        .786        .786         .786
                          (AC-FT)       12.         12.         12.          12.

                    CUMULATIVE AREA =      .28 SQ MI


     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       R1
                    TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    2.81, TOTAL LOSS =    2.09, TOTAL EXCESS =     .72

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
    149.       4.25        (CFS)       22.          5.          2.           1.
                         (INCHES)     .713        .716        .716         .716
                          (AC-FT)       11.         11.         11.          11.

                    CUMULATIVE AREA =      .28 SQ MI

     ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       R1

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
    506.       4.25        (CFS)       47.         12.          4.           2.
                         (INCHES)    1.525       1.527       1.527        1.527
                          (AC-FT)       23.         23.         23.          23.

                    CUMULATIVE AREA =      .28 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 63 KK    *      13R   *        CNAME       R
          *            *
          **************

 64 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
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                    TIMINT        .083  TIME INTERVAL IN HOURS

                HYDROGRAPH ROUTING DATA

 65 RN            NO ROUTING

                                                                  ***

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      13R
                    TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
    510.       4.25        (CFS)     47.         12.          4.           2.
                         (INCHES)  1.539       1.540       1.540        1.540
                          (AC-FT)    23.         23.         23.          23.

                       CUMULATIVE AREA =     .28 SQ MI

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      13R
                    TRANSPOSITION AREA       .5 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
    506.       4.25        (CFS)     47.         12.          4.           2.
                         (INCHES)  1.523       1.525       1.525        1.525
                          (AC-FT)    23.         23.         23.          23.

                       CUMULATIVE AREA =     .28 SQ MI

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      13R
                    TRANSPOSITION AREA      1.0 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
    416.       4.25        (CFS)     43.         11.          4.           2.
                         (INCHES)  1.399       1.401       1.401        1.401
                          (AC-FT)    21.         21.         21.          21.

                       CUMULATIVE AREA =     .28 SQ MI

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      13R
                    TRANSPOSITION AREA      5.0 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
    256.       4.25        (CFS)     34.          9.          3.           1.
                         (INCHES)  1.118       1.120       1.120        1.120
                          (AC-FT)    17.         17.         17.          17.

                       CUMULATIVE AREA =     .28 SQ MI

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      13R
                    TRANSPOSITION AREA     10.0 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
    222.       4.25        (CFS)     31.          8.          3.           1.
                         (INCHES)  1.003       1.005       1.005        1.005
                          (AC-FT)    15.         15.         15.          15.

                       CUMULATIVE AREA =     .28 SQ MI

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      13R
                    TRANSPOSITION AREA     20.0 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
    186.       4.25        (CFS)     26.          7.          2.           1.
                         (INCHES)   .866        .869        .869         .869
                          (AC-FT)    13.         13.         13.          13.

                       CUMULATIVE AREA =     .28 SQ MI

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      13R
                    TRANSPOSITION AREA     30.0 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
    166.       4.25        (CFS)     24.          6.          2.           1.
                         (INCHES)   .784        .786        .786         .786
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                    (AC-FT)        12.          12.          12.          12.

                    CUMULATIVE AREA =      .28 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      13R
                    TRANSPOSITION AREA     40.0 SQ MI

 K FLOW      TIME                          MAXIMUM AVERAGE FLOW
 (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  149.       4.25        (CFS)      22.          5.          2.           1.
                      (INCHES)     .713        .716        .716         .716
                       (AC-FT)      11.         11.         11.          11.

                    CUMULATIVE AREA =      .28 SQ MI

    ***             ***             ***             ***             ***


                    INTERPOLATED HYDROGRAPH AT      13R

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
 (CFS)         (HR)                  6-HR       24-HR       72-HR    166.58-HR
  506.         4.25        (CFS)      47.         12.          4.           2.
                      (INCHES)    1.525       1.527       1.527        1.527
                       (AC-FT)      23.         23.         23.          23.

                    CUMULATIVE AREA =      .28 SQ MI


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          *            *
 66 KK    *        M1  *
          *            *
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                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=5.19     Lca=2.41     S=230.06     Kn=0.050     LAG=66.8
                    S-GRAPH TYPE=PHX MNT

 70 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

 71 BA          SUBBASIN CHARACTERISTICS
                      TAREA        5.69  SUBBASIN AREA

 72 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .35  STARTING LOSS
                        DTH         .35  MOISTURE DEFICIT
                       PSIF        4.30  WETTING FRONT SUCTION
                      XKSAT         .35  HYDRAULIC CONDUCTIVITY
                      RTIMP       16.64  PERCENT IMPERVIOUS AREA

 71 UI          INPUT UNITGRAPH,  62 ORDINATES,  VOLUME = 1.00
                        .0     285.7     285.7     285.7     777.6    1062.4    1436.6    1746.7    1963.2    2166.6
                    2402.0    2950.4    3432.0    2400.0    1965.8    1755.2    1651.2    1527.0    1413.1    1330.6
                    1198.5    1122.7    1012.8     904.5     777.8     718.0     682.1     653.3     597.5     521.7
                     469.4     394.7     365.1     349.3     313.0     313.0     267.0     219.1     219.1     219.1
                     181.8     139.8     139.8     139.8     139.8     139.8     125.2      54.8      54.8      54.8
                      54.8      54.8      54.8      54.8      54.8      54.8      54.8      54.8      54.8      54.8
                      54.8      54.8
                                                                  ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       M1
                    TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.49, TOTAL EXCESS =    1.74

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
 (CFS)         (HR)                  6-HR       24-HR       72-HR    166.58-HR
 4449.         4.83        (CFS)    1042.        265.         88.          38.
                      (INCHES)    1.704       1.735       1.735        1.735
                       (AC-FT)     517.        526.        526.         526.

                    CUMULATIVE AREA =    5.69 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       M1
                    TRANSPOSITION AREA       .5 SQ MI
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TOTAL RAINFALL = 3.21, TOTAL LOSS = 1.49, TOTAL EXCESS = 1.72

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
4410.	4.83	(CFS)	1032.	263.	88.	38.
		(INCHES)	1.688	1.719	1.719	1.719
		(AC-FT)	512.	521.	521.	521.

CUMULATIVE AREA = 5.69 SQ MI

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HYDROGRAPH AT STATION M1
TRANSPOSITION AREA 1.0 SQ MI

TOTAL RAINFALL = 3.19, TOTAL LOSS = 1.58, TOTAL EXCESS = 1.61

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3892.	4.83	(CFS)	962.	245.	82.	35.
		(INCHES)	1.572	1.603	1.603	1.603
		(AC-FT)	477.	486.	486.	486.

CUMULATIVE AREA = 5.69 SQ MI

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HYDROGRAPH AT STATION M1
TRANSPOSITION AREA 5.0 SQ MI

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.75, TOTAL EXCESS = 1.35

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2868.	4.83	(CFS)	803.	206.	69.	30.
		(INCHES)	1.312	1.347	1.347	1.347
		(AC-FT)	398.	409.	409.	409.

CUMULATIVE AREA = 5.69 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M1
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.04, TOTAL LOSS = 1.80, TOTAL EXCESS = 1.24

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2550.	4.83	(CFS)	733.	189.	63.	27.
		(INCHES)	1.199	1.236	1.236	1.236
		(AC-FT)	363.	375.	375.	375.

CUMULATIVE AREA = 5.69 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M1
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 2.94, TOTAL LOSS = 1.84, TOTAL EXCESS = 1.10

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2198.	4.83	(CFS)	651.	169.	56.	24.
		(INCHES)	1.065	1.103	1.103	1.103
		(AC-FT)	323.	334.	334.	334.

CUMULATIVE AREA = 5.69 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M1
TRANSPOSITION AREA 30.0 SQ MI

TOTAL RAINFALL = 2.87, TOTAL LOSS = 1.85, TOTAL EXCESS = 1.02

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1995.	4.83	(CFS)	601.	156.	52.	22.
		(INCHES)	.983	1.021	1.021	1.021
		(AC-FT)	298.	310.	310.	310.

CUMULATIVE AREA = 5.69 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M1
TRANSPOSITION AREA 40.0 SQ MI

TOTAL RAINFALL = 2.81, TOTAL LOSS = 1.86, TOTAL EXCESS = .95

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1826.	4.83	(CFS)	558.	145.	48.	21.
		(INCHES)	.912	.950	.950	.950

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                    (AC-FT)      277.        288.        288.        288.

                    CUMULATIVE AREA =    5.69 SQ MI

    ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       M1

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                   6-HR       24-HR       72-HR    166.58-HR
  2809.        4.83        (CFS)      790.        203.         68.         29.
                         (INCHES)    1.291       1.327       1.327       1.327
                          (AC-FT)     392.        402.        402.        402.

                    CUMULATIVE AREA =    5.69 SQ MI


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          *            *
 80 KK    *    M1-M2   *        CNAME     M2R
          *            *
          **************

 81 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

 82 RS          STORAGE ROUTING
                      NSTPS          24  NUMBER OF SUBREACHES
                       ITYP        FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

 83 RC          NORMAL DEPTH CHANNEL
                        ANL        .040  LEFT OVERBANK N-VALUE
                       ANCH        .040  MAIN CHANNEL N-VALUE
                        ANR        .045  RIGHT OVERBANK N-VALUE
                      RLNTH      34770.  REACH LENGTH
                        SEL       .0133  ENERGY SLOPE
                      ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
 85 RY        ELEVATION     15.50     12.00     11.80     10.30     10.00     11.00     11.20     15.50
 84 RX        DISTANCE        .00    961.00   1028.00   1051.00   1136.00   1153.00   1193.00   1900.00

                                                   ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00     10.04     31.85     55.84     83.80    124.04    176.33    247.15    348.50    479.21
          OUTFLOW        .00     14.90     93.45    224.24    409.05    667.47   1015.19   1494.80   2155.84   3041.09
        ELEVATION      10.00     10.29     10.58     10.87     11.16     11.45     11.74     12.03     12.32     12.61

          STORAGE     639.28    828.72   1047.51   1295.67   1573.20   1880.08   2216.32   2581.93   2976.90   3401.24
          OUTFLOW    4191.29   5643.45   7432.01   9589.48  12146.85  15133.83  18579.05  22510.24  26954.29  31937.40
        ELEVATION      12.89     13.18     13.47     13.76     14.05     14.34     14.63     14.92     15.21     15.50

    ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION    M1-M2
                  TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                   6-HR       24-HR       72-HR    166.58-HR
  3235.        6.58        (CFS)     1033.        265.         88.         38.
                         (INCHES)    1.689       1.735       1.735       1.735
                          (AC-FT)     512.        526.        526.        526.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
     21.       6.58                     7.          2.          1.          0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
  (FEET)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   12.65       6.58                  11.45       10.45       10.15       10.07

                    CUMULATIVE AREA =    5.69 SQ MI

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                    HYDROGRAPH AT STATION    M1-M2
                  TRANSPOSITION AREA       .5 SQ MI
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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3202.	6.58	(CFS)	1023.	263.	88.	38.
		(INCHES)	1.673	1.719	1.719	1.719
		(AC-FT)	507.	521.	521.	521.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
21.	6.58	7.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.65	6.58	11.45	10.45	10.15	10.07

CUMULATIVE AREA = 5.69 SQ MI

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HYDROGRAPH AT STATION M1-M2
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2918.	6.67	(CFS)	953.	245.	82.	35.
		(INCHES)	1.558	1.603	1.603	1.603
		(AC-FT)	473.	486.	486.	486.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
19.	6.67	7.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.57	6.67	11.41	10.44	10.15	10.06

CUMULATIVE AREA = 5.69 SQ MI

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HYDROGRAPH AT STATION M1-M2
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2310.	6.75	(CFS)	796.	206.	69.	30.
		(INCHES)	1.302	1.347	1.347	1.347
		(AC-FT)	395.	409.	409.	409.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
15.	6.75	6.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.37	6.75	11.33	10.42	10.14	10.06

CUMULATIVE AREA = 5.69 SQ MI

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HYDROGRAPH AT STATION M1-M2
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2069.	6.75	(CFS)	728.	189.	63.	27.
		(INCHES)	1.190	1.236	1.236	1.236
		(AC-FT)	361.	375.	375.	375.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
14.	6.75	5.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.28	6.75	11.30	10.42	10.14	10.06

CUMULATIVE AREA = 5.69 SQ MI

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HYDROGRAPH AT STATION M1-M2
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1799.	6.75	(CFS)	646.	169.	56.	24.
		(INCHES)	1.057	1.103	1.103	1.103
		(AC-FT)	320.	334.	334.	334.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
12.	6.75	5.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.16	6.75	11.24	10.40	10.13	10.06

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                    CUMULATIVE AREA =    5.69 SQ MI

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                    HYDROGRAPH AT STATION    M1-M2
                  TRANSPOSITION AREA     30.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  1640.       6.75       (CFS)     596.        156.         52.         22.
                       (INCHES)    .975       1.021       1.021       1.021
                        (AC-FT)    296.        310.        310.        310.

PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                 6-HR       24-HR       72-HR    166.58-HR
     11.      6.75                   5.          1.          0.          0.

PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
   12.09      6.75                11.21       10.40       10.13       10.06

                    CUMULATIVE AREA =    5.69 SQ MI

***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION    M1-M2
                  TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  1506.       6.75       (CFS)     553.        145.         48.         21.
                       (INCHES)    .904        .950        .950        .950
                        (AC-FT)    274.        288.        288.        288.

PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                 6-HR       24-HR       72-HR    166.58-HR
     10.      6.75                   4.          1.          0.          0.

PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
   12.03      6.75                11.17       10.39       10.13       10.06

                    CUMULATIVE AREA =    5.69 SQ MI

***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT    M1-M2

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  2265.       6.75       (CFS)     784.        203.         68.         29.
                       (INCHES)   1.282       1.327       1.327       1.327
                        (AC-FT)    389.        402.        402.        402.

                    CUMULATIVE AREA =    5.69 SQ MI


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          *            *
 86 KK    *        M2  *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=6.59     Lca=3.00     S=71.62     Kn=0.050     LAG=100.2
                    S-GRAPH TYPE=DES RNGLND

 90 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

 91 BA          SUBBASIN CHARACTERISTICS
                      TAREA       7.44  SUBBASIN AREA

 91 LG          GREEN AND AMPT LOSS RATE
                      STRTL        .35  STARTING LOSS
                        DTH        .35  MOISTURE DEFICIT
                       PSIF       3.96  WETTING FRONT SUCTION
                      XKSAT        .44  HYDRAULIC CONDUCTIVITY
                      RTIMP        .29  PERCENT IMPERVIOUS AREA

 91 UI          INPUT UNITGRAPH,  74 ORDINATES,  VOLUME = 1.00
                      .0     250.4     250.4     250.4     250.4     438.2     719.8     924.8    1114.8    1312.9
                  1497.2    1700.9    1779.1    2056.7    2161.1    2246.8    2290.1    2399.5    2399.5    2399.5
                  2351.5    2259.2    2219.8    2074.0    1858.2    1745.1    1567.9    1438.6    1323.6    1215.0
```

1118.4	1022.5	940.0	874.2	767.8	718.5	685.6	569.2	559.1	484.2
472.0	435.0	383.9	383.9	334.1	265.4	265.4	265.4	257.9	171.4
171.4	171.4	171.4	171.4	171.4	131.6	60.9	60.9	60.9	60.9
60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9
60.9	60.9	60.9	60.9						

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HYDROGRAPH AT STATION M2
TRANSPOSITION AREA .0 SQ MI

TOTAL RAINFALL = 3.23, TOTAL LOSS = 1.90, TOTAL EXCESS = 1.33

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3162.	5.42	(CFS)	1056.	265.	88.	38.
		(INCHES)	1.320	1.324	1.324	1.324
		(AC-FT)	523.	525.	525.	525.

CUMULATIVE AREA = 7.44 SQ MI

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HYDROGRAPH AT STATION M2
TRANSPOSITION AREA .5 SQ MI

TOTAL RAINFALL = 3.21, TOTAL LOSS = 1.90, TOTAL EXCESS = 1.31

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3127.	5.42	(CFS)	1044.	262.	87.	38.
		(INCHES)	1.305	1.310	1.310	1.310
		(AC-FT)	518.	519.	519.	519.

CUMULATIVE AREA = 7.44 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M2
TRANSPOSITION AREA 1.0 SQ MI

TOTAL RAINFALL = 3.19, TOTAL LOSS = 2.01, TOTAL EXCESS = 1.17

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2778.	5.42	(CFS)	935.	235.	78.	34.
		(INCHES)	1.169	1.173	1.173	1.173
		(AC-FT)	464.	465.	465.	465.

CUMULATIVE AREA = 7.44 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M2
TRANSPOSITION AREA 5.0 SQ MI

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.23, TOTAL EXCESS = .87

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2020.	5.42	(CFS)	691.	174.	58.	25.
		(INCHES)	.864	.868	.868	.868
		(AC-FT)	343.	344.	344.	344.

CUMULATIVE AREA = 7.44 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M2
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.04, TOTAL LOSS = 2.30, TOTAL EXCESS = .74

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1721.	5.42	(CFS)	589.	148.	49.	21.
		(INCHES)	.737	.741	.741	.741
		(AC-FT)	292.	294.	294.	294.

CUMULATIVE AREA = 7.44 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M2
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 2.94, TOTAL LOSS = 2.34, TOTAL EXCESS = .60

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1395.	5.42	(CFS)	477.	120.	40.	17.
		(INCHES)	.597	.601	.601	.601
		(AC-FT)	237.	238.	238.	238.

CUMULATIVE AREA = 7.44 SQ MI

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***            ***            ***            ***            ***

                HYDROGRAPH AT STATION       M2
               TRANSPOSITION AREA     30.0 SQ MI

TOTAL RAINFALL =    2.87, TOTAL LOSS =    2.35, TOTAL EXCESS =     .52

K FLOW     TIME                          MAXIMUM AVERAGE FLOW
(CFS)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
1212.      5.42        (CFS)     415.        104.         35.         15.
                     (INCHES)    .519        .522        .522        .522
                      (AC-FT)    206.        207.        207.        207.

                CUMULATIVE AREA =    7.44 SQ MI


***            ***            ***            ***            ***

                HYDROGRAPH AT STATION       M2
               TRANSPOSITION AREA     40.0 SQ MI

TOTAL RAINFALL =    2.81, TOTAL LOSS =    2.35, TOTAL EXCESS =     .46

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1058.       5.42        (CFS)     362.         91.         30.         13.
                     (INCHES)    .453        .456        .456        .456
                      (AC-FT)    180.        181.        181.        181.

                CUMULATIVE AREA =    7.44 SQ MI

***            ***            ***            ***            ***


                INTERPOLATED HYDROGRAPH AT       M2

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1849.       5.42        (CFS)     633.        159.         53.         23.
                     (INCHES)    .791        .795        .795        .795
                      (AC-FT)    314.        315.        315.        315.

                CUMULATIVE AREA =    7.44 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
101 KK    *          M *        CNAME      5R
          *            *
          **************

102 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


103 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                          ***

***            ***            ***            ***            ***

                HYDROGRAPH AT STATION        M
               TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  4508.       6.50        (CFS)    2060.        530.        177.         76.
                     (INCHES)   1.460       1.502       1.502       1.502
                      (AC-FT)   1021.       1051.       1051.       1051.

                CUMULATIVE AREA =   13.12 SQ MI


***            ***            ***            ***            ***

                HYDROGRAPH AT STATION        M
               TRANSPOSITION AREA       .5 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  4458.       6.50        (CFS)    2039.        525.        175.         76.
                     (INCHES)   1.444       1.487       1.487       1.487
                      (AC-FT)   1011.       1041.       1041.       1041.

                CUMULATIVE AREA =   13.12 SQ MI
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*** *** *** *** ***

HYDROGRAPH AT STATION M
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
4008.	6.50	(CFS)	1860.	480.	160.	69.
		(INCHES)	1.318	1.360	1.360	1.360
		(AC-FT)	922.	952.	952.	952.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3085.	6.58	(CFS)	1462.	380.	127.	55.
		(INCHES)	1.036	1.076	1.076	1.076
		(AC-FT)	725.	753.	753.	753.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2709.	6.58	(CFS)	1294.	337.	112.	49.
		(INCHES)	.917	.955	.955	.955
		(AC-FT)	641.	669.	669.	669.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2315.	6.58	(CFS)	1103.	289.	96.	42.
		(INCHES)	.781	.818	.818	.818
		(AC-FT)	547.	573.	573.	573.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2094.	6.58	(CFS)	992.	261.	87.	38.
		(INCHES)	.703	.738	.738	.738
		(AC-FT)	492.	517.	517.	517.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION M
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1912.	6.58	(CFS)	897.	236.	79.	34.
		(INCHES)	.636	.670	.670	.670
		(AC-FT)	445.	469.	469.	469.

CUMULATIVE AREA = 13.12 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT M

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2555.	6.58	(CFS)	1219.	318.	106.	46.
		(INCHES)	.864	.901	.901	.901
		(AC-FT)	604.	631.	631.	631.

CUMULATIVE AREA = 13.12 SQ MI

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              **************
              *            *
104 KK        *        5R  *        CNAME       M
              *            *
              **************

105 KO            OUTPUT CONTROL VARIABLES
                        IPRNT          3  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE
                        IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                         IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       .083  TIME INTERVAL IN HOURS


                HYDROGRAPH ROUTING DATA

106 RN            NO ROUTING

                                                                  ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       5R
                    TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  4508.       6.50        (CFS)    2060.       530.        177.         76.
                       (INCHES)   1.460      1.502       1.502       1.502
                        (AC-FT)   1021.      1051.       1051.       1051.

                     CUMULATIVE AREA =   13.12 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       5R
                    TRANSPOSITION AREA       .5 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  4458.       6.50        (CFS)    2039.       525.        175.         76.
                       (INCHES)   1.444      1.487       1.487       1.487
                        (AC-FT)   1011.      1041.       1041.       1041.

                     CUMULATIVE AREA =   13.12 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       5R
                    TRANSPOSITION AREA      1.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  4008.       6.50        (CFS)    1860.       480.        160.         69.
                       (INCHES)   1.318      1.360       1.360       1.360
                        (AC-FT)    922.       952.        952.        952.

                     CUMULATIVE AREA =   13.12 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       5R
                    TRANSPOSITION AREA      5.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  3085.       6.58        (CFS)    1462.       380.        127.         55.
                       (INCHES)   1.036      1.076       1.076       1.076
                        (AC-FT)    725.       753.        753.        753.

                     CUMULATIVE AREA =   13.12 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       5R
                    TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  2709.       6.58        (CFS)    1294.       337.        112.         49.
                       (INCHES)    .917       .955        .955        .955
                        (AC-FT)    641.       669.        669.        669.

                     CUMULATIVE AREA =   13.12 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       5R
                    TRANSPOSITION AREA     20.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
```

```
 2315.      6.58        (CFS)      1103.        289.         96.          42.
                     (INCHES)       .781        .818        .818         .818
                      (AC-FT)       547.        573.        573.         573.

                    CUMULATIVE AREA =   13.12 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       5R
                  TRANSPOSITION AREA     30.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2094.       6.58        (CFS)      992.        261.         87.          38.
                     (INCHES)       .703        .738        .738         .738
                      (AC-FT)       492.        517.        517.         517.

                    CUMULATIVE AREA =   13.12 SQ MI


   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       5R
                  TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1912.       6.58        (CFS)      897.        236.         79.          34.
                     (INCHES)       .636        .670        .670         .670
                      (AC-FT)       445.        469.        469.         469.

                    CUMULATIVE AREA =   13.12 SQ MI

   ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       5R

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  2555.       6.58        (CFS)     1219.        318.        106.          46.
                     (INCHES)       .864        .901        .901         .901
                      (AC-FT)       604.        631.        631.         631.

                    CUMULATIVE AREA =   13.12 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
107 KK    *        N1  *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=2.79     Lca=1.44     S=340.38     Kn=0.050     LAG=39.7
                    S-GRAPH TYPE=PHX MNT

111 KO         OUTPUT CONTROL VARIABLES
                    IPRNT           3  PRINT CONTROL
                    IPLOT           0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                     IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT        .083  TIME INTERVAL IN HOURS


           SUBBASIN RUNOFF DATA

112 BA         SUBBASIN CHARACTERISTICS
                    TAREA        1.52  SUBBASIN AREA

113 LG         GREEN AND AMPT LOSS RATE
                    STRTL         .35  STARTING LOSS
                      DTH         .35  MOISTURE DEFICIT
                     PSIF        4.07  WETTING FRONT SUCTION
                    XKSAT         .42  HYDRAULIC CONDUCTIVITY
                    RTIMP        8.38  PERCENT IMPERVIOUS AREA

112 UI         INPUT UNITGRAPH,  37 ORDINATES,  VOLUME = 1.00
                      .0     128.3     166.8     436.7     697.6     885.4    1048.9    1439.8    1097.6     811.0
                   717.9     633.2     554.4     482.3     398.7     327.2     300.3     268.1     210.8     167.7
                   152.7     140.5     106.8      98.3      84.1      62.8      62.8      62.8      38.3      24.6
                    24.6      24.6      24.6      24.6      24.6      24.6      24.6
                                                                   ***
   ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       N1
                  TRANSPOSITION AREA       .0 SQ MI

  TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.73, TOTAL EXCESS =    1.50

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
```

(CFS)	(HR)		6-HR	24-HR	72-HR	166.58-HR
1619.	4.50	(CFS)	245.	62.	21.	9.
		(INCHES)	1.497	1.501	1.501	1.501
		(AC-FT)	122.	122.	122.	122.

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1
TRANSPOSITION AREA .5 SQ MI

TOTAL RAINFALL = 3.21, TOTAL LOSS = 1.72, TOTAL EXCESS = 1.49

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1604.	4.50	(CFS)	243.	61.	20.	9.
		(INCHES)	1.481	1.486	1.486	1.486
		(AC-FT)	120.	121.	121.	121.

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1
TRANSPOSITION AREA 1.0 SQ MI

TOTAL RAINFALL = 3.19, TOTAL LOSS = 1.82, TOTAL EXCESS = 1.36

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1371.	4.50	(CFS)	222.	56.	19.	8.
		(INCHES)	1.356	1.361	1.361	1.361
		(AC-FT)	110.	111.	111.	111.

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1
TRANSPOSITION AREA 5.0 SQ MI

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.02, TOTAL EXCESS = 1.08

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
922.	4.50	(CFS)	175.	44.	15.	6.
		(INCHES)	1.068	1.074	1.074	1.074
		(AC-FT)	87.	87.	87.	87.

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.04, TOTAL LOSS = 2.08, TOTAL EXCESS = .96

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
798.	4.50	(CFS)	155.	39.	13.	6.
		(INCHES)	.948	.954	.954	.954
		(AC-FT)	77.	78.	78.	78.

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 2.94, TOTAL LOSS = 2.12, TOTAL EXCESS = .82

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
665.	4.50	(CFS)	133.	34.	11.	5.
		(INCHES)	.811	.818	.818	.818
		(AC-FT)	66.	66.	66.	66.

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1
TRANSPOSITION AREA 30.0 SQ MI

TOTAL RAINFALL = 2.87, TOTAL LOSS = 2.14, TOTAL EXCESS = .74

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
590.	4.50	(CFS)	120.	30.	10.	4.
		(INCHES)	.731	.738	.738	.738
		(AC-FT)	59.	60.	60.	60.

CUMULATIVE AREA = 1.52 SQ MI

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   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       N1
                  TRANSPOSITION AREA     40.0 SQ MI

  TOTAL RAINFALL =    2.81, TOTAL LOSS =    2.14, TOTAL EXCESS =     .67

 K FLOW     TIME                          MAXIMUM AVERAGE FLOW
 CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  529.      4.50        (CFS)     109.         28.          9.           4.
                      (INCHES)    .665        .672        .672         .672
                       (AC-FT)     54.         55.         55.          55.

                    CUMULATIVE AREA =    1.52 SQ MI

   ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       N1

 PEAK FLOW    TIME                          MAXIMUM AVERAGE FLOW
   (CFS)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1253.      4.50        (CFS)     210.         53.         18.           8.
                      (INCHES)   1.281       1.286       1.286        1.286
                       (AC-FT)    104.        105.        105.         105.

                    CUMULATIVE AREA =    1.52 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
118 KK    *    N1-N2   *        CNAME     N2R
          *            *
          **************

119 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS

             HYDROGRAPH ROUTING DATA

120 RS          STORAGE ROUTING
                      NSTPS          21  NUMBER OF SUBREACHES
                       ITYP        FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

121 RC          NORMAL DEPTH CHANNEL
                        ANL        .050  LEFT OVERBANK N-VALUE
                       ANCH        .047  MAIN CHANNEL N-VALUE
                        ANR        .050  RIGHT OVERBANK N-VALUE
                      RLNTH      25648.  REACH LENGTH
                        SEL      .0115  ENERGY SLOPE
                      ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
123 RY        ELEVATION     17.00     13.00     11.50     10.00     10.00     11.50     13.00     17.00
122 RX        DISTANCE        .00    280.00    350.00    358.00    367.00    381.00    451.00    730.00

                                                   ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00      2.54      6.25     11.13     17.19     27.12     44.50     69.34    101.64    142.76
          OUTFLOW        .00      6.54     23.72     52.83     95.68    169.86    286.37    461.11    707.80   1024.91
        ELEVATION      10.00     10.37     10.74     11.11     11.47     11.84     12.21     12.58     12.95     13.32

          STORAGE     195.01    258.43    333.02    418.78    515.70    623.79    743.06    873.49   1015.09   1167.85
          OUTFLOW    1452.39   2010.36   2715.16   3582.35   4626.84   5862.90   7304.30   8964.33  10855.88  12991.49
        ELEVATION      13.68     14.05     14.42     14.79     15.16     15.53     15.89     16.26     16.63     17.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN    10856. TO    12991.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION    N1-N2
                  TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW    TIME                          MAXIMUM AVERAGE FLOW
   (CFS)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1025.      6.08        (CFS)     244.         62.         21.           9.
                      (INCHES)    1.490       1.501       1.501        1.501
                       (AC-FT)     121.        122.        122.         122.
```

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
7.	6.08	2.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.32	6.08	11.51	10.40	10.13	10.06

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1-N2
TRANSPOSITION AREA .5 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1014.	6.08	(CFS)	242.	61.	20.	9.
		(INCHES)	1.475	1.486	1.486	1.486
		(AC-FT)	120.	121.	121.	121.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
7.	6.08	2.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.30	6.08	11.50	10.40	10.13	10.06

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1-N2
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
902.	6.08	(CFS)	221.	56.	19.	8.
		(INCHES)	1.350	1.361	1.361	1.361
		(AC-FT)	110.	111.	111.	111.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
6.	6.08	2.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.17	6.08	11.47	10.39	10.13	10.06

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1-N2
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
668.	6.17	(CFS)	174.	44.	15.	6.
		(INCHES)	1.062	1.074	1.074	1.074
		(AC-FT)	86.	87.	87.	87.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
5.	6.17	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.89	6.17	11.38	10.37	10.12	10.05

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1-N2
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
578.	6.17	(CFS)	154.	39.	13.	6.
		(INCHES)	.941	.954	.954	.954
		(AC-FT)	76.	78.	78.	78.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	6.17	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.75	6.17	11.34	10.36	10.12	10.05

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1-N2
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
479.	6.25	(CFS)	132.	34.	11.	5.
		(INCHES)	.804	.818	.818	.818
		(AC-FT)	65.	66.	66.	66.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
3.	6.25	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.61	6.25	11.28	10.35	10.12	10.05

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1-N2
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
423.	6.25	(CFS)	119.	30.	10.	4.
		(INCHES)	.723	.738	.738	.738
		(AC-FT)	59.	60.	60.	60.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
3.	6.25	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.50	6.25	11.24	10.34	10.11	10.05

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N1-N2
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
379.	6.33	(CFS)	108.	28.	9.	4.
		(INCHES)	.657	.672	.672	.672
		(AC-FT)	53.	55.	55.	55.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
3.	6.33	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.41	6.33	11.20	10.33	10.11	10.05

CUMULATIVE AREA = 1.52 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT N1-N2

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
840.	6.17	(CFS)	209.	53.	18.	8.
		(INCHES)	1.274	1.286	1.286	1.286
		(AC-FT)	104.	105.	105.	105.

CUMULATIVE AREA = 1.52 SQ MI

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              *            *
124 KK        *        N2  *
              *            *
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THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
L=5.64 Lca=3.27 S=170.14 Kn=0.055 LAG=90.7
S-GRAPH TYPE=PHX MNT

KO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	1	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	2000	LAST ORDINATE PUNCHED OR SAVED
TIMINT	.083	TIME INTERVAL IN HOURS

SUBBASIN RUNOFF DATA

129 BA SUBBASIN CHARACTERISTICS

TAREA	3.33	SUBBASIN AREA

130 LG GREEN AND AMPT LOSS RATE

STRTL	.35	STARTING LOSS
DTH	.35	MOISTURE DEFICIT
PSIF	4.12	WETTING FRONT SUCTION
XKSAT	.41	HYDRAULIC CONDUCTIVITY
RTIMP	2.67	PERCENT IMPERVIOUS AREA

129 UI INPUT UNITGRAPH, 85 ORDINATES, VOLUME = 1.00

.0	123.0	123.0	123.0	123.0	310.8	396.0	496.7	616.3	730.8
796.5	869.0	928.6	990.2	1125.9	1316.1	1517.9	1186.4	925.6	834.3
764.3	726.5	694.1	654.4	619.9	586.9	557.1	517.8	491.7	466.8
422.4	387.3	352.0	325.3	302.3	296.8	283.0	272.2	257.3	234.3
202.1	202.1	163.1	157.2	157.2	143.9	134.8	134.8	134.8	103.6
94.3	94.3	94.3	94.3	83.8	60.2	60.2	60.2	60.2	60.2
60.2	60.2	60.2	32.5	23.6	23.6	23.6	23.6	23.6	23.6
23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6
23.6	23.6	23.6	23.6	23.6					

***

*** *** *** *** ***

HYDROGRAPH AT STATION N2
TRANSPOSITION AREA .0 SQ MI

TOTAL RAINFALL = 3.23, TOTAL LOSS = 1.82, TOTAL EXCESS = 1.41

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1790.	5.25	(CFS)	497.	126.	42.	18.
		(INCHES)	1.390	1.414	1.414	1.414
		(AC-FT)	246.	251.	251.	251.

CUMULATIVE AREA = 3.33 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N2
TRANSPOSITION AREA .5 SQ MI

TOTAL RAINFALL = 3.21, TOTAL LOSS = 1.81, TOTAL EXCESS = 1.40

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1772.	5.25	(CFS)	491.	125.	42.	18.
		(INCHES)	1.374	1.398	1.398	1.398
		(AC-FT)	244.	248.	248.	248.

CUMULATIVE AREA = 3.33 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N2
TRANSPOSITION AREA 1.0 SQ MI

TOTAL RAINFALL = 3.19, TOTAL LOSS = 1.92, TOTAL EXCESS = 1.27

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1538.	5.17	(CFS)	445.	113.	38.	16.
		(INCHES)	1.245	1.268	1.268	1.268
		(AC-FT)	221.	225.	225.	225.

CUMULATIVE AREA = 3.33 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N2
TRANSPOSITION AREA 5.0 SQ MI

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.13, TOTAL EXCESS = .97

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1076.	5.17	(CFS)	339.	87.	29.	12.
		(INCHES)	.948	.969	.969	.969
		(AC-FT)	168.	172.	172.	172.

CUMULATIVE AREA = 3.33 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N2
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.04, TOTAL LOSS = 2.19, TOTAL EXCESS = .85

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
933.	5.17	(CFS)	296.	76.	25.	11.
		(INCHES)	.828	.848	.848	.848
		(AC-FT)	147.	150.	150.	150.

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                    CUMULATIVE AREA =    3.33 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       N2
                  TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    2.94, TOTAL LOSS =    2.23, TOTAL EXCESS =     .71

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    773.       5.17        (CFS)     247.         63.         21.          9.
                         (INCHES)    .690        .708        .708         .708
                          (AC-FT)    122.        126.        126.         126.

                    CUMULATIVE AREA =    3.33 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       N2
                  TRANSPOSITION AREA     30.0 SQ MI

   TOTAL RAINFALL =    2.87, TOTAL LOSS =    2.25, TOTAL EXCESS =     .63

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    680.       5.17        (CFS)     217.         56.         19.          8.
                         (INCHES)    .608        .625        .625         .625
                          (AC-FT)    108.        111.        111.         111.

                    CUMULATIVE AREA =    3.33 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       N2
                  TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    2.81, TOTAL LOSS =    2.25, TOTAL EXCESS =     .56

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    604.       5.17        (CFS)     193.         50.         17.          7.
                         (INCHES)    .540        .557        .557         .557
                          (AC-FT)     96.         99.         99.          99.

                    CUMULATIVE AREA =    3.33 SQ MI

   ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       N2

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1193.       5.17        (CFS)     366.         93.         31.         13.
                         (INCHES)   1.023       1.045       1.045        1.045
                          (AC-FT)    181.        185.        185.         185.

                    CUMULATIVE AREA =    3.33 SQ MI


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          *            *
140 KK    *         N  *        CNAME      8R
          *            *
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141 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


142 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***
   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        N
                  TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1859.       5.25        (CFS)     740.        188.         63.         27.
                         (INCHES)   1.419       1.441       1.441        1.441
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		(AC-FT)	367.	373.	373.	373.

CUMULATIVE AREA = 4.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N
TRANSPOSITION AREA .5 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1839.	5.25	(CFS)	732.	186.	62.	27.
		(INCHES)	1.403	1.426	1.426	1.426
		(AC-FT)	363.	369.	369.	369.

CUMULATIVE AREA = 4.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1609.	6.00	(CFS)	665.	169.	56.	24.
		(INCHES)	1.275	1.297	1.297	1.297
		(AC-FT)	330.	335.	335.	335.

CUMULATIVE AREA = 4.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1193.	6.00	(CFS)	512.	131.	44.	19.
		(INCHES)	.982	1.002	1.002	1.002
		(AC-FT)	254.	259.	259.	259.

CUMULATIVE AREA = 4.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1032.	6.08	(CFS)	449.	115.	38.	17.
		(INCHES)	.862	.881	.881	.881
		(AC-FT)	223.	228.	228.	228.

CUMULATIVE AREA = 4.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
846.	6.08	(CFS)	378.	97.	32.	14.
		(INCHES)	.724	.743	.743	.743
		(AC-FT)	187.	192.	192.	192.

CUMULATIVE AREA = 4.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
740.	6.08	(CFS)	335.	86.	29.	12.
		(INCHES)	.642	.661	.661	.661
		(AC-FT)	166.	171.	171.	171.

CUMULATIVE AREA = 4.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION N
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
657.	6.08	(CFS)	300.	77.	26.	11.
		(INCHES)	.575	.593	.593	.593
		(AC-FT)	149.	153.	153.	153.

CUMULATIVE AREA = 4.85 SQ MI

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***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT        N

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1201.       6.00        (CFS)     515.        131.         44.          19.
                        (INCHES)    .987       1.007       1.007        1.007
                         (AC-FT)    255.        261.        261.         261.

                    CUMULATIVE AREA =    4.85 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
143 KK    *        8R  *        CNAME       N
          *            *
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144 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

145 RN          NO ROUTING
                                                                  ***

***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       8R
                    TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1859.       5.25        (CFS)     740.        188.         63.          27.
                        (INCHES)   1.419       1.441       1.441        1.441
                         (AC-FT)    367.        373.        373.         373.

                    CUMULATIVE AREA =    4.85 SQ MI

***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       8R
                    TRANSPOSITION AREA       .5 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1839.       5.25        (CFS)     732.        186.         62.          27.
                        (INCHES)   1.403       1.426       1.426        1.426
                         (AC-FT)    363.        369.        369.         369.

                    CUMULATIVE AREA =    4.85 SQ MI

***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       8R
                    TRANSPOSITION AREA      1.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1609.       6.00        (CFS)     665.        169.         56.          24.
                        (INCHES)   1.275       1.297       1.297        1.297
                         (AC-FT)    330.        335.        335.         335.

                    CUMULATIVE AREA =    4.85 SQ MI

***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       8R
                    TRANSPOSITION AREA      5.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1193.       6.00        (CFS)     512.        131.         44.          19.
                        (INCHES)    .982       1.002       1.002        1.002
                         (AC-FT)    254.        259.        259.         259.

                    CUMULATIVE AREA =    4.85 SQ MI

***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       8R
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                    TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  1032.       6.08       (CFS)     449.        115.         38.          17.
                       (INCHES)    .862        .881        .881         .881
                        (AC-FT)    223.        228.        228.         228.

                     CUMULATIVE AREA =    4.85 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       8R
                   TRANSPOSITION AREA     20.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
   846.       6.08       (CFS)     378.         97.         32.          14.
                       (INCHES)    .724        .743        .743         .743
                        (AC-FT)    187.        192.        192.         192.

                     CUMULATIVE AREA =    4.85 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       8R
                   TRANSPOSITION AREA     30.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
   740.       6.08       (CFS)     335.         86.         29.          12.
                       (INCHES)    .642        .661        .661         .661
                        (AC-FT)    166.        171.        171.         171.

                     CUMULATIVE AREA =    4.85 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION       8R
                   TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
   657.       6.08       (CFS)     300.         77.         26.          11.
                       (INCHES)    .575        .593        .593         .593
                        (AC-FT)    149.        153.        153.         153.

                     CUMULATIVE AREA =    4.85 SQ MI

   ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       8R

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  1201.       6.00       (CFS)     515.        131.         44.          19.
                       (INCHES)    .987       1.007       1.007        1.007
                        (AC-FT)    255.        261.        261.         261.

                     CUMULATIVE AREA =    4.85 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
146 KK    *     P1A    *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=2.28     Lca=1.41     S=461.40     Kn=0.055     LAG=37.8
                    S-GRAPH TYPE=PHX MNT

150 KO         OUTPUT CONTROL VARIABLES
                    IPRNT          3  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE
                    IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                     IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT       .083  TIME INTERVAL IN HOURS

          SUBBASIN RUNOFF DATA

151 BA         SUBBASIN CHARACTERISTICS
                    TAREA        .50  SUBBASIN AREA

152 LG         GREEN AND AMPT LOSS RATE
                    STRTL        .35  STARTING LOSS
                      DTH        .35  MOISTURE DEFICIT
                     PSIF       3.99  WETTING FRONT SUCTION
                    XKSAT        .41  HYDRAULIC CONDUCTIVITY
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                    RTIMP       16.36  PERCENT IMPERVIOUS AREA

151 UI          INPUT UNITGRAPH,  36 ORDINATES,  VOLUME = 1.00
                      .0      44.3      65.2     161.0     254.8     318.1     389.8     500.0     319.1     264.1
                    232.2     203.7     177.0     147.1     118.2     105.2      95.1      75.0      59.4      52.9
                     48.5      36.0      33.9      26.8      21.7      21.7      21.6       8.5       8.5       8.5
                      8.5       8.5       8.5       8.5       8.5       8.5

                                                                  ***

  ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.55, TOTAL EXCESS =    1.68

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   580.        4.42        (CFS)      90.         23.          8.           3.
                         (INCHES)   1.671       1.679       1.679       1.679
                          (AC-FT)    45.         45.         45.         45.

                     CUMULATIVE AREA =     .50 SQ MI

  ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA       .5 SQ MI

   TOTAL RAINFALL =    3.21, TOTAL LOSS =    1.55, TOTAL EXCESS =    1.66

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   575.        4.42        (CFS)      89.         22.          7.           3.
                         (INCHES)   1.655       1.663       1.663       1.663
                          (AC-FT)    44.         44.         44.         44.

                     CUMULATIVE AREA =     .50 SQ MI

  ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA      1.0 SQ MI

   TOTAL RAINFALL =    3.19, TOTAL LOSS =    1.64, TOTAL EXCESS =    1.55

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   494.        4.50        (CFS)      83.         21.          7.           3.
                         (INCHES)   1.539       1.548       1.548       1.548
                          (AC-FT)    41.         41.         41.         41.

                     CUMULATIVE AREA =     .50 SQ MI

  ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA      5.0 SQ MI

   TOTAL RAINFALL =    3.10, TOTAL LOSS =    1.82, TOTAL EXCESS =    1.28

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   344.        4.50        (CFS)      68.         17.          6.           2.
                         (INCHES)   1.269       1.279       1.279       1.279
                          (AC-FT)    34.         34.         34.         34.

                     CUMULATIVE AREA =     .50 SQ MI

  ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.04, TOTAL LOSS =    1.87, TOTAL EXCESS =    1.17

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   301.        4.50        (CFS)      62.         16.          5.           2.
                         (INCHES)   1.156       1.167       1.167       1.167
                          (AC-FT)    31.         31.         31.         31.

                     CUMULATIVE AREA =     .50 SQ MI

  ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    2.94, TOTAL LOSS =    1.90, TOTAL EXCESS =    1.03

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   256.        4.50        (CFS)      55.         14.          5.           2.
                         (INCHES)   1.022       1.033       1.033       1.033
                          (AC-FT)    27.         28.         28.         28.
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                    CUMULATIVE AREA =     .50 SQ MI

***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA     30.0 SQ MI

TOTAL RAINFALL =    2.87, TOTAL LOSS =    1.92, TOTAL EXCESS =     .95

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   230.       4.50       (CFS)       51.         13.          4.           2.
                       (INCHES)     .940        .952        .952         .952
                        (AC-FT)      25.         25.         25.          25.

                    CUMULATIVE AREA =     .50 SQ MI

***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      P1A
                  TRANSPOSITION AREA     40.0 SQ MI

TOTAL RAINFALL =    2.81, TOTAL LOSS =    1.93, TOTAL EXCESS =     .88

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   209.       4.50       (CFS)       47.         12.          4.           2.
                       (INCHES)     .871        .884        .884         .884
                        (AC-FT)      23.         24.         24.          24.

                    CUMULATIVE AREA =     .50 SQ MI

***             ***             ***             ***             ***


                    INTERPOLATED HYDROGRAPH AT      P1A

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   575.       4.42       (CFS)       89.         22.          7.           3.
                       (INCHES)    1.655       1.663       1.663        1.663
                        (AC-FT)      44.         44.         44.          44.

                    CUMULATIVE AREA =     .50 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
157 KK    *   P1A-1B   *        CNAME    P1BR
          *            *
          **************

158 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

159 RS          STORAGE ROUTING
                      NSTPS          18  NUMBER OF SUBREACHES
                       ITYP        FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

160 RC          NORMAL DEPTH CHANNEL
                        ANL        .050  LEFT OVERBANK N-VALUE
                       ANCH        .047  MAIN CHANNEL N-VALUE
                        ANR        .050  RIGHT OVERBANK N-VALUE
                      RLNTH      20103.  REACH LENGTH
                        SEL       .0111  ENERGY SLOPE
                      ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
162 RY        ELEVATION     17.00     13.00     11.50     10.00     10.00     11.50     13.00     17.00
    RX        DISTANCE        .00    280.00    350.00    358.00    367.00    381.00    451.00    730.00

                                                   ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00      1.99      4.90      8.72     13.47     21.26     34.88     54.35     79.67    111.90
          OUTFLOW        .00      6.43     23.30     51.90     94.00    166.88    281.35    453.02    695.38   1006.93
        ELEVATION      10.00     10.37     10.74     11.11     11.47     11.84     12.21     12.58     12.95     13.32

          STORAGE     152.85    202.56    261.02    328.24    404.21    488.94    582.42    684.65    795.64    915.38
```

OUTFLOW	1426.90	1975.09	2667.52	3519.50	4545.66	5760.03	7176.14	8807.04	10665.41	12763.55
ELEVATION	13.68	14.05	14.42	14.79	15.16	15.53	15.89	16.26	16.63	17.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 8807. TO 12764.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

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HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
382.	5.83	(CFS)	89.	23.	8.	3.
		(INCHES)	1.661	1.679	1.679	1.679
		(AC-FT)	44.	45.	45.	45.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
3.	5.83	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.43	5.83	11.04	10.27	10.09	10.04

CUMULATIVE AREA = .50 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA .5 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
379.	5.83	(CFS)	88.	22.	7.	3.
		(INCHES)	1.645	1.663	1.663	1.663
		(AC-FT)	44.	44.	44.	44.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
3.	5.83	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.42	5.83	11.03	10.27	10.09	10.04

CUMULATIVE AREA = .50 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
342.	5.92	(CFS)	82.	21.	7.	3.
		(INCHES)	1.529	1.548	1.548	1.548
		(AC-FT)	41.	41.	41.	41.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
2.	5.92	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.34	5.92	11.02	10.27	10.09	10.04

CUMULATIVE AREA = .50 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
260.	5.92	(CFS)	68.	17.	6.	2.
		(INCHES)	1.259	1.279	1.279	1.279
		(AC-FT)	34.	34.	34.	34.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
2.	5.92	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.14	5.92	10.97	10.26	10.09	10.04

CUMULATIVE AREA = .50 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

(CFS)	(HR)		6-HR	24-HR	72-HR	166.58-HR
230.	5.92	(CFS)	62.	16.	5.	2.
		(INCHES)	1.144	1.167	1.167	1.167
		(AC-FT)	31.	31.	31.	31.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
2.	5.92	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.05	5.92	10.94	10.25	10.08	10.04

CUMULATIVE AREA = .50 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
198.	5.92	(CFS)	54.	14.	5.	2.
		(INCHES)	1.009	1.033	1.033	1.033
		(AC-FT)	27.	28.	28.	28.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
1.	5.92	0.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
11.94	5.92	10.91	10.25	10.08	10.04

CUMULATIVE AREA = .50 SQ MI

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HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
179.	5.92	(CFS)	50.	13.	4.	2.
		(INCHES)	.927	.952	.952	.952
		(AC-FT)	25.	25.	25.	25.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
1.	5.92	0.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
11.88	5.92	10.89	10.24	10.08	10.03

CUMULATIVE AREA = .50 SQ MI

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HYDROGRAPH AT STATION P1A-1B
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
164.	5.83	(CFS)	46.	12.	4.	2.
		(INCHES)	.858	.884	.884	.884
		(AC-FT)	23.	24.	24.	24.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
1.	5.83	0.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
11.83	5.83	10.86	10.24	10.08	10.03

CUMULATIVE AREA = .50 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT P1A-1B

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
379.	5.83	(CFS)	88.	22.	7.	3.
		(INCHES)	1.645	1.663	1.663	1.663
		(AC-FT)	44.	44.	44.	44.

CUMULATIVE AREA = .50 SQ MI

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                *            *
163 KK          *      P1B   *
                *            *
                **************
                              THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                              L=4.39      Lca=2.32      S=70.84      Kn=0.055      LAG=85.3
                              S-GRAPH TYPE=PHX MNT

167 KO            OUTPUT CONTROL VARIABLES
                        IPRNT           3  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE
                        IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                         IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT        .083  TIME INTERVAL IN HOURS


              SUBBASIN RUNOFF DATA

168 BA            SUBBASIN CHARACTERISTICS
                        TAREA        1.94  SUBBASIN AREA

169 LG            GREEN AND AMPT LOSS RATE
                        STRTL         .35  STARTING LOSS
                          DTH         .35  MOISTURE DEFICIT
                         PSIF        4.23  WETTING FRONT SUCTION
                        XKSAT         .39  HYDRAULIC CONDUCTIVITY
                        RTIMP        4.67  PERCENT IMPERVIOUS AREA

168 UI            INPUT UNITGRAPH,  79 ORDINATES,  VOLUME = 1.00
                        .0      76.7      76.7      76.7      89.7     220.6     274.3     335.9     433.0     478.1
                    527.9     570.8     609.5     688.6     814.1     942.3     716.4     568.2     506.8     467.3
                    446.8     421.9     394.8     374.4     356.4     329.1     309.3     294.0     263.4     241.8
                    216.8     200.9     187.7     181.8     176.5     163.1     160.4     127.4     126.0     109.8
                     98.0      98.0      90.8      84.0      84.0      84.0      60.1      58.8      58.8      58.8
                     58.8      40.7      37.5      37.5      37.5      37.5      37.5      37.5      37.5      17.9
                     14.7      14.7      14.7      14.7      14.7      14.7      14.7      14.7      14.7      14.7
                     14.7      14.7      14.7      14.7      14.7      14.7      14.7      14.7      14.7
                                                                          ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      P1B
                    TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.77, TOTAL EXCESS =    1.46

K FLOW      TIME                          MAXIMUM AVERAGE FLOW
(CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
1122.       5.08        (CFS)      299.         76.         25.          11.
                      (INCHES)    1.435       1.458       1.458        1.458
                       (AC-FT)     148.        151.        151.         151.

                     CUMULATIVE AREA =    1.94 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      P1B
                    TRANSPOSITION AREA       .5 SQ MI

   TOTAL RAINFALL =    3.21, TOTAL LOSS =    1.77, TOTAL EXCESS =    1.44

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                   6-HR       24-HR       72-HR    166.58-HR
  1111.        5.08        (CFS)      296.         75.         25.          11.
                         (INCHES)    1.420       1.443       1.443        1.443
                          (AC-FT)     147.        149.        149.         149.

                     CUMULATIVE AREA =    1.94 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      P1B
                    TRANSPOSITION AREA      1.0 SQ MI

   TOTAL RAINFALL =    3.19, TOTAL LOSS =    1.87, TOTAL EXCESS =    1.32

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                   6-HR       24-HR       72-HR    166.58-HR
   969.        5.08        (CFS)      269.         68.         23.          10.
                         (INCHES)    1.292       1.314       1.314        1.314
                          (AC-FT)     133.        136.        136.         136.

                     CUMULATIVE AREA =    1.94 SQ MI


    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      P1B
                    TRANSPOSITION AREA      5.0 SQ MI

   TOTAL RAINFALL =    3.10, TOTAL LOSS =    2.08, TOTAL EXCESS =    1.02

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                   6-HR       24-HR       72-HR    166.58-HR
   684.        5.08        (CFS)      208.         53.         18.           8.
                         (INCHES)    1.000       1.021       1.021        1.021
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                    (AC-FT)      103.        106.        106.        106.

                    CUMULATIVE AREA =    1.94 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      P1B
                    TRANSPOSITION AREA     10.0 SQ MI

  TOTAL RAINFALL =    3.04, TOTAL LOSS =    2.13, TOTAL EXCESS =     .90

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   596.       5.08        (CFS)     183.         47.         16.          7.
                        (INCHES)    .880        .903        .903        .903
                         (AC-FT)     91.         93.         93.         93.

                    CUMULATIVE AREA =    1.94 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      P1B
                    TRANSPOSITION AREA     20.0 SQ MI

  TOTAL RAINFALL =    2.94, TOTAL LOSS =    2.17, TOTAL EXCESS =     .76

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   497.       5.08        (CFS)     155.         40.         13.          6.
                        (INCHES)    .742        .764        .764        .764
                         (AC-FT)     77.         79.         79.         79.

                    CUMULATIVE AREA =    1.94 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      P1B
                    TRANSPOSITION AREA     30.0 SQ MI

  TOTAL RAINFALL =    2.87, TOTAL LOSS =    2.19, TOTAL EXCESS =     .68

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   440.       5.08        (CFS)     137.         35.         12.          5.
                        (INCHES)    .659        .681        .681        .681
                         (AC-FT)     68.         70.         70.         70.

                    CUMULATIVE AREA =    1.94 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      P1B
                    TRANSPOSITION AREA     40.0 SQ MI

  TOTAL RAINFALL =    2.81, TOTAL LOSS =    2.20, TOTAL EXCESS =     .61

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   393.       5.08        (CFS)     123.         32.         11.          5.
                        (INCHES)    .590        .612        .612        .612
                         (AC-FT)     61.         63.         63.         63.

                    CUMULATIVE AREA =    1.94 SQ MI

    ***             ***             ***             ***             ***


                    INTERPOLATED HYDROGRAPH AT      P1B

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   852.       5.08        (CFS)     244.         62.         21.          9.
                        (INCHES)   1.172       1.194       1.194       1.194
                         (AC-FT)    121.        123.        123.        123.

                    CUMULATIVE AREA =    1.94 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
178 KK    *         P  *        CNAME     12R
          *            *
          **************

179 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
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                    TIMINT        .083  TIME INTERVAL IN HOURS

180 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

   ***            ***             ***             ***             ***

                      HYDROGRAPH AT STATION         P
                    TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1197.        5.17        (CFS)     388.         99.         33.          14.
                         (INCHES)   1.480       1.504       1.504        1.504
                          (AC-FT)   192.        195.        195.         195.

                      CUMULATIVE AREA =    2.44 SQ MI

   ***            ***             ***             ***             ***

                      HYDROGRAPH AT STATION         P
                    TRANSPOSITION AREA       .5 SQ MI

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1185.        5.17        (CFS)     384.         97.         32.          14.
                         (INCHES)   1.464       1.488       1.488        1.488
                          (AC-FT)   190.        193.        193.         193.

                      CUMULATIVE AREA =    2.44 SQ MI

   ***            ***             ***             ***             ***

                      HYDROGRAPH AT STATION         P
                    TRANSPOSITION AREA      1.0 SQ MI

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1038.        5.17        (CFS)     351.         89.         30.          13.
                         (INCHES)   1.339       1.362       1.362        1.362
                          (AC-FT)   174.        177.        177.         177.

                      CUMULATIVE AREA =    2.44 SQ MI

   ***            ***             ***             ***             ***

                      HYDROGRAPH AT STATION         P
                    TRANSPOSITION AREA      5.0 SQ MI

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   746.        5.25        (CFS)     275.         70.         23.          10.
                         (INCHES)   1.051       1.074       1.074        1.074
                          (AC-FT)   137.        140.        140.         140.

                      CUMULATIVE AREA =    2.44 SQ MI

   ***            ***             ***             ***             ***

                      HYDROGRAPH AT STATION         P
                    TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   653.        5.25        (CFS)     245.         63.         21.           9.
                         (INCHES)    .933        .957        .957         .957
                          (AC-FT)   121.        124.        124.         124.

                      CUMULATIVE AREA =    2.44 SQ MI

   ***            ***             ***             ***             ***

                      HYDROGRAPH AT STATION         P
                    TRANSPOSITION AREA     20.0 SQ MI

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   545.        5.25        (CFS)     208.         54.         18.           8.
                         (INCHES)    .795        .820        .820         .820
                          (AC-FT)   103.        107.        107.         107.

                      CUMULATIVE AREA =    2.44 SQ MI

   ***            ***             ***             ***             ***

                      HYDROGRAPH AT STATION         P
                    TRANSPOSITION AREA     30.0 SQ MI

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   482.        5.25        (CFS)     187.         48.         16.           7.
                         (INCHES)    .712        .737        .737         .737
                          (AC-FT)    93.         96.         96.          96.
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                    CUMULATIVE AREA =    2.44 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION        P
                    TRANSPOSITION AREA     40.0 SQ MI

 K FLOW     TIME                          MAXIMUM AVERAGE FLOW
 CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
  429.      5.25        (CFS)      169.         44.         15.          6.
                     (INCHES)      .644        .668        .668         .668
                      (AC-FT)       84.         87.         87.         87.

                    CUMULATIVE AREA =    2.44 SQ MI

    ***             ***             ***             ***             ***


                    INTERPOLATED HYDROGRAPH AT        P

 PEAK FLOW  TIME                          MAXIMUM AVERAGE FLOW
  (CFS)     (HR)                   6-HR       24-HR       72-HR    166.58-HR
   874.     5.17        (CFS)      309.         79.         26.         11.
                     (INCHES)     1.179       1.203       1.203       1.203
                      (AC-FT)      153.        156.        156.        156.

                    CUMULATIVE AREA =    2.44 SQ MI


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          *            *
181 KK    *      12R   *        CNAME       P
          *            *
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182 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       .083  TIME INTERVAL IN HOURS

            HYDROGRAPH ROUTING DATA

183 RN          NO ROUTING

                                                                ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      12R
                    TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW  TIME                          MAXIMUM AVERAGE FLOW
  (CFS)     (HR)                   6-HR       24-HR       72-HR    166.58-HR
  1197.     5.17        (CFS)      388.         99.         33.         14.
                     (INCHES)     1.480       1.504       1.504       1.504
                      (AC-FT)      192.        195.        195.        195.

                    CUMULATIVE AREA =    2.44 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      12R
                    TRANSPOSITION AREA       .5 SQ MI

 PEAK FLOW  TIME                          MAXIMUM AVERAGE FLOW
  (CFS)     (HR)                   6-HR       24-HR       72-HR    166.58-HR
  1185.     5.17        (CFS)      384.         97.         32.         14.
                     (INCHES)     1.464       1.488       1.488       1.488
                      (AC-FT)      190.        193.        193.        193.

                    CUMULATIVE AREA =    2.44 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      12R
                    TRANSPOSITION AREA      1.0 SQ MI

 AK FLOW    TIME                          MAXIMUM AVERAGE FLOW
 (CFS)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
  1038.     5.17        (CFS)      351.         89.         30.         13.
                     (INCHES)     1.339       1.362       1.362       1.362
                      (AC-FT)      174.        177.        177.        177.

                    CUMULATIVE AREA =    2.44 SQ MI
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***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      12R
                  TRANSPOSITION AREA      5.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   746.       5.25        (CFS)     275.         70.         23.          10.
                        (INCHES)   1.051       1.074       1.074        1.074
                         (AC-FT)    137.        140.        140.         140.

                      CUMULATIVE AREA =    2.44 SQ MI

***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      12R
                  TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   653.       5.25        (CFS)     245.         63.         21.           9.
                        (INCHES)    .933        .957        .957         .957
                         (AC-FT)    121.        124.        124.         124.

                      CUMULATIVE AREA =    2.44 SQ MI

***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      12R
                  TRANSPOSITION AREA     20.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   545.       5.25        (CFS)     208.         54.         18.           8.
                        (INCHES)    .795        .820        .820         .820
                         (AC-FT)    103.        107.        107.         107.

                      CUMULATIVE AREA =    2.44 SQ MI

***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      12R
                  TRANSPOSITION AREA     30.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   482.       5.25        (CFS)     187.         48.         16.           7.
                        (INCHES)    .712        .737        .737         .737
                         (AC-FT)     93.         96.         96.          96.

                      CUMULATIVE AREA =    2.44 SQ MI

***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      12R
                  TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   429.       5.25        (CFS)     169.         44.         15.           6.
                        (INCHES)    .644        .668        .668         .668
                         (AC-FT)     84.         87.         87.          87.

                      CUMULATIVE AREA =    2.44 SQ MI

***             ***             ***             ***             ***


                    INTERPOLATED HYDROGRAPH AT      12R

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   874.       5.17        (CFS)     309.         79.         26.          11.
                        (INCHES)   1.179       1.203       1.203        1.203
                         (AC-FT)    153.        156.        156.         156.

                      CUMULATIVE AREA =    2.44 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
KK        *        01  *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=5.20     Lca=2.79     S=64.07     Kn=0.055     LAG=99.9
                    S-GRAPH TYPE=PHX MNT

188 KO          OUTPUT CONTROL VARIABLES
                  IPRNT           3  PRINT CONTROL
                  IPLOT           0  PLOT CONTROL
                  QSCAL          0.  HYDROGRAPH PLOT SCALE
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                IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                 IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
               TIMINT       .083  TIME INTERVAL IN HOURS


          SUBBASIN RUNOFF DATA

 9 BA        SUBBASIN CHARACTERISTICS
                TAREA        3.09  SUBBASIN AREA

190 LG       GREEN AND AMPT LOSS RATE
                STRTL         .35  STARTING LOSS
                  DTH         .35  MOISTURE DEFICIT
                 PSIF        4.19  WETTING FRONT SUCTION
                XKSAT         .39  HYDRAULIC CONDUCTIVITY
                RTIMP        2.10  PERCENT IMPERVIOUS AREA

189 UI       INPUT UNITGRAPH,  93 ORDINATES,  VOLUME = 1.00
                  .0     104.0     104.0     104.0     104.0     182.0     299.0     378.7     446.4     550.1
            624.5     676.8     731.5     781.3     824.5     905.4    1042.0    1204.8    1242.7     887.0
            765.3     690.9     643.3     614.9     590.5     558.5     530.8     506.5     485.1     454.9
            429.4     410.3     388.6     357.0     326.6     302.9     274.9     261.0     254.4     242.2
            239.2     221.8     217.4     189.5     170.8     170.8     140.5     132.9     132.9     129.1
            113.9     113.9     113.9     113.9      79.7      79.7      79.7      79.7      79.7      79.7
             50.9      50.9      50.9      50.9      50.9      50.9      50.9      50.9      50.9      32.3
             19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9
             19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9      19.9
             19.9      19.9      19.9

                                                   ***

   ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION       O1
                TRANSPOSITION AREA       .0 SQ MI

  TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.81, TOTAL EXCESS =    1.42

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  1565.       5.33       (CFS)     460.        118.         39.          17.
                       (INCHES)   1.385       1.415       1.415       1.415
                        (AC-FT)    228.        233.        233.        233.

                     CUMULATIVE AREA =    3.09 SQ MI


   ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION       O1
                TRANSPOSITION AREA       .5 SQ MI

  TOTAL RAINFALL =    3.21, TOTAL LOSS =    1.81, TOTAL EXCESS =    1.40

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  1549.       5.33       (CFS)     455.        116.         39.          17.
                       (INCHES)   1.369       1.399       1.399       1.399
                        (AC-FT)    226.        230.        230.        230.

                     CUMULATIVE AREA =    3.09 SQ MI


   ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION       O1
                TRANSPOSITION AREA      1.0 SQ MI

  TOTAL RAINFALL =    3.19, TOTAL LOSS =    1.92, TOTAL EXCESS =    1.27

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
  1343.       5.33       (CFS)     412.        105.         35.          15.
                       (INCHES)   1.240       1.268       1.268       1.268
                        (AC-FT)    204.        209.        209.        209.

                     CUMULATIVE AREA =    3.09 SQ MI


   ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION       O1
                TRANSPOSITION AREA      5.0 SQ MI

  TOTAL RAINFALL =    3.10, TOTAL LOSS =    2.13, TOTAL EXCESS =     .97

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
   934.       5.33       (CFS)     314.         81.         27.          12.
                       (INCHES)    .945        .970        .970        .970
                        (AC-FT)    156.        160.        160.        160.

                     CUMULATIVE AREA =    3.09 SQ MI


   ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION       O1
                TRANSPOSITION AREA     10.0 SQ MI
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   TOTAL RAINFALL =    3.04, TOTAL LOSS =    2.19, TOTAL EXCESS =     .85

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   812.       5.33       (CFS)      275.         71.         24.          10.
                      (INCHES)      .827        .850        .850         .850
                       (AC-FT)      136.        140.        140.         140.

                      CUMULATIVE AREA =    3.09 SQ MI

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       01
                    TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    2.94, TOTAL LOSS =    2.23, TOTAL EXCESS =     .71

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   675.       5.33       (CFS)      229.         59.         20.           8.
                      (INCHES)      .690        .710        .710         .710
                       (AC-FT)      114.        117.        117.         117.

                      CUMULATIVE AREA =    3.09 SQ MI

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       01
                    TRANSPOSITION AREA     30.0 SQ MI

   TOTAL RAINFALL =    2.87, TOTAL LOSS =    2.25, TOTAL EXCESS =     .63

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   594.       5.33       (CFS)      202.         52.         17.           7.
                      (INCHES)      .607        .626        .626         .626
                       (AC-FT)      100.        103.        103.         103.

                      CUMULATIVE AREA =    3.09 SQ MI

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION       01
                    TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    2.81, TOTAL LOSS =    2.25, TOTAL EXCESS =     .56

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   528.       5.33       (CFS)      179.         46.         15.           7.
                      (INCHES)      .539        .557        .557         .557
                       (AC-FT)       89.         92.         92.          92.

                      CUMULATIVE AREA =    3.09 SQ MI

   ***            ***            ***            ***            ***


                      INTERPOLATED HYDROGRAPH AT       01

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1057.       5.33       (CFS)      343.         88.         29.          13.
                      (INCHES)     1.033       1.059       1.059        1.059
                       (AC-FT)      170.        174.        174.         174.

                      CUMULATIVE AREA =    3.09 SQ MI


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          *            *
201 KK    *        7R  *        CNAME       O
          *            *
          **************

202 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS

              HYDROGRAPH ROUTING DATA

203 RN          NO ROUTING

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HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1565.	5.33	(CFS)	460.	118.	39.	17.
		(INCHES)	1.385	1.415	1.415	1.415
		(AC-FT)	228.	233.	233.	233.

CUMULATIVE AREA = 3.09 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA .5 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1549.	5.33	(CFS)	455.	116.	39.	17.
		(INCHES)	1.369	1.399	1.399	1.399
		(AC-FT)	226.	230.	230.	230.

CUMULATIVE AREA = 3.09 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1343.	5.33	(CFS)	412.	105.	35.	15.
		(INCHES)	1.240	1.268	1.268	1.268
		(AC-FT)	204.	209.	209.	209.

CUMULATIVE AREA = 3.09 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
934.	5.33	(CFS)	314.	81.	27.	12.
		(INCHES)	.945	.970	.970	.970
		(AC-FT)	156.	160.	160.	160.

CUMULATIVE AREA = 3.09 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
812.	5.33	(CFS)	275.	71.	24.	10.
		(INCHES)	.827	.850	.850	.850
		(AC-FT)	136.	140.	140.	140.

CUMULATIVE AREA = 3.09 SQ MI

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HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
675.	5.33	(CFS)	229.	59.	20.	8.
		(INCHES)	.690	.710	.710	.710
		(AC-FT)	114.	117.	117.	117.

CUMULATIVE AREA = 3.09 SQ MI

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HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
594.	5.33	(CFS)	202.	52.	17.	7.
		(INCHES)	.607	.626	.626	.626
		(AC-FT)	100.	103.	103.	103.

CUMULATIVE AREA = 3.09 SQ MI

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HYDROGRAPH AT STATION 7R
TRANSPOSITION AREA 40.0 SQ MI

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PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
   528.       5.33        (CFS)     179.         46.         15.           7.
                        (INCHES)    .539        .557        .557         .557
                         (AC-FT)     89.         92.         92.          92.

                       CUMULATIVE AREA =    3.09 SQ MI

  ***            ***            ***            ***            ***


                       INTERPOLATED HYDROGRAPH AT       7R

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
  1057.       5.33        (CFS)     343.         88.         29.          13.
                        (INCHES)   1.033       1.059       1.059        1.059
                         (AC-FT)    170.        174.        174.         174.

                       CUMULATIVE AREA =    3.09 SQ MI


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          *            *
204 KK    *     Q1A    *
          *            *
          **************
                       THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                       L=3.13     Lca=1.52     S=256.86     Kn=0.055     LAG=49.3
                       S-GRAPH TYPE=PHX MNT

208 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

BA              SUBBASIN CHARACTERISTICS
                      TAREA       1.30  SUBBASIN AREA

210 LG          GREEN AND AMPT LOSS RATE
                      STRTL        .35  STARTING LOSS
                        DTH        .35  MOISTURE DEFICIT
                       PSIF       4.13  WETTING FRONT SUCTION
                      XKSAT        .40  HYDRAULIC CONDUCTIVITY
                      RTIMP      11.20  PERCENT IMPERVIOUS AREA

209 UI          INPUT UNITGRAPH,  46 ORDINATES,  VOLUME = 1.00
                        .0      89.1      89.1     213.8     363.9     517.4     613.9     697.5     873.6    1021.0
                     663.2     556.5     506.6     454.8     413.3     367.5     326.0     281.0     232.0     214.4
                     199.4     177.4     146.4     118.7     112.4      97.6      96.7      68.3      68.3      66.1
                      43.6      43.6      43.6      43.6      30.8      17.1      17.1      17.1      17.1      17.1
                      17.1      17.1      17.1      17.1      17.1      17.1
                                                                  ***

  ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION      Q1A
                     TRANSPOSITION AREA       .0 SQ MI

  TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.65, TOTAL EXCESS =    1.58

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
  1217.       4.58        (CFS)     219.         55.         18.           8.
                        (INCHES)   1.568       1.579       1.579        1.579
                         (AC-FT)    108.        109.        109.         109.

                       CUMULATIVE AREA =    1.30 SQ MI

  ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION      Q1A
                     TRANSPOSITION AREA       .5 SQ MI

  TOTAL RAINFALL =    3.21, TOTAL LOSS =    1.65, TOTAL EXCESS =    1.56

AK FLOW       TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
  1206.       4.58        (CFS)     217.         55.         18.           8.
                        (INCHES)   1.552       1.563       1.563        1.563
                         (AC-FT)    107.        108.        108.         108.

                       CUMULATIVE AREA =    1.30 SQ MI

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HYDROGRAPH AT STATION Q1A
TRANSPOSITION AREA 1.0 SQ MI

TOTAL RAINFALL = 3.19, TOTAL LOSS = 1.75, TOTAL EXCESS = 1.44

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1042.	4.58	(CFS)	200.	50.	17.	7.
		(INCHES)	1.431	1.442	1.442	1.442
		(AC-FT)	99.	100.	100.	100.

CUMULATIVE AREA = 1.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1A
TRANSPOSITION AREA 5.0 SQ MI

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.94, TOTAL EXCESS = 1.16

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
724.	4.67	(CFS)	160.	41.	14.	6.
		(INCHES)	1.149	1.162	1.162	1.162
		(AC-FT)	79.	80.	80.	80.

CUMULATIVE AREA = 1.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1A
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.04, TOTAL LOSS = 1.99, TOTAL EXCESS = 1.05

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
633.	4.67	(CFS)	144.	37.	12.	5.
		(INCHES)	1.033	1.047	1.047	1.047
		(AC-FT)	71.	72.	72.	72.

CUMULATIVE AREA = 1.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1A
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 2.94, TOTAL LOSS = 2.03, TOTAL EXCESS = .91

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
534.	4.67	(CFS)	125.	32.	11.	5.
		(INCHES)	.896	.911	.911	.911
		(AC-FT)	62.	63.	63.	63.

CUMULATIVE AREA = 1.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1A
TRANSPOSITION AREA 30.0 SQ MI

TOTAL RAINFALL = 2.87, TOTAL LOSS = 2.05, TOTAL EXCESS = .83

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
478.	4.67	(CFS)	114.	29.	10.	4.
		(INCHES)	.814	.829	.829	.829
		(AC-FT)	56.	57.	57.	57.

CUMULATIVE AREA = 1.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1A
TRANSPOSITION AREA 40.0 SQ MI

TOTAL RAINFALL = 2.81, TOTAL LOSS = 2.05, TOTAL EXCESS = .76

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
432.	4.67	(CFS)	104.	27.	9.	4.
		(INCHES)	.745	.761	.761	.761
		(AC-FT)	52.	53.	53.	53.

CUMULATIVE AREA = 1.30 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT Q1A

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR

```
990.      4.58       (CFS)      193.        49.        16.         7.
                  (INCHES)     1.385      1.396      1.396      1.396
                   (AC-FT)      96.        97.        97.        97.

                 CUMULATIVE AREA =    1.30 SQ MI


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          *            *
216 KK    *   Q1A-1B   *        CNAME    Q1BR
          *            *
          **************

217 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

218 RS          STORAGE ROUTING
                     NSTPS           8  NUMBER OF SUBREACHES
                      ITYP        FLOW  TYPE OF INITIAL CONDITION
                    RSVRIC         .00  INITIAL CONDITION
                         X         .00 WORKING R AND D COEFFICIENT

219 RC          NORMAL DEPTH CHANNEL
                       ANL        .050  LEFT OVERBANK N-VALUE
                      ANCH        .047  MAIN CHANNEL N-VALUE
                       ANR        .050  RIGHT OVERBANK N-VALUE
                     RLNTH       9171.  REACH LENGTH
                       SEL       .0117  ENERGY SLOPE
                     ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                         --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
221 RY       ELEVATION     17.00     13.00     11.50     10.00     10.00     11.50     13.00     17.00
220 RX       DISTANCE        .00    280.00    350.00    358.00    367.00    381.00    451.00    730.00

                                                  ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00       .91      2.23      3.98      6.15      9.70     15.91     24.79     36.34     51.05
          OUTFLOW        .00      6.60     23.92     53.28     96.51    171.33    288.85    465.10    713.93   1033.79
        ELEVATION      10.00     10.37     10.74     11.11     11.47     11.84     12.21     12.58     12.95     13.32

          STORAGE      69.73     92.40    119.07    149.74    184.39    223.04    265.69    312.32    362.95    417.58
          OUTFLOW    1464.96   2027.77   2738.67   3613.37   4666.90   5913.66   7367.54   9041.94  10949.87  13103.98
        ELEVATION      13.68     14.05     14.42     14.79     15.16     15.53     15.89     16.26     16.63     17.00


*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN     9042. TO    13104.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION   Q1A-1B
                     TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                   6-HR       24-HR       72-HR    166.58-HR
   1004.        5.17        (CFS)      218.        55.         18.          8.
                         (INCHES)     1.566      1.579       1.579       1.579
                          (AC-FT)      108.       109.        109.        109.

PEAK STORAGE    TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
      6.        5.17                     1.         0.          0.          0.

 PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
   (FEET)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   13.28        5.17                  11.45      10.39       10.13       10.06

                       CUMULATIVE AREA =    1.30 SQ MI

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION   Q1A-1B
                     TRANSPOSITION AREA       .5 SQ MI

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                   6-HR       24-HR       72-HR    166.58-HR
    994.        5.17        (CFS)      216.        55.         18.          8.
                         (INCHES)     1.550      1.563       1.563       1.563
                          (AC-FT)      107.       108.        108.        108.

PEAK STORAGE    TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
```

6.	5.17	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.27	5.17	11.45	10.39	10.13	10.06

CUMULATIVE AREA = 1.30 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Q1A-1B
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
881.	5.17	(CFS)	199.	50.	17.	7.
		(INCHES)	1.428	1.442	1.442	1.442
		(AC-FT)	99.	100.	100.	100.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
6.	5.17	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.14	5.17	11.42	10.38	10.13	10.05

CUMULATIVE AREA = 1.30 SQ MI

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HYDROGRAPH AT STATION Q1A-1B
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
645.	5.17	(CFS)	160.	41.	14.	6.
		(INCHES)	1.147	1.162	1.162	1.162
		(AC-FT)	79.	80.	80.	80.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	5.17	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.84	5.17	11.35	10.36	10.12	10.05

CUMULATIVE AREA = 1.30 SQ MI

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HYDROGRAPH AT STATION Q1A-1B
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
564.	5.25	(CFS)	144.	37.	12.	5.
		(INCHES)	1.031	1.047	1.047	1.047
		(AC-FT)	71.	72.	72.	72.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	5.25	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.73	5.25	11.31	10.36	10.12	10.05

CUMULATIVE AREA = 1.30 SQ MI

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HYDROGRAPH AT STATION Q1A-1B
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
474.	5.25	(CFS)	125.	32.	11.	5.
		(INCHES)	.894	.911	.911	.911
		(AC-FT)	62.	63.	63.	63.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
3.	5.25	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.59	5.25	11.27	10.35	10.12	10.05

CUMULATIVE AREA = 1.30 SQ MI

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HYDROGRAPH AT STATION Q1A-1B
TRANSPOSITION AREA 30.0 SQ MI

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 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
    423.       5.25        (CFS)     113.         29.         10.           4.
                         (INCHES)    .812        .829        .829         .829
                          (AC-FT)     56.         57.         57.          57.

 PEAK STORAGE  TIME                        MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR     166.58-HR
      3.       5.25                    1.          0.          0.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
  (FEET)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
   12.49       5.25                 11.23       10.34       10.11        10.05

                        CUMULATIVE AREA =    1.30 SQ MI


    ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION   Q1A-1B
                    TRANSPOSITION AREA     40.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
    382.       5.25        (CFS)     104.         27.          9.           4.
                         (INCHES)    .743        .761        .761         .761
                          (AC-FT)     51.         53.         53.          53.

 PEAK STORAGE  TIME                        MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR     166.58-HR
      3.       5.25                    1.          0.          0.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
  (FEET)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
   12.40       5.25                 11.20       10.33       10.11        10.05

                        CUMULATIVE AREA =    1.30 SQ MI

    ***            ***            ***            ***            ***


                      INTERPOLATED HYDROGRAPH AT   Q1A-1B

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
    843.       5.17        (CFS)     193.         49.         16.           7.
                         (INCHES)   1.383       1.396       1.396        1.396
                          (AC-FT)     96.         97.         97.          97.

                        CUMULATIVE AREA =    1.30 SQ MI


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            *            *
222 KK      *     Q1B    *
            *            *
            **************
                      THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                      L=2.35     Lca=1.14     S=141.40     Kn=0.055     LAG=44.3
                      S-GRAPH TYPE=PHX MNT

226 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

227 BA          SUBBASIN CHARACTERISTICS
                      TAREA        .94  SUBBASIN AREA

228 LG          GREEN AND AMPT LOSS RATE
                      STRTL        .35  STARTING LOSS
                        DTH        .35  MOISTURE DEFICIT
                       PSIF       4.32  WETTING FRONT SUCTION
                      XKSAT        .37  HYDRAULIC CONDUCTIVITY
                      RTIMP      14.81  PERCENT IMPERVIOUS AREA

227 UI          INPUT UNITGRAPH,  41 ORDINATES,  VOLUME = 1.00
                        .0      71.7      71.7     221.5     340.7     455.8     538.5     652.0     833.6     538.2
                     443.7     398.9     355.8     316.3     280.5     235.9     196.4     173.4     160.2     138.8
                     114.8      91.6      84.7      78.5      62.5      55.0      54.2      35.1      35.1      35.1
                      35.1      15.8      13.7      13.7      13.7      13.7      13.7      13.7      13.7      13.7
                      13.7

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    ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      Q1B
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                    TRANSPOSITION AREA        .0 SQ MI

   TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.56, TOTAL EXCESS =    1.67

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   980.       4.50        (CFS)     167.         42.         14.          6.
                        (INCHES)   1.656       1.666       1.666       1.666
                         (AC-FT)    83.         83.         83.         83.

                    CUMULATIVE AREA =     .94 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      Q1B
                    TRANSPOSITION AREA        .5 SQ MI

   TOTAL RAINFALL =    3.21, TOTAL LOSS =    1.56, TOTAL EXCESS =    1.65

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   971.       4.50        (CFS)     165.         42.         14.          6.
                        (INCHES)   1.640       1.650       1.650       1.650
                         (AC-FT)    82.         82.         82.         82.

                    CUMULATIVE AREA =     .94 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      Q1B
                    TRANSPOSITION AREA      1.0 SQ MI

   TOTAL RAINFALL =    3.19, TOTAL LOSS =    1.65, TOTAL EXCESS =    1.54

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   839.       4.50        (CFS)     153.         39.         13.          6.
                        (INCHES)   1.522       1.533       1.533       1.533
                         (AC-FT)    76.         77.         77.         77.

                    CUMULATIVE AREA =     .94 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      Q1B
                    TRANSPOSITION AREA      5.0 SQ MI

   TOTAL RAINFALL =    3.10, TOTAL LOSS =    1.83, TOTAL EXCESS =    1.27

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   592.       4.58        (CFS)     126.         32.         11.          5.
                        (INCHES)   1.254       1.266       1.266       1.266
                         (AC-FT)    63.         63.         63.         63.

                    CUMULATIVE AREA =     .94 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      Q1B
                    TRANSPOSITION AREA     10.0 SQ MI

   TOTAL RAINFALL =    3.04, TOTAL LOSS =    1.88, TOTAL EXCESS =    1.16

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   521.       4.58        (CFS)     115.         29.         10.          4.
                        (INCHES)   1.141       1.154       1.154       1.154
                         (AC-FT)    57.         58.         58.         58.

                    CUMULATIVE AREA =     .94 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      Q1B
                    TRANSPOSITION AREA     20.0 SQ MI

   TOTAL RAINFALL =    2.94, TOTAL LOSS =    1.92, TOTAL EXCESS =    1.02

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   443.       4.58        (CFS)     101.         26.          9.          4.
                        (INCHES)   1.006       1.021       1.021       1.021
                         (AC-FT)    50.         51.         51.         51.

                    CUMULATIVE AREA =     .94 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION      Q1B
                    TRANSPOSITION AREA     30.0 SQ MI

   TOTAL RAINFALL =    2.87, TOTAL LOSS =    1.93, TOTAL EXCESS =     .94

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
```

```
    399.      4.58        (CFS)        93.         24.          8.           3.
                        (INCHES)      .924        .939        .939         .939
                         (AC-FT)       46.         47.         47.          47.

                       CUMULATIVE AREA =     .94 SQ MI


     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      Q1B
                     TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    2.81, TOTAL LOSS =    1.94, TOTAL EXCESS =     .87

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
    363.       4.58        (CFS)       86.         22.          7.           3.
                        (INCHES)      .853        .868        .868         .868
                         (AC-FT)       43.         43.         43.          43.

                       CUMULATIVE AREA =     .94 SQ MI

     ***             ***             ***             ***             ***


                       INTERPOLATED HYDROGRAPH AT      Q1B

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
    851.       4.50        (CFS)      155.         39.         13.           6.
                        (INCHES)     1.533       1.544       1.544        1.544
                         (AC-FT)       77.         77.         77.          77.

                       CUMULATIVE AREA =     .94 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 234 KK     *          Q *        CNAME     14R
            *            *
            **************

 235 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


 236 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        Q
                     TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   1409.       5.08        (CFS)      383.         97.         32.          14.
                        (INCHES)     1.596       1.615       1.615        1.615
                         (AC-FT)      190.        192.        192.         192.

                       CUMULATIVE AREA =    2.23 SQ MI


     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        Q
                     TRANSPOSITION AREA       .5 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   1395.       5.08        (CFS)      380.         96.         32.          14.
                        (INCHES)     1.580       1.599       1.599        1.599
                         (AC-FT)      188.        191.        191.         191.

                       CUMULATIVE AREA =    2.23 SQ MI

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION        Q
                     TRANSPOSITION AREA      1.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   1255.       5.08        (CFS)      351.         89.         30.          13.
                        (INCHES)     1.461       1.480       1.480        1.480
                         (AC-FT)      174.        176.        176.         176.
```

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                    CUMULATIVE AREA =    2.23 SQ MI

  ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        Q
                  TRANSPOSITION AREA      5.0 SQ MI

K FLOW     TIME                          MAXIMUM AVERAGE FLOW
(CFS)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
 955.      5.08        (CFS)    285.         72.         24.         10.
                    (INCHES)   1.185        1.206       1.206       1.206
                     (AC-FT)    141.        144.        144.        144.

                    CUMULATIVE AREA =    2.23 SQ MI

  ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        Q
                  TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW  TIME                          MAXIMUM AVERAGE FLOW
 (CFS)     (HR)                 6-HR       24-HR       72-HR    166.58-HR
 843.      5.08        (CFS)    257.         66.         22.          9.
                    (INCHES)   1.069        1.092       1.092       1.092
                     (AC-FT)    127.        130.        130.        130.

                    CUMULATIVE AREA =    2.23 SQ MI

  ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        Q
                  TRANSPOSITION AREA     20.0 SQ MI

PEAK FLOW  TIME                          MAXIMUM AVERAGE FLOW
 (CFS)     (HR)                 6-HR       24-HR       72-HR    166.58-HR
 709.      5.08        (CFS)    224.         57.         19.          8.
                    (INCHES)    .933        .957        .957        .957
                     (AC-FT)    111.        114.        114.        114.

                    CUMULATIVE AREA =    2.23 SQ MI

  ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        Q
                  TRANSPOSITION AREA     30.0 SQ MI

K FLOW     TIME                          MAXIMUM AVERAGE FLOW
(CFS)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
 633.      5.08        (CFS)    205.         53.         18.          8.
                    (INCHES)    .851        .875        .875        .875
                     (AC-FT)    101.        104.        104.        104.

                    CUMULATIVE AREA =    2.23 SQ MI

  ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        Q
                  TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW  TIME                          MAXIMUM AVERAGE FLOW
 (CFS)     (HR)                 6-HR       24-HR       72-HR    166.58-HR
 571.      5.08        (CFS)    188.         48.         16.          7.
                    (INCHES)    .782        .806        .806        .806
                     (AC-FT)     93.         96.         96.         96.

                    CUMULATIVE AREA =    2.23 SQ MI

  ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT        Q

PEAK FLOW  TIME                          MAXIMUM AVERAGE FLOW
 (CFS)     (HR)                 6-HR       24-HR       72-HR    166.58-HR
 1105.     5.08        (CFS)    318.         81.         27.         12.
                    (INCHES)   1.323        1.343       1.343       1.343
                     (AC-FT)    158.        160.        160.        160.

                    CUMULATIVE AREA =    2.23 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
237 KK    *       14R  *        CNAME       Q
          *            *
          **************

238 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
```

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QSCAL        0.  HYDROGRAPH PLOT SCALE
IPNCH        0   PUNCH COMPUTED HYDROGRAPH
IOUT        22   SAVE HYDROGRAPH ON THIS UNIT
ISAV1        1   FIRST ORDINATE PUNCHED OR SAVED
ISAV2     2000   LAST ORDINATE PUNCHED OR SAVED
TIMINT    .083   TIME INTERVAL IN HOURS


HYDROGRAPH ROUTING DATA

RN          NO ROUTING

                                                                  ***

***            ***            ***            ***            ***

                HYDROGRAPH AT STATION      14R
              TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR      24-HR      72-HR    166.58-HR
  1409.       5.08       (CFS)     383.        97.        32.          14.
                       (INCHES)   1.596      1.615      1.615       1.615
                        (AC-FT)   190.       192.       192.        192.

                 CUMULATIVE AREA =    2.23 SQ MI

***            ***            ***            ***            ***

                HYDROGRAPH AT STATION      14R
              TRANSPOSITION AREA       .5 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR      24-HR      72-HR    166.58-HR
  1395.       5.08       (CFS)     380.        96.        32.          14.
                       (INCHES)   1.580      1.599      1.599       1.599
                        (AC-FT)   188.       191.       191.        191.

                 CUMULATIVE AREA =    2.23 SQ MI

***            ***            ***            ***            ***

                HYDROGRAPH AT STATION      14R
              TRANSPOSITION AREA      1.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR      24-HR      72-HR    166.58-HR
  1255.       5.08       (CFS)     351.        89.        30.          13.
                       (INCHES)   1.461      1.480      1.480       1.480
                        (AC-FT)   174.       176.       176.        176.

                 CUMULATIVE AREA =    2.23 SQ MI

***            ***            ***            ***            ***

                HYDROGRAPH AT STATION      14R
              TRANSPOSITION AREA      5.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR      24-HR      72-HR    166.58-HR
   955.       5.08       (CFS)     285.        72.        24.          10.
                       (INCHES)   1.185      1.206      1.206       1.206
                        (AC-FT)   141.       144.       144.        144.

                 CUMULATIVE AREA =    2.23 SQ MI

***            ***            ***            ***            ***

                HYDROGRAPH AT STATION      14R
              TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR      24-HR      72-HR    166.58-HR
   843.       5.08       (CFS)     257.        66.        22.           9.
                       (INCHES)   1.069      1.092      1.092       1.092
                        (AC-FT)   127.       130.       130.        130.

                 CUMULATIVE AREA =    2.23 SQ MI

***            ***            ***            ***            ***

                HYDROGRAPH AT STATION      14R
              TRANSPOSITION AREA     20.0 SQ MI

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR      24-HR      72-HR    166.58-HR
   709.       5.08       (CFS)     224.        57.        19.           8.
                       (INCHES)    .933       .957       .957        .957
                        (AC-FT)   111.       114.       114.        114.

                 CUMULATIVE AREA =    2.23 SQ MI

***            ***            ***            ***            ***

                HYDROGRAPH AT STATION      14R
              TRANSPOSITION AREA     30.0 SQ MI
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PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   633.       5.08        (CFS)     205.         53.         18.           8.
                        (INCHES)    .851        .875        .875         .875
                         (AC-FT)    101.        104.        104.         104.

                       CUMULATIVE AREA =    2.23 SQ MI

  ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION      14R
                   TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   571.       5.08        (CFS)     188.         48.         16.           7.
                        (INCHES)    .782        .806        .806         .806
                         (AC-FT)     93.         96.         96.          96.

                       CUMULATIVE AREA =    2.23 SQ MI

  ***             ***             ***             ***             ***


                       INTERPOLATED HYDROGRAPH AT      14R

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1105.       5.08        (CFS)     318.         81.         27.          12.
                        (INCHES)   1.323       1.343       1.343        1.343
                         (AC-FT)    158.        160.        160.         160.

                       CUMULATIVE AREA =    2.23 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
240 KK    *        L1  *
          *            *
          **************
                     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                     L=4.93     Lca=2.29     S=308.27     Kn=0.050     LAG=60.6
                     S-GRAPH TYPE=PHX MNT

244 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

245 BA          SUBBASIN CHARACTERISTICS
                      TAREA        3.55  SUBBASIN AREA

246 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .27  STARTING LOSS
                        DTH         .32  MOISTURE DEFICIT
                       PSIF        4.36  WETTING FRONT SUCTION
                      XKSAT         .35  HYDRAULIC CONDUCTIVITY
                      RTIMP       16.28  PERCENT IMPERVIOUS AREA

245 UI          INPUT UNITGRAPH,  57 ORDINATES,  VOLUME = 1.00
                        .0     195.7     195.7     266.9     603.6     823.3    1120.6    1287.1    1452.3    1611.1
                     1991.3    2326.8    1575.1    1312.3    1173.4    1097.4    1002.3     929.5     850.5     775.7
                      701.2     620.5     526.0     484.9     458.9     430.6     397.3     321.6     291.0     250.1
                      241.8     214.4     214.4     171.3     150.1     150.1     149.5      95.8      95.8      95.8
                       95.8      95.8      79.7      37.5      37.5      37.5      37.5      37.5      37.5      37.5
                       37.5      37.5      37.5      37.5      37.5      37.5      37.5
                                                                   ***

  ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION       L1
                   TRANSPOSITION AREA       .0 SQ MI

 TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.44, TOTAL EXCESS =    1.79

  K FLOW      TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 3069.        4.75        (CFS)     672.        171.         57.          25.
                        (INCHES)   1.763       1.789       1.789        1.789
                         (AC-FT)    333.        338.        338.         338.

                       CUMULATIVE AREA =    3.55 SQ MI

  ***             ***             ***             ***             ***
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HYDROGRAPH AT STATION L1
TRANSPOSITION AREA .5 SQ MI

TOTAL RAINFALL = 3.21, TOTAL LOSS = 1.44, TOTAL EXCESS = 1.77

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3043.	4.75	(CFS)	666.	169.	56.	24.
		(INCHES)	1.748	1.773	1.773	1.773
		(AC-FT)	330.	335.	335.	335.

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1
TRANSPOSITION AREA 1.0 SQ MI

TOTAL RAINFALL = 3.19, TOTAL LOSS = 1.53, TOTAL EXCESS = 1.66

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2683.	4.75	(CFS)	621.	158.	53.	23.
		(INCHES)	1.628	1.654	1.654	1.654
		(AC-FT)	308.	313.	313.	313.

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1
TRANSPOSITION AREA 5.0 SQ MI

TOTAL RAINFALL = 3.10, TOTAL LOSS = 1.70, TOTAL EXCESS = 1.40

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1978.	4.75	(CFS)	522.	133.	44.	19.
		(INCHES)	1.368	1.398	1.398	1.398
		(AC-FT)	259.	264.	264.	264.

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.04, TOTAL LOSS = 1.75, TOTAL EXCESS = 1.28

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1760.	4.75	(CFS)	477.	122.	41.	18.
		(INCHES)	1.252	1.284	1.284	1.284
		(AC-FT)	237.	243.	243.	243.

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 2.94, TOTAL LOSS = 1.79, TOTAL EXCESS = 1.15

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1522.	4.83	(CFS)	425.	109.	36.	16.
		(INCHES)	1.115	1.148	1.148	1.148
		(AC-FT)	211.	217.	217.	217.

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1
TRANSPOSITION AREA 30.0 SQ MI

TOTAL RAINFALL = 2.87, TOTAL LOSS = 1.81, TOTAL EXCESS = 1.07

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1386.	4.83	(CFS)	394.	102.	34.	15.
		(INCHES)	1.032	1.066	1.066	1.066
		(AC-FT)	195.	202.	202.	202.

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1
TRANSPOSITION AREA 40.0 SQ MI

TOTAL RAINFALL = 2.81, TOTAL LOSS = 1.82, TOTAL EXCESS = .99

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1274.	4.83	(CFS)	366.	95.	32.	14.
		(INCHES)	.961	.994	.994	.994
		(AC-FT)	182.	188.	188.	188.

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT L1

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2128.	4.75	(CFS)	543.	139.	46.	20.
		(INCHES)	1.424	1.453	1.453	1.453
		(AC-FT)	269.	275.	275.	275.

CUMULATIVE AREA = 3.55 SQ MI

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              **************
              *            *
253 KK        *   L1-L2A   *        CNAME    L2AR
              *            *
              **************

254 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS

            HYDROGRAPH ROUTING DATA

255 RS          STORAGE ROUTING
                      NSTPS          3  NUMBER OF SUBREACHES
                       ITYP       FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC        .00  INITIAL CONDITION
                          X        .00 WORKING R AND D COEFFICIENT

256 RC          NORMAL DEPTH CHANNEL
                        ANL       .046  LEFT OVERBANK N-VALUE
                       ANCH       .045  MAIN CHANNEL N-VALUE
                        ANR       .046  RIGHT OVERBANK N-VALUE
                      RLNTH      7079.  REACH LENGTH
                        SEL      .0174  ENERGY SLOPE
                      ELMAX         .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
258 RY        ELEVATION    19.00     17.00     14.00     10.00     10.00     14.00     18.00     22.00
257 RX        DISTANCE       .00     80.00    165.00    200.00    215.00    255.00    340.00    420.00
```

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	2.15	5.51	10.09	15.88	22.89	31.11	41.00	53.99	70.19
OUTFLOW	.00	35.92	135.31	310.20	574.19	940.29	1420.82	2127.41	3068.20	4246.30
ELEVATION	10.00	10.63	11.26	11.89	12.53	13.16	13.79	14.42	15.05	15.68
STORAGE	89.60	112.23	138.39	168.52	202.55	239.74	278.31	318.17	359.34	401.79
OUTFLOW	5700.67	7465.85	9545.37	12023.62	14941.79	18538.68	22670.75	27260.26	32304.19	37801.64
ELEVATION	16.32	16.95	17.58	18.21	18.84	19.47	20.11	20.74	21.37	22.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 18539. TO 37802.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

*** *** *** *** ***

HYDROGRAPH AT STATION L1-L2A
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2913.	4.92	(CFS)	672.	171.	57.	25.
		(INCHES)	1.762	1.789	1.789	1.789
		(AC-FT)	333.	338.	338.	338.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
17.	4.92	5.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.95	4.92	12.14	10.58	10.19	10.08

CUMULATIVE AREA = 3.55 SQ MI

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HYDROGRAPH AT STATION L1-L2A
TRANSPOSITION AREA .5 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2888.	4.92	(CFS)	666.	169.	56.	24.
		(INCHES)	1.746	1.773	1.773	1.773
		(AC-FT)	330.	335.	335.	335.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
17.	4.92	5.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.93	4.92	12.13	10.58	10.19	10.08

CUMULATIVE AREA = 3.55 SQ MI

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HYDROGRAPH AT STATION L1-L2A
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2570.	4.92	(CFS)	621.	158.	53.	23.
		(INCHES)	1.627	1.654	1.654	1.654
		(AC-FT)	308.	313.	313.	313.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
16.	4.92	5.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.72	4.92	12.08	10.57	10.19	10.08

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1-L2A
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1929.	4.92	(CFS)	522.	133.	44.	19.
		(INCHES)	1.368	1.398	1.398	1.398
		(AC-FT)	259.	264.	264.	264.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
13.	4.92	4.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.24	4.92	11.97	10.54	10.18	10.08

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1-L2A
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1717.	4.92	(CFS)	477.	122.	41.	18.
		(INCHES)	1.251	1.284	1.284	1.284
		(AC-FT)	237.	243.	243.	243.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
12.	4.92	4.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.05	4.92	11.92	10.53	10.18	10.08

CUMULATIVE AREA = 3.55 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L1-L2A
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1483.	5.00	(CFS)	425.	109.	36.	16.
		(INCHES)	1.114	1.148	1.148	1.148
		(AC-FT)	211.	217.	217.	217.

```
PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
     11.       5.00                    4.          1.          0.           0.

PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
  (FEET)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   13.85       5.00                 11.84       10.51       10.17        10.07

                        CUMULATIVE AREA =    3.55 SQ MI

   ***            ***            ***            ***            ***

                        HYDROGRAPH AT STATION   L1-L2A
                      TRANSPOSITION AREA     30.0 SQ MI

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1345.       5.00       (CFS)      393.        102.         34.          15.
                        (INCHES)    1.031       1.066       1.066        1.066
                         (AC-FT)     195.        202.        202.         202.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
     10.       5.00                    4.          1.          0.           0.

PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
  (FEET)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   13.69       5.00                 11.79       10.50       10.17        10.07

                        CUMULATIVE AREA =    3.55 SQ MI

   ***            ***            ***            ***            ***

                        HYDROGRAPH AT STATION   L1-L2A
                      TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   1236.       5.00       (CFS)      366.         95.         32.          14.
                        (INCHES)     .960        .994        .994         .994
                         (AC-FT)     182.        188.        188.         188.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
      9.       5.00                    3.          1.          0.           0.

PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
  (FEET)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   13.55       5.00                 11.74       10.49       10.16        10.07

                        CUMULATIVE AREA =    3.55 SQ MI

   ***            ***            ***            ***            ***

                        INTERPOLATED HYDROGRAPH AT   L1-L2A

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
   2066.       4.92       (CFS)      543.        139.         46.          20.
                        (INCHES)    1.423       1.453       1.453        1.453
                         (AC-FT)     269.        275.        275.         275.

                        CUMULATIVE AREA =    3.55 SQ MI


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          *            *
259 KK    *      L2A   *
          *            *
          **************
                        THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                        L=2.46     Lca=1.12     S=136.18     Kn=0.055     LAG=45.0
                        S-GRAPH TYPE=DES RNGLND

263 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS

             SUBBASIN RUNOFF DATA

264 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .69  SUBBASIN AREA

265 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .35  STARTING LOSS
                        DTH         .38  MOISTURE DEFICIT
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                    PSIF        5.64  WETTING FRONT SUCTION
                   XKSAT         .20  HYDRAULIC CONDUCTIVITY
                   RTIMP         .00  PERCENT IMPERVIOUS AREA

264 UI          INPUT UNITGRAPH,  34 ORDINATES,  VOLUME = 1.00
                     .0      51.8      51.8     153.3     242.2     330.7     404.5     460.6     494.9     492.2
                  461.4     394.4     327.8     266.9     221.7     182.7     150.1     121.9     100.6      84.2
                   69.9      54.9      46.5      35.5      35.5      26.1      12.6      12.6      12.6      12.6
                   12.6      12.6      12.6      12.6
                                                                   ***

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2A
                  TRANSPOSITION AREA       .0 SQ MI

  TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.63, TOTAL EXCESS =    1.60

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   738.       4.58       (CFS)      119.        30.         10.          4.
                       (INCHES)    1.595       1.595       1.595       1.595
                        (AC-FT)     59.         59.         59.         59.

                     CUMULATIVE AREA =     .69 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2A
                  TRANSPOSITION AREA       .5 SQ MI

  TOTAL RAINFALL =    3.21, TOTAL LOSS =    1.63, TOTAL EXCESS =    1.58

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   731.       4.58       (CFS)      118.        29.         10.          4.
                       (INCHES)    1.579       1.579       1.579       1.579
                        (AC-FT)     58.         58.         58.         58.

                     CUMULATIVE AREA =     .69 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2A
                  TRANSPOSITION AREA      1.0 SQ MI

  TOTAL RAINFALL =    3.19, TOTAL LOSS =    1.74, TOTAL EXCESS =    1.45

K FLOW        TIME                          MAXIMUM AVERAGE FLOW
(CFS)         (HR)                  6-HR       24-HR       72-HR    166.58-HR
   647.       4.58       (CFS)      108.        27.          9.          4.
                       (INCHES)    1.445       1.445       1.445       1.445
                        (AC-FT)     53.         53.         53.         53.

                     CUMULATIVE AREA =     .69 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2A
                  TRANSPOSITION AREA      5.0 SQ MI

  TOTAL RAINFALL =    3.10, TOTAL LOSS =    1.91, TOTAL EXCESS =    1.20

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   482.       4.67       (CFS)       89.        22.          7.          3.
                       (INCHES)    1.195       1.195       1.195       1.195
                        (AC-FT)     44.         44.         44.         44.

                     CUMULATIVE AREA =     .69 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2A
                  TRANSPOSITION AREA     10.0 SQ MI

  TOTAL RAINFALL =    3.04, TOTAL LOSS =    1.96, TOTAL EXCESS =    1.08

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   429.       4.67       (CFS)       80.        20.          7.          3.
                       (INCHES)    1.074       1.074       1.074       1.074
                        (AC-FT)     40.         40.         40.         40.

                     CUMULATIVE AREA =     .69 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2A
                  TRANSPOSITION AREA     20.0 SQ MI

  TOTAL RAINFALL =    2.94, TOTAL LOSS =    2.00, TOTAL EXCESS =     .93

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   370.       4.67       (CFS)       70.        17.          6.          3.
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                    (INCHES)      .933        .933        .933        .933
                     (AC-FT)      34.         34.         34.         34.

                    CUMULATIVE AREA =     .69 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2A
                  TRANSPOSITION AREA     30.0 SQ MI

  TOTAL RAINFALL =    2.87, TOTAL LOSS =    2.03, TOTAL EXCESS =     .85

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   337.       4.67       (CFS)       63.         16.          5.           2.
                     (INCHES)      .848        .848        .848        .848
                     (AC-FT)       31.         31.         31.         31.

                    CUMULATIVE AREA =     .69 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L2A
                  TRANSPOSITION AREA     40.0 SQ MI

  TOTAL RAINFALL =    2.81, TOTAL LOSS =    2.03, TOTAL EXCESS =     .78

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   308.       4.67       (CFS)       58.         14.          5.           2.
                     (INCHES)      .776        .776        .776        .776
                     (AC-FT)       29.         29.         29.         29.

                    CUMULATIVE AREA =     .69 SQ MI

   ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT      L2A

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   692.       4.58       (CFS)      113.         28.          9.           4.
                     (INCHES)     1.516       1.516       1.516       1.516
                     (AC-FT)       56.         56.         56.         56.

                    CUMULATIVE AREA =     .69 SQ MI


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          *            *
270 KK    *     L2BR   *        CNAME  L2A-2B
          *            *
          **************

271 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


272 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION     L2BR
                  TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  3418.       4.92       (CFS)      791.        200.         67.          29.
                     (INCHES)     1.734       1.757       1.757       1.757
                     (AC-FT)      392.        397.        397.        397.

                    CUMULATIVE AREA =    4.24 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION     L2BR
                  TRANSPOSITION AREA       .5 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  3388.       4.92       (CFS)      784.        198.         66.          29.
                     (INCHES)     1.719       1.741       1.741       1.741
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(AC-FT)	389.	394.	394.	394.

CUMULATIVE AREA = 4.24 SQ MI

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HYDROGRAPH AT STATION L2BR
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3030.	4.92	(CFS)	728.	185.	62.	27.
		(INCHES)	1.597	1.620	1.620	1.620
		(AC-FT)	361.	366.	366.	366.

CUMULATIVE AREA = 4.24 SQ MI

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HYDROGRAPH AT STATION L2BR
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2318.	4.92	(CFS)	611.	156.	52.	22.
		(INCHES)	1.339	1.365	1.365	1.365
		(AC-FT)	303.	309.	309.	309.

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2BR
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2068.	4.92	(CFS)	557.	142.	47.	21.
		(INCHES)	1.222	1.250	1.250	1.250
		(AC-FT)	276.	283.	283.	283.

CUMULATIVE AREA = 4.24 SQ MI

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HYDROGRAPH AT STATION L2BR
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1778.	4.92	(CFS)	495.	127.	42.	18.
		(INCHES)	1.085	1.113	1.113	1.113
		(AC-FT)	245.	252.	252.	252.

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2BR
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1606.	4.92	(CFS)	456.	117.	39.	17.
		(INCHES)	1.001	1.030	1.030	1.030
		(AC-FT)	226.	233.	233.	233.

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2BR
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1475.	4.92	(CFS)	424.	109.	36.	16.
		(INCHES)	.930	.959	.959	.959
		(AC-FT)	210.	217.	217.	217.

CUMULATIVE AREA = 4.24 SQ MI

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INTERPOLATED HYDROGRAPH AT L2BR

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2391.	4.92	(CFS)	623.	159.	53.	23.
		(INCHES)	1.366	1.391	1.391	1.391
		(AC-FT)	309.	314.	314.	314.

CUMULATIVE AREA = 4.24 SQ MI

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            *            *
273 KK      *   L2A-2B   *        CNAME    L2BR
            *            *
            **************

274 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

275 RS          STORAGE ROUTING
                      NSTPS          7  NUMBER OF SUBREACHES
                       ITYP       FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC        .00  INITIAL CONDITION
                          X        .00 WORKING R AND D COEFFICIENT

276 RC          NORMAL DEPTH CHANNEL
                        ANL       .046  LEFT OVERBANK N-VALUE
                       ANCH       .045  MAIN CHANNEL N-VALUE
                        ANR       .046  RIGHT OVERBANK N-VALUE
                      RLNTH      20743.  REACH LENGTH
                        SEL      .0147  ENERGY SLOPE
                      ELMAX         .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                      CROSS-SECTION DATA
                        --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
278 RY        ELEVATION     19.00     17.00     14.00     10.00     10.00     14.00     18.00     22.00
277 RX        DISTANCE        .00     80.00    165.00    200.00    215.00    255.00    340.00    420.00

                                                                  ***

                                      COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00      6.29     16.15     29.56     46.54     67.08     91.18    120.14    158.20    205.67
          OUTFLOW        .00     33.02    124.37    285.11    527.77    864.27   1305.94   1955.40   2820.12   3902.96
        ELEVATION      10.00     10.63     11.26     11.89     12.53     13.16     13.79     14.42     15.05     15.68

          STORAGE     262.57    328.88    405.54    493.81    593.54    702.53    815.55    932.37   1052.99   1177.41
          OUTFLOW    5239.75   6862.20   8773.58  11051.45  13733.67  17039.73  20837.71  25056.13  29692.23  34745.19
        ELEVATION      16.32     16.95     17.58     18.21     18.84     19.47     20.11     20.74     21.37     22.00

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION   L2A-2B
                     TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   3040.       5.42        (CFS)      788.        200.         67.          29.
                         (INCHES)    1.729       1.757       1.757        1.757
                          (AC-FT)     391.        397.        397.         397.

PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
     24.       5.42                     8.          2.          1.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
   15.18       5.42                  12.45       10.67       10.22        10.10

                       CUMULATIVE AREA =    4.24 SQ MI

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION   L2A-2B
                     TRANSPOSITION AREA       .5 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   3013.       5.42        (CFS)      781.        198.         66.          29.
                         (INCHES)    1.713       1.741       1.741        1.741
                          (AC-FT)     387.        394.        394.         394.

PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
     24.       5.42                     8.          2.          1.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
   15.16       5.42                  12.45       10.67       10.22        10.10

                       CUMULATIVE AREA =    4.24 SQ MI

     ***             ***             ***             ***             ***
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HYDROGRAPH AT STATION L2A-2B
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2717.	5.42	(CFS)	726.	185.	62.	27.
		(INCHES)	1.592	1.620	1.620	1.620
		(AC-FT)	360.	366.	366.	366.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
22.	5.42	7.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.98	5.42	12.39	10.66	10.22	10.09

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2A-2B
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2108.	5.50	(CFS)	609.	156.	52.	22.
		(INCHES)	1.335	1.365	1.365	1.365
		(AC-FT)	302.	309.	309.	309.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
18.	5.50	7.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.53	5.50	12.25	10.63	10.21	10.09

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2A-2B
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1877.	5.50	(CFS)	555.	142.	47.	21.
		(INCHES)	1.218	1.250	1.250	1.250
		(AC-FT)	275.	283.	283.	283.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
17.	5.50	6.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.34	5.50	12.18	10.61	10.20	10.09

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2A-2B
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1611.	5.50	(CFS)	492.	127.	42.	18.
		(INCHES)	1.080	1.113	1.113	1.113
		(AC-FT)	244.	252.	252.	252.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
15.	5.50	6.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
14.09	5.50	12.08	10.59	10.20	10.09

CUMULATIVE AREA = 4.24 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2A-2B
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1453.	5.58	(CFS)	454.	117.	39.	17.
		(INCHES)	.996	1.030	1.030	1.030
		(AC-FT)	225.	233.	233.	233.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
14.	5.58	5.	1.	0.	0.

```
 PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
   (FEET)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    13.93       5.58                 12.02       10.58       10.19        10.08

                          CUMULATIVE AREA =    4.24 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   L2A-2B
                      TRANSPOSITION AREA     40.0 SQ MI

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
    1318.       5.58        (CFS)     422.        109.         36.          16.
                          (INCHES)    .925        .959        .959         .959
                           (AC-FT)    209.        217.        217.         217.

PEAK STORAGE    TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
     13.        5.58                    5.          1.          0.           0.

 PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
   (FEET)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    13.80       5.58                 11.96       10.56       10.19        10.08

                          CUMULATIVE AREA =    4.24 SQ MI

     ***             ***             ***             ***             ***


                        INTERPOLATED HYDROGRAPH AT   L2A-2B

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
    2167.       5.50        (CFS)     621.        159.         53.          23.
                          (INCHES)   1.361       1.391       1.391        1.391
                           (AC-FT)    308.        314.        314.         314.

                          CUMULATIVE AREA =    4.24 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
   KK     *      L2B   *
          *            *
          **************
                     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                     L=5.13     Lca=1.82     S=93.37     Kn=0.055     LAG=78.1
                     S-GRAPH TYPE=DES RNGLND

 283 KO          OUTPUT CONTROL VARIABLES
                       IPRNT            3  PRINT CONTROL
                       IPLOT            0  PLOT CONTROL
                       QSCAL           0.  HYDROGRAPH PLOT SCALE
                       IPNCH            1  PUNCH COMPUTED HYDROGRAPH
                        IOUT           22  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1            1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         2000  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT         .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

 284 BA          SUBBASIN CHARACTERISTICS
                       TAREA         4.08  SUBBASIN AREA

 285 LG          GREEN AND AMPT LOSS RATE
                       STRTL          .35  STARTING LOSS
                         DTH          .35  MOISTURE DEFICIT
                        PSIF         4.18  WETTING FRONT SUCTION
                       XKSAT          .40  HYDRAULIC CONDUCTIVITY
                       RTIMP          .00  PERCENT IMPERVIOUS AREA

 284 UI          INPUT UNITGRAPH,  58 ORDINATES,  VOLUME = 1.00
                      .0     176.0     176.0     176.0     311.9     535.5     724.3     902.8    1071.3    1224.6
                  1376.8    1511.6    1580.9    1658.5    1686.4    1686.4    1632.5    1568.6    1460.6    1278.3
                  1172.5    1031.0     927.3     829.8     742.5     663.7     594.6     529.9     481.8     405.6
                   377.6     331.8     310.2     269.8     269.2     186.5     186.5     186.5     145.4     120.5
                   120.5     120.5     120.5      90.9      42.8      42.8      42.8      42.8      42.8      42.8
                    42.8      42.8      42.8      42.8      42.8      42.8      42.8      42.8

                                                                   ***

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      L2B
                      TRANSPOSITION AREA        .0 SQ MI

   TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.86, TOTAL EXCESS =    1.37

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
    2276.       5.08        (CFS)     599.        150.         50.          22.
                          (INCHES)   1.367       1.367       1.367        1.367
                           (AC-FT)    297.        297.        297.         297.
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CUMULATIVE AREA = 4.08 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B
TRANSPOSITION AREA .5 SQ MI

TOTAL RAINFALL = 3.21, TOTAL LOSS = 1.86, TOTAL EXCESS = 1.35

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2251.	5.08	(CFS)	593.	148.	49.	21.
		(INCHES)	1.351	1.351	1.351	1.351
		(AC-FT)	294.	294.	294.	294.

CUMULATIVE AREA = 4.08 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B
TRANSPOSITION AREA 1.0 SQ MI

TOTAL RAINFALL = 3.19, TOTAL LOSS = 1.97, TOTAL EXCESS = 1.22

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2003.	5.08	(CFS)	534.	134.	45.	19.
		(INCHES)	1.218	1.218	1.218	1.218
		(AC-FT)	265.	265.	265.	265.

CUMULATIVE AREA = 4.08 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B
TRANSPOSITION AREA 5.0 SQ MI

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.19, TOTAL EXCESS = .91

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1464.	5.08	(CFS)	401.	100.	33.	14.
		(INCHES)	.914	.914	.914	.914
		(AC-FT)	199.	199.	199.	199.

CUMULATIVE AREA = 4.08 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.04, TOTAL LOSS = 2.24, TOTAL EXCESS = .79

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1265.	5.08	(CFS)	347.	87.	29.	13.
		(INCHES)	.792	.792	.792	.792
		(AC-FT)	172.	172.	172.	172.

CUMULATIVE AREA = 4.08 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 2.94, TOTAL LOSS = 2.29, TOTAL EXCESS = .65

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1040.	5.08	(CFS)	286.	71.	24.	10.
		(INCHES)	.652	.652	.652	.652
		(AC-FT)	142.	142.	142.	142.

CUMULATIVE AREA = 4.08 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B
TRANSPOSITION AREA 30.0 SQ MI

TOTAL RAINFALL = 2.87, TOTAL LOSS = 2.31, TOTAL EXCESS = .57

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
908.	5.08	(CFS)	249.	62.	21.	9.
		(INCHES)	.568	.568	.568	.568
		(AC-FT)	123.	123.	123.	123.

CUMULATIVE AREA = 4.08 SQ MI

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                    HYDROGRAPH AT STATION      L2B
                  TRANSPOSITION AREA     40.0 SQ MI

   TOTAL RAINFALL =    2.81, TOTAL LOSS =    2.31, TOTAL EXCESS =     .50

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   800.       5.08       (CFS)      219.         55.         18.          8.
                       (INCHES)     .499        .499        .499         .499
                        (AC-FT)     109.        109.        109.         109.

                     CUMULATIVE AREA =    4.08 SQ MI

    ***            ***            ***            ***            ***


                     INTERPOLATED HYDROGRAPH AT      L2B

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  1532.       5.08       (CFS)      418.        104.         35.         15.
                       (INCHES)     .952        .952        .952         .952
                        (AC-FT)     207.        207.        207.         207.

                     CUMULATIVE AREA =    4.08 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
292 KK    *       L3R  *        CNAME  L2B-L3
          *            *
          **************

293 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS


  HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                          ***

    ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L3R
                  TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  5065.       5.33       (CFS)     1384.        350.        117.         50.
                       (INCHES)    1.547       1.566       1.566        1.566
                        (AC-FT)     686.        694.        694.         694.

                     CUMULATIVE AREA =    8.32 SQ MI

    ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L3R
                  TRANSPOSITION AREA       .5 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  5015.       5.33       (CFS)     1370.        347.        116.         50.
                       (INCHES)    1.532       1.550       1.550        1.550
                        (AC-FT)     679.        688.        688.         688.

                     CUMULATIVE AREA =    8.32 SQ MI

    ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L3R
                  TRANSPOSITION AREA      1.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
  4495.       5.33       (CFS)     1256.        318.        106.         46.
                       (INCHES)    1.405       1.423       1.423        1.423
                        (AC-FT)     623.        631.        631.         631.

                     CUMULATIVE AREA =    8.32 SQ MI

    ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      L3R
                  TRANSPOSITION AREA      5.0 SQ MI
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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3378.	5.33	(CFS)	1007.	256.	85.	37.
		(INCHES)	1.125	1.144	1.144	1.144
		(AC-FT)	499.	507.	507.	507.

CUMULATIVE AREA = 8.32 SQ MI

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HYDROGRAPH AT STATION L3R
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2954.	5.42	(CFS)	901.	229.	76.	33.
		(INCHES)	1.007	1.025	1.025	1.025
		(AC-FT)	447.	455.	455.	455.

CUMULATIVE AREA = 8.32 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3R
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2476.	5.42	(CFS)	777.	198.	66.	29.
		(INCHES)	.869	.887	.887	.887
		(AC-FT)	385.	393.	393.	393.

CUMULATIVE AREA = 8.32 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3R
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2179.	5.50	(CFS)	703.	180.	60.	26.
		(INCHES)	.786	.804	.804	.804
		(AC-FT)	348.	356.	356.	356.

CUMULATIVE AREA = 8.32 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3R
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1936.	5.50	(CFS)	640.	164.	55.	24.
		(INCHES)	.716	.733	.733	.733
		(AC-FT)	317.	325.	325.	325.

CUMULATIVE AREA = 8.32 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT L3R

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3064.	5.42	(CFS)	929.	236.	79.	34.
		(INCHES)	1.039	1.057	1.057	1.057
		(AC-FT)	461.	469.	469.	469.

CUMULATIVE AREA = 8.32 SQ MI

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            *            *
295 KK      *   L2B-L3   *        CNAME     L3R
            *            *
            **************
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296 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS

            HYDROGRAPH ROUTING DATA
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297 RS          STORAGE ROUTING
                     NSTPS          19  NUMBER OF SUBREACHES
                     ITYP        FLOW  TYPE OF INITIAL CONDITION
                    RSVRIC         .00  INITIAL CONDITION
                         X         .00 WORKING R AND D COEFFICIENT

298 RC          NORMAL DEPTH CHANNEL
                       ANL        .050  LEFT OVERBANK N-VALUE
                      ANCH        .040  MAIN CHANNEL N-VALUE
                       ANR        .060  RIGHT OVERBANK N-VALUE
                     RLNTH      19943.  REACH LENGTH
                       SEL       .0089  ENERGY SLOPE
                     ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
300 RY        ELEVATION    18.00     11.80     11.70     10.00     10.00     11.70     11.80     18.00
299 RX        DISTANCE       .00   1093.00   1210.00   1215.00   1225.00   1232.00   1372.00   2000.00

                                                  ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE       .00      2.21      5.00      8.36     12.29     64.26    145.64    249.55    375.99    524.96
          OUTFLOW       .00      8.75     29.54     61.91    106.59    295.10    751.21   1485.94   2533.00   3927.79
        ELEVATION     10.00     10.42     10.84     11.26     11.68     12.11     12.53     12.95     13.37     13.79

          STORAGE    696.46    890.49   1107.05   1346.14   1607.76   1891.90   2198.58   2527.79   2879.53   3253.80
          OUTFLOW   5705.10   7898.66  10541.13  13664.13  17298.39  21473.76  26219.33  31563.50  37534.01  44158.04
        ELEVATION     14.21     14.63     15.05     15.47     15.89     16.32     16.74     17.16     17.58     18.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN    21474. TO    44158.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION   L2B-L3
                    TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   4293.       6.58        (CFS)     1371.        350.        117.         50.
                         (INCHES)    1.532       1.566       1.566        1.566
                          (AC-FT)     680.        694.        694.         694.

PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
     29.       6.58                    11.          3.          1.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
   13.88       6.58                  12.70       10.85       10.28        10.12

                      CUMULATIVE AREA =    8.32 SQ MI

     ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION   L2B-L3
                    TRANSPOSITION AREA       .5 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   4240.       6.58        (CFS)     1357.        347.        116.         50.
                         (INCHES)    1.517       1.550       1.550        1.550
                          (AC-FT)     673.        688.        688.         688.

PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
     29.       6.58                    11.          3.          1.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
   13.86       6.58                  12.70       10.85       10.28        10.12

                      CUMULATIVE AREA =    8.32 SQ MI

     ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION   L2B-L3
                    TRANSPOSITION AREA      1.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   3787.       6.67        (CFS)     1244.        318.        106.         46.
                         (INCHES)    1.391       1.423       1.423        1.423
                          (AC-FT)     617.        631.        631.         631.

 PEAK STORAGE  TIME                         MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
     27.       6.67                    10.          3.          1.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                   6-HR       24-HR       72-HR    166.58-HR
   13.75       6.67                  12.65       10.83       10.28        10.12

                      CUMULATIVE AREA =    8.32 SQ MI
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HYDROGRAPH AT STATION L2B-L3
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2841.	6.83	(CFS)	996.	256.	85.	37.
		(INCHES)	1.113	1.144	1.144	1.144
		(AC-FT)	494.	507.	507.	507.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
22.	6.83	9.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.46	6.83	12.53	10.80	10.27	10.12

CUMULATIVE AREA = 8.32 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B-L3
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2461.	6.92	(CFS)	891.	229.	76.	33.
		(INCHES)	.996	1.025	1.025	1.025
		(AC-FT)	442.	455.	455.	455.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
19.	6.92	8.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.34	6.92	12.48	10.79	10.26	10.11

CUMULATIVE AREA = 8.32 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B-L3
TRANSPOSITION AREA 20.0 SQ MI

K FLOW CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2057.	7.00	(CFS)	768.	198.	66.	29.
		(INCHES)	.858	.887	.887	.887
		(AC-FT)	381.	393.	393.	393.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
17.	7.00	7.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.18	7.00	12.40	10.77	10.26	10.11

CUMULATIVE AREA = 8.32 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B-L3
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1814.	7.08	(CFS)	694.	180.	60.	26.
		(INCHES)	.776	.804	.804	.804
		(AC-FT)	344.	356.	356.	356.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
15.	7.08	7.	2.	1.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.08	7.08	12.36	10.75	10.25	10.11

CUMULATIVE AREA = 8.32 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2B-L3
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1611.	7.17	(CFS)	632.	164.	55.	24.
		(INCHES)	.706	.733	.733	.733
		(AC-FT)	313.	325.	325.	325.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR

```
    14.      7.17                    6.          2.          1.          0.

PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                    6-HR       24-HR       72-HR    166.58-HR
   13.00      7.17                   12.31       10.74       10.25       10.11

                        CUMULATIVE AREA =    8.32 SQ MI

   ***             ***             ***             ***             ***


                        INTERPOLATED HYDROGRAPH AT   L2B-L3

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR       24-HR       72-HR    166.58-HR
   2551.      6.92        (CFS)       918.        236.         79.         34.
                        (INCHES)     1.027       1.057       1.057       1.057
                         (AC-FT)      455.        469.        469.        469.

                        CUMULATIVE AREA =    8.32 SQ MI


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            *            *
301 KK      *       L2C  *
            *            *
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                          THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                          L=3.20     Lca=1.55     S=91.31     Kn=0.055     LAG=61.2
                          S-GRAPH TYPE=DES RNGLND

305 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

    BA          SUBBASIN CHARACTERISTICS
                      TAREA        1.33  SUBBASIN AREA

307 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .35  STARTING LOSS
                        DTH         .35  MOISTURE DEFICIT
                       PSIF        4.19  WETTING FRONT SUCTION
                      XKSAT         .42  HYDRAULIC CONDUCTIVITY
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

306 UI          INPUT UNITGRAPH,  45 ORDINATES,  VOLUME = 1.00
                       .0      73.3      73.3     100.0     227.1     318.4     414.0     500.5     577.1     643.2
                    678.8     702.6     699.6     666.3     621.7     533.3     468.3     402.9     351.3     303.8
                    266.7     226.8     200.7     164.0     145.0     131.9     112.4      98.0      77.7      77.7
                     56.5      50.2      50.2      50.2      28.5      17.8      17.8      17.8      17.8      17.8
                     17.8      17.8      17.8      17.8      17.8
                                                                  ***

   ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      L2C
                      TRANSPOSITION AREA       .0 SQ MI

  TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.90, TOTAL EXCESS =    1.33

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR       24-HR       72-HR    166.58-HR
    913.      4.83        (CFS)       190.         47.         16.          7.
                        (INCHES)     1.329       1.329       1.329       1.329
                         (AC-FT)       94.         94.         94.         94.

                        CUMULATIVE AREA =    1.33 SQ MI

   ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      L2C
                      TRANSPOSITION AREA       .5 SQ MI

  TOTAL RAINFALL =    3.21, TOTAL LOSS =    1.90, TOTAL EXCESS =    1.32

  K FLOW      TIME                              MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                    6-HR       24-HR       72-HR    166.58-HR
    904.      4.83        (CFS)       188.         47.         16.          7.
                        (INCHES)     1.314       1.314       1.314       1.314
                         (AC-FT)       93.         93.         93.         93.

                        CUMULATIVE AREA =    1.33 SQ MI

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HYDROGRAPH AT STATION L2C
TRANSPOSITION AREA 1.0 SQ MI

TOTAL RAINFALL = 3.19, TOTAL LOSS = 2.01, TOTAL EXCESS = 1.18

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
794.	4.83	(CFS)	168.	42.	14.	6.
		(INCHES)	1.179	1.179	1.179	1.179
		(AC-FT)	83.	83.	83.	83.

CUMULATIVE AREA = 1.33 SQ MI

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HYDROGRAPH AT STATION L2C
TRANSPOSITION AREA 5.0 SQ MI

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.23, TOTAL EXCESS = .87

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
564.	4.83	(CFS)	125.	31.	10.	4.
		(INCHES)	.874	.874	.874	.874
		(AC-FT)	62.	62.	62.	62.

CUMULATIVE AREA = 1.33 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2C
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.04, TOTAL LOSS = 2.29, TOTAL EXCESS = .75

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
482.	4.83	(CFS)	107.	27.	9.	4.
		(INCHES)	.748	.748	.748	.748
		(AC-FT)	53.	53.	53.	53.

CUMULATIVE AREA = 1.33 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2C
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 2.94, TOTAL LOSS = 2.33, TOTAL EXCESS = .61

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
392.	4.83	(CFS)	87.	22.	7.	3.
		(INCHES)	.608	.608	.608	.608
		(AC-FT)	43.	43.	43.	43.

CUMULATIVE AREA = 1.33 SQ MI

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HYDROGRAPH AT STATION L2C
TRANSPOSITION AREA 30.0 SQ MI

TOTAL RAINFALL = 2.87, TOTAL LOSS = 2.35, TOTAL EXCESS = .53

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
341.	4.83	(CFS)	75.	19.	6.	3.
		(INCHES)	.528	.528	.528	.528
		(AC-FT)	37.	37.	37.	37.

CUMULATIVE AREA = 1.33 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2C
TRANSPOSITION AREA 40.0 SQ MI

TOTAL RAINFALL = 2.81, TOTAL LOSS = 2.35, TOTAL EXCESS = .46

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
299.	4.83	(CFS)	66.	16.	5.	2.
		(INCHES)	.462	.462	.462	.462
		(AC-FT)	33.	33.	33.	33.

CUMULATIVE AREA = 1.33 SQ MI

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INTERPOLATED HYDROGRAPH AT L2C

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR

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754.      4.83        (CFS)      161.        40.        13.         6.
                    (INCHES)    1.125      1.125      1.125      1.125
                     (AC-FT)     80.        80.        80.        80.

                  CUMULATIVE AREA =    1.33 SQ MI


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          *            *
313 KK    *   L2C-2D   *        CNAME    L2DR
          *            *
          **************

314 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       .083  TIME INTERVAL IN HOURS


            HYDROGRAPH ROUTING DATA

315 RS          STORAGE ROUTING
                     NSTPS          6  NUMBER OF SUBREACHES
                      ITYP       FLOW  TYPE OF INITIAL CONDITION
                    RSVRIC        .00  INITIAL CONDITION
                         X        .00 WORKING R AND D COEFFICIENT

316 RC          NORMAL DEPTH CHANNEL
                       ANL       .046  LEFT OVERBANK N-VALUE
                      ANCH       .045  MAIN CHANNEL N-VALUE
                       ANR       .046  RIGHT OVERBANK N-VALUE
                     RLNTH      9752.  REACH LENGTH
                       SEL      .0122  ENERGY SLOPE
                     ELMAX         .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                        --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
318 RY      ELEVATION    19.00     17.00     14.00     10.00     10.00     14.00     18.00     22.00
317 RX      DISTANCE       .00     80.00    165.00    200.00    215.00    255.00    340.00    420.00

                                                        ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

        STORAGE        .00      2.96      7.59     13.90     21.88     31.54     42.87     56.48     74.38     96.70
        OUTFLOW        .00     30.08    113.30    259.74    480.80    787.35   1189.72   1781.38   2569.15   3555.62
      ELEVATION      10.00     10.63     11.26     11.89     12.53     13.16     13.79     14.42     15.05     15.68

        STORAGE     123.44    154.62    190.66    232.16    279.05    330.29    383.42    438.35    495.06    553.55
        OUTFLOW    4773.44   6251.50   7992.78  10067.93  12511.46  15523.30  18983.28  22826.29  27049.80  31653.07
      ELEVATION      16.32     16.95     17.58     18.21     18.84     19.47     20.11     20.74     21.37     22.00


*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN     7993. TO    31653.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

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                      HYDROGRAPH AT STATION   L2C-2D
                    TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    868.       5.17        (CFS)     190.        47.         16.          7.
                         (INCHES)   1.328      1.329       1.329      1.329
                          (AC-FT)    94.        94.         94.        94.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
      6.       5.17                    2.         0.          0.          0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
   13.28       5.17                 11.14      10.29       10.10       10.04

                  CUMULATIVE AREA =    1.33 SQ MI

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION   L2C-2D
                    TRANSPOSITION AREA       .5 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    858.       5.17        (CFS)     188.        47.         16.          7.
                         (INCHES)   1.313      1.314       1.314      1.314
                          (AC-FT)    93.        93.         93.        93.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
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6.	5.17		1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.27	5.17	11.13	10.28	10.09	10.04

CUMULATIVE AREA = 1.33 SQ MI

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HYDROGRAPH AT STATION L2C-2D
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
750.	5.25	(CFS)	168.	42.	14.	6.
		(INCHES)	1.179	1.179	1.179	1.179
		(AC-FT)	83.	83.	83.	83.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
5.	5.25	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
13.08	5.25	11.08	10.27	10.09	10.04

CUMULATIVE AREA = 1.33 SQ MI

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HYDROGRAPH AT STATION L2C-2D
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
533.	5.25	(CFS)	125.	31.	10.	4.
		(INCHES)	.874	.874	.874	.874
		(AC-FT)	62.	62.	62.	62.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	5.25	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.63	5.25	10.94	10.23	10.08	10.03

CUMULATIVE AREA = 1.33 SQ MI

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HYDROGRAPH AT STATION L2C-2D
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
450.	5.33	(CFS)	107.	27.	9.	4.
		(INCHES)	.748	.748	.748	.748
		(AC-FT)	53.	53.	53.	53.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
3.	5.33	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.44	5.33	10.87	10.22	10.07	10.03

CUMULATIVE AREA = 1.33 SQ MI

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HYDROGRAPH AT STATION L2C-2D
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
365.	5.33	(CFS)	87.	22.	7.	3.
		(INCHES)	.608	.608	.608	.608
		(AC-FT)	43.	43.	43.	43.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
3.	5.33	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.20	5.33	10.78	10.19	10.06	10.03

CUMULATIVE AREA = 1.33 SQ MI

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HYDROGRAPH AT STATION L2C-2D
TRANSPOSITION AREA 30.0 SQ MI

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PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
   317.       5.33        (CFS)      75.         19.          6.           3.
                        (INCHES)    .528        .528        .528         .528
                         (AC-FT)     37.         37.         37.          37.

PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                  6-HR       24-HR       72-HR     166.58-HR
     3.       5.33                   1.          0.          0.           0.

PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                  6-HR       24-HR       72-HR     166.58-HR
   12.06      5.33                 10.72       10.18       10.06        10.03

                        CUMULATIVE AREA =    1.33 SQ MI

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION   L2C-2D
                     TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
   275.       5.33        (CFS)      66.         16.          5.           2.
                        (INCHES)    .462        .462        .462         .462
                         (AC-FT)     33.         33.         33.          33.

PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                  6-HR       24-HR       72-HR     166.58-HR
     2.       5.33                   1.          0.          0.           0.

PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                  6-HR       24-HR       72-HR     166.58-HR
   11.94      5.33                 10.67       10.17       10.06        10.02

                        CUMULATIVE AREA =    1.33 SQ MI

   ***            ***            ***            ***            ***


                     INTERPOLATED HYDROGRAPH AT   L2C-2D

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     166.58-HR
   712.       5.25        (CFS)     161.         40.         13.           6.
                        (INCHES)   1.125       1.125       1.125        1.125
                         (AC-FT)     80.         80.         80.          80.

                        CUMULATIVE AREA =    1.33 SQ MI


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          *            *
319 KK    *      L2D   *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=2.77     Lca=1.24     S=74.13     Kn=0.055     LAG=55.4
                    S-GRAPH TYPE=DES RNGLND

323 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


            SUBBASIN RUNOFF DATA

324 BA          SUBBASIN CHARACTERISTICS
                      TAREA       1.23  SUBBASIN AREA

325 LG          GREEN AND AMPT LOSS RATE
                      STRTL        .35  STARTING LOSS
                        DTH        .35  MOISTURE DEFICIT
                       PSIF       3.58  WETTING FRONT SUCTION
                      XKSAT        .54  HYDRAULIC CONDUCTIVITY
                      RTIMP        .00  PERCENT IMPERVIOUS AREA

326 UI          INPUT UNITGRAPH,  41 ORDINATES,  VOLUME = 1.00
                       .0      75.4      75.4     141.9     262.4     378.7     482.1     569.6     651.1     696.0
                    722.7     714.8     677.8     607.5     518.2     439.1     376.3     322.3     277.2     232.7
                    200.6     167.8     142.2     124.1     114.5      79.9      79.9      61.7      51.6      51.6
                     51.6      20.1      18.4      18.4      18.4      18.4      18.4      18.4      18.4      18.4
                     18.4

                                                                   ***

   ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION      L2D
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TRANSPOSITION AREA .0 SQ MI

TOTAL RAINFALL = 3.23, TOTAL LOSS = 1.99, TOTAL EXCESS = 1.24

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
878.	4.75	(CFS)	165.	41.	14.	6.
		(INCHES)	1.242	1.242	1.242	1.242
		(AC-FT)	82.	82.	82.	82.

CUMULATIVE AREA = 1.23 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2D
TRANSPOSITION AREA .5 SQ MI

TOTAL RAINFALL = 3.21, TOTAL LOSS = 1.98, TOTAL EXCESS = 1.23

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
869.	4.75	(CFS)	163.	41.	14.	6.
		(INCHES)	1.229	1.229	1.229	1.229
		(AC-FT)	81.	81.	81.	81.

CUMULATIVE AREA = 1.23 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2D
TRANSPOSITION AREA 1.0 SQ MI

TOTAL RAINFALL = 3.19, TOTAL LOSS = 2.12, TOTAL EXCESS = 1.07

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
737.	4.75	(CFS)	141.	35.	12.	5.
		(INCHES)	1.064	1.064	1.064	1.064
		(AC-FT)	70.	70.	70.	70.

CUMULATIVE AREA = 1.23 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2D
TRANSPOSITION AREA 5.0 SQ MI

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.34, TOTAL EXCESS = .76

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
498.	4.75	(CFS)	101.	25.	8.	4.
		(INCHES)	.759	.759	.759	.759
		(AC-FT)	50.	50.	50.	50.

CUMULATIVE AREA = 1.23 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2D
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.04, TOTAL LOSS = 2.40, TOTAL EXCESS = .63

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
415.	4.75	(CFS)	84.	21.	7.	3.
		(INCHES)	.632	.632	.632	.632
		(AC-FT)	41.	41.	41.	41.

CUMULATIVE AREA = 1.23 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2D
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 2.94, TOTAL LOSS = 2.45, TOTAL EXCESS = .49

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
324.	4.75	(CFS)	65.	16.	5.	2.
		(INCHES)	.492	.492	.492	.492
		(AC-FT)	32.	32.	32.	32.

CUMULATIVE AREA = 1.23 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L2D
TRANSPOSITION AREA 30.0 SQ MI

TOTAL RAINFALL = 2.87, TOTAL LOSS = 2.46, TOTAL EXCESS = .41

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR

```
 273.     4.75        (CFS)       55.        14.         5.          2.
                    (INCHES)     .414       .414       .414        .414
                     (AC-FT)      27.        27.        27.         27.

                   CUMULATIVE AREA =    1.23 SQ MI

  ***            ***            ***            ***            ***

                   HYDROGRAPH AT STATION      L2D
                 TRANSPOSITION AREA     40.0 SQ MI

  TOTAL RAINFALL =    2.81, TOTAL LOSS =    2.46, TOTAL EXCESS =     .35

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   230.       4.75        (CFS)       46.        12.         4.          2.
                    (INCHES)     .348       .348       .348        .348
                     (AC-FT)      23.        23.        23.         23.

                   CUMULATIVE AREA =    1.23 SQ MI

  ***            ***            ***            ***            ***


                   INTERPOLATED HYDROGRAPH AT      L2D

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
   706.       4.75        (CFS)      136.        34.        11.         5.
                    (INCHES)    1.025      1.025      1.025       1.025
                     (AC-FT)      67.        67.        67.         67.

                   CUMULATIVE AREA =    1.23 SQ MI


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          *            *
331 KK    *     L3RB   *        CNAME  L2D-L3
          *            *
          **************

332 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT        .083  TIME INTERVAL IN HOURS

333 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

  ***            ***            ***            ***            ***

                   HYDROGRAPH AT STATION     L3RB
                 TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
  1503.       5.00        (CFS)      354.        89.        30.        13.
                    (INCHES)    1.287      1.287      1.287       1.287
                     (AC-FT)     176.       176.       176.        176.

                   CUMULATIVE AREA =    2.56 SQ MI

  ***            ***            ***            ***            ***

                   HYDROGRAPH AT STATION     L3RB
                 TRANSPOSITION AREA       .5 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
  1486.       5.00        (CFS)      350.        88.        29.        13.
                    (INCHES)    1.273      1.273      1.273       1.273
                     (AC-FT)     174.       174.       174.        174.

                   CUMULATIVE AREA =    2.56 SQ MI

  ***            ***            ***            ***            ***

                   HYDROGRAPH AT STATION     L3RB
                 TRANSPOSITION AREA      1.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR    166.58-HR
  1280.       5.00        (CFS)      309.        77.        26.        11.
                    (INCHES)    1.124      1.124      1.124       1.124
                     (AC-FT)     153.       153.       153.        153.
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                    CUMULATIVE AREA =    2.56 SQ MI

  ***            ***            ***            ***            ***

                  HYDROGRAPH AT STATION     L3RB
                 TRANSPOSITION AREA      5.0 SQ MI

K FLOW     TIME                          MAXIMUM AVERAGE FLOW
(CFS)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
 881.      5.08       (CFS)     225.         56.         19.          8.
                    (INCHES)    .818        .819        .819         .819
                     (AC-FT)    112.        112.        112.         112.

                    CUMULATIVE AREA =    2.56 SQ MI

  ***            ***            ***            ***            ***

                  HYDROGRAPH AT STATION     L3RB
                 TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW  TIME                          MAXIMUM AVERAGE FLOW
(CFS)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
 733.      5.08       (CFS)     190.         48.         16.          7.
                    (INCHES)    .692        .692        .692         .692
                     (AC-FT)     94.         94.         94.          94.

                    CUMULATIVE AREA =    2.56 SQ MI

  ***            ***            ***            ***            ***

                  HYDROGRAPH AT STATION     L3RB
                 TRANSPOSITION AREA     20.0 SQ MI

PEAK FLOW  TIME                          MAXIMUM AVERAGE FLOW
(CFS)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
 577.      5.08       (CFS)     152.         38.         13.          5.
                    (INCHES)    .552        .552        .552         .552
                     (AC-FT)     75.         75.         75.          75.

                    CUMULATIVE AREA =    2.56 SQ MI

  ***            ***            ***            ***            ***

                  HYDROGRAPH AT STATION     L3RB
                 TRANSPOSITION AREA     30.0 SQ MI

K FLOW     TIME                          MAXIMUM AVERAGE FLOW
(CFS)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
 489.      5.17       (CFS)     130.         33.         11.          5.
                    (INCHES)    .473        .473        .473         .473
                     (AC-FT)     65.         65.         65.          65.

                    CUMULATIVE AREA =    2.56 SQ MI

  ***            ***            ***            ***            ***

                  HYDROGRAPH AT STATION     L3RB
                 TRANSPOSITION AREA     40.0 SQ MI

PEAK FLOW  TIME                          MAXIMUM AVERAGE FLOW
(CFS)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
 411.      5.17       (CFS)     112.         28.          9.          4.
                    (INCHES)    .407        .407        .407         .407
                     (AC-FT)     56.         56.         56.          56.

                    CUMULATIVE AREA =    2.56 SQ MI

  ***            ***            ***            ***            ***


                 INTERPOLATED HYDROGRAPH AT     L3RB

PEAK FLOW  TIME                          MAXIMUM AVERAGE FLOW
(CFS)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
1043.      5.00       (CFS)     260.         65.         22.          9.
                    (INCHES)    .945        .946        .946         .946
                     (AC-FT)    129.        129.        129.         129.

                    CUMULATIVE AREA =    2.56 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
334 KK    *    L2D-L3  *        CNAME    L3RB
          *            *
          **************

335 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
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                QSCAL          0.  HYDROGRAPH PLOT SCALE
                IPNCH          0   PUNCH COMPUTED HYDROGRAPH
                 IOUT         22   SAVE HYDROGRAPH ON THIS UNIT
                 ISAV1         1   FIRST ORDINATE PUNCHED OR SAVED
                 ISAV2      2000   LAST ORDINATE PUNCHED OR SAVED
                TIMINT      .083   TIME INTERVAL IN HOURS


          HYDROGRAPH ROUTING DATA

 RS         STORAGE ROUTING
                 NSTPS         40  NUMBER OF SUBREACHES
                  ITYP       FLOW  TYPE OF INITIAL CONDITION
                RSVRIC        .00  INITIAL CONDITION
                     X        .00 WORKING R AND D COEFFICIENT

 337 RC     NORMAL DEPTH CHANNEL
                   ANL       .050  LEFT OVERBANK N-VALUE
                  ANCH       .040  MAIN CHANNEL N-VALUE
                   ANR       .060  RIGHT OVERBANK N-VALUE
                 RLNTH     27374.  REACH LENGTH
                   SEL      .0077  ENERGY SLOPE
                 ELMAX         .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                        --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
 339 RY     ELEVATION    18.00     11.80     11.70     10.00     10.00     11.70     11.80     18.00
 338 RX     DISTANCE       .00   1093.00   1210.00   1215.00   1225.00   1232.00   1372.00   2000.00

                                                  ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

        STORAGE       .00      3.04      6.86     11.48     16.88     88.20    199.91    342.54    516.10    720.58
        OUTFLOW       .00      8.14     27.48     57.58     99.15    274.49    698.74   1382.13   2356.05   3653.42
      ELEVATION     10.00     10.42     10.84     11.26     11.68     12.11     12.53     12.95     13.37     13.79

        STORAGE    955.98   1222.32   1519.58   1847.76   2206.87   2596.90   3017.86   3469.74   3952.55   4466.29
        OUTFLOW   5306.57   7346.90   9804.77  12709.62  16090.00  19973.70  24387.77  29358.61  34912.05  41073.35
      ELEVATION     14.21     14.63     15.05     15.47     15.89     16.32     16.74     17.16     17.58     18.00


*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN       58. TO    41073.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION   L2D-L3
                   TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
   1046.       7.83       (CFS)     351.         89.         30.          13.
                        (INCHES)   1.277       1.287       1.287        1.287
                         (AC-FT)    174.        176.        176.         176.

PEAK STORAGE   TIME                        MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
      7.       7.83                   2.          1.          0.           0.

 PEAK STAGE    TIME                        MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
   12.74       7.83                11.90       10.51       10.17        10.07

                     CUMULATIVE AREA =    2.56 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION   L2D-L3
                   TRANSPOSITION AREA       .5 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
   1032.       7.83       (CFS)     348.         88.         29.          13.
                        (INCHES)   1.262       1.273       1.273        1.273
                         (AC-FT)    172.        174.        174.         174.

PEAK STORAGE   TIME                        MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
      7.       7.83                   2.          1.          0.           0.

 PEAK STAGE    TIME                        MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                 6-HR       24-HR       72-HR    166.58-HR
   12.73       7.83                11.90       10.51       10.17        10.07

                     CUMULATIVE AREA =    2.56 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION   L2D-L3
                   TRANSPOSITION AREA      1.0 SQ MI

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR    166.58-HR
    866.       7.92       (CFS)     307.         77.         26.          11.
                        (INCHES)   1.113       1.124       1.124        1.124
                         (AC-FT)    152.        153.        153.         153.

PEAK STORAGE   TIME                        MAXIMUM AVERAGE STORAGE
```

(AC-FT)	(HR)	6-HR	24-HR	72-HR	166.58-HR
6.	7.92	2.	1.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.63	7.92	11.85	10.50	10.17	10.07

CUMULATIVE AREA = 2.56 SQ MI

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HYDROGRAPH AT STATION L2D-L3
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
598.	8.42	(CFS)	223.	56.	19.	8.
		(INCHES)	.809	.819	.819	.819
		(AC-FT)	110.	112.	112.	112.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	8.42	2.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.43	8.42	11.72	10.46	10.15	10.07

CUMULATIVE AREA = 2.56 SQ MI

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HYDROGRAPH AT STATION L2D-L3
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
489.	8.58	(CFS)	188.	48.	16.	7.
		(INCHES)	.682	.692	.692	.692
		(AC-FT)	93.	94.	94.	94.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
4.	8.58	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.32	8.58	11.65	10.45	10.15	10.06

CUMULATIVE AREA = 2.56 SQ MI

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HYDROGRAPH AT STATION L2D-L3
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
356.	8.83	(CFS)	150.	38.	13.	5.
		(INCHES)	.543	.552	.552	.552
		(AC-FT)	74.	75.	75.	75.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
3.	8.83	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.19	8.83	11.56	10.42	10.14	10.06

CUMULATIVE AREA = 2.56 SQ MI

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HYDROGRAPH AT STATION L2D-L3
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
286.	9.25	(CFS)	128.	33.	11.	5.
		(INCHES)	.464	.473	.473	.473
		(AC-FT)	63.	65.	65.	65.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	166.58-HR
2.	9.17	1.	0.	0.	0.

K STAGE EET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	166.58-HR
12.12	9.25	11.50	10.40	10.13	10.06

CUMULATIVE AREA = 2.56 SQ MI

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HYDROGRAPH AT STATION L2D-L3
TRANSPOSITION AREA 40.0 SQ MI

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 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    251.       9.75        (CFS)     110.         28.          9.           4.
                         (INCHES)    .399        .407        .407         .407
                          (AC-FT)     54.         56.         56.          56.

PEAK STORAGE   TIME                        MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
      2.       9.75                    1.          0.          0.           0.

PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR       24-HR       72-HR    166.58-HR
   12.05       9.75                 11.43       10.39       10.13        10.06

                        CUMULATIVE AREA =    2.56 SQ MI

     ***            ***            ***            ***            ***


                        INTERPOLATED HYDROGRAPH AT   L2D-L3

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
    653.       8.25        (CFS)     258.         65.         22.           9.
                         (INCHES)    .936        .946        .946         .946
                          (AC-FT)    128.        129.        129.         129.

                        CUMULATIVE AREA =    2.56 SQ MI


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            *            *
340 KK      *        L3  *
            *            *
            **************
                        THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                        L=4.75     Lca=2.00     S=44.27     Kn=0.055     LAG=91.0
                        S-GRAPH TYPE=DES RNGLND

344 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           1  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

345 BA          SUBBASIN CHARACTERISTICS
                      TAREA        5.85  SUBBASIN AREA

346 LG          GREEN AND AMPT LOSS RATE
                      STRTL         .34  STARTING LOSS
                        DTH         .33  MOISTURE DEFICIT
                       PSIF        3.98  WETTING FRONT SUCTION
                      XKSAT         .42  HYDRAULIC CONDUCTIVITY
                      RTIMP        1.05  PERCENT IMPERVIOUS AREA

345 UI          INPUT UNITGRAPH,  67 ORDINATES,  VOLUME = 1.00
                        .0     216.5     216.5     216.5     216.5     547.0     701.8     899.0    1098.3    1266.3
                     1460.0    1557.8    1786.1    1888.6    1950.2    2034.9    2074.9    2074.9    2053.8    1965.5
                     1920.6    1789.2    1583.5    1486.1    1313.6    1207.8    1091.4     994.6     909.2     825.0
                      759.9     664.0     614.5     574.5     483.5     461.5     408.2     402.7     332.0     332.0
                      296.9     229.5     229.5     229.5     197.6     148.2     148.2     148.2     148.2     148.2
                      121.7      52.7      52.7      52.7      52.7      52.7      52.7      52.7      52.7      52.7
                       52.7      52.7      52.7      52.7      52.7      52.7      52.7
                                                                  ***

     ***            ***            ***            ***            ***

                        HYDROGRAPH AT STATION       L3
                      TRANSPOSITION AREA       .0 SQ MI

   TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.82, TOTAL EXCESS =    1.41

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   2872.       5.25        (CFS)     883.        221.         74.          32.
                         (INCHES)   1.403       1.405       1.405        1.405
                          (AC-FT)    438.        439.        439.         439.

                        CUMULATIVE AREA =    5.85 SQ MI

     ***            ***            ***            ***            ***

                        HYDROGRAPH AT STATION       L3
                      TRANSPOSITION AREA       .5 SQ MI

   TOTAL RAINFALL =    3.21, TOTAL LOSS =    1.82, TOTAL EXCESS =    1.39
```

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2841.	5.25	(CFS)	873.	219.	73.	32.
		(INCHES)	1.388	1.390	1.390	1.390
		(AC-FT)	433.	434.	434.	434.

CUMULATIVE AREA = 5.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3
TRANSPOSITION AREA 1.0 SQ MI

TOTAL RAINFALL = 3.19, TOTAL LOSS = 1.93, TOTAL EXCESS = 1.26

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2544.	5.25	(CFS)	790.	198.	66.	28.
		(INCHES)	1.254	1.257	1.257	1.257
		(AC-FT)	392.	392.	392.	392.

CUMULATIVE AREA = 5.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3
TRANSPOSITION AREA 5.0 SQ MI

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.15, TOTAL EXCESS = .95

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1888.	5.25	(CFS)	598.	150.	50.	22.
		(INCHES)	.950	.953	.953	.953
		(AC-FT)	297.	298.	298.	298.

CUMULATIVE AREA = 5.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.04, TOTAL LOSS = 2.20, TOTAL EXCESS = .83

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1639.	5.25	(CFS)	521.	131.	44.	19.
		(INCHES)	.828	.832	.832	.832
		(AC-FT)	259.	260.	260.	260.

CUMULATIVE AREA = 5.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 2.94, TOTAL LOSS = 2.25, TOTAL EXCESS = .69

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1357.	5.33	(CFS)	433.	109.	36.	16.
		(INCHES)	.688	.691	.691	.691
		(AC-FT)	215.	216.	216.	216.

CUMULATIVE AREA = 5.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3
TRANSPOSITION AREA 30.0 SQ MI

TOTAL RAINFALL = 2.87, TOTAL LOSS = 2.27, TOTAL EXCESS = .61

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1190.	5.33	(CFS)	380.	95.	32.	14.
		(INCHES)	.603	.607	.607	.607
		(AC-FT)	188.	189.	189.	189.

CUMULATIVE AREA = 5.85 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L3
TRANSPOSITION AREA 40.0 SQ MI

TOTAL RAINFALL = 2.81, TOTAL LOSS = 2.27, TOTAL EXCESS = .54

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1054.	5.33	(CFS)	336.	85.	28.	12.
		(INCHES)	.534	.537	.537	.537
		(AC-FT)	167.	168.	168.	168.

```
                    CUMULATIVE AREA =    5.85 SQ MI

   ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       L3

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 1832.        5.25        (CFS)     581.        146.         49.          21.
                        (INCHES)    .923        .926        .926         .926
                         (AC-FT)    288.        289.        289.         289.

                    CUMULATIVE AREA =    5.85 SQ MI


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          *            *
354 KK    *        L   *        CNAME      1R
          *            *
          **************

355 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


356 HC          HYDROGRAPH COMBINATION
                      ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                          ***

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        L
                  TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 5242.        6.58        (CFS)    2493.        660.        220.          95.
                        (INCHES)   1.386       1.467       1.467        1.467
                         (AC-FT)   1236.       1309.       1309.        1309.

                    CUMULATIVE AREA =   16.73 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        L
                  TRANSPOSITION AREA       .5 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 5179.        6.58        (CFS)    2467.        653.        218.          94.
                        (INCHES)   1.371       1.452       1.452        1.452
                         (AC-FT)   1223.       1295.       1295.        1295.

                    CUMULATIVE AREA =   16.73 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        L
                  TRANSPOSITION AREA      1.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 4581.        6.67        (CFS)    2234.        593.        198.          85.
                        (INCHES)   1.241       1.319       1.319        1.319
                         (AC-FT)   1108.       1177.       1177.        1177.

                    CUMULATIVE AREA =   16.73 SQ MI

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION        L
                  TRANSPOSITION AREA      5.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
 3410.        6.75        (CFS)    1724.        462.        154.          67.
                        (INCHES)    .958       1.027       1.027        1.027
                         (AC-FT)    855.        917.        917.         917.

                    CUMULATIVE AREA =   16.73 SQ MI

   ***            ***            ***            ***            ***
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HYDROGRAPH AT STATION L
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2919.	6.92	(CFS)	1517.	408.	136.	59.
		(INCHES)	.843	.907	.907	.907
		(AC-FT)	752.	809.	809.	809.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2428.	7.00	(CFS)	1279.	345.	115.	50.
		(INCHES)	.711	.767	.767	.767
		(AC-FT)	634.	684.	684.	684.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2134.	7.00	(CFS)	1137.	308.	103.	44.
		(INCHES)	.632	.684	.684	.684
		(AC-FT)	564.	610.	610.	610.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION L
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1887.	7.08	(CFS)	1019.	277.	92.	40.
		(INCHES)	.567	.615	.615	.615
		(AC-FT)	505.	549.	549.	549.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT L

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2552.	6.92	(CFS)	1340.	361.	120.	52.
		(INCHES)	.745	.803	.803	.803
		(AC-FT)	664.	717.	717.	717.

CUMULATIVE AREA = 16.73 SQ MI

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            *            *
357 KK      *        1R  *        CNAME       L
            *            *
            **************
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358 KO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	2000	LAST ORDINATE PUNCHED OR SAVED
TIMINT	.083	TIME INTERVAL IN HOURS

HYDROGRAPH ROUTING DATA

RN NO ROUTING

***

*** *** *** *** ***

HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
5242.	6.58	(CFS)	2493.	660.	220.	95.
		(INCHES)	1.386	1.467	1.467	1.467
		(AC-FT)	1236.	1309.	1309.	1309.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA .5 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
5179.	6.58	(CFS)	2467.	653.	218.	94.
		(INCHES)	1.371	1.452	1.452	1.452
		(AC-FT)	1223.	1295.	1295.	1295.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA 1.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
4581.	6.67	(CFS)	2234.	593.	198.	85.
		(INCHES)	1.241	1.319	1.319	1.319
		(AC-FT)	1108.	1177.	1177.	1177.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA 5.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
3410.	6.75	(CFS)	1724.	462.	154.	67.
		(INCHES)	.958	1.027	1.027	1.027
		(AC-FT)	855.	917.	917.	917.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2919.	6.92	(CFS)	1517.	408.	136.	59.
		(INCHES)	.843	.907	.907	.907
		(AC-FT)	752.	809.	809.	809.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2428.	7.00	(CFS)	1279.	345.	115.	50.
		(INCHES)	.711	.767	.767	.767
		(AC-FT)	634.	684.	684.	684.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
2134.	7.00	(CFS)	1137.	308.	103.	44.
		(INCHES)	.632	.684	.684	.684
		(AC-FT)	564.	610.	610.	610.

CUMULATIVE AREA = 16.73 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 1R
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
1887.	7.08	(CFS)	1019.	277.	92.	40.
		(INCHES)	.567	.615	.615	.615

```
                    (AC-FT)      505.        549.        549.        549.

                    CUMULATIVE AREA =   16.73 SQ MI

    ***            ***            ***            ***            ***


                    INTERPOLATED HYDROGRAPH AT       1R

 K FLOW     TIME                          MAXIMUM AVERAGE FLOW
(CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
 2552.      6.92        (CFS)     1340.       361.        120.         52.
                     (INCHES)      .745       .803        .803        .803
                      (AC-FT)      664.        717.        717.        717.

                    CUMULATIVE AREA =   16.73 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
360 KK    *        Z1  *
          *            *
          **************
                    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                    L=1.70     Lca=0.66     S=47.00     Kn=0.055     LAG=39.1
                    S-GRAPH TYPE=DES RNGLND

364 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                     IPNCH          1  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2       2000  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       .083  TIME INTERVAL IN HOURS


             SUBBASIN RUNOFF DATA

365 BA          SUBBASIN CHARACTERISTICS
                     TAREA        .66  SUBBASIN AREA

366 LG          GREEN AND AMPT LOSS RATE
                     STRTL        .32  STARTING LOSS
                       DTH        .29  MOISTURE DEFICIT
                      PSIF       4.00  WETTING FRONT SUCTION
                     XKSAT        .43  HYDRAULIC CONDUCTIVITY
                     RTIMP       2.91  PERCENT IMPERVIOUS AREA

365 UI          INPUT UNITGRAPH,  29 ORDINATES,  VOLUME = 1.00
                       .0      57.4      79.5     205.3     321.8     424.0     504.1     545.2     541.0     493.7
                   399.5     319.2     256.3     205.1     164.9     127.7     104.6      87.9      60.8      54.1
                    39.3      39.3      21.8      14.0      14.0      14.0      14.0      14.0      14.0
                                                                      ***

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       Z1
                   TRANSPOSITION AREA       .0 SQ MI

  TOTAL RAINFALL =    3.23, TOTAL LOSS =    1.75, TOTAL EXCESS =    1.48

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
  741.        4.50        (CFS)     105.         26.          9.           4.
                     (INCHES)     1.475       1.476       1.476        1.476
                      (AC-FT)      52.         52.         52.          52.

                    CUMULATIVE AREA =     .66 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       Z1
                   TRANSPOSITION AREA       .5 SQ MI

  TOTAL RAINFALL =    3.21, TOTAL LOSS =    1.75, TOTAL EXCESS =    1.46

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
 (CFS)        (HR)                  6-HR       24-HR       72-HR    166.58-HR
  734.        4.50        (CFS)     104.         26.          9.           4.
                     (INCHES)     1.459       1.460       1.460        1.460
                      (AC-FT)      52.         52.         52.          52.

                    CUMULATIVE AREA =     .66 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION       Z1
                   TRANSPOSITION AREA      1.0 SQ MI

  TOTAL RAINFALL =    3.19, TOTAL LOSS =    1.86, TOTAL EXCESS =    1.33
```

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
636.	4.50	(CFS)	95.	24.	8.	3.
		(INCHES)	1.327	1.328	1.328	1.328
		(AC-FT)	47.	47.	47.	47.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Z1
TRANSPOSITION AREA 5.0 SQ MI

TOTAL RAINFALL = 3.10, TOTAL LOSS = 2.07, TOTAL EXCESS = 1.03

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
442.	4.50	(CFS)	73.	18.	6.	3.
		(INCHES)	1.027	1.028	1.028	1.028
		(AC-FT)	36.	36.	36.	36.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Z1
TRANSPOSITION AREA 10.0 SQ MI

TOTAL RAINFALL = 3.04, TOTAL LOSS = 2.13, TOTAL EXCESS = .91

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
383.	4.50	(CFS)	65.	16.	5.	2.
		(INCHES)	.906	.907	.907	.907
		(AC-FT)	32.	32.	32.	32.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Z1
TRANSPOSITION AREA 20.0 SQ MI

TOTAL RAINFALL = 2.94, TOTAL LOSS = 2.17, TOTAL EXCESS = .77

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
319.	4.50	(CFS)	55.	14.	5.	2.
		(INCHES)	.765	.766	.766	.766
		(AC-FT)	27.	27.	27.	27.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Z1
TRANSPOSITION AREA 30.0 SQ MI

TOTAL RAINFALL = 2.87, TOTAL LOSS = 2.19, TOTAL EXCESS = .68

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
283.	4.50	(CFS)	49.	12.	4.	2.
		(INCHES)	.680	.681	.681	.681
		(AC-FT)	24.	24.	24.	24.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION Z1
TRANSPOSITION AREA 40.0 SQ MI

TOTAL RAINFALL = 2.81, TOTAL LOSS = 2.20, TOTAL EXCESS = .61

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
253.	4.58	(CFS)	43.	11.	4.	2.
		(INCHES)	.608	.610	.610	.610
		(AC-FT)	22.	22.	22.	22.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT Z1

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
694.	4.50	(CFS)	100.	25.	8.	4.
		(INCHES)	1.405	1.406	1.406	1.406
		(AC-FT)	50.	50.	50.	50.

CUMULATIVE AREA = .66 SQ MI

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            *            *
370 KK      *        4R  *        CNAME       Z
            *            *
            **************

371 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        2000  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

372 RN          NO ROUTING

                                                                  ***

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       4R
                      TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   741.       4.50        (CFS)      105.        26.          9.           4.
                        (INCHES)    1.475       1.476       1.476        1.476
                         (AC-FT)       52.        52.         52.          52.

                       CUMULATIVE AREA =     .66 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       4R
                      TRANSPOSITION AREA       .5 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   734.       4.50        (CFS)      104.        26.          9.           4.
                        (INCHES)    1.459       1.460       1.460        1.460
                         (AC-FT)       52.        52.         52.          52.

                       CUMULATIVE AREA =     .66 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       4R
                      TRANSPOSITION AREA      1.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   636.       4.50        (CFS)       95.         8.          8.           3.
                        (INCHES)    1.327       1.328       1.328        1.328
                         (AC-FT)       47.        47.         47.          47.

                       CUMULATIVE AREA =     .66 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       4R
                      TRANSPOSITION AREA      5.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   442.       4.50        (CFS)       73.        18.          6.           3.
                        (INCHES)    1.027       1.028       1.028        1.028
                         (AC-FT)       36.        36.         36.          36.

                       CUMULATIVE AREA =     .66 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       4R
                      TRANSPOSITION AREA     10.0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR    166.58-HR
   383.       4.50        (CFS)       65.        16.          5.           2.
                        (INCHES)     .906       .907        .907         .907
                         (AC-FT)       32.        32.         32.          32.

                       CUMULATIVE AREA =     .66 SQ MI

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       4R
```

TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
319.	4.50	(CFS)	55.	14.	5.	2.
		(INCHES)	.765	.766	.766	.766
		(AC-FT)	27.	27.	27.	27.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 4R
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
283.	4.50	(CFS)	49.	12.	4.	2.
		(INCHES)	.680	.681	.681	.681
		(AC-FT)	24.	24.	24.	24.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION 4R
TRANSPOSITION AREA 40.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
253.	4.58	(CFS)	43.	11.	4.	2.
		(INCHES)	.608	.610	.610	.610
		(AC-FT)	22.	22.	22.	22.

CUMULATIVE AREA = .66 SQ MI

*** *** *** *** ***

INTERPOLATED HYDROGRAPH AT 4R

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	166.58-HR
694.	4.50	(CFS)	100.	25.	8.	4.
		(INCHES)	1.405	1.406	1.406	1.406
		(AC-FT)	50.	50.	50.	50.

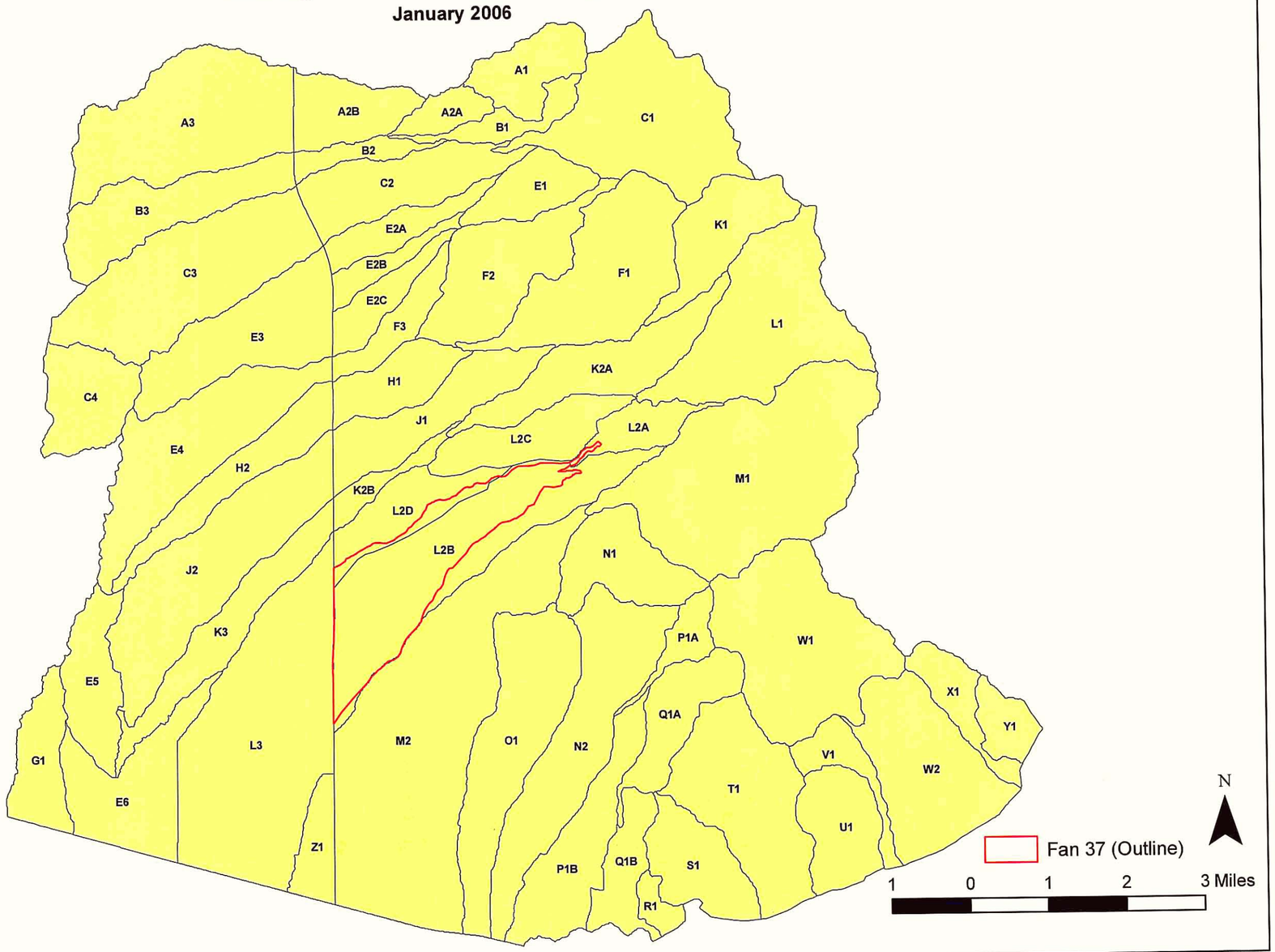
CUMULATIVE AREA = .66 SQ MI

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	R1	506.	4.25	47.	12.	4.	.28		
ROUTED TO	13R	506.	4.25	47.	12.	4.	.28		
HYDROGRAPH AT	M1	2809.	4.83	790.	203.	68.	5.69		
ROUTED TO	M1-M2	2265.	6.75	784.	203.	68.	5.69		
HYDROGRAPH AT	M2	1849.	5.42	633.	159.	53.	7.44		
2 COMBINED AT	M	2555.	6.58	1219.	318.	106.	13.12		
ROUTED TO	5R	2555.	6.58	1219.	318.	106.	13.12		
HYDROGRAPH AT	N1	1253.	4.50	210.	53.	18.	1.52		
ROUTED TO	N1-N2	840.	6.17	209.	53.	18.	1.52		
HYDROGRAPH AT	N2	1193.	5.17	366.	93.	31.	3.33		
2 COMBINED AT	N	1201.	6.00	515.	131.	44.	4.85		
ROUTED TO	8R	1201.	6.00	515.	131.	44.	4.85		
HYDROGRAPH AT	P1A	575.	4.42	89.	22.	7.	.50		
ROUTED TO	P1A-1B	379.	5.83	88.	22.	7.	.50		
HYDROGRAPH AT	P1B	852.	5.08	244.	62.	21.	1.94		
2 COMBINED AT	P	874.	5.17	309.	79.	26.	2.44		
ROUTED TO	12R	874.	5.17	309.	79.	26.	2.44		
HYDROGRAPH AT	O1	1057.	5.33	343.	88.	29.	3.09		
ROUTED TO	7R	1057.	5.33	343.	88.	29.	3.09		
HYDROGRAPH AT	Q1A	990.	4.58	193.	49.	16.	1.30		
ROUTED TO	Q1A-1B	843.	5.17	193.	49.	16.	1.30		
HYDROGRAPH AT	Q1B	851.	4.50	155.	39.	13.	.94		
2 COMBINED AT	Q	1105.	5.08	318.	81.	27.	2.23		
ROUTED TO	14R	1105.	5.08	318.	81.	27.	2.23		
HYDROGRAPH AT	L1	2128.	4.75	543.	139.	46.	3.55		
ROUTED TO	L1-L2A	2066.	4.92	543.	139.	46.	3.55		
HYDROGRAPH AT	L2A	692.	4.58	113.	28.	9.	.69		
2 COMBINED AT	L2BR	2391.	4.92	623.	159.	53.	4.24		
ROUTED TO	L2A-2B	2167.	5.50	621.	159.	53.	4.24		
HYDROGRAPH AT	L2B	1532.	5.08	418.	104.	35.	4.08		
2 COMBINED AT	L3R	3064.	5.42	929.	236.	79.	8.32		
ROUTED TO	L2B-L3	2551.	6.92	918.	236.	79.	8.32		
HYDROGRAPH AT	L2C	754.	4.83	161.	40.	13.	1.33		
ROUTED TO	L2C-2D	712.	5.25	161.	40.	13.	1.33		
HYDROGRAPH AT	L2D	706.	4.75	136.	34.	11.	1.23		
2 COMBINED AT	L3RB	1043.	5.00	260.	65.	22.	2.56		
ROUTED TO	L2D-L3	653.	8.25	258.	65.	22.	2.56		
HYDROGRAPH AT	L3	1832.	5.25	581.	146.	49.	5.85		
3 COMBINED AT	L	2552.	6.92	1340.	361.	120.	16.73		
ROUTED TO	1R	2552.	6.92	1340.	361.	120.	16.73		
HYDROGRAPH AT	Z1	694.	4.50	100.	25.	8.	.66		
ROUTED TO	4R	694.	4.50	100.	25.	8.	.66		

*** NORMAL END OF HEC-1 ***

Buckeye/Sun Valley Area
Drainage Master Study - Drainage Basins
January 2006



N:\720001\hydro\ArcMap\GIS_projects\comment_response\Fan37_A\A_Appendix_D.mxd (10/12/06)

APPENDIX E

Hydraulic Analysis Supporting Documentation

Manning's n-Value Determination for Reach Upstream of Site 37 Hydrographic Apex

Location of cross section: at hydrographic apex

Description of channel: Bed material is mostly sand and gravel with some cobbles. The channel banks consist of dense brush and trees. Many of the trees and bushes are taller than the base flood elevation. The bed is relatively flat and unobstructed along straight segments of the channel. However, in places where bends occur the channel experiences typical islands of deposition and subsequent vegetative growth creating obstruction areas.

Subdivision of typical cross section and evaluation of Manning's n-Value: The cross section shows no major breaks and is consistent enough that no sub-division for different n-values is required. Also, large changes in vegetation are not evident enough to require sub-divisions either.

Components and weighted values of Manning's n-values
(Refer to Table 1 and Table 2 copied from Thomsen and Hjalmarson, 1991 provided in this Appendix)

100-Year Flood			
Portion of area or wetted perimeter of subsection from left end	Components	Manning's n Adjustments	
	n_b = base value of n for a straight uniform channel	0.028	
	n_1 = value for surface irregularities	0.01	
	n_2 = value for obstruction	--	
	n_3 = value for vegetation	0.045	
0.15	n =	0.083	0.012
	n_b = base value of n for a straight uniform channel	0.028	
	n_1 = value for surface irregularities	--	
	n_2 = value for obstruction	--	
	n_3 = value for vegetation	0.025	
0.45	n =	0.053	0.024
	n_b = base value of n for a straight uniform channel	0.028	
	n_1 = value for surface irregularities	0.03	
	n_2 = value for obstruction	--	
	n_3 = value for vegetation	0.035	
0.15	n =	0.093	0.014
	n_b = base value of n for a straight uniform channel	0.028	
	n_1 = value for surface irregularities	--	
	n_2 = value for obstruction	--	
	n_3 = value for vegetation	0.015	
0.10	n =	0.043	0.004
	n_b = base value of n for a straight uniform channel	0.028	
	n_1 = value for surface irregularities	0.01	
	n_2 = value for obstruction	--	
	n_3 = value for vegetation	0.045	
0.15	n =	0.083	0.012
1.00			0.066

Table 1.--*Base values of Manning's n for stable channels*

[Modified from Aldridge and Garrett, 1973, table 1]

Channel material	Size of bed material		Base *n* values	
	Millimeters	Inches	Benson and Dalrymple (1967)[1]	Chow (1959)[2]
Concrete.....	-------	--------	0.012-0.018	0.011
Rock cut.....	-------	--------	----------	.025
Firm soil.....	-------	--------	.025- .032	.020
Coarse sand.....	1-2	--------	.026- .035	-----
Fine gravel.....	-------	--------	----------	.024
Gravel.....	2-64	0.08-2.5	.028- .035	-----
Coarse gravel.....	-------	--------	----------	.028
Cobble.....	64-256	2.5-10.0	.030- .050	-----
Boulder.....	>256	>10.0	.040- .070	-----

[1]Straight uniform channel.
[2]Smoothest channel attainable in indicated material.

Table 2.--*Adjustment factors for the determination of overall Manning's n values*--Continued

Channel conditions	Manning's n adjustment[1]	Example
Vegetation—Continued:		
Very large	.050- .100	Turf grass or weeds where the average depth of flow is less than half the height of vegetation; small bushy trees intergrown with weeds along side slopes of dense cattails growing along channel bottom; trees intergrown with weeds and brush.
Variations in channel cross section:		
Gradual	.000	Size and shape of cross sections change gradually.
Alternating	.001- .005	Large and small cross sections alternate occasionally, or the main flow occasionally shifts from side to side owing to changes in cross-sectional shape.
Alternating	.010- .015	Large and small cross sections alternate frequently, or the main flow frequently shifts from side to side owing to changes in cross-sectional shape.
Degree of meadering[3]:		
Minor	1.00	Ratio of the meander length to the straight length of the channel reach is 1.0 to 1.2.
Appreciable	1.15	Ratio of the meader length to the straight length of channel is 1.2 to 1.5.
Severe	1.30	Ratio of the meander length to the straight length of channel is greater than 1.5.

[1]Adjustments for degree of irregularity, variations in cross section, effect of obstructions, and vegetation are added to the base n value (table 1) before multiplying by the adjustment for meander.

[2]*Conditions considered in other steps must not be reevaluated or duplicated in this section.*

[3]Adjustment values apply to flow confined in the channel and do not apply where downvalley flow crosses meanders. The adjustment is a multiplier.

For floodflows in sand channels with moveable beds, roughness mainly is a function of the size of the bed material as shown in the following table (Benson and Dalrymple, 1967, p. 22).

Median grain size, in millimeters	Manning's *n*	Median grain size, in millimeters	Manning's *n*
0.2	0.012	0.6	.023
.3	.017	.8	.025
.4	.020	1.0	.026
.5	.022		

Table 2.--*Adjustment factors for the determination of overall Manning's n values*

[Modified from Chow, 1959]

Channel conditions	Manning's n adjustment[1]	Example
Degree of irregularity:		
Smooth	0.000	Smoothest channel attainable in given bed material.
Minor	.001- .005	Channels with slightly eroded or scoured side slopes.
Moderate	.006- .010	Channels with moderately sloughed or eroded side slopes.
Severe	.011- .020	Channels with badly sloughed banks; unshaped, jagged, and irregular surfaces of channels in rock.
Effects of obstruction[2]:		
Negligible	.000- .004	A few scattered obstructions, which include debris deposits, stumps, exposed roots, logs, piers, or isolated boulders, that occupy less than 5 percent of the cross-sectional area.
Minor	.005- .015	Obstructions occupy 5 to 15 percent of the cross-sectional area and the spacing between obstructions is such that the sphere of influence around one obstruction does not extend to the sphere of influence around another obstruction. Smaller adjustments are used for curved smooth-surfaced objects than are used for sharp-edged angular objects.
Appreciable	.020- .030	Obstructions occupy from 15 to 50 percent of the cross-sectional area or the space between obstructions is small enough to cause the effects of several obstructions to be additive, thereby blocking an equivalent part of a cross section.
Severe	.040- .060	Obstructions occupy more than 50 percent of the cross-sectional area or the space between obstructions is small enough to cause turbulence across most of the cross section.
Vegetation:		
Small	.002- .010	Dense growths of flexible turf grass, such as Bermuda, or weeds where the average depth of flow is at least two times the height of the vegetation; supple tree seedlings such as willow, cottonwood, arrow weed, or saltcedar where the average depth of flow is at least three times the height of the vegetation.
Medium	.010- .025	Grass or weeds where the average depth of flow is from one to two times the height of the vegetation; moderately dense stemmy grass, weeds, or tree seedlings where the average depth of flow is from two to three times the height of the vegetation; moderately dense brush, similar to 1- to 2-year-old saltcedar in the dormant season, along the banks and no significant vegetation along the channel bottoms where the hydraulic radius exceeds 2 feet.
Large	.025- .050	Turf grass or weeds where the average depth to flow is about equal to the height of vegetation; small trees intergrown with some weeds and brush where the hydraulic radius exceeds 2 feet.

See footnotes at end of table.

Photo1: Upstream Example of Unstable Area Near Site 37 Hydrographic Apex

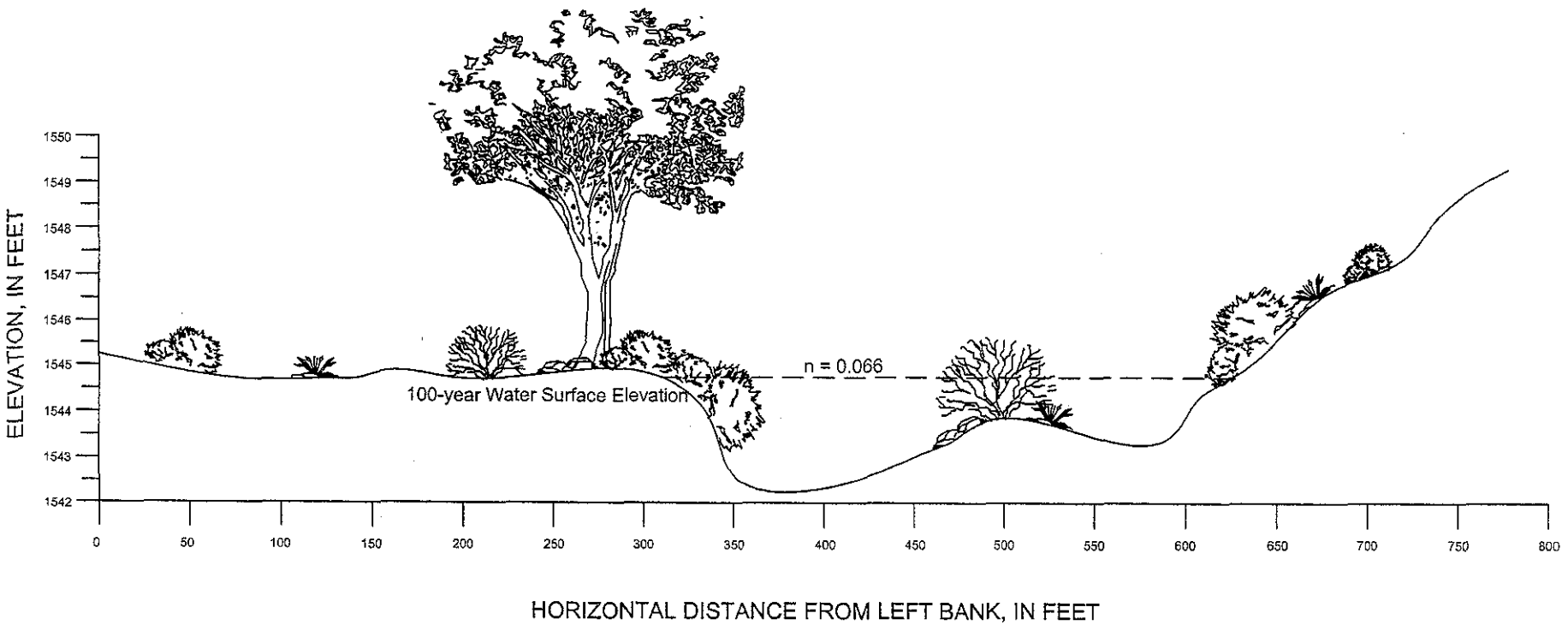
Photo2: Downstream Example of Unstable Area Near Site 37 Hydrographic Apex

Photo3: Upstream Example of Unstable Area Near Site 37 Hydrographic Apex

Photo2: Downstream Example of Unstable Area Near Site 37 Hydrographic Apex

Photo5: Downstream Example of Unstable Area Near Site 37 Hydrographic Apex

Photo6: Upstream Example of Unstable Area Near Site 37 Hydrographic Apex



Cross Section of Fan 37 Above Hydrographic Apex

N:\720001\hydro\ArcMap\GIS_projects\CAD_drawing\drawing1.dwg

Hydraulic Modeling Analysis Output
(HEC-RAS Version 3.1)

- HEC-RAS Report
- Results Table
- Cross-Section
- Profile

CVL

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

****

PROJECT DATA
Project Title: zoneA
Project File : zoneA.prj
Run Date and Time: 10/10/2006 3:30:03 PM

Project in English units

****

PLAN DATA

Plan Title: Plan 03
Plan File :
n:\720001\hydro\ArcMap\GIS_projects\Digital_Data\Digital_data_Oct12_2006\HecRAS\zone
A.p03

Geometry Title: apex
Geometry File :
n:\720001\hydro\ArcMap\GIS_projects\Digital_Data\Digital_data_Oct12_2006\HecRAS\zone
A.g02

Flow Title : apex_2
Flow File :
n:\720001\hydro\ArcMap\GIS_projects\Digital_Data\Digital_data_Oct12_2006\HecRAS\zone
A.f03

Plan Summary Information:

Number of:	Cross Sections	= 6	Mulitple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

```
*****************************************************************************

FLOW DATA

Flow Title: apex_2
Flow File :
n:\720001\hydro\ArcMap\GIS_projects\Digital_Data\Digital_data_Oct12_2006\HecRAS\zone
A.f03

Flow Data (cfs)
*************************************************************
* River           Reach           RS      *           PF 1 *
* 37_apex         37_apex         2780.806*           2520 *
*************************************************************

Boundary Conditions
*******************************************************************************
********************
* River           Reach           Profile         *           Upstream
    Downstream    *
*******************************************************************************
********************
* 37_apex         37_apex         PF 1            *             Critical
Normal S = 0.0126 *
*******************************************************************************
********************

*****************************************************************************

GEOMETRY DATA

Geometry Title: apex
Geometry File :
n:\720001\hydro\ArcMap\GIS_projects\Digital_Data\Digital_data_Oct12_2006\HecRAS\zone
A.g02

CROSS SECTION


RIVER: 37_apex
REACH: 37_apex            RS: 2780.806

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
       0 1602.68   29.19    1600   31.69    1600   37.84 1597.55   59.38    1590
   65.28 1589.46   81.78 1587.76   82.67 1587.77  223.02 1584.96  280.04 1587.91
   286.7 1588.13  298.16 1588.33  305.45 1588.29  322.58    1590  329.42    1590
  418.34  1592.6  420.05 1592.63  427.51 1592.84  434.72  1592.9  451.16 1593.45
  494.84 1593.94

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .066   59.38    .066  322.58    .066

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         59.38  322.58           519.32  519.32  519.32             .1       .3
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1589.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.066	
W.S. Elev (ft)	1589.33	Reach Len. (ft)	519.32	519.32	519.32
Crit W.S. (ft)	1588.12	Flow Area (sq ft)		629.26	
E.G. Slope (ft/ft)	0.009222	Area (sq ft)		629.26	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	249.37	Top Width (ft)		249.37	
Vel Total (ft/s)	4.00	Avg. Vel. (ft/s)		4.00	
Max Chl Dpth (ft)	4.37	Hydr. Depth (ft)		2.52	
Conv. Total (cfs)	26241.7	Conv. (cfs)		26241.7	
Length Wtd. (ft)	519.32	Wetted Per. (ft)		249.61	
Min Ch El (ft)	1584.96	Shear (lb/sq ft)		1.45	
Alpha	1.00	Stream Power (lb/ft s)		5.81	
Frctn Loss (ft)	9.75	Cum Volume (acre-ft)	0.00	31.63	
C & E Loss (ft)	0.05	Cum SA (acres)	0.14	14.48	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 37_apex
REACH: 37_apex RS: 2261.484

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1587.89	10.92	1583.85	19.1	1581.34	24.05	1580	82.72	1577.92
85.78	1577.83	122.78	1576.43	131.97	1576.25	287.46	1578.63	297.18	1580
353.72	1584.58	357.05	1584.68	363.54	1584.78	401.93	1587.57	416.54	1588.11
433.43	1588.07	446.49	1587.92	454.66	1588.23	459.12	1588.35	476.4	1588.52

```
Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .066   24.05    .066  297.18    .066

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         24.05  297.18               65      65      65            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
***********
* E.G. Elev (ft)          * 1579.78  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.77  * Wt. n-Val.              *          *   0.066  *
         *
* W.S. Elev (ft)          * 1579.00  * Reach Len. (ft)         *   65.00  *   65.00  *
  65.00  *
* Crit W.S. (ft)          * 1579.00  * Flow Area (sq ft)       *          *  357.19  *
         *
* E.G. Slope (ft/ft)      *0.057154  * Area (sq ft)            *          *  357.19  *
         *
* Q Total (cfs)           * 2520.00  * Flow (cfs)              *          * 2520.00  *
         *
* Top Width (ft)          *  237.92  * Top Width (ft)          *          *  237.92  *
         *
* Vel Total (ft/s)        *    7.06  * Avg. Vel. (ft/s)        *          *    7.06  *
         *
* Max Chl Dpth (ft)       *    2.75  * Hydr. Depth (ft)        *          *    1.50  *
         *
* Conv. Total (cfs)       * 10540.9  * Conv. (cfs)             *          * 10540.9  *
         *
* Length Wtd. (ft)        *   65.00  * Wetted Per. (ft)        *          *  238.01  *
         *
* Min Ch El (ft)          * 1576.25  * Shear (lb/sq ft)        *          *    5.35  *
         *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   37.78  *
         *
* Frctn Loss (ft)         *    1.81  * Cum Volume (acre-ft)    *    0.00  *   25.75  *
         *
* C & E Loss (ft)         *    0.10  * Cum SA (acres)          *    0.14  *   11.57  *
         *
*****************************************************************************************
***********

Warning: The energy equation could not be balanced within the specified number of
iterations.  The
         program used critical depth for the water surface and continued on with the
calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance)
is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross
sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and
previous cross section.
         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set
equal to critical
         depth, the calculated water surface came back below critical depth.  This
indicates that there is
         not a valid subcritical answer.  The program defaulted to critical depth.
```

CROSS SECTION

```
RIVER: 37_apex
REACH: 37_apex            RS: 2196.482

INPUT
Description:
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
       0 1582.92   42.61 1583.29   51.87 1584.96   52.46 1584.88   54.41 1585.17
   70.15 1586.69    79.8 1587.45   84.62 1587.77  111.09  1582.5  116.68    1580
  140.48 1578.91  201.52 1576.16   207.8 1575.93  231.98 1574.96  266.71 1573.74
  275.75  1573.5  292.11 1572.89  310.15 1572.54   373.9 1573.58  395.45 1576.63
  413.01    1580  418.86    1580  475.57 1584.13     508 1585.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .066  116.68    .066  413.01    .066

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        116.68  413.01            529.52  529.52  529.52             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************
***********
* E.G. Elev (ft)         * 1576.82  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)          *    0.42  * Wt. n-Val.              *          *   0.066  *
         *
* W.S. Elev (ft)         * 1576.40  * Reach Len. (ft)         *  529.52  *  529.52  *
 529.52  *
* Crit W.S. (ft)         * 1575.52  * Flow Area (sq ft)       *          *  481.84  *
         *
* E.G. Slope (ft/ft)     *0.016469  * Area (sq ft)            *          *  481.84  *
         *
* Q Total (cfs)          * 2520.00  * Flow (cfs)              *          * 2520.00  *
         *
* Top Width (ft)         *  197.57  * Top Width (ft)          *          *  197.57  *
         *
* Vel Total (ft/s)       *    5.23  * Avg. Vel. (ft/s)        *          *    5.23  *
         *
* Max Chl Dpth (ft)      *    3.86  * Hydr. Depth (ft)        *          *    2.44  *
         *
* Conv. Total (cfs)      * 19636.4  * Conv. (cfs)             *          * 19636.4  *
         *
* Length Wtd. (ft)       *  529.52  * Wetted Per. (ft)        *          *  197.85  *
         *
* Min Ch El (ft)         * 1572.54  * Shear (lb/sq ft)        *          *    2.50  *
         *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *   13.10  *
         *
* Frctn Loss (ft)        *    8.01  * Cum Volume (acre-ft)    *    0.00  *   25.13  *
         *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)          *    0.14  *   11.25  *
         *
*****************************************************************************
***********

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and
previous cross section.
         This may indicate the need for additional cross sections.
```

CROSS SECTION

RIVER: 37_apex
REACH: 37_apex RS: 1666.96

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1573.57	165.96	1570.82	169.39	1570.85	187.17	1570	217.49	1570
241.84	1570	258.58	1570	261.76	1570	278.28	1570	285.34	1570
298.07	1569.19	298.74	1569.19	303.38	1569.09	305.51	1569.14	309.42	1569.15
320.17	1568.88	325.93	1568.68	393.57	1566.32	418.93	1565.43	454.89	1564.44
461.15	1564.24	574	1567.92	580.12	1568.9				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.066	309.42	.066	580.12	.066

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
309.42	580.12	913.18	913.18	913.18	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1568.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.066	
W.S. Elev (ft)	1568.45	Reach Len. (ft)	913.18	913.18	913.18
Crit W.S. (ft)		Flow Area (sq ft)		551.69	
E.G. Slope (ft/ft)	0.013953	Area (sq ft)		551.69	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	244.92	Top Width (ft)		244.92	
Vel Total (ft/s)	4.57	Avg. Vel. (ft/s)		4.57	
Max Chl Dpth (ft)	4.21	Hydr. Depth (ft)		2.25	
Conv. Total (cfs)	21333.5	Conv. (cfs)		21333.5	
Length Wtd. (ft)	913.18	Wetted Per. (ft)		245.09	
Min Ch El (ft)	1564.24	Shear (lb/sq ft)		1.96	
Alpha	1.00	Stream Power (lb/ft s)		8.96	
Frctn Loss (ft)	14.11	Cum Volume (acre-ft)	0.00	18.84	
C & E Loss (ft)	0.01	Cum SA (acres)	0.14	8.56	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 37_apex
REACH: 37_apex RS: 753.7803

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1559.7	67.85	1558.77	75.62	1558.37	77.41	1558.28	94.28	1557.38
138.76	1556.08	148.57	1555.43	212.49	1556.21	217.38	1555.01	219.87	1555.38
224.86	1554.22	226.91	1554.14	228.38	1554.11	235.96	1551.96	241.29	1552.45
343.57	1551.21	362.75	1550.26	364.13	1550.17	367.12	1550.1	367.76	1550.13
368.33	1550.17	370.95	1550.21	372.46	1550.34	373.68	1550.41	430.82	1554.42
452.07	1555.69	461.66	1555.79	466.18	1556.08	470.35	1556.02	480.21	1556.73
488.12	1557.21	498.69	1557.72	503.1	1557.62	507.14	1557.84	516.09	1558.18
520.21	1558.31	524.8	1558.19	607.25	1557.18				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.066	219.87	.066	452.07	.066

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
219.87	452.07	617.78	617.78	617.78	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1554.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.		0.066	
W.S. Elev (ft)	1554.23	Reach Len. (ft)	617.78	617.78	617.78
Crit W.S. (ft)	1553.45	Flow Area (sq ft)		481.28	
E.G. Slope (ft/ft)	0.017206	Area (sq ft)		481.28	
Q Total (cfs)	2520.00	Flow (cfs)		2520.00	
Top Width (ft)	203.36	Top Width (ft)		203.36	
Vel Total (ft/s)	5.24	Avg. Vel. (ft/s)		5.24	
Max Chl Dpth (ft)	4.13	Hydr. Depth (ft)		2.37	
Conv. Total (cfs)	19211.2	Conv. (cfs)		19211.2	
Length Wtd. (ft)	617.78	Wetted Per. (ft)		203.86	
Min Ch El (ft)	1550.10	Shear (lb/sq ft)		2.54	
Alpha	1.00	Stream Power (lb/ft s)		13.28	
Frctn Loss (ft)	9.04	Cum Volume (acre-ft)	0.00	8.02	
C & E Loss (ft)	0.06	Cum SA (acres)	0.14	3.86	

****
****

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 37_apex
REACH: 37_apex RS: 136.0019

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3.14	1545.7	18.86	1545.55	42.44	1545.52	83.3	1545.48	110.02	1545.48
132.02	1545.37	160.31	1545.3	187.03	1545.44	303.34	1545.34	326.74	1543.87
337	1543.33	349.45	1542.59	396.34	1542.3	465.76	1543.28	471.03	1543.33
480.51	1543.64	595.18	1543.38	608.3	1544.3	612.83	1544.52	618.28	1544.69
621.23	1544.81	626.77	1544.93	659.5	1545.67	679.43	1546.64	721.73	1547.53
734.48	1548.09	779.48	1549.08						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3.14	.066	303.34	.066	659.5	.066

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
303.34	659.5	136	136	136	.1	.3

CROSS SECTION OUTPUT Profile #PF 1
****
****

E.G. Elev (ft)	1545.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.066	0.066	
W.S. Elev (ft)	1545.33	Reach Len. (ft)			
Crit W.S. (ft)	1544.50	Flow Area (sq ft)	0.33	649.30	
E.G. Slope (ft/ft)	0.012606	Area (sq ft)	0.33	649.30	
Q Total (cfs)	2520.00	Flow (cfs)	0.05	2519.95	
Top Width (ft)	361.01	Top Width (ft)	19.84	341.16	
Vel Total (ft/s)	3.88	Avg. Vel. (ft/s)	0.16	3.88	
Max Chl Dpth (ft)	3.03	Hydr. Depth (ft)	0.02	1.90	
Conv. Total (cfs)	22444.3	Conv. (cfs)	0.5	22443.8	
Length Wtd. (ft)		Wetted Per. (ft)	19.84	341.31	
Min Ch El (ft)	1542.30	Shear (lb/sq ft)	0.01	1.50	
Alpha	1.00	Stream Power (lb/ft s)	0.00	5.81	
Frctn Loss (ft)		Cum Volume (acre-ft)			

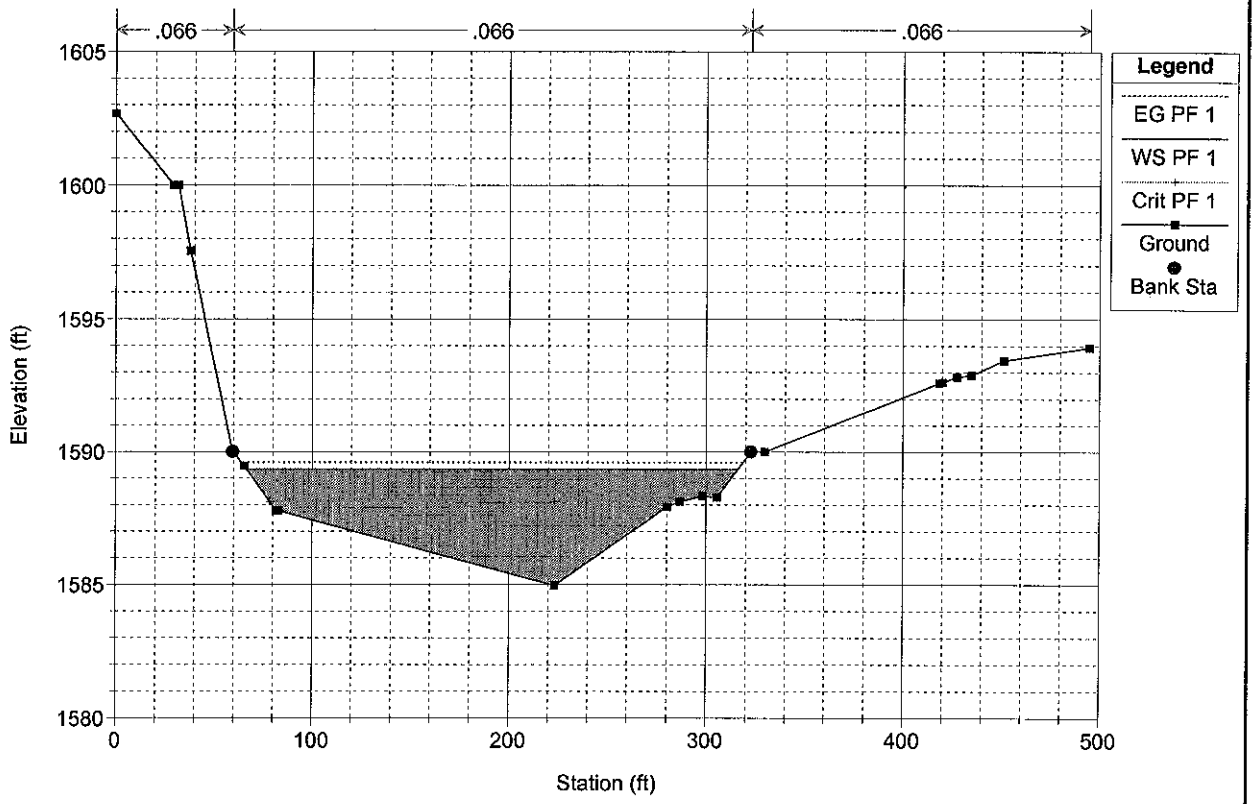
```
*
* C & E Loss (ft)        *          * Cum SA (acres)        *          *          *
*
*******************************************************************************
***********

Warning: Divided flow computed for this cross-section.

*****************************************************************************

SUMMARY OF MANNING'S N VALUES

River:37_apex
*****************************************************************
*     Reach      *   River Sta.   *   n1    *   n2    *   n3    *
*****************************************************************
*37_apex         *    2780.806    *     .066*     .066*     .066*
*37_apex         *    2261.484    *     .066*     .066*     .066*
*37_apex         *    2196.482    *     .066*     .066*     .066*
*37_apex         *    1666.96     *     .066*     .066*     .066*
*37_apex         *    753.7803    *     .066*     .066*     .066*
*37_apex         *    136.0019    *     .066*     .066*     .066*
*****************************************************************

*******************************************************************************

SUMMARY OF REACH LENGTHS

River: 37_apex
*****************************************************************
*     Reach      *   River Sta.   *  Left   * Channel *  Right  *
*****************************************************************
*37_apex         *    2780.806    *   519.32*   519.32*   519.32*
*37_apex         *    2261.484    *       65*       65*       65*
*37_apex         *    2196.482    *   529.52*   529.52*   529.52*
*37_apex         *    1666.96     *   913.18*   913.18*   913.18*
*37_apex         *    753.7803    *   617.78*   617.78*   617.78*
*37_apex         *    136.0019    *      136*      136*      136*
*****************************************************************

*******************************************************************************

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 37_apex

*****************************************************
*     Reach      *   River Sta.   * Contr.  * Expan.  *
*****************************************************
*37_apex         *    2780.806*       .1*       .3*
*37_apex         *    2261.484*       .1*       .3*
*37_apex         *    2196.482*       .1*       .3*
*37_apex         *    1666.96 *       .1*       .3*
*37_apex         *    753.7803*       .1*       .3*
*37_apex         *    136.0019*       .1*       .3*
*****************************************************
```

HEC-RAS Plan: Plan 03 River: 37_apex Reach: 37_apex Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
37_apex	2780.806	PF 1	2520.00	1584.96	1589.33	1588.12	1589.58	0.009222	4.00	629.26	249.37	0.44
37_apex	2261.484	PF 1	2520.00	1576.25	1579.00	1579.00	1579.78	0.057154	7.06	357.19	237.92	1.01
37_apex	2196.482	PF 1	2520.00	1572.54	1576.40	1575.52	1576.82	0.016469	5.23	481.84	197.57	0.59
37_apex	1666.96	PF 1	2520.00	1564.24	1568.45		1568.78	0.013953	4.57	551.69	244.92	0.54
37_apex	753.7803	PF 1	2520.00	1550.10	1554.23	1553.45	1554.66	0.017206	5.24	481.28	203.36	0.60
37_apex	136.0019	PF 1	2520.00	1542.30	1545.33	1544.50	1545.57	0.012606	3.88	649.63	361.01	0.50

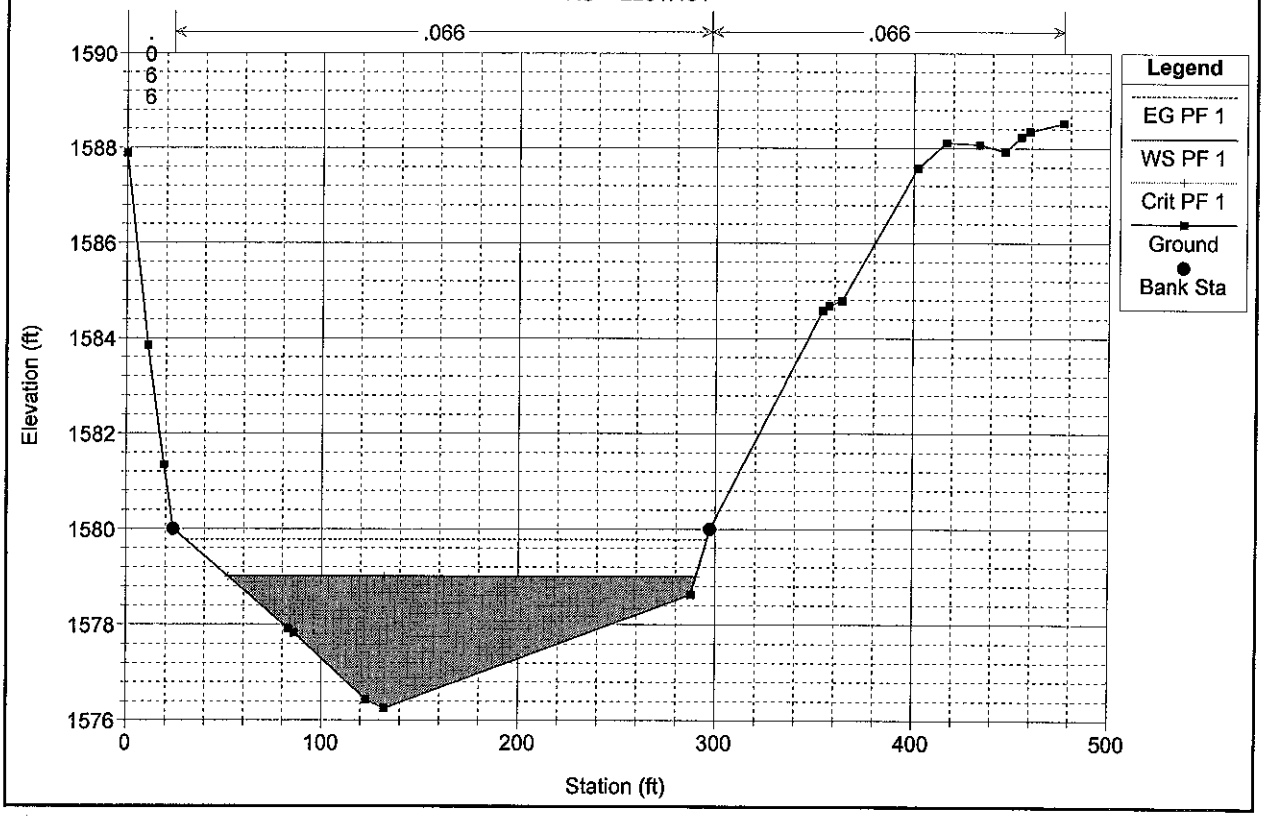
zoneA Plan: Plan 03 10/10/2006

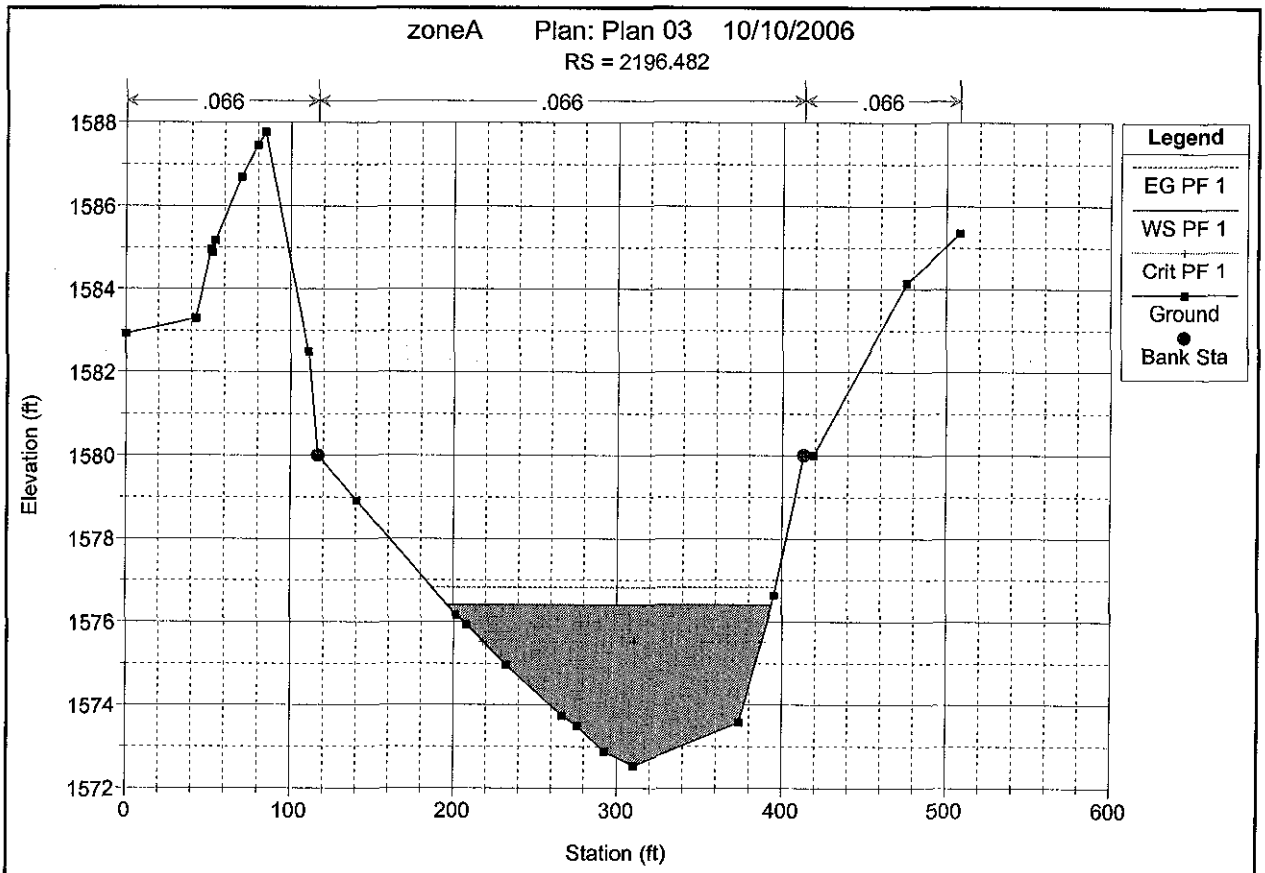
RS = 2780.806

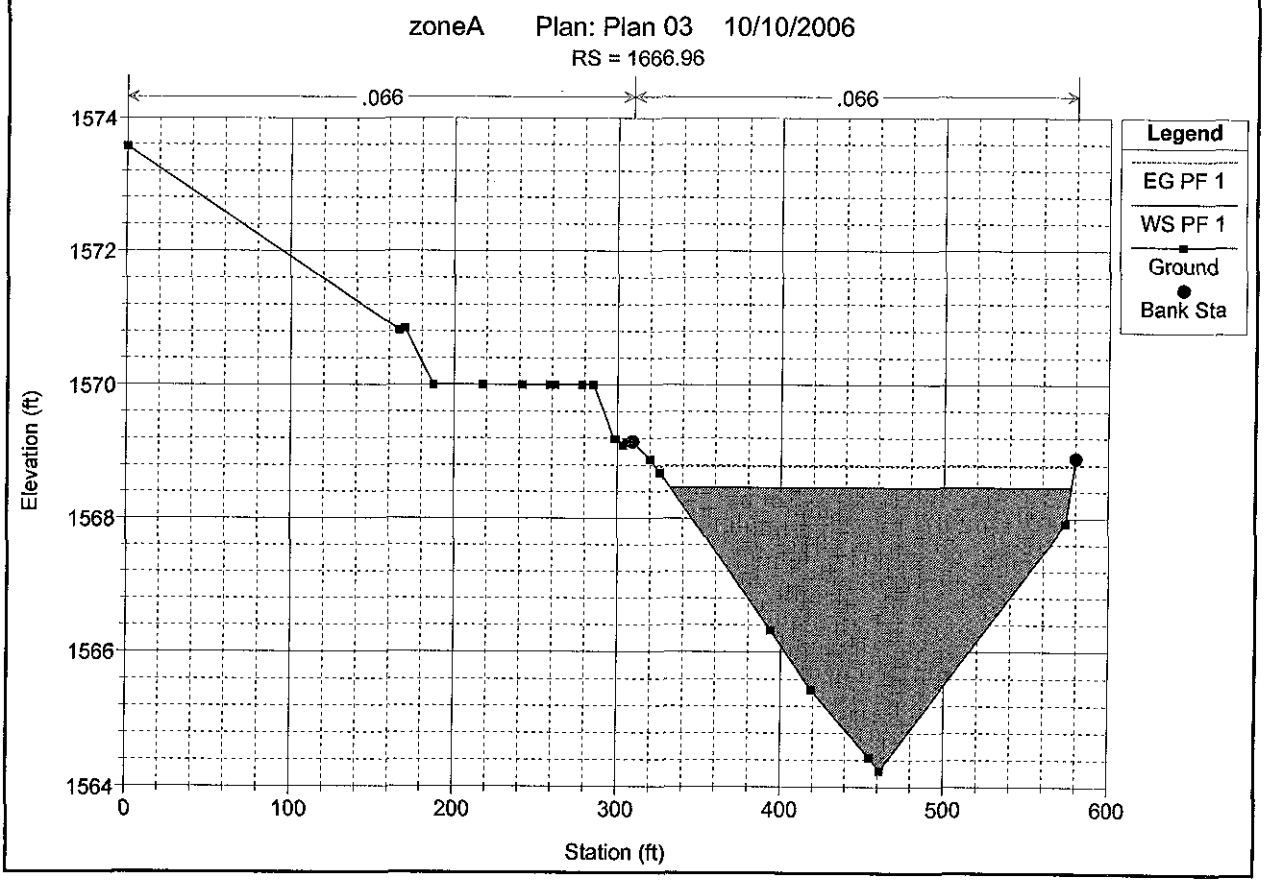


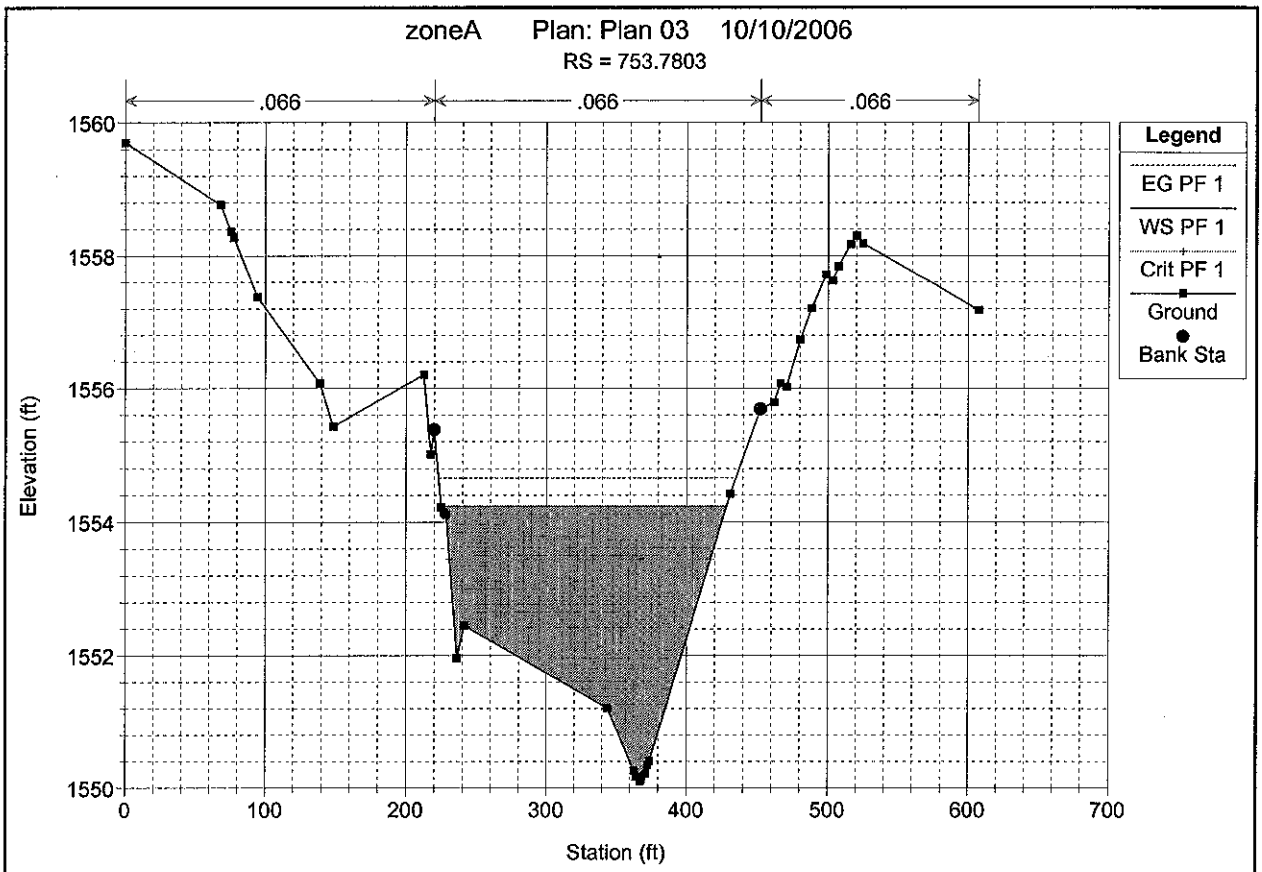
zoneA Plan: Plan 03 10/10/2006

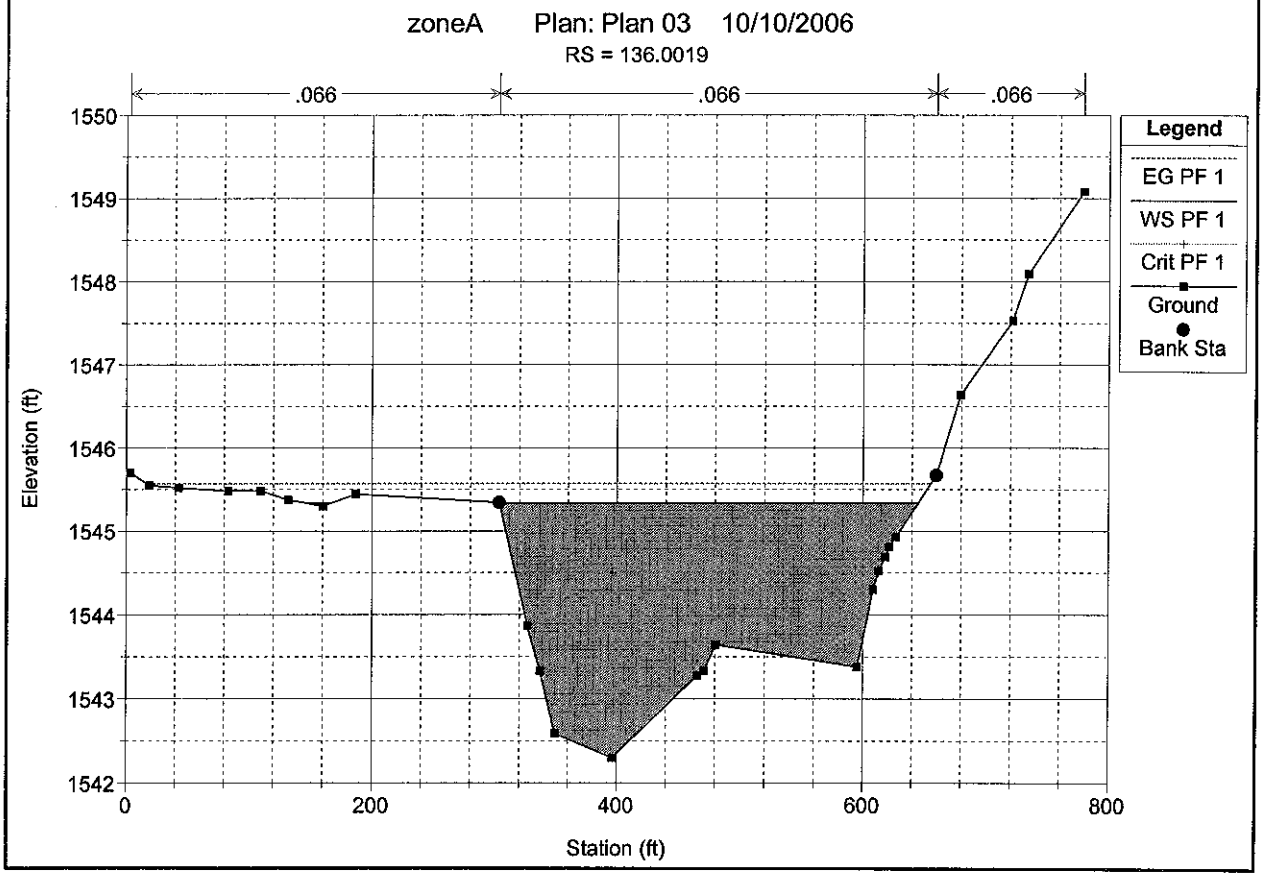
RS = 2261.484

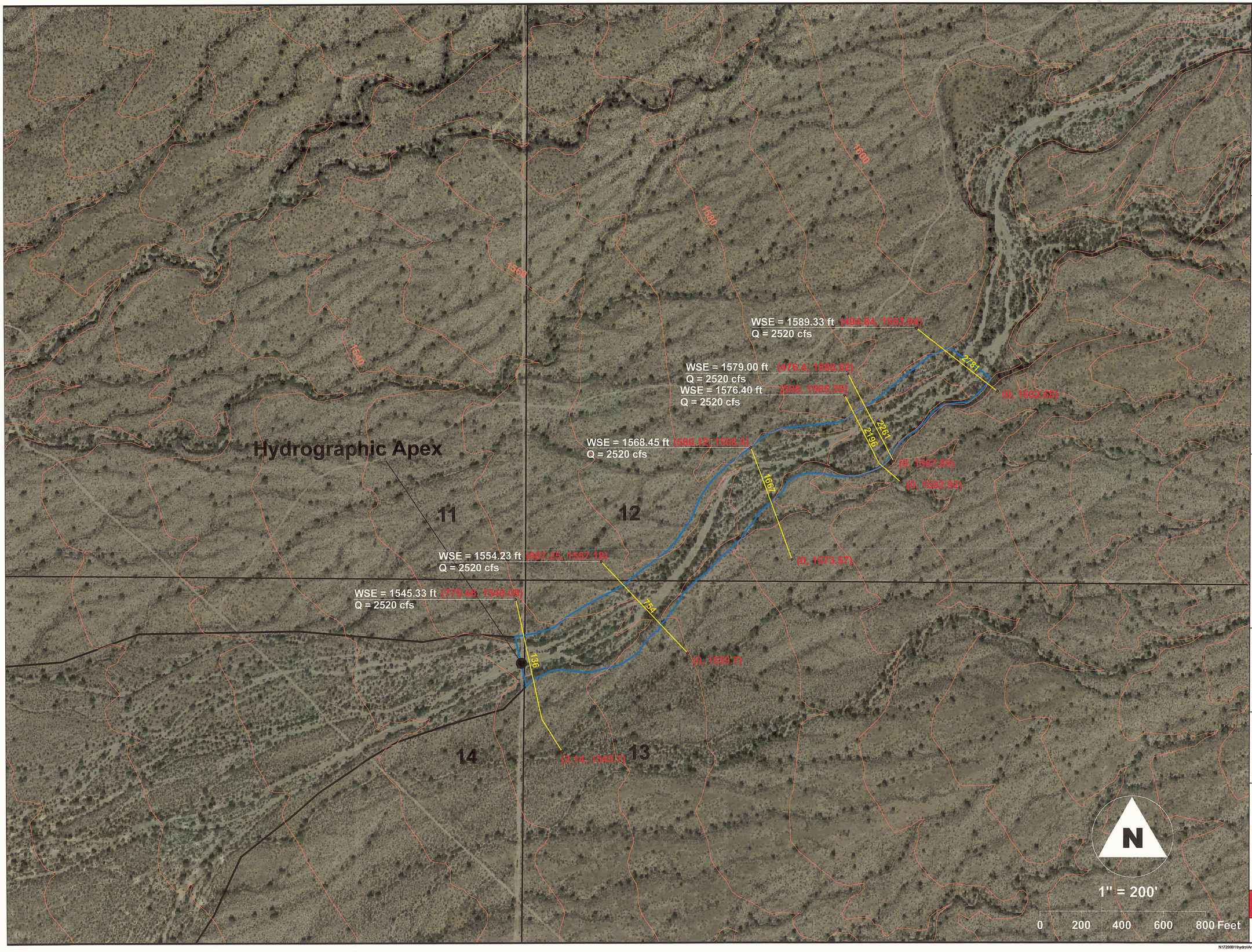



zoneA Plan: Plan 03 10/10/2006
RS = 2196.482
.066
.066
.066
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1588
1586
1584
1582
1580
1578
1576
1574
1572
0
100
200
300
400
500
600
Station (ft)

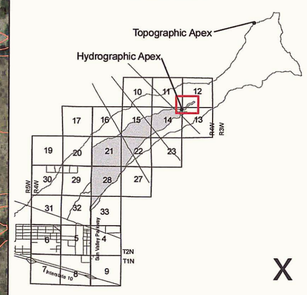

zoneA Plan: Plan 03 10/10/2006
RS = 1666.96
.066
.066
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1574
1572
1570
1568
1566
1564
0
100
200
300
400
500
600
Station (ft)


zoneA Plan: Plan 03 10/10/2006
RS = 753.7803
.066
.066
.066
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1560
1558
1556
1554
1552
1550
0
100
200
300
400
500
600
700
Station (ft)


zoneA Plan: Plan 03 10/10/2006
RS = 136.0019
.066
.066
.066
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1550
1549
1548
1547
1546
1545
1544
1543
1542
0
200
400
600
800
Station (ft)



INDEX MAP



X

LEGEND

- 2761 Cross-sections
- 10 ft contours
- 11 Section Boundary
- A
- AFHH
- WSE = 1589.33 ft, Q = 2520 cfs — Water Surface Elevation (ft) 100-Year Discharge
- (0, 1602.68) (Cross-section Station, Elevation)

NOTE

Aerial Photography: Flood Control District of Maricopa County, 2000

Topography: Flood Control Disctrict of Maricopa County (2000/2001)

Riverine Reach Upstream from Hydrographic Apex, Cross Section Layout and Approximate Floodplain

APPROXIMATE FLOOD HAZARD ASSESSMENT FOR WHITE TANK FANS

Alluvial Fan Site 37A (East of Sun Valley Parkway)

COE & VAN LOO
PLANNING · ENGINEERING · LANDSCAPE ARCHITECTURE
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264 - 6831

N:\72000\1\hydro\ArcMap\GIS_projects\comment_response\Fan37_AIA_Fan37_AIA_Figure_24x36_apex.mxd (10/10/06)

APPENDIX F

Erosion/Sediment Transport

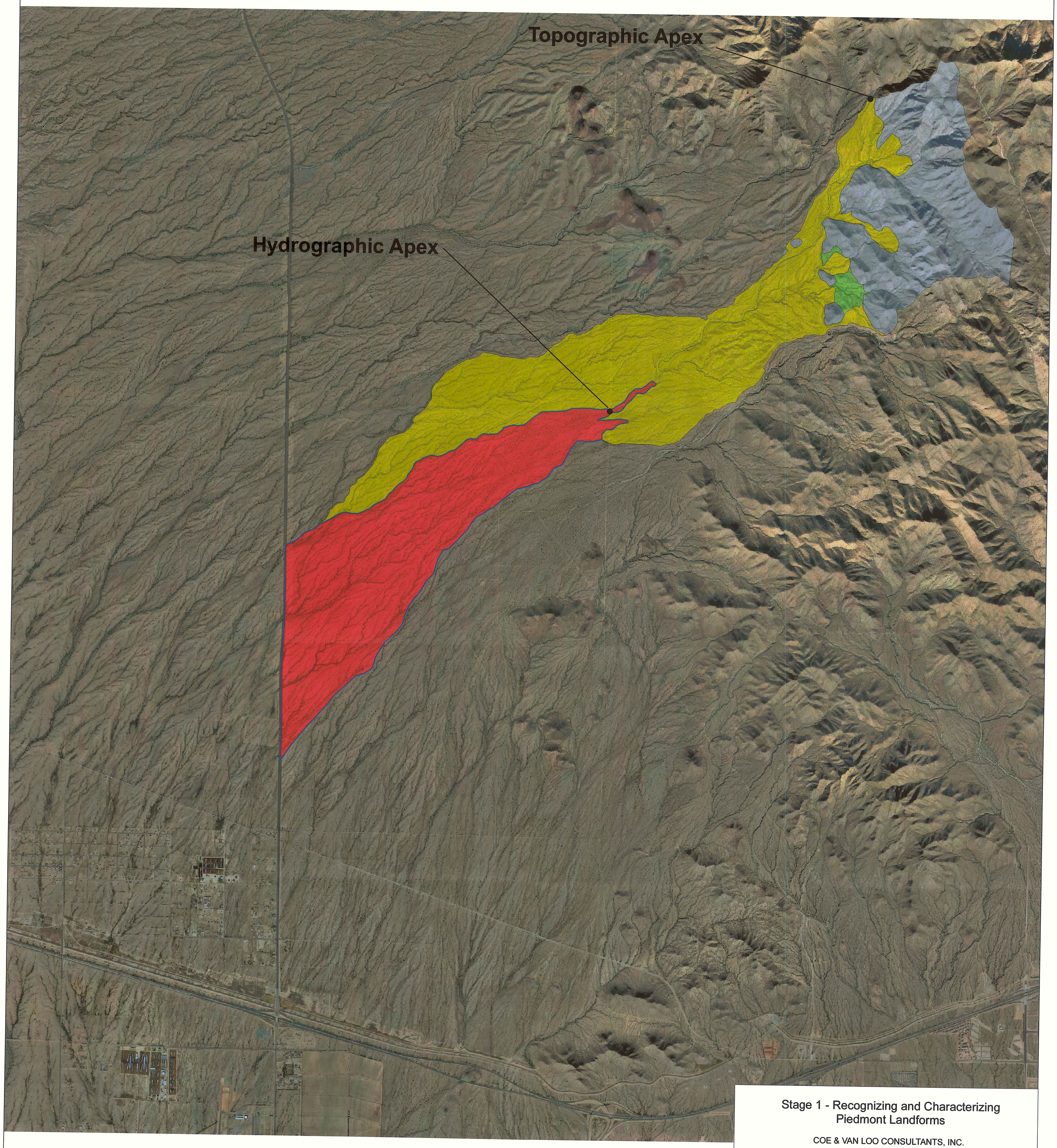
(See Appendix G – Supplemental Information of the JE Fuller/H&G TDNs 1, 2, 3, 4, 5, 6, 10, 11, 13, 16, 17, 18, 19 and 20)

CVL

APPENDIX G

Piedmont Flood Hazard Assessment Supporting Documentation

(See Appendix G – Supplemental Information of the JE Fuller/H&G TDNs 1, 2, 3, 4, 5, 6, 10, 11, 13, 16, 17, 18, 19 and 20)



Stage 1 - Recognizing and Characterizing Piedmont Landforms

COE & VAN LOO CONSULTANTS, INC.

Legend

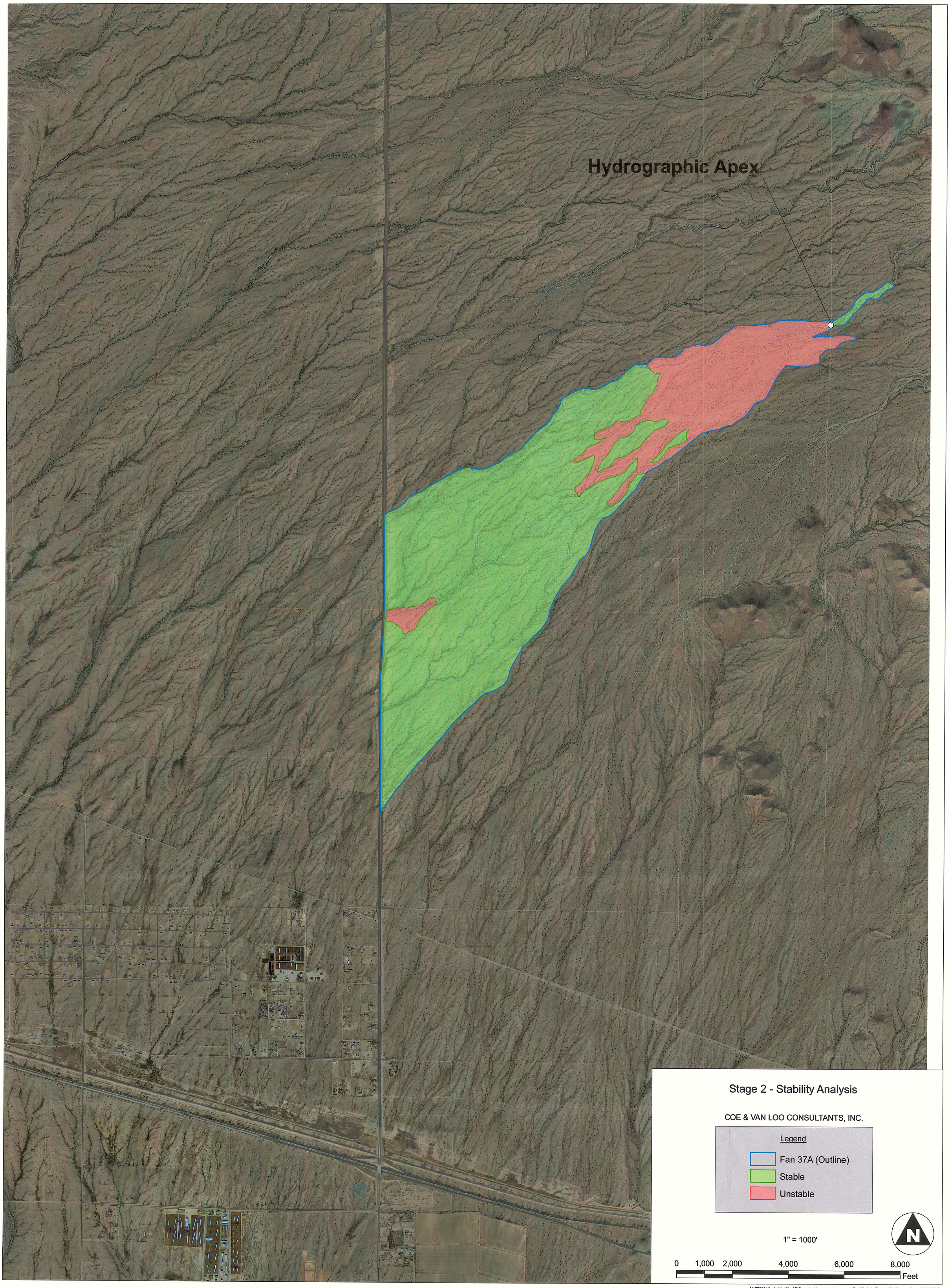
- Alluvial Fan
- Relict Fan
- Bedrock
- Pediment
- Fan 37A (Outline)

1' = 1500'

N

0 1,500 3,000 6,000 9,000 12,000 Feet

N:\720001\hydro\ArcMap\GIS_projects\comment_response\Fan37_A\A_Figure_36x47_stage1.mxd (10/10/06)



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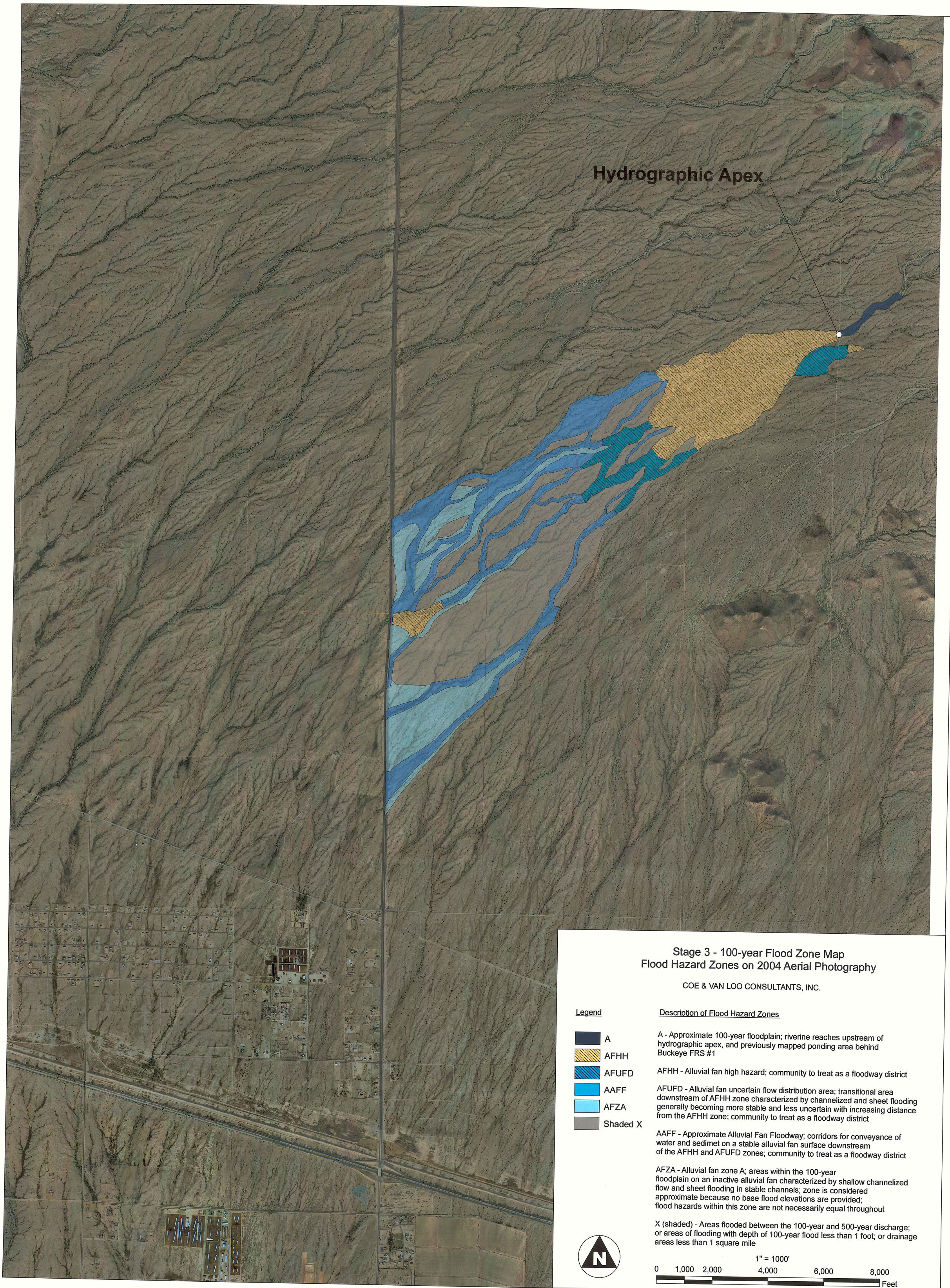
Hydrographic Apex
Stage 3 - 100-year Flood Zone Map
Flood Hazard Zones on 2004 Aerial Photography
COE & VAN LOO CONSULTANTS, INC.
Legend
A
AFHH
AFUFD
AAFF
AFZA
Shaded X
Description of Flood Hazard Zones
A - Approximate 100-year floodplain; riverine reaches upstream of hydrographic apex, and previously mapped ponding area behind Buckeye FRS #1
AFHH - Alluvial fan high hazard; community to treat as a floodway district
AFUFD - Alluvial fan uncertain flow distribution area; transitional area downstream of AFHH zone characterized by channelized and sheet flooding generally becoming more stable and less uncertain with increasing distance from the AFHH zone; community to treat as a floodway district
AAFF - Approximate Alluvial Fan Floodway; corridors for conveyance of water and sedimet on a stable alluvial fan surface downstream of the AFHH and AFUFD zones; community to treat as a floodway district
AFZA - Alluvial fan zone A; areas within the 100-year floodplain on an inactive alluvial fan characterized by shallow channelized flow and sheet flooding in stable channels; zone is considered approximate because no base flood elevations are provided; flood hazards within this zone are not necessarily equal throughout
X (shaded) - Areas flooded between the 100-year and 500-year discharge; or areas of flooding with depth of 100-year flood less than 1 foot; or drainage areas less than 1 square mile
N
1" = 1000'
0 1,000 2,000 4,000 6,000 8,000
Feet
N:\720001\hydro\ArcMap\GIS_projects\comment_response\Fan37_A\A_Figure_36x47_stage3.mxd (10/10/06)