FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

TECHNICAL DATA NOTEBOOK HYDROLOGY

BOOK 1 OF 2

Property of
Flood Control District of MC Library
Please Return to
2801 W. Durango
Phoenix, AZ 85009

Prepared For:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
3335 West Durango Street
Phoenix, Arizona 85009
(602) 262-1501

Prepared By:

BURGESS & NIPLE, INC.
5025 East Washington Street
Phoenix, AZ 85034
(602) 244-8100

Registered Professional Engineer (Civil)
CERTIFICATE NO. 12739
THOMAS R. LOOMIS
Date Signed 2-29-91
ARIZONA, U.S.A.

Project No. 10310

February, 1991
Revised May, 1991

Section 1

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

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SECTION 1: General Documentation and Correspondence

STUDY DOCUMENTATION ABSTRACT

Community: Maricopa County, Arizona

NFIP Community Number: 040037

County: Maricopa

State: Arizona

Date Study Accepted by FEMA: Pending

Study Contractor: Burgess & Niple, Inc.
Attn: Mr. James E. Mischler, P.E.
5025 East Washington Street, Suite 212
Phoenix, AZ 85034
(602) 244-8100
FCD Contract 90-05

Subconsultants:

Aerial Mapping Co., Inc.
McKuen Global Positioning Systems, Inc.

FEMA Technical Reviewer: Pending

FEMA Regional Reviewer: Pending

State Reviewer: Mr. James R. Morris, P.E.
(602) 542-1541

Local Reviewer: Mr. Pedro Calza
(602) 262-1501

River of Stream Name:

*Jackrabbit Wash

*Star Wash

*Unnamed Tributary of Jackrabbit Wash

*CAP Canal Ponding Areas

Reach Description: The following areas are included on FIRM panel numbers 1050, 1075, and 1525.

*Jackrabbit Wash, CAP Canal to Vulture Mine Road (approximately 10.0 miles)

*Star Wash, confluence with Jackrabbit Wash to high voltage power lines (approximately 2.1 miles)

*Unnamed Tributary of Jackrabbit Wash, Confluence with Jackrabbit Wash to Vulture Mine Road (Approximately 7.1 miles)

*CAP Canal Ponding Areas, Reach 7 structures CAP-1 to CAP-11.

Study Type: Jackrabbit Wash, Star Wash, Unnamed Tributary of Jackrabbit Wash - Detailed riverine using HEC-2 CAP Canal Ponding Areas - Approximate ponding using HEC-1.

SECTION 1: General Documentation and Correspondence

1.2 Contact (Telephone) Reports

CONVERSATION RECORD

Job No. 10310 Job Name Jackrabbit Wash Date 2/11/91

By J Mischler Time

With Roy Dodson, Dodson & Associates

☐ By Telephone ☐ Incoming ☐ Outgoing Telephone No. ( )

☐ Visit, Site City

Regarding: New HEC-2 not yet available. No date known. COE has uncovered new error and is making modification

Conversation Items:

Our order is on file and will be sent as soon as it becomes available.

Action Required:	Action Taken:

✓ 5k cc: Loomis

CONVERSATION RECORD

Job No. 10310 Job Name Jackrabbit Wash Date 9/19/90

By J. Mischler Time

With Dave Creighton, ADWR

☐ By Telephone ☐ Incoming ☐ Outgoing Telephone No. ( )

☐ Visit, Site City

Regarding:

Conversation Items: Sheet 17, soil survey maps.
72-73 orthophotos.
Check dams appear - with extensive vegetation - Probably 10-15 yrs old in 72-73

Program started in mid-50's
Could get date of check dams from BLM.

Action Required:	Action Taken:
	cc: Tom Loomis

SECTION 1: General Documentation and Correspondence

1.3 Meeting Minutes & Reports

Burgess & Niple, Inc.
Engineers and Architects
5025 East Washington Street • Suite 212 • Phoenix, AZ 85034 • (602) 244-8100

b&n 1912

MINUTES OF MEETING

PROJECT: FCD 90-05; Jackrabbit Wash Floodplain Delineation
SUBJECT: Meeting No. 1
DATE: August 24, 1990
TIME: 10:00 AM
ATTENDANCE: Mr. Pedro Calza, MCFCD
Mr. Amir Motamedi, MCFCD
Mr. Tom Loomis, B&N
Mr. James Mischler, B&N

NOTE: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

The primary purpose of this meeting was to review preliminary subbasin delineations prior to the field hydrology efforts.

1. Mr. Motamedi was satisfied with the subbasin delineations as presented in the meeting. It was noted that an additional subbasin break is needed for floodplain delineation of the unnamed tributary to Jackrabbit Wash.

2. Mr. Calza noted that Joe Tram had suggested a conservative hydrologic approach for ponding behind the CAP dike which is above the structural section but below the spoil elevation. The method would involve an additional HEC-1 analysis to find the most conservative result upstream and downstream with and without a breach in the dike. Mr. Mischler expressed concern that an assumption of dike failure as soon as the structural height was exceeded but before the spoil was overtopped could be overly conservative. Burgess & Niple will proceed with a single HEC-1 model to determine if the aforementioned condition will occur, at which time potential solutions will be discussed in more detail.

3. Mr. Calza noted that the CAP dike in the Wittman ADMS area has experienced breaches.

4. Mr. Loomis will begin hydrology field work on September 4. A field trip for District and ADWR personnel was scheduled for September 18. The trip will begin at the District office at 8:00 AM.

Respectfully Submitted,

James E Mischler

James E. Mischler, P.E.
BURGESS & NIPLE, INC.

JEM:sk

cc: Attendees

Burgess & Niple, Inc.
Engineers and Architects
1106 North Beeline Highway • Payson, AZ 85541 • (602) 474-5313
Fax. (602) 474-3511 • Columbus Fax. (614) 451-1385

b&n 1912

MINUTES OF MEETING

Project: FLD 90-05; Jackrabbit Wash Floodplain Delineation

Subject: Meeting Number 2

Date: October 26, 1990

Time: 11:00 A.M.

Attendees: Mr. Pedro Calza, Flood Control District of Maricopa County
Mr. Amir Motamedi, Flood Control District of Maricopa County
Ms. Sandra Shillito, Flood Control District of Maricopa County
Mr. Tom Loomis, Burgess & Niple, Inc.

NOTE: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

The primary purpose of this meeting was to review final sub-basin delineations and sub-basin parameters prior to creation of the HEC-1 computer models.

1. The revisions to sub-basin delineations subsequent to receipt of review comments from Mr. Dave Creighton of Arizona Department of Water Resources and performance of the field hydrology were discussed. No immediate problems were encountered. Mr. Motamedi stated that review comments should be forthcoming the week of October 29, 1990.

2. Mr. Calza requested that the spread sheet files used to calculate the sub-basin parameters be submitted on floppy diskette. Mr. Loomis agreed to furnish the files.

3. Mr. Motamedi requested that the Green and Ampt parameters proposed for each SCS Soil Map Unit be checked against Table 4.2 of the Flood Control District of Maricopa County Manual for uniformity of values for each soil classification. Mr. Loomis agreed to make the check.

4. Mr. Motamedi requested that trial sub-basin HEC-1 models be done to compare the effects of hillslope versus rangeland K_b values. The County has found that use of the rangeland values in some alluvium terrace areas yields unreasonable results. Mr. Loomis agreed to spot check Basin 10 for this effect.

5. The preliminary time of concentration estimates, made using the Papadakis Method, were discussed. Mr. Motamedi pointed out that this method quite often yields a T_c value greater than the duration of rainfall excess. If this is found to be the case, then the S-Graph Method is to be used instead of the Clark Unit Hydrograph.

6. Mr. Calza requested that the aerial photograph contact prints be forwarded to him as soon as they are available. Mr. Loomis agreed to check on the status of the contact prints.

7. Mr. Calza requested that Burgess & Niple, Inc. obtain a price for preparing a high altitude photograph of the entire watershed. This shall be done as close to scale as possible without paneling the site.

The meeting adjourned at 12:50 P.M.

Respectfully Submitted,

Thomas R. Loomis

Thomas R. Loomis

TRL:lms/Minutes/TRL/9010

cc: Attendees
Mr. Jim Mischler

BURGESS
& NIPLE

ENGINEERS
ARCHITECTS

Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation

Subject: Meeting No. 3

Date: November 8, 1990

Attendees: Mr. Russ Cruff, MCFCD
Mr. Amir Motamedi, MCFCD
Mr. Jim Morris, ADWR
Mr. Tom Loomis, B&N
Mr. James Mischler, B&N

Burgess & Niple, Inc.
5025 East Washington Street
Suite 212
Phoenix, AZ 85034
602 244-8100
Fax 602 244-1915

Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

1. The 100-Year pond may exceed structural height, but not spoil height. If this be the case, it may not be possible to presume, under FEMA guidelines, that the levee will hold.

2. Burgess & Niple will proceed as if the CAP will hold, and the problem, (if any), will be evaluated based on pond elevations vs. structural and spoil elevations.

3. Jim Morris recommends 2 hydrologic routings - with ponding and without ponding. The study will need to consider at structures at each location in more detail.

Respectfully submitted,

James E Mischler

James E. Mischler, P.E.

cc: Attendees
Mr. Pedro Calza, MCFCD

BURGESS & NIPLE

ENGINEERS
ARCHITECTS

Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation

Subject: Meeting No. 4

Date: November 27, 1990

Attendees: Mr. Pedro Calza, MCFCD
Mr. James Mischler, B&N

Burgess & Niple, Inc.
5025 East Washington Street
Suite 212
Phoenix, AZ 85034
602 244-8100
Fax 602 244-1915

Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

1. Burgess & Niple presented preliminary locations of cross-sections for HEC-2 modelling. Locations were generally acceptable to the District. Mr. Calza requested that sections near roads be located to allow minimal future modifications for bridge modelling.

Respectfully submitted,

James E Mischler

James E. Mischler, P.E.

cc: Attendees

BURGESS & NIPLE

ENGINEERS
ARCHITECTS

Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation

Subject: Meeting No. 5

Date: December 20, 1990

Attendees: Mr. Pedro Calza, MCFCD
Mr. James Mischler, B&N

Burgess & Niple, Inc.
5025 East Washington Street
Suite 212
Phoenix, AZ 85034
602 244-8100
Fax 602 244-1915

Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

1. Mr. Mischler presented copies of the draft Mannings "n" value report. Mr. Calza requested that the photos and documentation be included in the hydraulics report also.

Respectfully submitted,

James E Mischler

James E. Mischler, P.E.

cc: Attendees

BURGESS & NIPLE

ENGINEERS
ARCHITECTS

Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation

Subject: Meeting No. 6

Date: January 20, 1991

Attendees: Mr. Pedro Calza, MCFCD
Mr. James Mischler, B&N

Burgess & Niple, Inc.
5025 East Washington Street
Suite 212
Phoenix, AZ 85034
602 244-8100
Fax 602 244-1915

Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

1. Mr. Mischler submitted prints of floodplain mapping showing cross section locations and a computer diskette containing preliminary HEC-2 input files for Star, Jackrabbit, and the unnamed tributary of Jackrabbit Wash.

2. The split flow reach from Jackrabbit Wash, river mile 15.5 to river mile 16.0, has yet to be resolved. The final model will have an appropriate flow distribution.

3. Floodways will be calculated with method 6 initially, and adjusted using Method 1. In the final model, all floodway limits will be set by Method 1.

Respectfully submitted,

James E Mischler

James E. Mischler, P.E.

cc: Attendees

BURGESS
& NIPLE
ENGINEERS
ARCHITECTS

Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation

Subject: Meeting No. 7

Date: February 12, 1991

Attendees: Mr. Amir Motamedi, MCFCD
Mr. Thomas Loomis, B&N
Mr. James Mischler, B&N

Burgess & Niple, Inc.
5025 East Washington Street
Suite 212
Phoenix, AZ 85034
602 244-8100
Fax 602 244-1915

Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

1. Mr. Motamedi requested that a sheet showing how composite soils were developed for the hydrology report be included following the tables to illustrate the procedures used.

2. For transmission losses, a composite loss rating was used. The model was not sensitive to different methods of considering rock areas.

3. Per SCS soil maps, no individual soil has infiltration greater than 4 inches. Burgess & Niple's composite values are generally from 1 to 3 inches. Mr. Motamedi requested that a discussion and justification of composite values that are much less than field measurements be included in the hydrology report.

4. Preliminary hydrology is approved by the District.

Respectfully submitted,

James E Mischler

James E. Mischler, P.E.

cc: Attendees
Mr. Pedro Calza, MCFCD

BURGESS
& NIPLE
ENGINEERS
ARCHITECTS

Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation

Subject: Meeting No. 8

Date: February 13, 1991

Attendees: Mr. Jim Morris, ADWR
Mr. Dave Creighton, ADWR
Mr. Dan Lawrence, ADWR (Briefly)
Mr. Thomas Loomis, B&N

Burgess & Niple, Inc.
5025 East Washington Street
Suite 212
Phoenix, AZ 85034
602 244-8100
Fax 602 244-1915

Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

1. Mr. Loomis presented the problem with Daggs Wash at the Central Arizona Project Canal crossing, Structure CAP-8.

   Problem: 100-Year 24-hour storm at structure. Stage exceeds the top of compacted embankment by 1.3' and is 0.9' below the top of uncompacted embankment. Flow probably tops the concrete overshoot walls and drains into the canal. The duration of stage above the top of compacted embankment is probably very short.

   The CAP canal at this location is situated with the top of canal lining approximately at the original natural grand surface. The drainage structure crossing the canal is a concrete flume with a base width of 47.5' and a wall height of 7'. The height of the collective dikes is approximately 10'.

   Mr. Loomis and Mr. Morris agreed the failure of the embankment is extremely unlikely, and that if a failure occurred, it would involve scouring of the uncompacted 2' at the top of the dike. It was tentatively agreed that the routed peak through the structure should be used for flood control regulation downstream, since any flow which overtops the

embankment or flume walls will be trapped by the canal. Therefore, this would be a conservative assumption. Burgess & Niple is to estimate the time duration that the flood stage exceeds the top elevation of the compacted embankment. If it is, in fact, a very short time, then Burgess & Niple is to proceed with this assumption in preparation of the final report.

Respectfully submitted,

James E Mischler, for

Thomas R. Loomis, P.E.

cc: Attendees
Mr. Pedro Calza, MCFCD
Mr. James Mischler, B&N

BURGESS & NIPLE

ENGINEERS
ARCHITECTS

Project: FCD 90-05; Jackrabbit Wash Floodplain Delineation

Subject: Meeting No. 9

Date: February 15, 1991

Attendees: Mr. Pedro Calza, MCFCD
Mr. James Mischler, B&N

Burgess & Niple, Inc.
5025 East Washington Street
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Note: If this discussion does not reflect your understanding of the subject matter covered in the meeting, please notify the preparer.

1. Mr. Mischler indicated that study documents suitable for submission to FEMA would be submitted by February 28, 1991.

2. Mr. Calza noted that the preliminary HEC-2 natural profile model recently submitted seemed appropriate, pending adjustments at the split flow reach on Jackrabbit Wash.

Respectfully submitted,

James E. Mischler

James E. Mischler, P.E.

cc: Attendees

SECTION 1: General Documentation and Correspondence

1.4 General Correspondence

FLOOD CONTROL DISTRICT
of
Maricopa County

3335 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 262-1501

D. E. Sagramoso, P.E., Chief Engineer and General Manager

BOARD OF DIRECTORS
Betsey Bayless
James D. Bruner
Carole Carpenter
Tom Freestone
Ed Pastor

FEB 12 19[illegible]

Mr. James E. Mischler, P.E.
Burgess and Niple, Inc.
5025 East Washington Street
Suite 212
Phoenix, Arizona 85034

SUBJECT: Jackrabbit Wash FIS (FCD 90-05)

Dear Mr. Mischler:

We have reviewed the Preliminary Data Notebooks, Hydrology, submitted to the Flood Control District on December 22, 1990, for the subject area. The report did not include the stage-storage routing for the CAP structures as of yet.

Our review emphasized mainly on the peak flows estimated using the HEC-1 simulation. It is our opinion that the results presented so far are reasonable and compare well with the results obtained by statistical analysis on the USGS gage on Jackrabbit.

We have a few minor comments on the report which we will discuss with you and Mr. Loomis at the February 12th meeting.

If you have any questions, please call Sandy Shillito or me at 262-1501.

Sincerely,

Amir M. Motamedi
Hydrologist

HAND DELIVERED 12/27

Burgess & Niple, Inc.
Engineers and Architects
6 North Beeline Highway • Payson, AZ 85541
(602) 474-5313 FAX: (602) 474-3511

b&n 1912

LETTER OF TRANSMITTAL

DATE 12/22/90 JOB NO 10310

RE Jackrabbit Wash Floodplain Delineation Study FCD 90-05

TO Flood Control District of Maricopa Co.
3335 West Durango Street
Phoenix, AZ. 85009
Attn: Mr. Pedro Calzo

WE ARE SENDING YOU [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications
[ ] Copy of letter [ ] Change order [ ] _____

COPIES	DATE	NO.	DESCRIPTION
3	12/22/90		Preliminary Technical Data Notebook Hydrology
1			Project Photographs

THESE ARE TRANSMITTED:

[ ] For approval [ ] Approved as submitted [ ] Resubmit _____ copies for approval
[ ] For your use [ ] Approved as noted [ ] Submit _____ copies for distribution
[ ] As requested [ ] Returned for corrections [ ] Return _____ corrected prints
[X] For review and comment [ ] _____

REMARKS Pedro: I have included the field photographs to help you with the review. We will want them back. I am intending to use suitable photos in the final report. Please excuse the tabbing system. Your comments on report organization will be appreciated and incorporated into the final report. The order specified by ADWR for the TDN is somewhat cumbersome and will need "Fine Tuning". Have a Happy New Year!

COPY TO _____

SIGNED: Tom Loomis

If enclosures are not as noted, Kindly notify us at once.

CC: To T. Loomis

FLOOD CONTROL DISTRICT
of
Maricopa County

3335 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 262-1501

D. E. Sagramoso, P.E., Chief Engineer and General Manager

BOARD OF DIRECTORS
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RECEIVED
NOV 6 1990
BURGESS & NIPLE, INC.

NOV 5 1990

Mr. Thomas R. Loomis, P.E.
Burgess & Niple, Inc.
5025 East Washington Street
Suite 212
Phoenix, Arizona 85034

SUBJECT: Subbasin Delineation Review of Jackrabbit Wash

Dear Mr. Loomis:

We have reviewed the subbasin delineations for the contributing area to Jackrabbit Wash. We feel the boundaries and concentration points are acceptable. Please continue with your determination of parameters for these subbasins.

If you have any questions concerning this review, please contact Sandy Shillito or myself at 262-1501.

Sincerely,

Amir Motamedi
Hydrologist

FLOOD CONTROL DISTRICT
RECEIVED
NOV 01 1990
REMARKS

ARIZONA
DEPARTMENT
OF WATER
RESOURCES

Rose Mofford, Governor
N. W. Plummer
Director

15 South 15th Avenue
Phoenix, Arizona 85007

October 29, 1990

Joe Tram
Floodplain Branch Manager
Flood Control District of Maricopa County
3335 West Durango Street
Phoenix, Arizona 85009

RE: Central Arizona Project and Flood Insurance Studies

Dear Mr. Tram:

This is in response to your letter of 11 October 1990 requesting guidance on modeling CAP cross-drainage structures when completing studies for floodplain mapping purposes. ADWR recommends that CAP cross-drainage structures be critically examined during any floodplain study and only be credited if they can be certified according to FEMA requirements and if they have assured maintenance.

Since many of the CAP cross-drainage structures are sized for floods less than a 100-year event, this will mean that an evaluation of the CAP's effect both upstream for ponding and downstream for maximum expected outflows under 100-year condition will have to be made. We would be happy to discuss the exact procedure with you as necessary.

Please feel free to contact me at 542-1541 if you have any questions or need any additional information.

Sincerely,

James R. Morris

James R. Morris, P.E.
Chief
Flood Management Section

JRM:bw

HAND DELIVERED

Burgess & Niple, Inc.
Engineers and Architects
106 North Beeline Highway • Payson, AZ 85541
(602) 474-5313 FAX: (602) 474-3511

b&n 1912

LETTER OF TRANSMITTAL

DATE October 26, 1990	JOB NO 10310
RE: FCDMC Jackrabbit Wash	
Floodplain Delineation Study	
FCD 90-05	

TO FLOOD CONTROL DISTRICT OF MARICOPA CO.
3335 West Durango Street
Phoenix, AZ 85009
Attention: Pedro Calza

WE ARE SENDING YOU [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications
[ ] Copy of letter [ ] Change order [ ] _____

COPIES	DATE	NO.	DESCRIPTION
2	10/26/90	1	Preliminary Exhibit "A"
2	"	5	Preliminary Exhibit "B"
2	"	5	Preliminary Exhibit "C"
2	10/18/90	35	Preliminary Appendix C, Table C-1
2	10/18/90	4	Preliminary Appendix C, Table C-2
2	10/24/90	31	Preliminary Appendix C, Table C-3
2	10/25/90	4	Preliminary Appendix C, Table C-4
2	10/25/90	4	Preliminary Appendix C, Table C-5

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[ ] For your use [ ] Approved as noted [ ] Submit _____ copies for distribution
[ ] As requested [ ] Returned for corrections [ ] Return _____ corrected prints
[X] For review and comment [ ] _____

REMARKS

RECEIVED
OCT 29 1990
BURGESS & NIPLE, INC.

COPY TO Jim Mischler

TRL:sj

SIGNED: Thomas R. Loomis

If enclosures are not as noted, Kindly notify us at once. Thomas R. Loomis, P.E.

Burgess & Niple, Inc.
Engineers and Architects
1106 North Beeline Highway • Payson, AZ 85541 • (602) 474-5313
Fax. (602) 474-3511 • Columbus Fax. (614) 451-1385

October 19, 1990

Arizona Department of Water Resources
15 South 15th Avenue
Phoenix, AZ 85007

Attention: Dave Creighton, P.E.

Ref: M.C.F.C.D. Jackrabbit Wash Floodplain Delineation Study
FCD 90-05
Project No. 10310

Dear Dave:

Per your telephone conversations with Andy Romance on September 13, 1990 and September 14, 1990, your comments are addressed herein regarding Sub-Basin Delineations, Tc Path, and Flood Routing Paths.

Reference is made to the preliminary Burgess & Niple Exhibit "C".

Sheet 1 of 5

1-1) The west boundary of Sub-Basin 18B has been modified and the Tc flow paths revised.

1-2) A shape adjustment is not being applied to the long and narrow Sub-Basins. The A.D.O.T. adjustment does not appear to be appropriate for this watershed.

Sheet 2 of 5

2-1) The existing Tc Path shown in Sub-Basin 2A was found to yield the longest flow time, and therefore, has not been revised.

2-2) The Tc Path shown in Sub-Basin 5B has been revised.

Sheet 3 of 5

3-1) The "7G" identifier has been removed from Sub-Basin 7E.

3-2) The "10K" identifier has been changed to "10J" in Sub-Basin 10J, and the "10AA" identifier has been changed to "10Z" in Sub-Basin 10Z. Note the remainder of Sub-Basins in Major Basin No. 10 have been adjusted accordingly.

3-3) A routing path has been added between CP-63 and CP-64.

3-4) The Tc Path in Sub-Basin 10AB has been revised.

Sheet 4 of 5

4-1) The Tc Path in Sub-Basin 1I has been revised.

4-2) The Tc Path in Sub-Basin 3B has been revised.

Sheet 5 of 5

5-1) A Tc Path in Sub-Basin 10Z has been added.

5-2) The existing Tc Path shown in Sub-Basin 10W has not been changed. In my opinion, the long and narrow area above the Tc starting point can be considered non-effective for the purpose of calculating the Tc.

5-3) The location of the routing path in Sub-Basin 10Y has been clarified where it aspproaches the boundary of Sub-Basin 12B.

5-4) A Tc Path in Sub-Basin 10G has been added.

5-5) The location of the routing path in Sub-Basin 10A has been clarified where it approaches the boundary of Sub-Basin 7C.

Dave, if you have further review comments, please call Andy or myself at your convenience. I have enclosed a new copy of Exhibit "C" which reflects the changes we have discussed.

Sincerely,

BURGESS & NIPLE, INC.

Thomas R. Loomis, P.E.

TRL:lms/L.ADWR/TRL/9010

Enclosure

cc: Jim Mischler
Amir Motamedi

Burgess & Niple, Inc.
Engineers and Architects
23 East Washington Street • Suite 212 • Phoenix, AZ 85034
(602) 244-8100 FAX: (602) 244-1915

b&n 1912

LETTER OF TRANSMITTAL

DATE August 27, 1990 JOB NO 10310

RE Jackrabbit Wash Floodplain Delineation Study

TO Mr. Pedro Calza
Flood Control District of Maricopa Co.
3335 West Durango St.
Phoenix Az 85009

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Flood Hazard Study Announcement Affidavit of Publication - Original

THESE ARE TRANSMITTED:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☒ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____

REMARKS _____

COPY TO _____

SIGNED: James E. Mockler

If enclosures are not as noted, Kindly notify us at once.

AFFIDAVIT OF PUBLICATION

THE ARIZONA REPUBLIC / *The Phoenix Gazette*

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

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

The Arizona Republic
x~~*The Phoenix Gazette*~~x

~~AUGUST 16, 1990~~

Joan Lohr

Sworn to before me this

20TH day of

AUGUST A.D. 19 90

OFFICIAL SEAL
MARY LEE MEASEL
NOTARY PUBLIC STATE OF ARIZONA
MARICOPA COUNTY
My Comm. Expires March 17, 1991

Mary Lee Measel
Notary Public

INVOICE NO. 05461

ANNOUNCEMENT OF FLOOD HAZARD STUDY

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

Jackrabbit Wash from Vulture Mine Road to the CAP Canal; an unnamed tributary to Jackrabbit Wash from Vulture Mine Road to it's mouth in Section 6, T.3N., R.5W.; Star Wash from the electric power line crossing to it's mouth; and adjacent ponding areas along the CAP Canal.

The study is being performed for the Flood Control District by Burgess & Niple, Inc., Engineers & Architects, of Phoenix, Arizona.

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

This announcement is intended to notify all interested persons of the commencement of this study so that they may have an opportunity to bring any relevant facts and technical data concerning local flood hazards to the attention of the Flood Control District for consideration in the course of this study. Such information should be furnished to Mr. Pedro Caiza or Mr. Joe Tram, Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, AZ 85009, telephone (602) 262-1501 for Burgess & Niple's use in performing the study.

Published: Arizona Republic, August 16, 1990.

#10310

Burgess & Niple, Inc.
Engineers and Architects
5025 East Washington Street • Suite 212 • Phoenix, AZ 85034 • (602) 244-8100

b&n 1912

August 13, 1990

WEST VALLEY VIEW
310 North 8th Street
Avondale, AZ 85323

Attention: Newsroom

To Whom It May Concern:

Enclosed is a news release, "Announcement of Flood Elevation Study", for Maricopa County that the Flood Control District of Maricopa County has requested be published. Would you please place this as a news item in your newspaper, and provide us a copy of same. If you have any questions, please call me.

Very truly yours,

BURGESS & NIPLE, INC.

James E Mischler

James E. Mischler, P.E.

JEM:pr

Enclosure

cc: Mr. Pedro Calza, Flood Control District

Burgess & Niple, Inc.
Engineers and Architects
5025 East Washington Street • Suite 212 • Phoenix, AZ 85034 • (602) 244-8100

b&n 1912

August 13, 1990

DAILY NEWS - SUN
P.O. Box 1779
Sun City, AZ 85372

Attention: Newsroom

To Whom It May Concern:

Enclosed is a news release, "Announcement of Flood Elevation Study", for Maricopa County that the Flood Control District of Maricopa County has requested be published. Would you please place this as a news item in your newspaper, and provide us a copy of same. If you have any questions, please call me.

Very truly yours,

BURGESS & NIPLE, INC.

James E. Mischler

James E. Mischler, P.E.

JEM:pr

Enclosure

cc: Mr. Pedro Calza, Flood Control District

Burgess & Niple, Inc.
Engineers and Architects
5025 East Washington Street • Suite 212 • Phoenix, AZ 85034 • (602) 244-8100

b&n 1912

August 13, 1990

Mr. Michael Hart, Editor
THE PEORIA TIMES
7122 North 59th Avenue
Glendale, AZ 85301

Dear Mr. Hart:

Enclosed is a news release, "Announcement of Flood Elevation Study", for Maricopa County that the Flood Control District of Maricopa County has requested be published. Would you please place this as a news item in your newspaper, and provide us a copy of same. If you have any questions, please call me.

Very truly yours,

BURGESS & NIPLE, INC.

James E. Mischler

James E. Mischler, P.E.

JEM:pr

Enclosure

cc: Mr. Pedro Calza, Flood Control District

Burgess & Niple, Inc.
Engineers and Architects
5025 East Washington Street • Suite 212 • Phoenix, AZ 85034 • (602) 244-8100

b&n 1912

August 13, 1990

Mr. Red Ulbrick, Editor
THE WESTER NEWS
12001 North 112th Avenue
Youngtown, AZ 85363

Dear Mr. Ulbrick:

Enclosed is a news release, "Announcement of Flood Elevation Study", for Maricopa County that the Flood Control District of Maricopa County has requested be published. Would you please place this as a news item in your newspaper, and provide us a copy of same. If you have any questions, please call me.

Very truly yours,

BURGESS & NIPLE, INC.

James E Mischler

James E. Mischler, P.E.

JEM:pr

Enclosure

cc: Mr. Pedro Calza, Flood Control District

*** NEWS RELEASE ***

ANNOUNCEMENT OF FLOOD HAZARD STUDY

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

> Jackrabbit Wash from Vulture Mine Road to the CAP Canal; an unnamed tributary to Jackrabbit Wash from Vulture Mine Road to it's mouth in Section 6, T.3N., R.5W.; Star Wash from the electric power line crossing to it's mouth; and adjacent ponding areas along the CAP Canal.

The study is being performed for the Flood Control District by Burgess & Niple, Inc., Engineers & Architects, of Phoenix, Arizona.

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SECTION 1: General Documentation and Correspondence

1.5 Contract Scope of Work

FLOOD CONTROL DISTRICT
of
Maricopa County

3335 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 262-1501

D. E. Sagramoso, P.E., Chief Engineer and General Manager

BOARD OF DIRECTORS
Betsey Bayless
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Ed Pastor

AUG 02 '90

RECEIVED
AUG 3 1990
BURGESS & NIPLE, INC.

Mr. Donn E. Abegglen, P.E.
Vice President
Burgess & Niple, Inc.
5025 East Washington Street, Suite 212
Phoenix, Arizona 85034

SUBJECT: FCD 90-05, Jackrabbit Wash Floodplain Delineation Study

Dear Mr. Abegglen:

This letter will serve as confirmation of the July 23, 1990, verbal Notice To Proceed for the work under the above-referenced contract that was approved by the Board of Directors on the same date.

A copy of the fully executed contract is enclosed for your use. If you have any questions, please do not hesitate to contact Mr. Pedro Calza at 262-1501.

Sincerely,

Leanna Cumberland
Chief, Contracting Branch

Enclosure (1)

EXHIBIT "A"

SCOPE OF WORK
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
JACKRABBIT WASH TOPOGRAPHIC MAPPING AND FLOOD INSURANCE STUDY
FCD 90-05

General

The project consists of topographic mapping and floodplain and floodway delineations of the following streams:

* Jackrabbit Wash from the Vulture Mine Road crossing in Section 4, R.6W., T.4N. to the Central Arizona Project (CAP) Canal overshoot.

* Star Wash from the powerlines in Section 33 T.4N., R.5W. to the Central Arizona Project (CAP) Canal overshoot.

* Unnamed tributary to Jackrabbit Wash which crosses Vulture Mine Road in the southeastern 1/4 of Section 8, T.4N., R.6W.; from Vulture Mine Road to the confluence with Jackrabbit Wash.

The project also consist of topographic mapping and ponded floodplain delineations (Zone A) along the upstream side of the CAP Canal; from the southwest 1/4 of Section 13, T.3N., R.6W. to the Hassayampa River. Hydraulic analyses of pipe siphons and box overshoots within the CAP Canal study area will be made for use in the ponding analysis.

The Consultant will develop the hydrology using the Corps of Engineer's HEC-1 computer model and backwater analysis using the HEC-2 computer model to determine floodplain and floodway delineations for the 100-year peak flood. Work must be reviewed and accepted by the Federal Emergency Management Agency (FEMA) prior to the finalization of this contract. As part of this requirement, the Consultant shall be responsible for Public Notification regarding this project. Work under this Scope will be completed within 240 calendar days from the date of the Notice to Proceed, including 60 days for Flood Control District reviews.

Task 1 Data Collection

1.1 The Consultant will collect and review pertinent data from the District and other outside sources. Data to be collected will include previous flood hazard reports and hydrology for the study area; existing topographic mapping; historical flooding information; as-built plans for existing structures; FEMA Flood Hazard Boundary Maps and any Letters of Map Amendment and/or Revisions and other pertinent information.

1.2 A written summary of the data collection effort will be submitted to the District for information purposes.

1.3 The Consultant will submit a project schedule showing coordination meetings and completion dates for each of the tasks in the contract.

Task 2 Topographic Mapping

2.1 The Consultant will notify property owners and obtain necessary Rights-of-Entry for the study areas. The District will assist Consultant as may be necessary to complete this task.

2.2 An aerial survey subcontractor shall be retained by the firm as part of this contract. The Consultant shall coordinate the aerial surveying work with the aerial surveying consultant to ensure that the specifications of the aerial surveying work are met. Quality control on surveys will be per FEMA 37, Flood Insurance Study Guidelines and Specifications for Study Contractors.

2.2.1 Prepare topographic mapping to a 4-foot contour interval, 1"=400' scale, with spot elevations on section line and mid-section line roads.

2.2.2 Ground Control:

a. The Consultant shall provide survey control.

b. The Consultant shall systematically set panel points and establish horizontal and vertical control throughout the areas to be mapped for use in compilation by the aerial survey consultant. Where readily available, surveys will tie into the State Plane Coordinate System. Field control shall be sufficient to readily allow for compilation of maps by the aerial survey contractor at the desired map scale and contour interval and will be based on the National Geodetic Vertical Datum (NGVD).

c. The horizontal and vertical control points shall be located and marked by the Consultant. The controls for the area mapping shall be in sufficient numbers and shall be in locations which will be compatible with the accuracy of the mapping requirements. The controls shall be of at least third order accuracy. Section corners, quarter corners, and mid-section points shall be used for control points wherever possible.

2.2.3 Digital contour and planimetric data developed for this project shall be delivered in AutoCAD DXF ASCII format, as specified in Autodesk, Inc., publication TD106-009 (May 7, 1986). Layer names and graphics attributes shall be fully documented by the Consultant. The delivered DXF files shall be compatible with the requirements, and subject to the limitations, of the ESRI DXFARC or the ESRI SIF2ARC software translator as detailed in the January 1989 release of the "ARC/INFO Users Guide". File deliveries shall be in ASCII format on industry-standard 1/2" magnetic tape, 2400-foot reels, written in generic unlabeled COPY format, with specified record-lengths and blocksizes.

2.2.4 The Consultant shall provide permanent non-erasable topographic mylar sheets 24" x 36" with a scale of 1-inch equal to 400 feet, with a contour interval of 4 feet for mapping. A cover sheet will be provided with the project title, date of topographic mapping,

and a location map showing geographic range covered by each specific mapping sheet. Each manuscript shall include a minimum of north arrow, scale, section corners and quarter corners, current and proposed streets and highway names, State Plane Coordinate System, major drainage features, corporate boundaries, cross-section lines, channel station center line, index map, description and elevation of control points and ERM's and reference marks used in ground control. The mapping will have an accuracy such that ninety percent (90%) of contours shall be within one-half contour of the true elevations and the remaining ten percent (10%) of the contours shall not be in error by more than one contour interval.

2.2.5 The Consultant shall provide permanent non-erasable topographic mylars as described above in Section 2.2.4 with delineated floodplains included.

2.2.6 Sketch maps no larger than 11" x 17" for the study area must be included in the final narrative report along with the flood profiles.

Task 3 Hydrology

3.1 The hydrologic study of the watershed will be delivered to the District under separate cover from the hydraulic analysis. The watershed study limits are:

a. The watershed upstream of the CAP Canal, from Reach 7 Station 121+60 to Station 571+50 (hereinafter referred to as the CAP Canal Study Reach); and

b. The watershed downstream from the CAP Canal Study Reach bounded on the east by the Hassayampa River, on the west by 371st Avenue and on the south by Interstate 10.

The Consultant will use the U.S. Army Corps of Engineers (COE) computer program HEC-1, 1989 Version, to develop a 100-year hydrologic model or models for the area. Using appropriate hydrologic judgement, sub-basins will be identified that provide a reasonable depiction of the watershed condition. The sub-basins will be as homogeneous as possible, using watershed area, watershed type (mountain versus valley), and time of concentration as criteria. Sub-basin break-downs will be done in sufficient detail to provide peak discharges at the following locations:

a. Drainage structures along the CAP Canal Study Reach.

b. Tributary confluences along the following washes where a significant change in peak discharge will occur or where the wash crosses a County road:

* Jackrabbit Wash
* Coyote Wash
* Star Wash
* Daggs Wash
* Dead Horse Wash

The watershed upstream of the CAP Canal will be broken into sub-basins of an average size of five (5) square miles. The watershed downstream from the CAP Canal will be broken into sub-basins of an average size of three (3) square miles.

An appropriate hydrograph time increment and number of hydrograph ordinates will be selected to allow for complete calculation of the flood hydrograph without sacrificing resolution of the flood peak. Calculations, or assumptions used in developing sub-basin and routing parameters, will be documented and made a part of the appendices for the hydrology report.

3.2 The specific hydrologic techniques to be used in this study are:

a. Rainfall: Peak discharges for the 100-year 6-hour storm will be estimated using rainfall distributions provided by the District. The peak discharge and peak volume for the 100-year 24-hour storm will be estimated using the SCS Type II 24-hour rainfall distribution.

   Point precipitation values will be derived using the information and procedures contained in the Hydrologic Design Manual for Maricopa County, Arizona (Design Manual). The most current edition as of the date of Notice to Proceed will be utilized for this contract.

b. Areal Reduction: The point precipitation values will be arealy reduced separately for critical concentration points as well as for the entire watershed. Precipitation reduction factors will be applied in watershed area increments of five (5) square miles. The U.S. Army Corps of Engineers (COE) Queen Creek areal reduction curve will be applied for the 6-hour duration storm. NOAA Hydro-40 will be used for the 2-hour and 24-hour duration storms.

c. Rainfall Excess: The Green and Ampt Infiltration Equation will be utilized for estimation of rainfall losses. This method will be applied in conformance with the Design Manual procedures using available soil texture data. It is anticipated that the SCS Soil Survey of Maricopa County, Arizona, Central and Aguila-Carefree Areas will be utilized for this effort in combination with additional data obtained during the initial records search. Where soils texture data is deemed insufficient, is not available, or deemed questionable, SCS curve numbers will be assigned based on hydrologic soil group, land-use and surface cover. The curve number values will then be used to estimate the Green and Ampt equation parameters, using the Design Manual procedures.

The average soils texture values for each sub-basin will be estimated by use of a grid averaging method. The grid interval will be one-half mile with an average number of grid points of 20 per sub-basin, unless conditions in a specific area dictate otherwise. Tightening or loosening of the grid in a specific area will be done at the discretion of the Consultant.

d. Unit Hydrograph: The Clark Unit Hydrograph method will be used for this project.

e. Time of Concentration: The Papadakis method will be used with the Clark unit hydrograph. If this method results in an unsuitable time of concentration, other methods will be applied and the results compared. The most realistic result as determined by the Consultant will be utilized.

f. Hydrograph Channel Routing: Channel routing will be accomplished using the Normal Depth option under HEC-1 wherever possible. Average cross sections will be developed utilizing available mapping and field reconnaissance data. Where reasonable cross section data cannot be obtained, particularly in the upper reaches of the watershed, the Muskingum method will be applied. The choice of routing method for questionable reaches will be discussed with District personnel prior to estimating routing parameters.

   The reach routing parameters for the lower reaches modeled using HEC-2 will be adjusted after the HEC-2 cross sections are available. The HEC-2 cross sections will be compared and a typical average cross section estimated.

g. Hydrograph Reservoir Routing: Analysis of the backwater ponding areas against the north bank of the CAP Canal Study Reach will be accomplished using the level-pool reservoir routing option of HEC-1. Elevation and surface area data will be generated from the strip contour map of the canal alignment in combination with USGS quadrangle maps. Stage versus discharge tables for low-level outlets, channel outlets and canal bank overtopping conditions will be estimated using appropriate hydraulic methodology. These curves will then be incorporated into the HEC-1 computer model. The end result of this effort will be to define Zone A 100-year floodplain limits for ponding on the upstream side of the CAP Canal Study Reach, and to identify canal bank overtopping locations.

h. Channel Transmission Losses: Channel transmission losses for the reaches modeled using the Normal Depth Channel method will be included in the model if deemed appropriate by the Consultant, and if sufficient data is available. Existing field data, or the literature, will be used as the basis for this effort. An average percolation rate for each routing reach considered will be estimated by calculating a composite by area of overbank soils versus channel bed soils in the reach. Separate average values will be estimated for each storm frequency modeled. The percolation rate estimates

arrived at will be checked for reasonableness by performing percolation tests in the field in channel bed and overbank soils. This will be accomplished during the field investigation phase.

Percolation testing will be done using a method which simulates the vertical rate only, and which also simulates an average flow depth to account for hydraulic head. The test depth will be between four and twelve inches based on judgement of the Consultant. This will not be an extensive effort and will only be done as necessary to provide confidence in, or adjustments to, the values estimated using available soils data. The losses will be modeled using the Channel Loss option under HEC-1. The SCS National Engineering Handbook, Section 4 Hydrology, Chapter 19 will be used as the base reference for estimating the loss parameter. Mr. Dave Creighton of ADWR and Mr. Harry Milsaps of the SCS will be consulted in this effort.

3.3 The District will provide appropriate references to facilitate parameter estimation.

3.4 The output of the computer model will be reviewed to determine if peak flows and volumes are realistic. This will be done by comparing the results with available gage data, previous studies and USGS gage regression analysis results. Adjustments to the input data areas of precipitation loss, routing, and transmission losses will be made in order to obtain realistic and justifiable results.

3.5 Attempts will be made to recover historic stream gage data where available and compare the data with the results obtained by the hydrologic model. Major differences will be discussed in the final report.

3.6 The Consultant will obtain the approval of the District at each of the following steps:

a. Soil and watershed boundary maps.

b. HEC-1 input parameters and parameter estimation.

c. HEC-1 flow diagram.

d. HEC-1 results.

3.7 The final report will include the following sections organized according to the latest draft of the ADWR State Standards Workgroup criteria at the time of Notice to Proceed for organizing and submitting technical documentation for flood studies:

a. Scope of the study.

b. Description of the watershed.

c. Previous studies and reports.

d. Methodology.

e. Assumptions.

f. Results.

g. Comparison of the results with other studies and/or stream gages.

h. Conclusion.

i. List of references and agencies contacted.

3.7.1 Tables and figures for the main text:

a. Watershed area (18x24) foldout map.

b. Table showing the flow peaks and volumes at critical concentration points for different frequency and duration storms.

c. Table showing the critical peaks and volumes for major concentration points as compared to previous studies (where available).

d. Spreadsheet showing sub-basins and their major parameters (slope, area, friction, total rainfall, time of concentration or Lag, major structures, etc.).

3.7.2 Tables and figures for the appendices:

a. Topographic base map showing the sub-watershed delineations, routing reaches, Tc calculation paths, major man-made structures, and references (i.e. street names, Township Range Section, etc.) at a scale of 1"=2000'.

b. Soils and land-use map at the same scale as the base map.

c. Schematic map for the HEC-1 computer model which depicts the sub-basins (area, Tc), the flow paths, the routing reaches (length, slope, friction, width, associated velocities, associated transmission losses, etc.), order of combining the hydrographs, channel, pipe or culvert dimensions (where appropriate).

d. Pertinent data on structures in the watershed (such as spillway elevation, rating curves, etc.).

3.8 The proposed approach to performing the hydrology portion of the contract is presented as follows, organized by work task:

a. Data Collection: Research records and obtain CAP access privileges. Research records of the following agencies:

* Flood Control District of Maricopa County (District)

* Maricopa County Highway Department (MCHD)
* Arizona Department of Water Resources (ADWR)
* U.S. Bureau of Reclamation (USBR)
* U.S. Geological Survey (USGS)
* U.S. Soil Conservation Service (SCS)

Prepare a summary of findings for submittal to the District. Included under this task is a field trip with District personnel at the start of the project to identify the critical points of the watershed and problem areas.

b. Preliminary Sub-Basin Delineation: Prepare two sets of 1"=2000' scale base maps and one 1"=10000' scale base map from 7.5 minute USGS quadrangle maps. The 2000 scale maps will be on 5 - 36"x42" sheets, and the 10000 scale map will be on 1 - 18"x24" sheet.

The soils grid will be drafted on one set of 2000 scale maps, and the preliminary sub-basin delineations will be prepared and drafted on the second set. Tentative Tc flow paths and routing paths will be determined and drafted on the sub-basin maps.

Sample parameter calculation forms will be prepared for review by the District.

c. Meeting Number One with the District: Copies of the base maps and parameter calculation forms will be submitted to the District for review one week prior to the meeting. These maps, the proposed parameter calculations and the findings of the records search will be discussed.

d. Field Investigation: A detailed field reconnaissance will be done to accomplish the following:

1. Verify questionable sub-basin boundaries;

2. Verify Tc path locations. Estimate average low flow channel cross sections for use in calculating Tc values using TR-55 methodology. This data will be used to check approximately 10% of the Tc values estimated using the Papadakis method;

3. Verify routing path locations. Estimate reach route cross sections for use in determining HEC-1 Normal Depth parameters. Distances will be paced, and relative elevations obtained using a hand level. This will be done for approximately 20% of the routing reaches. The data obtained will be used to estimate average cross section configurations for the remainder of the reaches. This will be done by comparing the observed data with the USGS quadrangle maps and visually matching similar reaches;

4. Observe routing reach channel bed and overbank soils. Check for consistency with the SCS mapping. Take percolation tests at six representative locations. Take

three tests at each location, one in the channel bed and one on each overbank area, for a total of 18 tests. Use an 8 inch or 12 inch diameter plastic pipe, set 4 to 12 inches into the ground. The hole will be pre-soaked and the percolation test taken by applying a hydraulic head in the pipe at the average estimated flow depth at the test location. The test results will be used as confidence checks on the percolation values derived from the SCS soil survey data;

5. Vegetation transects will be taken in the watershed at representative locations to establish average vegetation cover densities. The regions will be established based on visual observations in the field;

6. The Tc data, routing reach data, and vegetation cover data will be documented and summarized for input to the parameter estimation spreadsheets where appropriate; and

7. The sub-basin delineation and soils boundary maps will be revised to reflect the findings of the field reconnaissance.

District personnel may accompany the Consultant at intervals during the field reconnaissance phase.

e. Meeting Number Two with the District: Meeting number two will be held after the hydrologic field reconnaissance is accomplished and the sub-basin delineations are completed. The proposed approach to parameter estimation, routing methodology and channel transmission loss estimates will be discussed and finalized at this meeting.

f. Final Sub-Basin Delineation: The areas of sub-basins will be planimetered. Areas of soils types from a representative sample (about 1/3 of the total) will be planimetered. Time of concentration flow paths and routing reach paths will be measured and elevations for the top and bottom of representative reaches will be determined. The data collected will then be placed into the parameter estimation and summary spreadsheets. Sub-basin identifiers, Tc path data, and routing reach data will be drafted onto the exhibit maps.

g. Parameter Estimations: The following parameters will be estimated under this task:

1. Green and Ampt Coefficients - Values will be assigned for the soil type at all grid locations for each sub-basin. These values will be input to the parameter spreadsheet, and composite values for each sub-basin calculated;

2. Time of Concentration - The Green and Ampt values, sub-basin areas and Tc parameters will be input to the MCUHP1 computer program and the base HEC-1 input data files created. The resultant Tc estimates will then be input to

the summary spreadsheet, and average reach velocities calculated. The Tc estimates will be checked for reasonableness by inspecting velocities and by estimating Tc values for 25% of the sub-basins using TR-55 methodology; and

3. Reach Routing Data - The Normal Depth channel cross sections will be sketched, average velocities estimated for each reach, and the number of routing steps calculated. Velocities for the reaches to be modeled by the Muskingum method will be estimated and x and K coefficients assigned. The number of routing steps will then be calculated.

h. Channel Losses: The average percolation rates for the routing reaches which will include transmission losses will be estimated as follows. This will be done after peak discharges are obtained from the initial HEC-1 runs made without transmission losses:

1. Only Normal Depth Channel routing reaches will be considered. The proposal is based on 50% of the Normal Depth Channel routing reaches being modeled to include transmission losses. The proposal is also based on the assumption that there will be a total of approximately 120 reaches modeled, and that 100 of these will be Normal Depth Channel reaches;

2. The average inundation width for each storm will be estimated for each reach. The soils areas for channel bed soils versus channel overbank soils will then be estimated using the grid data to obtain a proportion of soils types across the cross section;

3. Average percolation values for each reach for each storm will then be calculated in a spreadsheet; and

4. The same process will be used for percolation losses in the ponding areas upstream of the CAP Canal Study Reach, where deemed appropriate.

i. Meeting Number Three with the District: Meeting number three will be held after all the parameters except transmission losses have been estimated. A draft copy of parameter estimations will be submitted to the District at least one week prior to this meeting.

j. HEC-1 Diagram: The HEC-1 schematic diagram will be prepared as described in Section 3.7.2C.

k. HEC-1 Computer Models: The HEC-1 computer input data files, created under Task 3g, will be made into working models by the addition of hydrograph routing and combination control operations in accordance with the routing diagram. Comments on logic, assumptions, and watershed identification will also be

added to the files. The models will then be run, debugged, the results checked for reasonableness, and adjustments made accordingly.

l. Hydraulics of Structures and Storage Routing: Hydraulic structures and crossings along the CAP Canal Study Reach will be analyzed utilizing the field survey data. Stage versus discharge and stage versus storage volume curves for each structure and crossing will be developed for input to the HEC-1 models. The new contour mapping will be used in conjunction with the USGS quadrangle maps for estimation of available ponding volumes.

m. Add Storage Routing to HEC-1 Model: The stage versus discharge and stage versus volume curves will be added to the HEC-1 models as reservoir routing operations. The results will be checked for reasonableness and locations of overtopping of the CAP Canal banks determined.

The hydrology results will then be compared with previous studies and available gage data. The models will be calibrated or adjusted if necessary.

n. Preliminary Hydrology Report: The preliminary hydrology report will be prepared as described under Section 3.7 and bound in a format suitable for review. Three (3) copies will be submitted to the District for review.

o. Meeting Number Four with the District: Meeting number four will be held after the preliminary HEC-1 results have been obtained and a draft report has been prepared. A copy of the draft report and the copy of the HEC-1 input files on a floppy disk (compatible with the District's IBM-AT computer) will be delivered to the District one week prior to the meeting. A second copy will be forwarded to ADWR for their review and comment.

p. Meeting Number Five with the District: Meeting number five will be held to review comments by the District and ADWR one week after the Consultant has received the District's comments. The District will require a minimum of two weeks to review the report and the models.

The second field trip may be scheduled for the same week as meeting number five so that the results obtained can be discussed in the field.

q. Final Hydrology Report: The final hydrology report will be prepared as described under Section 3.7, and will reflect the review comments from the District and ADWR. The reach routing parameters for the lower reaches, modeled using HEC-2, will be adjusted using the HEC-2 cross sections. The HEC-2 cross sections available for each routing reach will be compared and

a typical average cross section estimated. The final report will reflect this effort. Six (6) copies will be submitted to the District.

r. FEMA Revisions and Coordination: The response from FEMA will be reviewed and all comments addressed. This task will include revisions which are necessary- to obtain FEMA approval both to the HEC-1 models and the final report.

Task 4 Field Survey

4.1 Prepare topographic mapping to a 4 foot contour interval with a scale of 1" = 400' feet, with spot elevations on section line and mid-section line roads, for floodplain/floodway delineation areas as identified in Task 2 or FEMA criteria, whichever is more stringent.

4.2 Ground Control for Floodplain Delineations:

a. Topographic mapping and survey work shall meet or exceed Federal Emergency Management Agency (FEMA) minimum criteria as defined in FEMA Document 37, Flood Insurance Study Guidelines and Specifications for Study Contractors, Appendix 4, September 1985. This would include, but is not limited to: the establishment of "permanent" elevation reference marks (ERM's); field control; and verification of profiles by the ground survey profile procedure.

b. Horizontal and Vertical Control; Systematically set panel points and establish horizontal and vertical control throughout the area to be mapped using the Global Positioning system supplemented by conventional field methods for use in compilation by the aerial survey contractor. Surveys will tie into State Plane Coordinate System. Field control shall be sufficient, at least one "permanent" point per mile, such point(s) being used as Elevation Reference Marks (ERM's). Surveys will be based on National Geodetic Vertical Datum (NGVD), per FEMA guidelines. "Permanent" survey points shall consist of existing monumentation, such as brass caps or similar survey monuments. Where additional monumentation is needed, survey markers conforming to Maricopa Association of Governments (MAG) Uniform Standard Detail for Public Works Construction, Detail 120-1, Type C, shall be placed 2" +/-above grade. Elevation Reference Marks will be labeled on available maps and described in a manor which allows them to be readily located in the field.

c. "As-Built" plans or surveys of bridges and hydraulic structures are to obtained by the Study Consultant.

d. The Consultant shall verify profiles for mapped floodplains. The ground survey profile procedure as described in FEMA Document 37 or other methods approved by FEMA.

Task 5 Floodplain and Floodway Delineation

5.1 Floodway and Floodway delineations must be obtained for the 100-year flood using the U.S. Army Corps of Engineers HEC-2 Water Surface Profiles computer model, 1989 version, and using methodology acceptable to FEMA. This model will simulate the effects of floodplain geomorphology, flow changes, bridges and culverts, hydraulic roughness factors, effective flow limitations, split-flows, and other considerations. The Consultant will prepare the study using the guidelines established in "The Flood Insurance Study Guidelines and Specification for Study Contractors', dated September 1985 and "Appeals, Revisions, and Amendments to Flood Insurance Maps", September 1985.

5.2 Bridges and Culverts must be modeled in compliance with HEC-2 modeling requirements for the selected routing. Where multiple bridges occur, each bridge will be modeled separately.

5.3 Cross sections shall be spaced an average of 1000 feet apart. Cross-sections will be plotted using a pen plotter. The cross-section plots will show water surface profiles, ineffective flow areas, "n" values, encroachments, channel stationing and other pertinent information. These plots are to be available at reviews.

5.4 Flood zones must be determined according to FEMA criteria.

5.5 The Contractor will prepare working maps and models of the 100-year floodplain and floodway during the course of the hydraulic modeling analysis for review by the Flood Control District at progress meetings. Floodways are to be determined using equal conveyance encroachment methods to start with, but only encroachment method 1 will be used in the final analysis.

5.6 The delineation work shall meet requirements for floodplain delineations as prescribed by FEMA and the Arizona Department of Water Resources.

5.7 The final report for the floodplain/floodway delineation study will include, but is not limited to the following:

I. Introduction

a. Purpose of study
b. Authority for study
c. Coordination and acknowledgments

II. Area Studied

a. Scope of study
b. Community description
c. Principal flood problems
d. Flood protection measures

III. Engineering methods

a. Hydrologic analyses
b. Hydraulic analyses

IV. Floodplain Management applications

a. Flood boundaries
b. Floodways

V. Insurance applications

VI. Other Studies

VII. Location of data

VIII. Bibliography

Task 6 Coordination

6.1 The Consultant shall participate in regular coordination meetings (at least every three weeks) with the District's Project Manager and in milestone coordination meetings in the development of the hydrologic and hydraulic analyses.

6.2 Prior to finalizing the hydraulic analysis, the Consultant will submit maps, report, and HEC-1 model to ADWR and other applicable governmental agency reviewers throughout the District. The Consultant will respond to questions by the reviewers and make modifications to the hydrologic maps, model, and report if necessary.

6.3 The Consultant will submit maps, report, and HEC-2 model to ADWR, FEMA for review by the Technical Evaluation Contractor (TEC), and other governmental agency reviewers through the District. The Consultant will respond to questions by the reviewers and make modifications to maps, models and report if required.

Task 7 Final Products

7.1 Mapping:

a. One complete set of 9" x 9" contact prints of the aerial stereo photographs sequentially numbered and catalogued.

b. One complete set of contour maps, blueline, draft copy for Flood Control District reference during the project, delivered immediately following the topographic mapping.

c. One complete set of contour maps at 1" = 400' scale with the floodplain delineations in reproducible form (mylar) and six blueline copies as outlined in Task 2.

d. One set of transparent overlays of photo-mylars.

e. One complete set of mylars for the foldout maps (no larger than 11" x 17") used in the report.

7.2 One-half inch magnetic tape formatted at 1600 bpi containing the topographic data and the digitized floodplain/floodway boundaries in the AutoCAD DXF ASCII format.

7.3 Six hardcopies of the HEC-2 and HEC-1 printouts and a copy of the HEC-2 and HEC-1 model input files on 5-1/4", 1.2 Mb diskettes compatible with an IBM-At personal computer.

7.4 Tabular list of control points (ERM's) used with descriptions, elevations, and coordinates.

7.5 Reports:

a. The Consultant will produce a final report incorporating the comments of the District, FEMA and other reviewers. Six copies of the Hydrology and Hydraulics reports as outlined in Tasks 3 and 5 respectively, will be delivered.

7.6 Documentation for this study will be as outlined in Instructions for Organizing and Submitting Technical Documentation for Flood Studies as required by ADWR.

SECTION 2: Mapping and Surveying Information

Section 2

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

SECTION 2: Mapping and Surveying Information

2.1 General

The May, 1991 revision of this document includes the addition of Book 2 to include the Exhibit drawings. The wording of Section 2.4 was also revised.

The mapping and survey data used for the hydrology portion of this project is described, by exhibit drawing, as follows:

Exhibits "A", "B" and "C" - The base mapping used for these exhibits consists of United States Geological Survey (USGS) 7.5 minute quadrangle maps. The maps were photo-mosaiced at full 1"=2000' scale for use for Exhibits "B" and "C". A composite of all the USGS quadrangle maps was reduced to 1"=10000' scale for Exhibit "A". The following are the USGS quadrangle maps used for this study:

AGUILA: 1990 provisional, 1951 and 1960 photo date, 20' contour interval (CI) 10' supplementary contour interval (SCI).

BELMONT MOUNTAIN: 1989 provisional, 1951 and 1960 photo date, 40' CI.

BLACK BUTTE: 1990 provisional, 1951 and 1960 photo date, 40 CI, 20 SPI.

BUCKEYE NW: 1982 Photo revised, 1955 and 1978 photo date, 10' CI.

BURNT MOUNTAIN: 1990 provisional, 1960 photo date, 20' CI.

DAGGS TANK: 1988 provisional, 1984 photo date, 20' CI.

FLATIRON MOUNTAIN: 1990 provisional, 1951 and 1960 photo date, 20' CI.

FOREPAUGH PEAK: 1990 provisional, 1951 and 1960 photo date, 20' CI, 10' SCI.

HOT ROCK MOUNTAIN: 1990 provisional, 1951 and 1960 photo date, 20' CI.

HUMMINGBIRD SPRING: 1990 provisional, 1960 photo date, 40' CI.

OUTLAW HILL: 1990 provisional, 1951 and 1960 photo date, 20 CI, 10' SCI.

STAR WELL: 1989 provisional, 1951 and 1960 photo date, 10' CI.

TIGER WELL: 1990 provisional, 1951 and 1960 photo date, 40' CI, 20' SCI.

VULTURE MINE: 1990 provisional, 1951 and 1960 photo date, 20' CI, 10' SCI.

VULTURE PEAK: 1990 provisional, 1951 and 1960 photo date, 20' CI, 10' SCI.

WAGNER WASH WELL: 1988 provisional, 1984 photo date, 20' CI.

WICKENBURG: 1978 photoinspected, 1962 photo date, 20' CI, 10 SCI.

WICKENBURG SW: 1965, 1962 photo date, 20' CI, 10' SCI.

WILDCAT WELL: 1990 provisional, 1951 and 1960 photo date, 20' CI.

WINTERSBURG: 1984 provisional, 1960 photo date, 10' CI.

Exhibit "D" - The cross sections on this exhibit were taken in the field during the period September 6, 1990 through September 20, 1990. The cross section vertical measurements were taken using a Hewlett-Packard laser level. Distances were paced or measured with a Philadelphia rod and hand tape. The horizontal location of each cross section is identified on Exhibit "C".

Each cross section was taken at a location deemed to be representative of that portion of a routing reach. Sufficient cross sections were taken to enable interpolation or estimation of typical cross sections for other representative reaches.

Exhibit "E" - The cross sections on this exhibit are plots of each reach route section used in the HEC-1 models. They were derived from the cross sections shown on Exhibit "D", or from available contour mapping, using one of the following methods:

1. The actual cross section taken in a reach was used where appropriate. The end legs of the section were extended if necessary to contain the computed peak flows. The actual grades shot in the field, or slopes calculated from the USGS quadrangle maps, were used in the extension process.

2. Interpolation between known cross sections from Exhibit "D".

3. Known cross sections from Exhibit "D" were used for reaches deemed similar to the source reach. A reach was deemed similar based on field observation, review of soil survey mapping, or examination of the terrain of the reach on the USGS quadrangle map.

4. Digitized HEC-2 cross sections for Jackrabbit Wash, the West Fork of Jackrabbit Wash, and Star Wash were used for those reaches mapped as a part of the floodplain delineation portion of this project. The mapping was prepared by Aerial Mapping Co. of Phoenix, AZ. The Aerial Mapping Co. job number is 90153, and the mapping flight date was September 28, 1990.

5. A portion of the watershed south of the Central Arizona Project Canal has been mapped at a scale of 1"=500' with a 1' contour interval. The mapping was used for cross sections south of the CAP canal, where possible. The mapping was prepared by Kenney Aerial Mapping of Phoenix, AZ. The Kenney Aerial Mapping job number is 890414. The flight date is unknown. This mapping was prepared for a proposed residential development project known as the "Belmont Planned Community". The mapping is referred to as the "Belmont Mapping" in this report.

The source of each cross section is referenced in Table R-2 under Section 3.2.2.2 Reach Route Parameters.

Exhibit "G" - The mapping for this exhibit was done to provide additional detail on the Coyote Wash split area. The mapping is at a scale of 1"=200' with a 2' contour interval. The mapping was prepared by Aerial Mapping Company. The Aerial Mapping Co. job number is 90153, and the flight date was September 28, 1990.

2.2 Index of Maps

2.4 Watershed and Hydrologic Analysis Maps

All maps under Sections 2.2 and 2.4 are contained in Book 2 of 2.

Section 3.1

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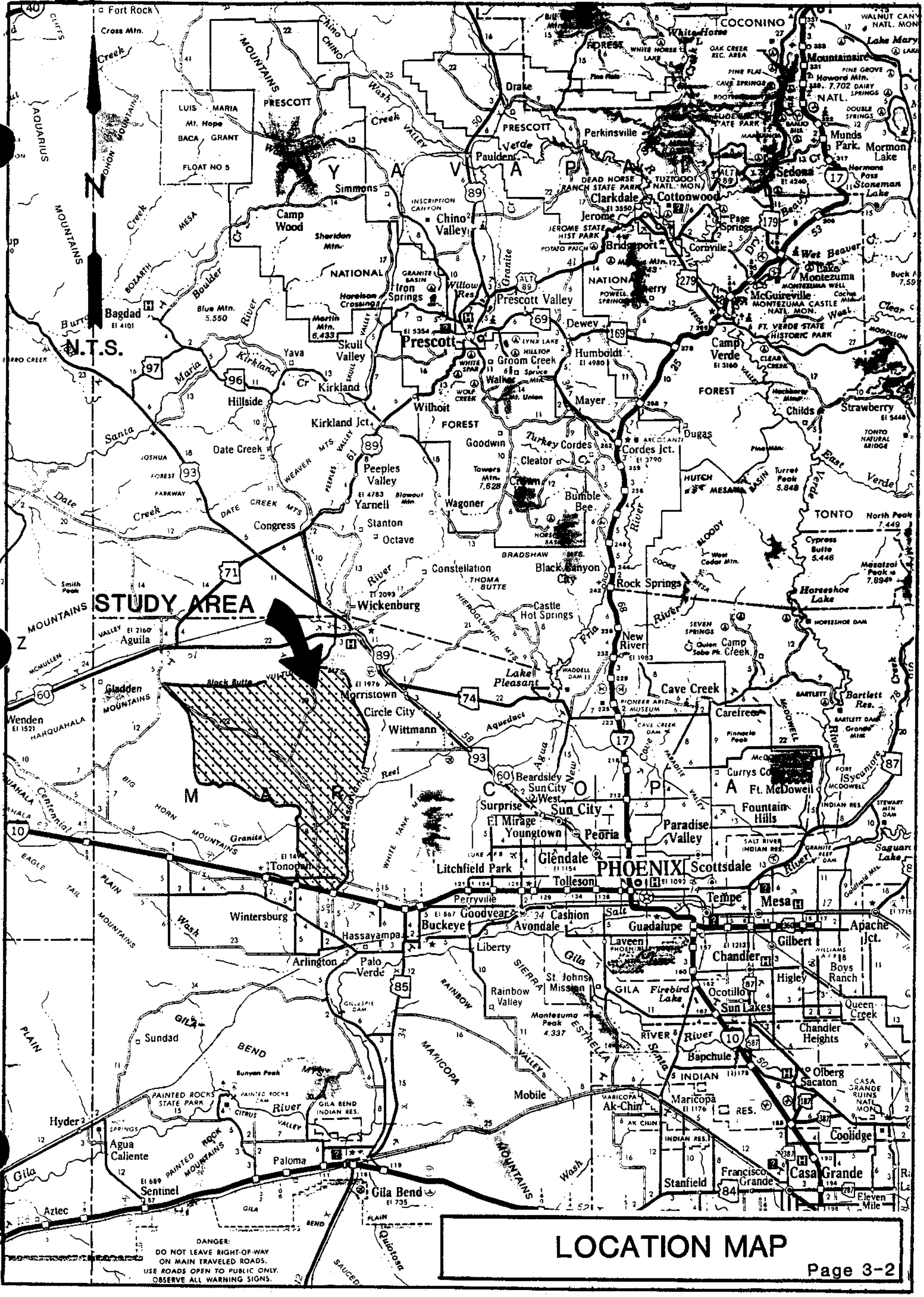
SECTION 3: Hydrologic Analysis

3.1 Hydrologic Method Description

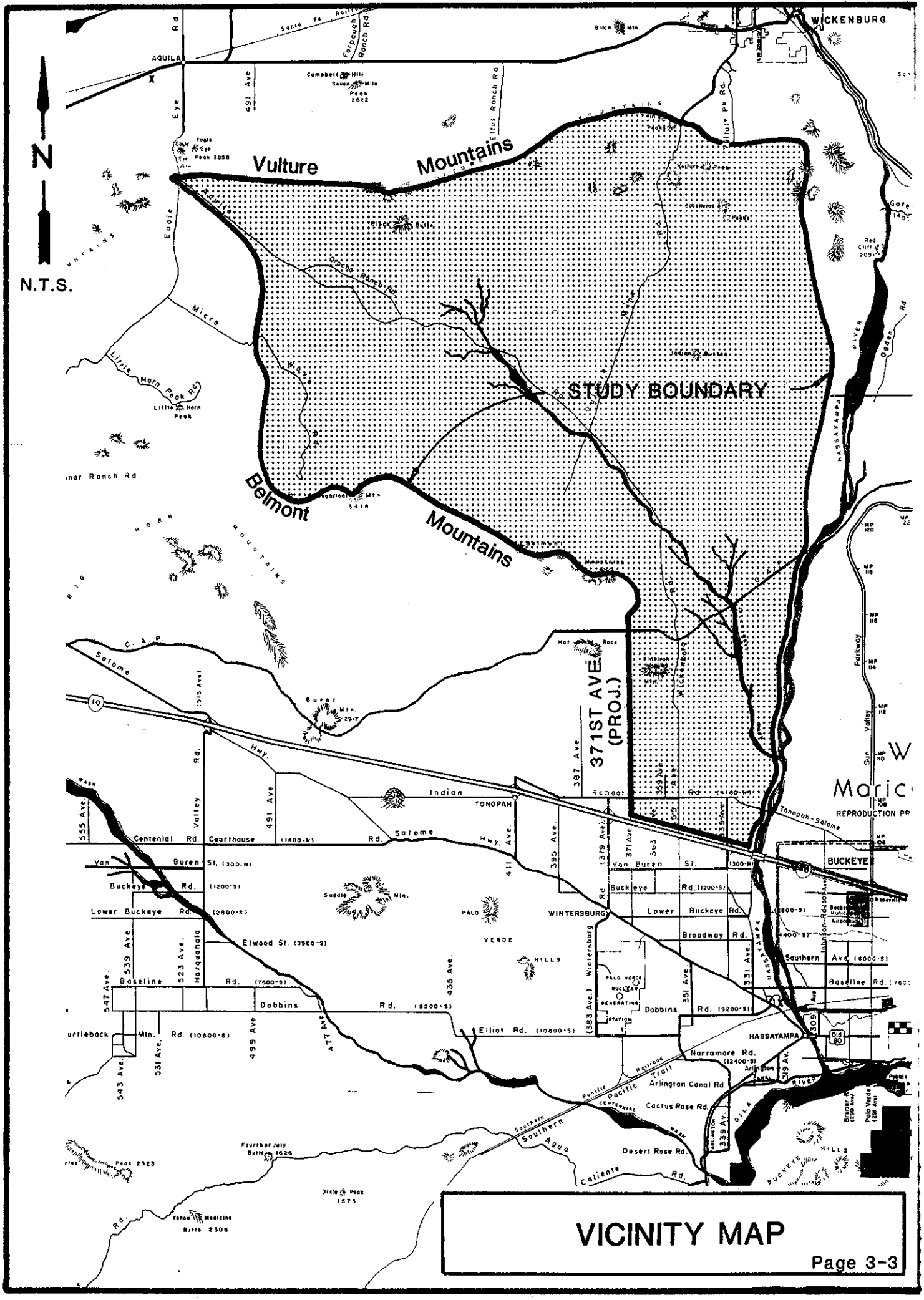
SECTION 3: Hydrologic Analysis

3.1 Hydrologic Method Description

The watershed was modeled utilizing methodology set forth in the Hydrologic Design Manual for Maricopa County, Arizona (Design Manual), prepared by the Special Projects Branch, Hydrology Division, Flood Control District of Maricopa County, dated September 1, 1990. This manual was specified for use in the Contract Scope of Work, which is contained under Section 1.5 of this report. The watershed was modeled for the 100-year 6-hour, and 100-year 24-hour, duration storms. Rainfall losses were estimated using the Green & Ampt infiltration equation with an estimate for surface retention loss. Hydrographs were routed through the watershed using normal depth channel routing. Reservoir routing, where water ponds against the Central Arizona Project Canal, was accomplished using the Modified Puls Method. The watershed was modeled using the U.S. Army Corps of Engineers HEC-1 Computer Program, version 4.0, dated September, 1990, as implemented by Dodson & Associates.



LOCATION MAP



VICINITY MAP

FLOOD CONTROL
DISTRICT
of
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1959

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Section 3.2

SECTION 3: Hydrologic Analysis

3.2 Parameter Estimation

3.2 Parameter Estimation

3.2.1 Drainage Area Boundaries

The study watershed is approximately 441.8 square miles in area. Refer to Exhibit "A" in Section 2.2.1 for the watershed boundary delineation. The study area is bounded on the north by the Vulture Mountains, on the east by the Vulture Mountains and the Hassayampa River, on the south by US Interstate 10, and on the west and southwest by 371st Avenue (projected) and the Belmont Mountains. The watershed is divided into two sections by the Central Arizona Project Canal. Refer to Exhibit "A" for the location of the canal. The major wash on the watershed is known as Jackrabbit Wash. Jackrabbit Wash has several major washes which contribute to it. These are known as Deadhorse Wash, Coyote Wash, Powerline Wash and Star Wash. A secondary wash on the watershed which contributes directly to the Hassayampa River is Daggs Wash.

The watershed was broken into 19 major drainage basins, 15 of which lie north, or upstream, of the Central Arizona Project Canal. The four remaining basins lie south of the Central Arizona Project Canal and north of Interstate 10. The watershed is rural in nature and essentially consists of desert terrain. There is some existing private residential development in major basin 10 which consists of single family lots in excess of 1 acre in size. Individual dwelling units are very scattered. There is also a small area of agriculture in major basin 1 which has been identified on Exhibit "B". The watershed is characterized by steep rugged mountainous terrain along the edges of the watershed and much flatter desert valley in the middle and southerly portion of the watershed. The typical soil type is a sandy loam. This correlates to an SCS Hydrologic Group A soil. The watershed can therefore be characterized as having a low runoff potential.

The criteria for delineating the watershed into sub-basins was to use an average sub-basin size upstream of the Central Arizona Project Canal of 5 square miles and an average sub-basin size downstream of the Central Arizona Project Canal of 3 square miles. In addition to this criteria, the watershed was also broken down to allow for computing peak discharges at major county road crossings and at confluences of major washes.

There are many small sub-basins against U.S. Interstate 10 and 371st Avenue which are less than 1.0 square mile. These sub-basins were not modelled.

3.2.2 Physical Parameters

3.2.2.1 Watershed Sub-Basin Parameters

General

The watershed sub-basin parameters were estimated in conformance with the Design Manual. The procedures used for estimating parameters are contained in the following sections. The descriptions only cover procedures which varied from the manual or procedures which could be done under the manual in more than one way.

Soils Parameters

General - Soils parameters were estimated using the Green & Ampt infiltration equation. Soil textures were obtained from the following sources:

1. Soil Survey of Maricopa County, Arizona, Central Part, prepared by the United States Department of Agriculture, Soil Conservation Service (SCS), dated September, 1977.

2. Soil Survey of Aguila-Carefree Area, Parts of Maricopa County and Pinal Counties, Arizona, prepared by the United States Department of Agriculture, Soil Conservation Service dated April, 1986.

Green & Ampt Parameters by SCS Soil Map Unit - The first step in determining rainfall loss values was to set Green & Ampt values for each SCS soil unit present on the watershed. This was accomplished using the data in Table 4.2 of the Design Manual. Appendices "A" and "C" of the Design Manual were used as a guide, although each map unit was evaluated by analyzing both "major" and

"minor" soils, as designated in the SCS soils surveys referenced above. The soil types present in each SCS map unit were listed in a table by major soil and minor soils. Refer to Table S-1 under this Section. Each soil type, whether major or minor, was assigned a percent of map unit based on information in the soil survey. Where the soil survey listed a group of minor soils as consisting of a total percentage of the watershed, this percentage was split evenly among each soil type. The controlling soil horizon was determined by inspection by the Engineer. The Engineer evaluated the different soil layers and determined which was a control layer. This was done based on the layer with the lowest permeability, when the upper layer or layers were determined to have insufficient storage volume to contain the average infiltration during the storm. The control layer used is shown in Table S-1.

A textural class was then assigned to each soil type. The textural class for major soils was assigned based on the average percent sand and percent clay listed in the SCS Soil Survey. The textural class assignment was done per the chart in Appendix D of the Design Manual. Minor soils were assigned a textural class based on the verbal description of the minor soil in the SCS Soil Survey. A composite Green & Ampt XKSAT value for each SCS map unit was then calculated using the percent of map unit. Refer to Table S-1 for a summary of these calculations.

Rock outcrops were also accounted for when arriving at the composite Green & Ampt XKSAT value. Where the SCS soil survey listed a percent of rock outcrop for each soil map unit, rock was accounted for in the calculations using a value of zero for the Green & Ampt XKSAT parameter. Since the majority of the rock areas on this watershed are hydraulicly unconnected, based on the field reconnaissance, it was assumed that only 75% of rock outcrop areas are effectively 100% impervious. The percentage of rock outcrop area in each SCS map unit was therefore reduced by 25%. The percentages of all remaining soil groups were then adjusted upward proportionally. The parameter RTIMP for percent impervious on the watershed was not used in this model. It was assumed to be accounted for in the method for handling rock outcrop described above.

Occasionally, a minor soil with an XKSAT value substantially higher than that of the major soils or other minor soils was found to unbalance the average XKSAT value. An example is soil map unit 13. Refer to Table S-1. The Carrizo minor soil has an XKSAT value of 4.6 inches per hour. The other soils are predominantly clays with XKSAT values less than 0.05 inches per hour. Since the Carrizo minor soil is found mostly in wash bottoms, and losses in the major washes are also accounted for by channel infiltration, the percent of Carrizo soil in the map unit was set to zero and the percentages of the remaining minor soils were increased proportionately. The resultant composite XKSAT value for this example was changed from 0.12 to 0.03 inches per hour. This type of adjustment was applied only where, in the judgement of the Engineer, the composite XKSAT value should be decreased in value, not increased.

Areas of desert pavement were encountered throughout the watershed. Although these areas appear on the surface to have high runoff potential, a careful examination in the field yielded evidence to the contrary. The exposed gravels on the surface would seem to detain runoff and allow water to infiltrate into the sandy soils between the rocks. The surface, although crusted, appears moderately permeable. The characteristics of the underlying soil horizon were assumed to control.

After the composite value for XKSAT was determined for the soil map unit, the remaining Green & Ampt parameters PSIF and DTHETA were determined by interpolation from Table 4.2 of the Design Manual. The soil condition for selection of DTHETA was assumed to be "dry". The composite values for Green & Ampt parameters by SCS map unit are listed in Table S-2.

Green & Ampt Parameters by Sub-Basin - A grid method was used to estimate composite Green & Ampt soil parameters by sub-basin. The grid method was applied as follows:

A grid was laid over the entire watershed on one-quarter mile intervals. Each grid point fell on a section corner, quarter section corner, or center of section.

The grid is shown on Exhibit "B" under Section 2.4.1. Exhibit "B" was then overlaid on top of the SCS Soil Survey Maps and a soil map unit was assigned to each grid point. Additional grid points were then added where the Engineer judged it was necessary to adequately represent the different soil map units in each sub-basin. The number of grid points for each SCS map unit was then totaled for each sub-basin. These totals are listed in Table S-3. Each SCS Soil map unit, and the associated number of grid points for each sub-basin, was then assigned a weighting factor. This weighting factor allowed the Engineer to fine tune the effects of each individual soil map unit. The Engineer made an examination of the boundaries of each soil map unit within the sub-basin and determined if a full quarter mile area for each map unit grid point was available, and agreed with the number of grid points. Visually, the Engineer determined whether a particular soil map unit was being overweighted by the number of grid points. The weighting factor was then used to either increase or reduce the effect of that particular soil map unit. The XKSAT estimate for each soil map unit in the sub-basin was then adjusted for the effects of vegetation cover using Figure 4.3 of the Design Manual. Vegetation cover density values are discussed under "Landuse Characteristics". Composite Green & Ampt parameters for each sub-basin were then calculated using the summation of the number of grid points times the weighing factor times the Green & Ampt value divided by the total number of weighted grid points for the sub-basin. The resultant values are listed in Table S-3.

A check of the accuracy of the grid method yielded satisfactory results. Three representative sub-basins were analyzed using planimetered areas of each soil map unit in the sub-basin. Composite Green & Ampt values were then calculated and compared with the results of the grid method. Refer to Table S-6.

Sample Calculation of Sub-Basin Parameters - The following is an example of the soil parameter calculations using the data from Tables S-1 through S-5. The composite Green & Ampt parameters for soil map unit number 52 will be estimated. Then the procedure to calculate composite Green & Ampt parameters

for sub-basin 2E will be described. Finally, the procedures used to estimate the sub-basin lag time and to select the appropriate S-Graph will be discussed.

Green & Ampt Parameters for SCS Soil Map Unit 52

Step 1: Determine the percentage of each soil present in the soil map unit and the control horizon for each map unit. The following is an excerpt from page 46 of the Soil Survey of Aguila-Carefree (see Section 6.5: Bibliography Reference No. 27):

> ***52-Gachado-Lomitas-Rock outcrop complex, 7 to 55 percent slopes.*** *This map unit is on mountain slopes and hill slopes. Elevation is 1,200 to 3,000 feet. The average annual precipitation is 7 to 10 inches, and the average annual air temperature is 70 to 73 degrees F.*
>
> *This unit is about 45 percent Gachado very gravelly loam, 20 percent Lomitas very gravelly sandy loam, and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.*
>
> *Included in this unit are small areas of Carrizo, Cherioni, Cipriano, Ebon, Gunsight, and Pinamt soils on fan terraces and Schenco and Vaiva soils on mountain slopes and hill slopes. Also included are small areas of exposed volcanic ash deposits. The included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.*

The following major and minor soils for soil map unit 52 were derived from the above description. Also refer to Table S-1, Page 14, for the summary of calculation results.

Major Soils

Gachado - A very gravelly loam. 45% of the map unit.
Lomitas - A very gravelly sandy loam. 20% of the map unit.
Rock Outcrop - 20% of the map unit.

Minor Soils

Carrizo, Cherioni, Cipriano, Ebon, Gunsight, Pinamt, Schenco and Vaiva soils. These minor soils make up the remaining 15% of the map. Each minor soil was assigned an equal percentage of the map unit. In this example, each minor soil was assigned a value of 1.9%. A value of 1.8% was used for the last two soils in order for all percentages to total 100%.

Next, the control horizon for each soil was determined. The following is an excerpt from page 292 of the Soil Survey of Aguila-Carefree Area:

Table 14.--Physical and Chemical Properties of Soils
(Excerpt from Soil Survey of Aguila Carefree Area)

Soil name and map symbol	*Depth*	*Clay*	*Permeability*	*Available water capacity*	*Soil reaction*	*Salinity*	*Shrink-swell potential*	*Erosion factors*	
								K	*T*
52 *Gachado------*	*0-1* *1-7* *7*	*15-20* *25-30* ---	*0.6-2.0* *0.2-0.6* ---	*0.07-0.10* *0.06-0.08* ---	*7.9-8.4* *7.9-8.4* ---	*<2* *<2* ---	*Low----------* *Low----------* ----------	*0.10* *0.15* ----	*1*
Lomitas------	*0-1* *1-10* *10*	*10-20* *15-25* ---	*2.0-6.0* *0.6-2.0* ---	*0.06-0.09* *0.06-0.09* ---	*7.4-8.4* *7.4-8.4* ---	*<2* *<2* ---	*Low----------* *Low----------* ----------	*0.05* *0.05* ----	*1*
Rock outcrop									

The control horizon for the Gachado soil was selected to be 1"-7" because this layer is less permeable than the top 1". By inspection, the top 1" of soil will not control because the total infiltration during the storm, whether 6-hour or 24-hour, will exceed 0.1". The available water capacity for the top 1" of Gachado soil is 0.1" or less. The same reasoning holds true for the Lomitas soil, which has a selected control horizon of 1"-10".

The control horizon for each minor soil was selected based on the textural descriptions for each soil series contained in pages 115-144 of the Soil Survey of Aguila-Carefree Area. The selected control horizon for each soil is shown in Table S-1 in parenthesis after the name of the soil.

Step 2: Determine the textural class for each major and minor soil. This was done for the major soils by use of the % sand and % clay values for the control horizon. The values were derived from the above Table 14, averaged, and used to determine textural class from the chart in Appendix D of the Design Manual (see the following page). The % sand and % clay values are shown in Table S-1, as well as the resultant soil textural class.

The textural class for each minor soil was derived from the description used to select the control horizon. Values of % sand and % clay are not available for the minor soils.

Step 3: Assign Green & Ampt values to each soil in the map unit. The Green & Ampt values, assigned by textural class, were taken from Table 4.2 of the Design Manual. The values for PSIF and DTHETA, shown in Table S-1, are there for information only. They were not used in the composite value calculation.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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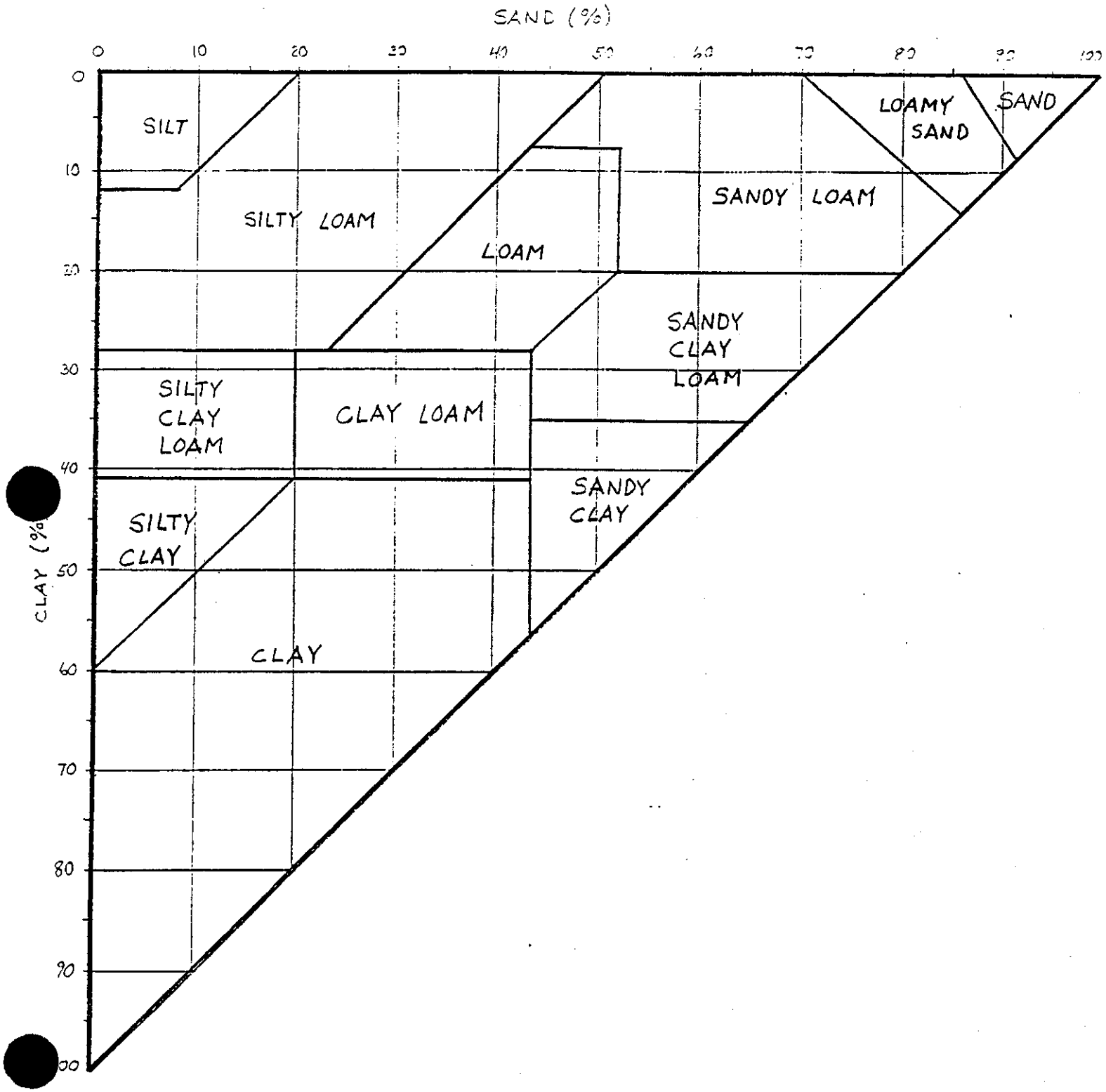


Table 4.2
(Excerpt from Design Manual)
Green and Ampt Loss Rate Parameter Values for Bare Ground

Soil Texture Classification (1)	*XKSAT Inches/hour (2)*	*PSIF Inches (3)*	*DTHETA*		
			Dry (4)	*Normal (5)*	*Saturated (6)*
sand	*4.6*	*1.9*	*0.35*	*0.30*	*0*
loamy sand	*1.2*	*2.4*	*0.35*	*0.30*	*0*
sandy loam	*0.40*	*4.3*	*0.35*	*0.25*	*0*
loam	*0.25*	*3.5*	*0.35*	*0.25*	*0*
silty loam	*0.15*	*6.6*	*0.40*	*0.25*	*0*
silt	*0.10*	*7.5*	*0.35*	*0.15*	*0*
sandy clay loam	*0.06*	*8.6*	*0.25*	*0.15*	*0*
clay loam	*0.04*	*8.2*	*0.25*	*0.15*	*0*
silty clay loam	*0.04*	*10.8*	*0.30*	*0.15*	*0*
sandy clay	*0.02*	*9.4*	*0.20*	*0.10*	*0*
silty clay	*0.02*	*11.5*	*0.20*	*0.10*	*0*
clay	*0.01*	*12.4*	*0.15*	*0.05*	*0*

[1] *Selection of DTHETA:*
Dry = Nonirrigated lands, such as desert and rangeland;
Normal = Irrigated lawn, turf, and permanent pasture;
Saturated = Irrigated agricultural land.

Step 4: Adjust the effective % imperviousness of hydraulically unconnected rock outcrops. Twenty percent of soil map unit number 52 is rock outcrop. It was assumed, based on field inspection, that only 75% of the rock outcrop areas are 100% impervious. The adjusted % of map unit for rock outcrop is therefore:

Adjusted Rock Outcrop % of Map Unit = 0.75x20=15%

The other soil percentages were then adjusted upward as follows:

Adjusted Gachado % of Map Unit = 45+(45/(100-20)(20-75*20/100)=47.81%*

The percentages of all remaining soils in the map unit were adjusted similarly. The results are shown in Table S-1.

Step 5: Calculate the composite value of XKSAT for map unit number 52. The adjusted percent of map unit, in combination with the XKSAT value for each soil, was used to calculate a composite value as follows:

$$XKSAT_{comp} = ((47.81*0.40)+(21.25*0.06)+(15*0)+2.02*(4.60+0.40+0.25+0.01+0.40+0.40)+1.91*(0.25+0.06))/100$$
$$= 0.33 \text{ inches/hour}$$

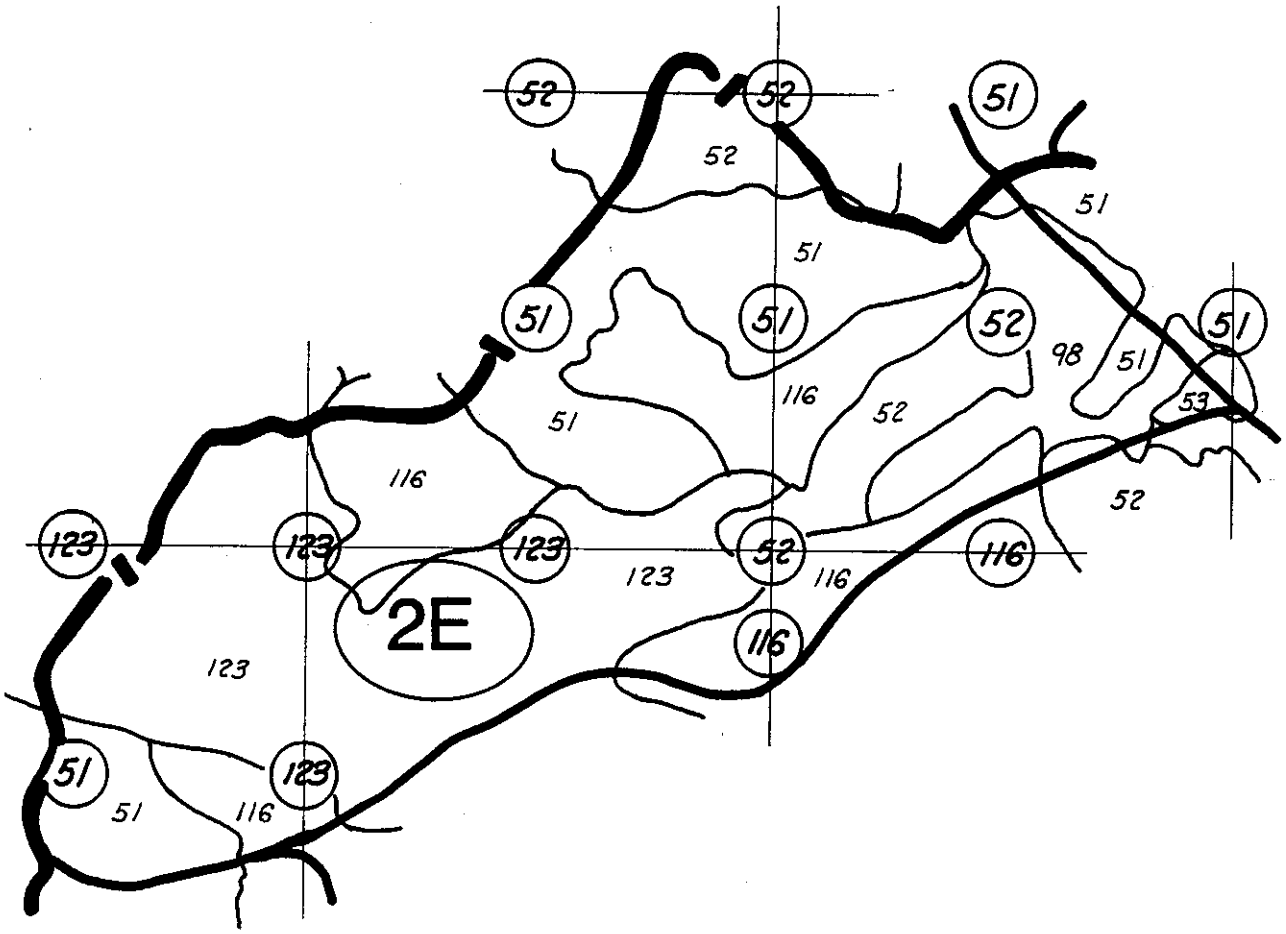
Step 6: Determine values for PSIF and DTHETA using the composite value of XKSAT. Values of PSIF and DTHETA were estimated by performing a linear interpolation between the values in Table 4-2 corresponding to the composite value of XKSAT. Refer to Table S-1 for the results, which are shown on the "Composite Values" line.

Green & Ampt Parameters for Sub-Basin 2E

Step 7: Determine the number of grid points and weighting factor for each soil map unit in sub-basin 2E. The number of grid points for each soil map unit were totaled and are shown in Table S-3. Refer to Figure 16 for a depiction of the grid points and the soil map unit limits for sub-basin 2E.

FIGURE 16

SUB-BASIN 2E SOILS MAP



LEGEND

(123) = GRID POINT IN SCS SOIL MAP UNIT NUMBER 123

123 = SOIL MAP UNIT NUMBER 123

= SOIL MAP UNIT BOUNDARY

= SUB-BASIN BOUNDARY

= SECTION LINE

The weighting factor for each map unit was then estimated by examining Figure 16. The visual examination yields that soil map unit 52, represented in Table S-3 by 3 grid points, has a total coverage area of less than 0.5 square miles. A weighting factor of 0.5 was chosen to reduce the effect of 3 grid points. The same was true for soil map unit 51, where a weighting factor of 0.8 was selected. Soil map unit 123 was assumed to have full coverage for all three grid points. Keep in mind that weighting factors were used to ensure that the coverage of each soil map unit present was weighted in the correct proportion to the other soils present. Soil map unit 116 only has one grid point, but by inspection should be weighted more heavily. Also, soil map unit 98 is present but isn't represented by a grid point. Since the characteristics of soil 98 are similar to soil 116, it was assumed to be represented by soil 116. Soil 116 was therefore weighted with a factor of 3.

The soils in sub-basin 2E required a more complex use of the weighting scheme than was typical for the watershed. The majority of sub-basins required little or no weighting.

Step 8: Adjust XKSAT for each soil map unit to reflect the effects of vegetation cover. The following formula, based on Figure 4.3 of the Design Manual, was used to calculate the conversion factor, C_k:

$$C_k = 0.88889 + 0.01111 * \text{Vegetation Cover Density}$$

The vegetation cover density in percent was estimated to be 30% for sub-basin 2E. The value of C_k for sub-basin 2E was calculated to be 1.22. The adjusted values of XKSAT are shown in Table S-3 for each soil map unit. The adjustment to XKSAT was not applied to soil map units having an unadjusted XKSAT value of 1.2 inches or greater.

Step 9: Calculate final composite Green & Ampt parameter values for the sub-basin. This was accomplished by summing the product of the number of grid points times the weighting factor times the parameter value for each soil map

unit, and then dividing the resultant sum by the summation of the number of grid points times the weighting factor for each soil map unit. For sub-basin 2E, the composite value was calculated as follows:

$$XKSAT_{comp} = ((3*0.5*0.41)+(3*0.8*0.14)+(3*1.0*0.59)+(1*3.0*0.63))/((3*0.5)+(3*0.8)+(3*1.0)+(1*3.0)) = 0.47 \text{ inches/hour}$$

Composite values for PSIF and DTHETA were calculated similarly. Refer to Table S-3 for the results.

Step 10: Determine the surface characteristics of sub-basin 2E. Refer to Table S-4. This table contains the data used to estimate sub-basin lag times, surface retention loss (IA), and the S-Graph to be used for hydrograph computation. The physical parameters of drainage area, flow path length, top and bottom elevations for the flow path, and the resultant average sub-basin slope, were derived from Exhibit "C". As can be seen from Table S-4, sub-basin 2E has an average lag time flow path slope of 95 feet per mile.

The surface characteristics of sub-basin 2E, listed in percent of the sub-basin area, were estimated to be:

Rangeland = 0%
Hillslope = 92%
Mountain = 8%

The limits of the hillslope and mountain areas of sub-basin 2E are depicted on sheet 4 of Exhibit "B". The composite IA value for sub-basin 2E shown in Table S-4 was calculated using the values for IA from Table 4.1 of the Design Manual. The values used were:

Surface Characteristic	IA (inches)
Desert and Rangeland	0.35
Hillslopes	0.15
Mountain	0.25

The composite IA value for sub-basin 2E was calculated as follows:

$$IA_{comp} = ((92*0.15)+(8*0.25))/100$$
$$= 0.16 \text{ inches}$$

Sub-Basin Lag Time and S-Graph Selection

Step 11: Estimate the lag time for sub-basin 2E. The lag time for sub-basin 2E was estimated using the expression setforth under "Lag Times" in this section. The variable L was set equal to the flow path length of 2.77 miles. The variable L_{ca} was estimated to be 1.14 miles. Refer to Page 4 of Exhibit "C" for a depiction of the flow path limits used to estimate L and L_{ca} for sub-basin 2E. The coefficient C was estimated using the expression $C=20K_n$. K_n, the mean Mannings n for all channels within the sub-basin, was estimated by calculating a composite value based on the sub-basin surface characteristics. The typical values used for each sub-basin were:

Surface Characteristic	K_n
Desert and Rangeland	0.03
Hillslopes	0.04
Mountains	0.05

These values are based on Figure 5.11 of the Design Manual, and were checked for reasonableness during the field reconnaissance. The composite value of K_n for sub-basin 2E was calculated as follows:

$$K_{n,comp} = ((92*0.04)+(8*0.05))/100$$
$$= 0.041$$

This is the value shown in Table S-4. The estimated lag time was then calculated as follows:

$$Lag = 20*0.041*(2.77*1.14/95^{0.5})^{0.38}$$
$$= 0.53 \text{ hours}$$

Step 12: Determine the S-Graph for use with sub-basin 2E. The choice of whether to use the Phoenix Mountain or Phoenix Valley S-Graph was made by inspecting the percentages of each surface characteristic. The total of the Hillslope and Mountain percentages was compared to the Rangeland percentage. The Phoenix Mountain S-Graph was selected if the total of the Hillslope and Mountain percentages was greater than 50%. The Phoenix Valley S-Graph was selected if the reverse was true. For sub-basin 2E, the Phoenix Mountain S-Graph was selected because the Hillslope and Mountain percentages totaled 100%.

Watershed Areas

The areas of each sub-basin were planimetered using the sub-basin delineations on Exhibit "C". Exhibit "C" is a 1"=2000' scale map. The area of each major basin was then planimetered from Exhibit "A", which is a 1"=10000' scale map. The totals for each major basin, as measured by the two methods, were then compared and a summary of the results is contained in Table S-7. The areas for each sub-basin and the total area of each major basin are contained in Table S-4.

Landuse Characteristics

The landuse characteristics of the watershed were divided into three (3) types, desert and rangeland, hillslopes, and mountain. The different landuse types are identified on Exhibit "B". The delineation between the three different landuse types was done using engineering judgment. The judgment was based on physical observations made on the watershed and examination of slope conditions on USGS quadrangle maps. The percentages of each landuse type present in each sub-basin were determined and are shown in Table S-4. These surface characteristics were used to determine a composite value for initial abstraction and also to aid in determining which S-graph type to use for each sub-basin. The initial abstraction values for each landuse type were taken from Table 4.1 of the Design Manual. The composite initial abstraction value used for each sub-

basin was calculated using the percentages of landuse type. Refer to Table S-4 and the "Sample Calculation of Sub-Basin Parameters" section.

The vegetation cover density values listed for each sub-basin in Table S-3 were based on observations made during the field reconnaissance. Vegetation density transects were taken at various locations on the watershed, in conjunction with the field cross sections. These locations are identified on Exhibit "B". The assignment of an average cover density to each sub-basin was based on interpolation between the known values, and engineering judgement.

The following photograph is an example of an area with an estimated vegetation cover density of 36%

Photograph K6 in Sub-Basin 5B

Refer to sheet 5 of Exhibit "B", and sub-basin 5B, for the location of this photograph.

Lag Times

A lag time for each sub-basin was evaluated using the following relationship:

$$LAG=C(LL_{ca}/S^{p})^{m}$$

where LAG = basin lag time in hours.

L = length of the longest watercourse in miles
L_{ca} = length along the watercourse to a point opposite the centroid in miles
S = watercourse slope in feet per mile
C = $20K_n$ (from U.S. Army Corps of Engineers, COE)
m = 0.38 (from COE)
p = 0.5
K_n = estimated mean Manning's n value for all channels in the basin.

The parameters listed above, which are necessary to estimate lag time, were derived from Exhibit "C". The information necessary to estimate lag time is contained in Table S-4. Refer to the example in the "Sample Calculation of Sub-Basin Parameters" section.

S-Graphs

The original contract scope of work specified use of S-Graphs for watershed areas in excess of 10 square miles and the Clark Unit Hydrograph for watershed areas less than 5 square miles. In the early portion of the study it was determined that the Design Manual procedure for estimating time of concentration for use with the Clark Unit Hydrograph was yielding unrealistic results. In conferences with Flood Control District personnel, it was determined that the S-Graph method may be more appropriate for use on most of the sub-basins on the watershed. An examination of the results of using S-Graphs on individual sub-basins yielded that it was reasonable to use the S-Graph for the majority of the sub-basins. The only sub-basins for which the method appears to yield unreasonable results were those with watershed areas less than 1 square mile. Since these sub-basins do not play a significant role in determining peak discharges on the watershed, it was decided to use the S-Graph throughout.

The Design Manual lists two types of S-Graphs approved for use in Maricopa County. These are the Phoenix Mountain S-Graph and Phoenix Valley S-Graph. The selection of an S-Graph for use on a particular sub-basin was based on land characteristics. If over 50% of the basin was mountain and hillslope, then the Phoenix Mountain S-Graph was selected. If over 50% of the basin area was rangeland, then the Phoenix Valley S-Graph was selected. The S-Graph type selected for each sub-basin is listed in Table S-4. A separate S-Graph was generated for each sub-basin by use of the computer program MCUHP2. This program was written by the Flood Control District and is furnished with the Design Manual. This program creates a set of UI records for direct input to HEC-1.

FLOOD CONTROL
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FCD 90-05

Table S-1

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
1	55.0	55.00	Antho-Noncalcareous (0-3)	65.0	10.0	3	Sandy Loam	0.40	4.3	0.35	0
	25.0	25.00	Antho-Calcareous (0-3)	65.0	10.0	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	4.0	4.00	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	4.0	4.00	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.00	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.00	Momoli (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.56	3.9	0.35	0
2	25.0	25.00	Antho, Calcareous (3-60)	72.5	10.0	3	Sandy Loam	0.40	4.3	0.35	0
	55.0	55.00	Antho, Noncalcareous (3-60)	72.5	10.0	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	4.0	4.00	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	4.0	4.00	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.00	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.00	Momoli (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.56	3.9	0.35	0
3	35.0	35.00	Antho (0-3)	65.0	10.0	3	Sandy Loam	0.40	4.3	0.35	0
	30.0	30.00	Carrizo (0-28)	92.5	5.0	1	Sand	4.60	1.9	0.35	0
	20.0	20.00	Maripo (0-18)	65.0	10.0	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Brios (2-21*)	**	**	1	Sand	4.60	1.9	0.35	0
	2.5	2.50	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.5	2.50	Vint (1-60*)	**	**	2	Loamy Sand	1.20	2.4	0.35	0
	2.5	2.50	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Momoli (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	1.89	2.3	0.35	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
4	35.0	35.00	Antho (0-3)	65.0	10.0	3	Sandy Loam	0.40	4.3	0.35	0
	30.0	30.00	Carrizo (0-10)	92.5	5.0	1	Sand	4.60	1.9	0.35	0
	20.0	20.00	Maripo (0-18)	65.0	10.0	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Brios (2-21*)	**	**	1	Sand	4.60	1.9	0.35	0
	2.5	2.50	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.5	2.50	Vint (1-60*)	**	**	2	Loamy Sand	1.20	2.4	0.35	0
	2.5	2.50	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Momoli (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	1.89	2.3	0.35	0
5	80.0	80.00	Anthony (2-40)	80.0	7.5	2	Loamy Sand	1.20	2.4	0.35	0
	10.0	10.00	Gila (2-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	10.0	10.00	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	1.06	2.5	0.35	0
6	40.0	40.00	Anthony (2-40)	80.0	7.5	2	Loamy Sand	1.20	2.4	0.35	0
	40.0	40.00	Arizo (1-8)	85.0	12.5	2	Loamy Sand	1.20	2.4	0.35	0
	20.0	20.00	[Non-Gravely] Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	1.04	2.8	0.35	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
7	40.0	40.00	Anthony (2-40)	80.0	7.5	2	Loamy Sand	1.20	2.4	0.35	0
	40.0	40.00	Arizo (1-8)	85.0	12.5	2	Loamy Sand	1.20	2.4	0.35	0
	20.0	20.00	[Non-Gravely] Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	1.04	2.8	0.35	0
8	80.0	80.00	Arizo (1-8)	70.0	12.5	3	Sandy Loam	0.40	4.3	0.35	0
	20.0	20.00	N/A	N/A	N/A	2	Loamy Sand	1.20	2.4	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.56	3.9	0.35	0
10	40.0	40.00	Brios (0-2)	77.5	7.5	2	Loamy Sand	1.20	2.4	0.35	0
	40.0	40.00	Carrizo (0-2)	92.5	5.0	1	Sand	4.60	1.9	0.35	0
	5.0	5.00	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	5.0	5.00	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Vint (1-60*)	**	**	2	Loamy Sand	1.20	2.4	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	2.43	2.2	0.35	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
11	40.0	40.00	Brios (0-2)	77.5	7.5	2	Loamy Sand	1.20	2.4	0.35	0
	40.0	40.00	Carrizo (0-2)	92.5	5.0	1	Sand	4.60	1.9	0.35	0
	5.0	5.00	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	5.0	5.00	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Vint (1-60*)	**	**	2	Loamy Sand	1.20	2.4	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	2.43	2.2	0.35	0
13	50.0	50.00	Carefree (1-50)	17.5	47.5	12	Clay	0.01	12.4	0.15	0
	40.0	40.00	Beardsley (2-36)	25.0	40.0	8	Clay Loam	0.04	8.2	0.25	0
	2.5	2.50	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	2.5	2.50	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.5	2.50	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	0
	2.5	2.50	Suncity (1-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.03	10.3	0.27	0
14	80.0	80.00	Carrizo (1-60)	92.5	2.5	1	Sand	4.60	1.9	0.35	0
	6.7	6.70	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.7	6.70	Brios (2-21*)	**	**	1	Sand	4.60	1.9	0.35	0
	6.6	6.60	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	4.04	2.0	0.35	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
16	65	67.87	Cellar (0-3)	80.0	17.5	3	Sandy Loam	0.40	4.3	0.35	0
	15	11.25	Rock Outcrops	N/A	N/A	0		0.00	0.0	0.00	0
	6.7	7.00	Nickel (1-10*)	**	**	4	Loam	0.25	3.5	0.35	0
	6.7	7.00	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	6.6	6.89	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0	0.00	"Unclassifieds"				0	0.00	0.0	0.00	0
	0	0.00					0	0.00	0.0	0.00	0
	0	0.00					0	0.00	0.0	0.00	0
	0	0.00					0	0.00	0.0	0.00	0
	0	0.00					0	0.00	0.0	0.00	0
	0	0.00					0	0.00	0.0	0.00	0
	0	0.00					0	0.00	0.0	0.00	0
	0	0.00					0	0.00	0.0	0.00	0
	0	0.00					0	0.00	0.0	0.00	0
	0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		15	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.33	3.9	0.35	0
17	65.0	67.87	Cellar (0-3)	80.0	17.5	3	Sandy Loam	0.40	4.3	0.35	0
	15.0	11.25	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	6.7	7.00	Nickel (1-10*)	**	**	4	Loam	0.25	3.5	0.35	0
	6.7	7.00	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	6.6	6.89	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00	"Unclassifieds"				0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		15	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.33	3.9	0.35	0
18	60.0	62.65	Cherioni (1-10)	87.5	12.5	2	Loamy Sand	1.20	2.4	0.35	0
	15.0	11.25	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	6.3	6.58	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	6.3	6.58	Gachado (2-8*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	6.2	6.47	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.2	6.47	Suncity (1-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00	"Unclassifieds"				0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		15	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.80	3.3	0.35	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
19	45.0	45.00	Chuckawalla (0-2)	77.5	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	35.0	35.00	Gunsight (0-3)	77.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.9	2.90	Sal (2-7*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.9	2.90	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.9	2.90	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.9	2.90	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.8	2.80	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.8	2.80	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.8	2.80	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.27	3.6	0.35	0
20	45.0	45.00	Chuckawalla (0-2)	77.5	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	35.0	35.00	Gunsight (0-3)	77.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.9	2.90	Sal (2-7*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.9	2.90	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.9	2.90	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	2.9	2.90	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	2.8	2.80	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	2.8	2.80	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.8	2.80	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.27	3.6	0.35	0
21	80.0	80.00	Cipriano (0-6)	72.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.0	2.00	Cherioni (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Suncity (1-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	8.0	6.00	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.08	8.1	0.30	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
22	80.0	80.00	Contine (2-30)	40.0	45.0	12	Clay	0.01	12.4	0.15	0
	6.7	6.70	Carefree (1-17*)	**	**	12	Clay	0.01	12.4	0.15	0
	6.7	6.70	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	0
	6.6	6.60	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.01	12.2	0.16	0
24	80.0	80.00	Continental (1-60)	15.0	45.0	11	Silty Clay	0.02	11.5	0.20	0
	10.0	10.00	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	10.0	10.00	Mohave (2-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.05	8.3	0.25	0
25	80.0	80.00	Continental (1-60)	15.0	45.0	11	Silty Clay	0.02	11.5	0.20	0
	10.0	10.00	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	10.0	10.00	Mohave (2-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.05	8.3	0.25	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
26	85.0	85.00	Continental (2-60)	15.0	45.0	11	Silty Clay	0.02	11.5	0.20	0
	7.5	7.50	Ohaco (2-7*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	7.5	7.50	Suncity Variant (2-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.02	9.6	0.22	0
27	55.0	55.00	Continental (1-60)	15.0	45.0	11	Silty Clay	0.02	11.5	0.20	0
	20.0	20.00	Mohave (2-20)	25.0	31.0	8	Clay Loam	0.04	8.2	0.25	0
	25.0	25.00	Guest (2-39*)	**	**	12	Clay	0.01	12.4	0.15	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.02	9.5	0.21	0
28	70.0	70.00	Continental (2-60)	15.0	45.0	11	Silty Clay	0.02	11.5	0.20	0
	20.0	20.00	Ohaco (2-27)	27.5	40.0	8	Clay Loam	0.04	8.2	0.25	0
	2.5	2.50	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.5	2.50	Suncity Variant (2-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.5	2.50	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.05	8.4	0.25	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
29	40.0	40.00	Denure (2-60)	65.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	30.0	30.00	Momoli (0-10)	75.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	20.0	20.00	Carrizo (0-10)	75.0	10.0	3	Sandy Loam	0.40	4.3	0.35	0
	3.4	3.40	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	3.3	3.30	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.3	3.30	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.53	4.0	0.35	0
30	40.0	40.00	Denure (2-60)	65.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	30.0	30.00	Momoli (0-10)	75.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	20.0	20.00	Carrizo (0-10)	75.0	10.0	3	Sandy Loam	0.40	4.3	0.35	0
	3.4	3.40	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	3.3	3.30	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.3	3.30	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.53	4.0	0.35	0
32	55.0	62.40	Dixaleta (1-8)	83.5	16.5	3	Sandy Loam	0.40	4.3	0.35	0
	35.0	26.25	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	1.7	1.93	Ohaco (2-7*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	1.7	1.93	Nickel (1-10*)	**	**	4	Loam	0.25	3.5	0.35	0
	1.7	1.93	Cave (1-14*)	**	**	4	Loam	0.25	3.5	0.35	0
	1.7	1.93	EBA (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	1.6	1.82	Gran (1-12*)	**	**	10	Sandy Clay	0.02	9.4	0.20	0
	1.6	1.82	Lehmans (2-6*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		35	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.27	3.6	0.35	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
33	80.0	80.00	Eba (3-36)	60.0	40.0	10	Sandy Clay	0.02	9.4	0.20	0
	10.0	10.00	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	10.0	10.00	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.02	9.6	0.22	0
34	80.0	80.00	Eba (3-36)	60.0	40.0	10	Sandy Clay	0.02	9.4	0.20	0
	10.0	10.00	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	10.0	10.00	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.02	9.6	0.22	0
35	80.0	80.00	Eba (3-36)	60.0	40.0	10	Sandy Clay	0.02	9.4	0.20	0
	10.0	10.00	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	10.0	10.00	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.02	9.6	0.22	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
36	45.0	45.00	Eba (3-36)	60.0	40.0	10	Sandy Clay	0.02	9.4	0.20	0
	35.0	35.00	Continental (1-60)	15.0	45.0	11	Silty Clay	0.02	11.5	0.20	0
	5.0	5.00	Ohaco (2-7*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	5.0	5.00	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	5.0	5.00	Suncity Varient (2-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	5.0	5.00	Tres Hermanos (2-4*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.03	9.8	0.23	0
38	40.0	40.00	Eba (3-36)	60.0	40.0	10	Sandy Clay	0.02	9.4	0.20	0
	25.0	25.00	Continental (1-60)	15.0	45.0	11	Silty Clay	0.02	11.5	0.20	0
	20.0	20.00	Cave (1-14)	50.0	12.5	4	Loam	0.25	3.5	0.35	0
	7.5	7.50	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	7.5	7.50	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.10	7.6	0.34	0
62	45.0	45.00	Eba (3-36)	60.0	40.0	10	Sandy Clay	0.02	9.4	0.20	0
	35.0	35.00	Pinaleno (1-12)	60.0	35.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.5	2.50	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	2.5	2.50	Ohaco (2-7*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.5	2.50	Greyeagle (1-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Nickel (1-10*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.5	2.50	Vado (2-28*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Tres Hermanos (2-4*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.08	8.1	0.30	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
43	45.0	45.00	Eba (3-36)	60.0	40.0	10	Sandy Clay	0.02	9.4	0.20	0
	35.0	35.00	Pinaleno (1-12)	40.0	35.0	8	Clay Loam	0.04	8.2	0.25	0
	5.0	5.00	Ohaco (2-7*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	5.0	5.00	Tres Hermanos (2-4*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	5.0	5.00	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.07	5.4	0.27	0
44	80.0	80.00	Ebon (1-43)	27.5	42.5	12	Clay	0.01	12.4	0.15	0
	2.9	2.90	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.9	2.90	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.9	2.90	Beardsley (2-24*)	**	**	12	Clay	0.01	12.4	0.15	0
	2.9	2.90	Luke (2-14*)	**	**	12	Clay	0.01	12.4	0.15	0
	2.8	2.80	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.8	2.80	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.8	2.80	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.04	8.2	0.25	0
45	80.0	80.00	Ebon (1-43)	27.5	42.5	12	Clay	0.01	12.4	0.15	0
	2.9	2.90	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.9	2.90	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.9	2.90	Beardsley (2-24*)	**	**	12	Clay	0.01	12.4	0.15	0
	2.9	2.90	Luke (2-14*)	**	**	12	Clay	0.01	12.4	0.15	0
	2.8	2.80	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.8	2.80	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.8	2.80	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.04	8.2	0.25	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
46	45.0	45.00	Ebon (1-43)	65.0	35.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	35.0	35.00	Contine (2-30)	40.0	45.0	12	Clay	0.01	12.4	0.15	0
	4.0	4.00	Beardsley (2-24*)	**	**	12	Clay	0.01	12.4	0.15	0
	4.0	4.00	Luke (2-14*)	**	**	12	Clay	0.01	12.4	0.15	0
	4.0	4.00	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.00	Suncity (1-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	4.0	4.00	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.06	8.5	0.26	0
47	35.0	35.00	Ebon (1-43)	65.0	35.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	20.0	20.00	Gunsight (3-60)	80.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	20.0	20.00	Cipriano (0-8)	72.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	8.3	8.33	Beardsley (2-24*)	**	**	12	Clay	0.01	12.4	0.15	0
	8.3	8.33	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	8.3	8.33	Luke (2-14*)	**	**	12	Clay	0.01	12.4	0.15	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.12	7.2	0.37	0
48	45.0	45.00	Ebon (1-43)	65.0	35.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	35.0	35.00	Pinamt (3-15)	67.5	25.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	2.9	2.86	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.9	2.86	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.9	2.86	Luke (2-14*)	**	**	12	Clay	0.01	12.4	0.15	0
	2.9	2.86	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.9	2.86	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.9	2.86	Momoli (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.9	2.86	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.10	7.5	0.35	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
49	45.0	45.00	Ebon (1-43)	65.0	35.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	35.0	35.00	Pinamt (3-15)	67.5	25.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	6.7	6.67	Luke (2-14*)	**	**	12	Clay	0.01	12.4	0.15	0
	6.7	6.67	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.7	6.67	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.10	7.5	0.35	0
50	45.0	45.00	Estrella,Calcareous (0-21)	40.0	17.5	4	Loam	0.25	3.5	0.35	0
	35.0	35.00	Estrella Noncalcareous (0-21)	40.0	17.5	4	Loam	0.25	3.5	0.35	0
	6.7	6.70	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	6.7	6.70	Valencia (1-20*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.6	6.60	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.25	3.6	0.35	0
51	47.5	47.80	Gachado (2-8)	78.0	22.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	25.0	25.16	Lomitas (2-17)	80.0	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	4.2	4.19	Cherioni (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	4.2	4.19	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	0
	4.2	4.19	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	4.2	4.19	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.2	4.19	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.2	4.19	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	1.88	Rock Outcrop	N/A	N/A	0	0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		3	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.11	7.1	0.36	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
52	45.0	47.81	Gachado (1-7)	82.5	17.5	3	Sandy Loam	0.40	4.3	0.35	0
	20.0	21.25	Lomitas (1-10)	80.0	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	20.0	15.00	Rock Outcrop	N/A	N/A	0	0	0.00	0.0	0.00	0
	1.9	2.02	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	1.9	2.02	Cherioni (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	1.9	2.02	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	1.9	2.02	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	0
	1.9	2.02	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	1.9	2.02	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	1.8	1.91	Schenco	**	**	4	Loam	0.25	3.5	0.35	0
	1.8	1.91	Vaiva	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		20	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.33	3.9	0.35	0
53	80.0	80.00	Gadsden (0-3)	15.0	52.5	12	Clay	0.01	12.4	0.15	0
	10.0	10.00	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	10.0	10.00	Glenbar (0-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.04	10.6	0.29	0
54	40.0	40.00	Gila,Calcareous (2-60)	47.5	13.0	4	Loam	0.25	3.5	0.35	0
	40.0	40.00	Gila,Noncalcareous. (2-60)	47.5	13.0	4	Loam	0.25	3.5	0.35	0
	10.0	10.00	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	10.0	10.00	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.28	3.7	0.35	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
55	40.0	40.00	Gilman,Calcareous (0-5)	35.0	23.5	4	Loam	0.25	3.5	0.35	0
	40.0	40.00	Gilman,Noncalcareous (0-5)	35.0	23.5	4	Loam	0.25	3.5	0.35	0
	2.3	2.30	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.3	2.30	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	2.2	2.20	Estrella (1-21*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.2	2.20	Glenbar (0-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.2	2.20	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.2	2.20	Valencia (1-20*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.2	2.20	Vint (1-60*)	**	**	2	Loamy Sand	1.20	2.4	0.35	0
	2.2	2.20	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.2	2.20	Momoli (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.39	4.2	0.35	0
56	40.0	40.00	Gilman,Calcareous (0-5)	35.0	23.5	4	Loam	0.25	3.5	0.35	0
	40.0	40.00	Gilman,Noncalcareous (0-5)	35.0	23.5	4	Loam	0.25	3.5	0.35	0
	2.9	2.90	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.9	2.90	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	2.9	2.90	Estrella (1-21*)	**	**	4	Loam	0.25	3.5	0.35	
	2.9	2.90	Glenbar (0-6*)	**	**	4	Loam	0.25	3.5	0.35	
	2.8	2.80	Vint (1-60*)	**	**	2	Loamy Sand	1.20	2.4	0.35	
	2.8	2.80	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.8	2.80	Momoli (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.42	4.3	0.35	0
57	80.0	80.00	Gilman (0-11)	25.0	32.5	8	Clay Loam	0.04	8.2	0.25	0
	10.0	10.00	Glenbar (0-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	10.0	10.00	Vint (1-60*)	**	**	2	Loamy Sand	1.20	2.4	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.18	5.8	0.39	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
60	40.0	40.00	Glenbar,Calcareous (0-6)	25.0	23.5	5	Silty Loam	0.15	6.6	0.40	0
	40.0	40.00	Glenbar,Noncalcareous (0-6)	25.0	23.5	5	Silty Loam	0.15	6.6	0.40	0
	4.0	4.00	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.00	Estrella (1-21*)	**	**	4	Loam	0.25	3.5	0.35	0
	4.0	4.00	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	4.0	4.00	Vint (1-60*)	**	**	2	Loamy Sand	1.20	2.4	0.35	0
	4.0	4.00	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.21	4.9	0.37	0
61	40.0	40.66	Gran (1-12)	60.0	40.0	10	Sandy Clay	0.02	9.4	0.20	0
	35.0	35.58	Wickenburg (1-12)	77.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	6.3	6.40	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	6.3	6.40	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	6.2	6.30	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.2	4.65	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		6	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.07	8.2	0.29	0
62	40.0	40.66	Gran (1-12)	60.0	40.0	10	Sandy Clay	0.02	9.4	0.20	0
	35.0	35.58	Wickenburg (1-12)	77.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	6.3	6.40	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	6.3	6.40	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	6.2	6.30	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.2	4.65	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		6	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.07	8.2	0.29	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
63	30.0	32.50	Gran (1-12)	70.0	30.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	25.0	27.08	Wickenburg (1-12)	77.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	25.0	18.75	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	4.0	4.33	Dixaleta (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.33	Lehmans (2-6*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	4.0	4.33	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	4.0	4.33	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	4.0	4.33	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		25	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.09	7.9	0.31	0
64	30.0	32.50	Gran (1-12)	70.0	30.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	25.0	27.08	Wickenburg (1-12)	77.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	25.0	18.75	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	4.0	4.33	Dixaleta (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.33	Lehmans (2-6*)	**	**	8	Clay Loam	0.04	8.2	0.25	
	4.0	4.33	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	
	4.0	4.33	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	
	4.0	4.33	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		25	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.09	7.9	0.31	0
65	45.0	45.00	Greyeagle (0-5)	67.5	14.0	3	Sandy Loam	0.40	4.3	0.35	0
	25.0	25.00	Continental (2-60)	15.0	42.5	11	Silty Clay	0.02	11.5	0.20	0
	15.0	15.00	Nickel (0-5)	70.0	17.5	3	Sandy Loam	0.40	4.3	0.35	0
	3.0	3.00	Ohaco (2-7*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.0	3.00	Suncity Variant (2-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.0	3.00	Cave (1-14*)	**	**	4	Loam	0.25	3.5	0.35	0
	3.0	3.00	Mohave (2-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.0	3.00	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.27	3.6	0.35	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
66	55.0	55.43	Greyeagle (0-5)	67.5	14.0	3	Sandy Loam	0.40	4.3	0.35	0
	30.0	30.23	Suncity Variant (2-9)	50.0	30.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	3.0	3.02	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.0	2.25	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	3.0	3.02	Cave (1-14*)	**	**	4	Loam	0.25	3.5	0.35	0
	3.0	3.02	Ohaco (2-7*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.0	3.02	Nickel (1-10*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		3	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.27	3.6	0.35	0
67	85.0	85.00	Guest (2-60)	25.0	42.5	12	Clay	0.01	12.4	0.15	0
	5.0	5.00	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	5.0	5.00	Mohave (2-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.03	10.2	0.26	0
68	45.0	45.00	Gunsight (1-60)	80.0	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	40.0	40.00	Cipriano (0-6)	72.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	3.8	3.75	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	3.8	3.75	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.8	3.75	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.8	3.75	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.11	7.4	0.36	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
69	45.0	45.00	Gunsight (1-60)	80.0	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	40.0	40.00	Cipriano (0-6)	72.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	3.8	3.75	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	3.8	3.75	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.8	3.75	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.8	3.75	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.11	7.4	0.36	0
70	40.0	40.00	Gunsight (0-11)	77.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	40.0	40.00	Rillito (0-12)	60.0	14.0	3	Sandy Loam	0.40	4.3	0.35	0
	2.3	2.30	Chuckawalla (2-6*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.3	2.30	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	0
	2.2	2.20	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.2	2.20	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	2.2	2.20	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	2.2	2.20	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.2	2.20	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.2	2.20	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	2.2	2.20	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.33	3.9	0.35	0
71	40.0	40.00	Gunsight (0-11)	77.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	40.0	40.00	Rillito (0-12)	60.0	14.0	3	Sandy Loam	0.40	4.3	0.35	0
	2.3	2.30	Chuckawalla (2-6*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.3	2.30	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	0
	2.2	2.20	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.2	2.20	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.2	2.20	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.2	2.20	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.2	2.20	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.2	2.20	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	2.2	2.20	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.33	3.9	0.35	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
72	45.0	49.82	Lehmans (2-20)	47.5	45.0	10	Sandy Clay	0.02	9.4	0.20	0
	30.0	22.50	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	5.0	5.54	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.54	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	5.0	5.54	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	5.0	5.54	Greyeagle (1-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.54	Nickel (1-10*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		30	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.09	7.9	0.31	0
73	45.0	49.82	Lehmans (2-20)	47.5	45.0	10	Sandy Clay	0.02	9.4	0.20	0
	30.0	22.50	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	5.0	5.54	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.54	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	5.0	5.54	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	5.0	5.54	Greyeagle (1-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.54	Nickel (1-10*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		30	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.09	7.9	0.31	0
74	45.0	45.00	Luke (1-28)	60.0	40.0	10	Sandy Clay	0.02	9.4	0.20	0
	35.0	35.00	Cipriano (0-6)	72.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	3.3	3.33	Beardsley (2-24*)	**	**	12	Clay	0.01	12.4	0.15	0
	3.3	3.33	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.3	3.33	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	0
	3.3	3.33	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.3	3.33	Suncity (1-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.3	3.33	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.06	8.6	0.25	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
75	80.0	80.00	Mohall (0-7)	25.0	27.5	4	Loam	0.25	3.5	0.35	0
	5.0	5.00	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	5.0	5.00	Glenbar (0-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	5.0	5.00	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	5.0	5.00	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.28	3.6	0.35	0
76	80.0	80.00	Mohall (0-7)	67.5	22.5	7	Sandy Clay Loam	0.06	8.6	0.25	0
	3.4	3.40	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.4	3.40	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.3	3.30	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.3	3.30	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	3.3	3.30	Estrella (1-21*)	**	**	4	Loam	0.25	3.5	0.35	
	3.3	3.30	Valencia (1-20*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.10	7.5	0.35	0
77	80.0	80.00	Mohall (2-42)	52.5	30.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	5.0	5.00	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	5.0	5.00	Glenbar (0-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	5.0	5.00	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	5.0	5.00	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.10	7.6	0.34	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
78	80.0	80.00	Mohall (0-6)	25.0	35.0	8	Clay Loam	0.04	8.2	0.25	0
	3.4	3.40	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.4	3.40	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.3	3.30	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.3	3.30	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.3	3.30	Estrella (1-21*)	**	**	4	Loam	0.25	3.5	0.35	0
	3.3	3.30	Valencia (1-20*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.08	5.0	0.31	0
81	45.0	45.00	Mohall (2-42)	47.5	30.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	25.0	25.00	Tremant (1-5)	45.0	32.5	7	Sandy Clay Loam	0.06	8.6	0.25	0
	4.3	4.29	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	4.3	4.29	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.3	4.29	Suncity (1-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	4.3	4.29	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.3	4.29	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.3	4.29	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	4.3	4.29	Valencia (1-20*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.13	6.9	0.38	0
82	80.0	80.00	Mohave (2-20)	25.0	27.5	4	Loam	0.25	3.5	0.35	0
	6.7	6.70	Gila (2-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.7	6.70	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	6.6	6.60	Tres Hermanos (2-4*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.23	4.1	0.36	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
83	80.0	80.00	Mohave (2-20)	25.0	27.5	4	Loam	0.25	3.5	0.35	0
	6.7	6.70	Gila (2-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.7	6.70	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	6.6	6.60	Tres Hermanos (2-4*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.23	4.1	0.36	0
84	85.0	85.00	Mohave (2-28)	35.0	27.5	4	Loam	0.25	3.5	0.35	0
	3.0	3.00	Mohave (2-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.0	3.00	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	3.0	3.00	Tres Hermanos (2-4*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.0	3.00	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.0	3.00	Guest (2-39*)	**	**	12	Clay	0.01	12.4	0.15	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.23	4.2	0.36	0
85	80.0	80.00	Mohave (0-6)	25.0	35.0	8	Clay Loam	0.04	8.2	0.25	0
	6.7	6.70	Gila (2-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.7	6.70	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	6.6	6.60	Tres Hermanos (2-4*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.06	8.3	0.26	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
86	85.0	85.00	Mohave (2-60)	35.0	27.5	4	Loam	0.25	3.5	0.35	0
	3.0	3.00	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.0	3.00	Gila (2-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.0	3.00	Tres Hermanos (2-4*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.0	3.00	Mohave (2-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.0	3.00	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.24	3.8	0.36	0
87	40.0	40.00	Mohave,Calcareous (2-20)	35.0	27.5	4	Loam	0.25	3.5	0.35	0
	45.0	45.00	Mohave,NonCalcareous (2-20)	25.0	27.5	4	Loam	0.25	3.5	0.35	0
	15.0	15.00	Mohave (2-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.22	4.5	0.37	0
88	45.0	45.00	Mohave (2-20)	25.0	27.5	4	Loam	0.25	3.5	0.35	0
	40.0	40.00	Guest (2-60)	25.0	42.5	12	Clay	0.01	12.4	0.15	0
	7.5	7.50	Mohave (2-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	7.5	7.50	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.12	7.1	0.37	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
89	50.0	50.00	Mohave (2-20)	25.0	27.5	4	Loam	0.25	3.5	0.35	0
	30.0	30.00	Tres Hermanos (2-20)	42.5	25.0	4	Loam	0.25	3.5	0.35	0
	5.0	5.00	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	5.0	5.00	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.24	3.7	0.35	0
91	45.0	45.00	Momoli (1-60)	77.5	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	35.0	35.00	Carrizo (0-11)	90.0	10.0	2	Loamy Sand	1.20	2.4	0.35	0
	2.5	2.50	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.5	2.50	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	2.5	2.50	Chuckawalla (2-6*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	
	2.5	2.50	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	2.5	2.50	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.5	2.50	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.76	3.4	0.35	0
92	45.0	45.00	Momoli (1-60)	77.5	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	35.0	35.00	Carrizo (0-11)	90.0	10.0	2	Loamy Sand	1.20	2.4	0.35	0
	2.5	2.50	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.5	2.50	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Chuckawalla (2-6*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.5	2.50	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.5	2.50	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.76	3.4	0.35	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
94	50.0	50.00	Nickel (1-10)	65.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	35.0	35.00	Cave (1-14)	50.0	12.5	4	Loam	0.25	3.5	0.35	0
	3.8	3.80	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.8	3.80	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.7	3.70	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	3.7	3.70	Greyeagle (1-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.33	4.0	0.35	0
95	85.0	85.00	Ohaco (2-27)	27.5	40.0	8	Clay Loam	0.04	8.2	0.25	0
	7.5	7.50	Continental (1-8*)	**	**	12	Clay	0.01	12.4	0.15	0
	7.5	7.50	Suncity Variant (2-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.04	10.6	0.29	0
96	45.0	45.00	Pinaleno (1-12)	60.0	35.0	10	Sandy Clay	0.02	9.4	0.20	0
	40.0	40.00	Tres Hermanos (2-22)	47.5	25.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.5	2.50	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Mohave (2-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.5	2.50	Greyeagle (1-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.5	2.50	Vado (2-28*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Nickel (1-10*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.08	8.1	0.29	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
97	45.0	45.00	Pinaleno (1-12)	60.0	35.0	10	Sandy Clay	0.02	9.4	0.20	0
	40.0	40.00	Tres Hermanos (2-22)	47.5	25.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.5	2.50	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Mohave (2-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.5	2.50	Greyeagle (1-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.5	2.50	Vado (2-28*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Nickel (1-10*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.08	8.1	0.29	0
98	45.0	45.00	Pinamt (1-28)	75.0	25.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	35.0	35.00	Tremant (0-5)	65.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	5.0	5.00	Chuckawalla (2-6*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	5.0	5.00	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	
	5.0	5.00	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	5.0	5.00	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.21	4.7	0.37	0
99	45.0	45.00	Pinamt (1-28)	75.0	25.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	35.0	35.00	Tremant (0-5)	65.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	5.0	5.00	Chuckawalla (2-6*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	5.0	5.00	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	0
	5.0	5.00	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.21	4.7	0.37	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
100	50.0	53.13	Quilotosa (2-14)	87.5	12.5	2	Loamy Sand	1.20	2.4	0.35	0
	20.0	21.25	Vaiva (3-11)	75.0	25.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	20.0	15.00	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	10.0	10.63	Schenco (2-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		20	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.68	3.6	0.35	0
102	70.0	70.00	Rillito (0-14)	60.0	14.0	3	Sandy Loam	0.40	4.3	0.35	0
	3.4	3.40	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.4	3.40	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.4	3.40	Tremant (1-9*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.3	3.30	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.3	3.30	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	3.3	3.30	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	3.3	3.30	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.3	3.30	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.3	3.30	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.52	4.0	0.35	0
103	65.0	48.75	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	25.0	36.61	Gachado (1-7)	75.0	25.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	10.0	14.64	Lomitas (2-6*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		65	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.08	5.0	0.30	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
105	60.0	45.00	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	20.0	27.50	Lehmans (2-15)	47.5	45.0	10	Sandy Clay	0.02	9.4	0.20	0
	6.7	9.21	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.7	9.21	Eba (0-3*)	**	**	4	Loam	0.25	3.5	0.35	0
	6.6	9.08	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		60	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.07	8.3	0.28	0
106	50.0	50.00	Sal (2-20)	70.0	30.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	30.0	30.00	Cipriano (0-20)	72.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	5.0	5.00	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Brios (2-21*)	**	**	1	Sand	4.60	1.9	0.35	
	5.0	5.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.55	3.9	0.35	0
107	50.0	50.00	Sal (2-20)	70.0	30.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	30.0	30.00	Cipriano (0-20)	72.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	5.0	5.00	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Brios (2-21*)	**	**	1	Sand	4.60	1.9	0.35	0
	5.0	5.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.55	3.9	0.35	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
108	50.0	55.36	Schenco (2-11)	70.0	21.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	30.0	22.50	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	2.0	2.21	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.0	2.21	Beardsley (2-24*)	**	**	12	Clay	0.01	12.4	0.15	0
	2.0	2.21	Cherioni (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.0	2.21	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.0	2.21	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	0
	2.0	2.21	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.0	2.21	Suncity (1-9*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.0	2.21	Gachado (2-8*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.0	2.21	Quilotosa (2-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.0	2.21	Vaiva (3-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		30	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.08	6.1	0.29	0
109	55.0	62.40	Schenco (2-11)	70.0	21.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	35.0	26.25	Rock Outcrops	NA	N/A	0	0	0.00	0.0	0.00	0
	1.5	1.70	Beardsley (2-24*)	**	**	12	Clay	0.01	12.4	0.15	0
	1.5	1.70	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	1.4	1.59	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	0
	1.4	1.59	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	1.4	1.59	Gachado (2-8*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	1.4	1.59	Quilotosa (2-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	1.4	1.59	Vaiva (3-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		35	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.06	8.5	0.25	0
110	55.0	55.53	Suncity (1-9)	45.0	30.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	30.0	30.29	Cipriano (0-6)	72.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	3.8	3.84	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	3.8	3.84	Beardsley (2-24*)	**	**	12	Clay	0.01	12.4	0.15	0
	3.7	3.74	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.7	2.78	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		4	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.24	3.7	0.35	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
112	65.0	65.00	Tremant,Noncalcareous (0-9)	65.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	15.0	15.00	Tremant,Calcareous (0-9)	65.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	2.5	2.50	Valencia (1-20*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.5	2.50	Momoli (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.5	2.50	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.50	4.1	0.35	0
114	45.0	45.00	Tremant,Noncalcareous (0-9)	65.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	35.0	35.00	Tremant,Calcareous (0-9)	65.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	2.4	2.38	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	1.0	1.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	2.4	2.38	Valencia (1-20*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	2.4	2.38	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	
	2.4	2.38	Chuckawalla (2-6*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	
	2.4	2.38	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.4	2.38	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.4	2.38	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.4	2.38	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.43	4.2	0.35	0
115	45.0	45.00	Tremant (0-9)	65.0	15.0	3	Sandy Loam	0.40	4.3	0.35	0
	35.0	35.00	Antho (3-60)	72.5	10.0	3	Sandy Loam	0.40	4.3	0.35	0
	2.0	2.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	4.5	4.50	Denure (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.5	4.50	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	4.5	4.50	Momoli (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.5	4.50	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.47	4.1	0.35	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
116	30.0	30.00	Tremant (2-26)	45.0	32.5	7	Sandy Clay Loam	0.06	8.6	0.25	0
	20.0	20.00	Gunsight (0-10)	85.0	12.5	2	Loamy Sand	1.20	2.4	0.35	0
	20.0	20.00	Rillito (2-60)	55.0	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	4.3	4.33	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	4.3	4.33	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.3	4.33	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	4.3	4.33	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	4.3	4.33	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	4.3	4.33	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.51	4.0	0.35	0
117	30.0	30.00	Tremant (2-26)	45.0	32.5	7	Sandy Clay Loam	0.06	8.6	0.25	0
	20.0	20.00	Gunsight (0-10)	85.0	12.5	2	Loamy Sand	1.20	2.4	0.35	0
	20.0	20.00	Rillito (2-60)	55.0	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	4.7	4.67	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	4.7	4.67	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.7	4.67	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	4.7	4.67	Contine (2-8*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	4.7	4.67	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.0	2.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	4.7	4.67	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.43	4.2	0.35	0
119	40.0	40.00	Tremant (0-9)	65.0	15.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	30.0	30.00	Suncity (2-12)	45.0	30.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	3.8	3.80	Gadsden (0-3*)	**	**	12	Clay	0.01	12.4	0.15	0
	3.8	3.80	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	3.8	3.80	Beardsley (2-24*)	**	**	12	Clay	0.01	12.4	0.15	0
	3.8	3.80	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.7	3.70	Mohall (2-5*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.7	3.70	Sal (2-7*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	3.7	3.70	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	3.7	3.70	Rillito (1-12*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.10	7.5	0.35	0

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.	PSIF (in.)	DTHETA (in.)	RTIMP (%)
120	65.0	65.00	Tres Hermanos,Noncalc. (2-22)	50.0	32.5	7	Sandy Clay Loam	0.06	8.6	0.25	0
	15.0	15.00	Tres Hermanos,Calc. (2-22)	50.0	32.5	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.9	2.90	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.9	2.90	Mohave (2-11*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	2.9	2.90	Greyeagle (1-5*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.9	2.90	Nickel (1-10*)	**	**	4	Loam	0.25	3.5	0.35	0
	2.8	2.80	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	2.8	2.80	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	2.8	2.80	Guest (2-39*)	**	**	12	Clay	0.01	12.4	0.15	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.09	7.7	0.33	0
121	50.0	50.00	Tres Hermanos (2-22)	50.0	32.5	7	Sandy Clay Loam	0.06	8.6	0.25	0
	35.0	35.00	Anthony (2-40)	80.0	7.5	2	Loamy Sand	1.20	2.4	0.35	0
	5.0	5.00	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	5.0	5.00	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	5.0	5.00	Nickel (1-10*)	**	**	4	Loam	0.25	3.5	0.35	
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.40	4.1	0.35	0
122	75.0	75.00	Vado (2-60)	85.0	13.0	2	Loamy Sand	1.20	2.4	0.35	0
	6.3	6.30	Anthony (2-25*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.3	6.30	Arizo (1-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	6.2	6.20	Pinaleno (1-5*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	6.2	6.20	Tres Hermandos (2-4*)	**	**	8	Clay Loam	0.04	8.2	0.25	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.96	3.0	0.35	

TABLE S-1
GREEN & AMPT VALUES BY SCS MAP UNIT

Map Unit No.	% of Map Unit	Adjust. % of Map Unit	Soil Name & Control Horizon	% Sand	% Clay	Class No.	Textural Class	XKSAT (in./hr.)	PSIF (in.)	DTHETA (in.)	RTIMP (%)
123	60.0	60.63	Vaiva (0-3)	67.5	20.0	7	Sandy Clay Loam	0.06	8.6	0.25	0
	4.0	4.04	Brios (2-21*)	**	**	1	Sand	4.60	1.9	0.35	0
	4.0	4.04	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	4.0	4.04	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.04	Chuckawalla (2-6*)	**	**	7	Sandy Clay Loam	0.06	8.6	0.25	0
	4.0	4.04	Ebon (1-11*)	**	**	12	Clay	0.01	12.4	0.15	0
	4.0	4.04	Gunsight (1-10*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.04	Pinamt (1-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.04	Cipriano (1-6*)	**	**	4	Loam	0.25	3.5	0.35	0
	4.0	4.04	Quilotosa (2-8*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	3.00	Rock Outcrops	N/A	N/A	0	0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		4	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.49	4.1	0.35	0
125	80.0	80.00	Vint (0-60)	70.0	7.5	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.00	Antho (0-3*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	4.0	4.00	Brios (2-21*)	**	**	1	Sand	4.60	1.9	0.35	0
	4.0	4.00	Carrizo (1-28*)	**	**	1	Sand	4.60	1.9	0.35	0
	4.0	4.00	Gilman (1-5*)	**	**	4	Loam	0.25	3.5	0.35	0
	4.0	4.00	Maripo (1-18*)	**	**	3	Sandy Loam	0.40	4.3	0.35	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
	0.0	0.00					0	0.00	0.0	0.00	0
		75	Assumed Effect. % Imp. of Hyd. Unconn. Rock Outcrops								
		0	Unadjusted % of Rock Outcrop in Map Unit				Composite Values	0.73	3.5	0.35	0

NOTES:

* Values from "Classification of Soils Description" beginning on page 115 of SOIL SURVEY OF AGUILA-CAREFREE AREA, PARTS OF MARICOPA AND PINAL COUNTIES, ARIZONA, USDA-SCS, 1982

** Minor soils' actual depths are not specified in the soil survey

FLOOD CONTROL
DISTRICT
of
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JACKRABBIT WASH
FLOODPLAIN DELINEATION STUDY

FCD 90-05

Table S-2

TABLE S-2

SUMMARY
of
GREEN & AMPT VALUES BY SCS MAP UNIT
(From Table S-1)

SCS Soil Map Unit	XKSAT (Unadj)	PSIF	DTHETA	RTIMP
112	0.50	4.1	0.35	0
114	0.43	4.2	0.35	0
115	0.47	4.1	0.35	0
116	0.51	4.0	0.35	0
117	0.43	4.2	0.35	0
119	0.10	7.5	0.35	0
120	0.09	7.7	0.33	0
121	0.49	4.1	0.35	0
122	0.96	3.0	0.35	0
123	0.49	4.1	0.35	0
125	0.73	3.5	0.35	0
AGB	0.40	4.3	0.35	0
AL	0.40	4.3	0.35	0
AgA	0.25	3.5	0.35	0
GgA	0.25	3.5	0.35	0
GxA	0.40	4.3	0.35	0
GxB	0.40	4.3	0.35	0
GYD	0.40	4.3	0.35	0
HLC	0.04	8.2	0.25	0
HM	0.04	8.2	0.25	0
HrB	0.04	8.2	0.25	0
LcA	0.25	3.5	0.35	0
PeA	0.40	4.3	0.35	0
RbA	0.40	4.3	0.35	0
RbB	0.40	4.3	0.35	0
RhB	0.40	4.3	0.35	0

TABLE S-2

SUMMARY
of
GREEN & AMPT VALUES BY SCS MAP UNIT
(From Table S-1)

SCS Soil Map Unit	XKSAT (Unadj)	PSIF	DTHETA	RTIMP
74	0.06	8.6	0.25	0
75	0.25	3.6	0.35	0
76	0.10	7.5	0.35	0
77	0.10	7.6	0.34	0
78	0.08	8.0	0.31	0
81	0.13	6.9	0.38	0
82	0.23	4.1	0.36	0
83	0.23	4.1	0.36	0
84	0.23	4.2	0.36	0
85	0.06	8.5	0.26	0
86	0.24	3.8	0.36	0
87	0.22	4.5	0.37	0
88	0.12	7.1	0.37	0
89	0.24	3.7	0.35	0
91	0.76	3.4	0.35	0
92	0.76	3.4	0.35	0
94	0.33	4.0	0.35	0
95	0.04	10.6	0.29	0
96	0.08	8.1	0.29	0
97	0.08	8.1	0.29	0
98	0.21	4.7	0.37	0
99	0.21	4.7	0.37	0
100	0.68	3.6	0.35	0
102	0.52	4.0	0.35	0
103	0.08	8.0	0.30	0
105	0.07	8.3	0.28	0
106	0.55	3.9	0.35	0
107	0.55	3.9	0.35	0
108	0.08	8.1	0.29	0
109	0.06	8.5	0.25	0
110	0.24	3.7	0.35	0

TABLE S-2

SUMMARY
of
GREEN & AMPT VALUES BY SCS MAP UNIT
(From Table S-1)

SCS Soil Map Unit	XKSAT (Unadj)	PSIF	DTHETA	RTIMP
38	0.10	7.6	0.34	0
42	0.08	8.1	0.30	0
43	0.07	8.4	0.27	0
44	0.04	8.2	0.25	0
45	0.04	8.2	0.25	0
46	0.06	8.5	0.26	0
47	0.12	7.2	0.37	0
48	0.10	7.5	0.35	0
49	0.10	7.5	0.35	0
50	0.25	3.6	0.35	0
51	0.11	7.3	0.36	0
52	0.33	3.9	0.35	0
53	0.04	10.6	0.29	0
54	0.28	3.7	0.35	0
55	0.39	4.2	0.35	0
56	0.42	4.3	0.35	0
57	0.18	5.8	0.39	0
60	0.21	4.9	0.37	0
61	0.07	8.2	0.29	0
62	0.07	8.2	0.29	0
63	0.09	7.9	0.31	0
64	0.09	7.9	0.31	0
65	0.27	3.6	0.35	0
66	0.27	3.6	0.35	0
67	0.03	10.2	0.26	0
68	0.11	7.4	0.36	0
69	0.11	7.4	0.36	0
70	0.33	3.9	0.35	0
71	0.33	3.9	0.35	0
72	0.09	7.9	0.31	0
73	0.09	7.9	0.31	0

TABLE S-2

SUMMARY
of
GREEN & AMPT VALUES BY SCS MAP UNIT
(From Table S-1)

SCS Soil Map Unit	XKSAT (Unadj)	PSIF	DTHETA	RTIMP
1	0.56	3.9	0.35	0
2	0.56	3.9	0.35	0
3	1.89	2.3	0.35	0
4	1.89	2.3	0.35	0
5	1.04	2.8	0.35	0
6	1.04	2.8	0.35	0
7	1.04	2.8	0.35	0
8	0.56	3.9	0.35	0
10	2.43	2.2	0.35	0
11	2.43	2.2	0.35	0
13	0.03	10.3	0.27	0
14	4.04	2.0	0.35	0
16	0.33	3.9	0.35	0
17	0.33	3.9	0.35	0
18	0.80	3.3	0.35	0
19	0.27	3.6	0.35	0
20	0.27	3.6	0.35	0
21	0.08	8.1	0.30	0
22	0.01	12.2	0.16	0
24	0.05	8.3	0.25	0
25	0.05	8.3	0.25	0
26	0.02	9.6	0.22	0
27	0.02	9.5	0.21	0
28	0.05	8.4	0.25	0
29	0.53	4.0	0.35	0
30	0.53	4.0	0.35	0
32	0.27	3.6	0.35	0
33	0.02	9.6	0.22	0
34	0.02	9.6	0.22	0
35	0.02	9.6	0.22	0
36	0.03	9.8	0.23	0

FLOOD CONTROL
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Table S-3

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
1A				Map Unit No.	65	82	87	27	88	73	86	67				
	33			# Grid Pts.	2	3	5	11	6	4	1	1				
				Wtg. Factor	1.00	1.00	1.00	0.70	1.00	1.00	1.00	1.20				
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.27	0.23	0.22	0.02	0.12	0.09	0.24	0.03	0.00	0.00	0.00	0.00
		0.16	....	XKSAT (Adj)	0.33	0.28	0.27	0.03	0.15	0.10	0.29	0.04	0.00	0.00	0.00	0.00
		6.9	....	PSIF	3.6	4.1	4.5	9.5	7.1	7.9	3.8	10.2	0.0	0.0	0.0	0.0
		0.31	....	DTHETA	0.35	0.36	0.37	0.21	0.37	0.31	0.36	0.26	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
1B				Map Unit No.	88	65	86	27	67	87						
	25			# Grid Pts.	5	5	1	7	3	4						
				Wtg. Factor	1.00	1.00	1.00	0.80	1.00	0.90						
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.12	0.27	0.24	0.02	0.03	0.22	0.00	0.00	0.00	0.00	0.00	0.00
		0.17	....	XKSAT (Adj)	0.15	0.33	0.29	0.03	0.04	0.27	0.00	0.00	0.00	0.00	0.00	0.00
		6.9	....	PSIF	7.1	3.6	3.8	9.5	10.2	4.5	0.0	0.0	0.0	0.0	0.0	0.0
		0.31	....	DTHETA	0.37	0.35	0.36	0.21	0.26	0.37	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
1C				Map Unit No.	87	65	88									
	3			# Grid Pts.	1	1	1									
				Wtg. Factor	1.00	0.50	1.00									
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.22	0.27	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.23	....	XKSAT (Adj)	0.27	0.33	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5.4	....	PSIF	4.5	3.6	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.37	0.35	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
1D				Map Unit No.	64	27	65	67	87	88						
	15			# Grid Pts.	1	6	3	1	2	2						
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00						
		31	----	Vegetation Cover Density (%)												
		1.23	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.02	0.27	0.03	0.22	0.12	0.00	0.00	0.00	0.00	0.00	0.00
		0.14	....	XKSAT (Adj)	0.11	0.03	0.33	0.04	0.27	0.15	0.00	0.00	0.00	0.00	0.00	0.00
		7.3	....	PSIF	7.9	9.5	3.6	10.2	4.5	7.1	0.0	0.0	0.0	0.0	0.0	0.0
		0.29	....	DTHETA	0.31	0.21	0.35	0.26	0.37	0.37	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
1E				Map Unit No.	65	88										
	6			# Grid Pts.	5	1										
				Wtg. Factor	1.00	3.00										
		29	----	Vegetation Cover Density (%)												
		1.21	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.27	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.26	....	XKSAT (Adj)	0.32	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.9	....	PSIF	3.6	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.35	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
1F				Map Unit No.	66	65	67									
	11			# Grid Pts.	2	8	1									
				Wtg. Factor	2.00	1.00	2.00									
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.27	0.27	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.29	....	XKSAT (Adj)	0.33	0.33	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.5	....	PSIF	3.6	3.6	10.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.34	....	DTHETA	0.35	0.35	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
1G				Map Unit No.	5	27	65	66	88	67	10					
	14			# Grid Pts.	1	3	2	5	1	1	1					
				Wtg. Factor	1.00	1.50	1.00	1.00	3.00	1.00	1.00					
		28	----	Vegetation Cover Density (%)												
		1.20	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	1.04	0.02	0.27	0.27	0.12	0.03	2.43	0.00	0.00	0.00	0.00	0.00
		0.37	....	XKSAT (Adj)	1.25	0.03	0.32	0.32	0.14	0.04	2.43	0.00	0.00	0.00	0.00	0.00
		6.0	....	PSIF	2.8	9.5	3.6	3.6	7.1	10.2	2.2	0.0	0.0	0.0	0.0	0.0
		0.31	....	DTHETA	0.35	0.21	0.35	0.35	0.37	0.26	0.35	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
1H				Map Unit No.	64	65	73	18	52	27	66	5	10	60	97	
	33			# Grid Pts.	2	19	1	2	2	2	1	1	1	1	1	
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		27	----	Vegetation Cover Density (%)												
		1.19	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.27	0.09	0.80	0.33	0.02	0.27	1.04	2.43	0.10	0.08	0.00
		0.40	....	XKSAT (Adj)	0.10	0.32	0.10	0.95	0.40	0.03	0.32	1.24	2.43	0.12	0.09	0.00
		4.5	....	PSIF	7.9	3.6	7.9	3.3	3.9	9.5	3.6	2.8	2.2	7.6	8.1	0.0
		0.34	....	DTHETA	0.31	0.35	0.31	0.35	0.35	0.21	0.35	0.35	0.35	0.34	0.29	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
1I				Map Unit No.	66	116	52	123	51	47	110	100	46			
	30			# Grid Pts.	4	7	5	3	6	1	2	1	1			
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
		31	----	Vegetation Cover Density (%)												
		1.23	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.27	0.51	0.33	0.49	0.11	0.12	0.24	0.68	0.06	0.00	0.00	0.00
		0.40	....	XKSAT (Adj)	0.33	0.63	0.41	0.60	0.14	0.15	0.30	0.83	0.08	0.00	0.00	0.00
		4.8	....	PSIF	3.6	4.0	3.9	4.1	7.3	7.2	3.7	3.6	8.5	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.36	0.37	0.35	0.35	0.26	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
1J				Map Unit No.	51	52	66	116	10							
	13			# Grid Pts.	6	4	1	1	1							
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00							
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	0.33	0.27	0.51	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.45	....	XKSAT (Adj)	0.14	0.41	0.33	0.64	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5.3	....	PSIF	7.3	3.9	3.6	4.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.36	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
1K				Map Unit No.	73	64	65	18	52	51	42					
	22			# Grid Pts.	5	2	5	6	1	2	1					
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.09	0.27	0.80	0.33	0.11	0.08	0.00	0.00	0.00	0.00	0.00
		0.42	....	XKSAT (Adj)	0.11	0.11	0.33	1.00	0.41	0.14	0.10	0.00	0.00	0.00	0.00	0.00
		5.5	....	PSIF	7.9	7.9	3.6	3.3	3.9	7.3	8.1	0.0	0.0	0.0	0.0	0.0
		0.34	....	DTHETA	0.31	0.31	0.35	0.35	0.35	0.36	0.30	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
1L				Map Unit No.	73	64	21	51	10	99						
	26			# Grid Pts.	1	1	12	10	1	1						
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00						
		35	----	Vegetation Cover Density (%)												
		1.28	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.09	0.08	0.11	2.43	0.21	0.00	0.00	0.00	0.00	0.00	0.00
		0.21	....	XKSAT (Adj)	0.11	0.11	0.10	0.14	2.43	0.27	0.00	0.00	0.00	0.00	0.00	0.00
		7.4	....	PSIF	7.9	7.9	8.1	7.3	2.2	4.7	0.0	0.0	0.0	0.0	0.0	0.0
		0.33	....	DTHETA	0.31	0.31	0.30	0.36	0.35	0.37	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
2A				Map Unit No.	51	52	116									
	38			# Grid Pts.	13	24	1									
				Wtg. Factor	1.50	1.00	1.00									
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	0.33	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.28	....	XKSAT (Adj)	0.13	0.39	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5.4	....	PSIF	7.3	3.9	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.36	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
2B				Map Unit No.	51	52	100	10	116							
	26			# Grid Pts.	4	15	5	1	1							
				Wtg. Factor	1.00	1.00	1.50	1.00	1.00							
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	0.33	0.68	2.43	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.54	....	XKSAT (Adj)	0.13	0.39	0.79	2.43	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.3	....	PSIF	7.3	3.9	3.6	2.2	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.36	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
2C				Map Unit No.	116	51	10	52	100	46						
	18			# Grid Pts.	1	7	4	3	2	1						
				Wtg. Factor	3.00	1.00	1.00	1.00	1.00	2.00						
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.51	0.11	2.43	0.33	0.68	0.06	0.00	0.00	0.00	0.00	0.00	0.00
		0.75	....	XKSAT (Adj)	0.64	0.14	2.43	0.41	0.84	0.08	0.00	0.00	0.00	0.00	0.00	0.00
		5.1	....	PSIF	4.0	7.3	2.2	3.9	3.6	8.5	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.36	0.35	0.35	0.35	0.26	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
2D				Map Unit No.	116	10	123	52	47	51						
	24			# Grid Pts.	2	2	8	1	1	10						
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00						
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.51	2.43	0.49	0.33	0.12	0.11	0.00	0.00	0.00	0.00	0.00	0.00
		0.54	....	XKSAT (Adj)	0.65	2.43	0.61	0.42	0.15	0.14	0.00	0.00	0.00	0.00	0.00	0.00
		5.4	....	PSIF	4.0	2.2	4.1	3.9	7.2	7.3	0.0	0.0	0.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.35	0.35	0.35	0.35	0.37	0.36	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
2E				Map Unit No.	52	51	123	116								
	10			# Grid Pts.	3	3	3	1								
				Wtg. Factor	0.50	0.80	1.00	3.00								
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.33	0.11	0.49	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.47	....	XKSAT (Adj)	0.41	0.14	0.59	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.8	....	PSIF	3.9	7.3	4.1	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.36	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
2F				Map Unit No.	51	10	4	125	69	110	52	123	116			
	22			# Grid Pts.	9	1	1	1	1	1	6	1	1			
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
		35	----	Vegetation Cover Density (%)												
		1.28	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	2.43	1.89	0.73	0.11	0.24	0.33	0.49	0.51	0.00	0.00	0.00
		0.49	....	XKSAT (Adj)	0.14	2.43	1.89	0.93	0.13	0.31	0.42	0.62	0.66	0.00	0.00	0.00
		5.3	....	PSIF	7.3	2.2	2.3	3.5	7.4	3.7	3.9	4.1	4.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.36	0.35	0.35	0.35	0.36	0.35	0.35	0.35	0.35	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
3A				Map Unit No.	64	73	94	18	21	3	62	36	66			
	31			# Grid Pts.	16	6	2	1	1	2	1	1	1			
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
		27	----	Vegetation Cover Density (%)												
		1.19	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.09	0.33	0.80	0.08	1.89	0.07	0.03	0.27	0.00	0.00	0.00
		0.27	....	XKSAT (Adj)	0.10	0.10	0.40	0.95	0.09	1.89	0.09	0.03	0.32	0.00	0.00	0.00
		7.1	....	PSIF	7.9	7.9	4.0	3.3	8.1	2.3	8.2	9.8	3.6	0.0	0.0	0.0
		0.32	....	DTHETA	0.31	0.31	0.35	0.35	0.30	0.35	0.29	0.23	0.35	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
3B				Map Unit No.	64	94	91	21	3	69	110	30	73	4		
	30			# Grid Pts.	4	6	2	11	1	2	1	1	1	1		
				Wtg. Factor	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00		
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.33	0.76	0.08	1.89	0.11	0.24	0.53	0.09	1.89	0.00	0.00
		0.41	....	XKSAT (Adj)	0.10	0.41	0.93	0.10	1.89	0.13	0.30	0.65	0.10	1.89	0.00	0.00
		6.1	....	PSIF	7.9	4.0	3.4	8.1	2.3	7.4	3.7	4.0	7.9	2.3	0.0	0.0
		0.33	....	DTHETA	0.31	0.35	0.35	0.30	0.35	0.36	0.35	0.35	0.31	0.35	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
3C				Map Unit No.	64	62	96	91	70	4	21	30				
	23			# Grid Pts.	11	2	1	1	4	2	1	1				
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.07	0.33	0.76	0.33	1.89	0.08	0.53	0.00	0.00	0.00	0.00
		0.38	....	XKSAT (Adj)	0.10	0.09	0.41	0.93	0.40	1.89	0.10	0.65	0.00	0.00	0.00	0.00
		6.2	....	PSIF	7.9	8.2	4.0	3.4	3.9	2.3	8.1	4.0	0.0	0.0	0.0	0.0
		0.32	....	DTHETA	0.31	0.29	0.35	0.35	0.35	0.35	0.30	0.35	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
3D				Map Unit No.	64	62	48	91	70	71	98					
	24			# Grid Pts.	12	3	1	4	1	2	1					
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.07	0.10	0.76	0.33	0.33	0.21	0.00	0.00	0.00	0.00	0.00
		0.29	....	XKSAT (Adj)	0.11	0.09	0.13	0.95	0.40	0.40	0.26	0.00	0.00	0.00	0.00	0.00
		6.5	....	PSIF	7.9	8.2	7.5	3.4	3.9	3.9	4.7	0.0	0.0	0.0	0.0	0.0
		0.32	....	DTHETA	0.31	0.29	0.35	0.35	0.35	0.35	0.37	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
3E				Map Unit No.	30	52	98	91	29	71	4	99	117			
	18			# Grid Pts.	2	1	1	1	1	9	1	1	1			
				Wtg. Factor	2.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00			
		36	----	Vegetation Cover Density (%)												
		1.29	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.53	0.33	0.21	0.76	0.53	0.33	1.89	0.21	0.43	0.00	0.00	0.00
		0.57	....	XKSAT (Adj)	0.69	0.43	0.27	0.98	0.69	0.42	1.89	0.27	0.55	0.00	0.00	0.00
		4.0	....	PSIF	4.0	3.9	4.7	3.4	4.0	3.9	2.3	4.7	4.2	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.37	0.35	0.35	0.35	0.35	0.37	0.35	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
4A				Map Unit No.	52	51	69	110	99	116	123	4				
	40			# Grid Pts.	14	13	1	2	1	1	7	1				
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00				
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.33	0.11	0.11	0.24	0.21	0.51	0.49	1.89	0.00	0.00	0.00	0.00
		0.37	....	XKSAT (Adj)	0.39	0.13	0.12	0.28	0.25	0.60	0.57	1.89	0.00	0.00	0.00	0.00
		5.1	....	PSIF	3.9	7.3	7.4	3.7	4.7	4.0	4.1	2.3	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.36	0.36	0.35	0.37	0.35	0.35	0.35	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
4B				Map Unit No.	99	69	51	52	123							
	23			# Grid Pts.	1	1	3	17	1							
				Wtg. Factor	1.00	1.00	1.00	0.80	1.00							
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.21	0.11	0.11	0.33	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.34	....	XKSAT (Adj)	0.25	0.12	0.13	0.39	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.7	....	PSIF	4.7	7.4	7.3	3.9	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.37	0.36	0.36	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
4C				Map Unit No.	110	69	51	52								
	13			# Grid Pts.	4	6	2	1								
				Wtg. Factor	1.00	1.00	1.00	1.00								
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.24	0.11	0.11	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.19	....	XKSAT (Adj)	0.28	0.12	0.13	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		6.0	....	PSIF	3.7	7.4	7.3	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.35	0.36	0.36	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
5A				Map Unit No.	52	69	119	81	11							
	43			# Grid Pts.	31	8	1	2	1							
				Wtg. Factor	0.80	0.90	1.00	1.00	1.00							
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.33	0.11	0.10	0.13	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.37	....	XKSAT (Adj)	0.39	0.12	0.12	0.15	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.8	....	PSIF	3.9	7.4	7.5	6.9	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.36	0.35	0.38	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
5B				Map Unit No.	69	51	52	119	11	71	4	117				
	29			# Grid Pts.	16	1	3	2	2	2	2	1				
				Wtg. Factor	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00				
		34	----	Vegetation Cover Density (%)												
		1.27	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	0.11	0.33	0.10	2.43	0.33	1.89	0.43	0.00	0.00	0.00	0.00
		0.45	....	XKSAT (Adj)	0.13	0.14	0.42	0.13	2.43	0.41	1.89	0.54	0.00	0.00	0.00	0.00
		6.1	....	PSIF	7.4	7.3	3.9	7.5	2.2	3.9	2.3	4.2	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.36	0.36	0.35	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
5C				Map Unit No.	119	11	52	81	123	96	69					
	24			# Grid Pts.	5	3	2	7	1	2	4					
				Wtg. Factor	1.00	1.00	1.00	0.80	1.00	1.00	1.00					
		29	----	Vegetation Cover Density (%)												
		1.21	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.10	2.43	0.33	0.13	0.49	0.08	0.11	0.00	0.00	0.00	0.00	0.00
		0.48	....	XKSAT (Adj)	0.12	2.43	0.40	0.16	0.59	0.09	0.13	0.00	0.00	0.00	0.00	0.00
		6.2	....	PSIF	7.5	2.2	3.9	6.9	4.1	8.1	7.4	0.0	0.0	0.0	0.0	0.0
		0.39	....	DTHETA	0.35	0.35	0.35	0.38	0.35	0.29	0.36	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
6A				Map Unit No.	81	69	68	47	100	119	30					
	17			# Grid Pts.	4	3	1	4	1	1	3					
				Wtg. Factor	1.00	5.00	1.00	1.00	1.00	1.00	1.00					
		29	----	Vegetation Cover Density (%)												
		1.21	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.13	0.11	0.10	0.12	0.68	0.10	0.53	0.00	0.00	0.00	0.00	0.00
		0.21	....	XKSAT (Adj)	0.16	0.13	0.12	0.14	0.82	0.12	0.65	0.00	0.00	0.00	0.00	0.00
		6.8	....	PSIF	6.9	7.4	7.5	7.2	3.6	7.5	4.0	0.0	0.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.38	0.36	0.35	0.37	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
6B				Map Unit No.	100	20	119	30	11	92	71	117	76	102	81	
	24			# Grid Pts.	1	4	3	6	1	4	1	1	1	1	1	
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.00	1.00	1.00	1.00	
		29	----	Vegetation Cover Density (%)												
		1.21	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.68	0.27	0.10	0.53	2.43	0.76	0.33	0.43	0.10	0.52	0.13	0.00
		0.58	....	XKSAT (Adj)	0.82	0.32	0.12	0.65	2.43	0.92	0.39	0.52	0.12	0.63	0.16	0.00
		4.4	....	PSIF	3.6	3.6	7.5	4.0	2.2	3.4	3.9	4.2	7.5	4.0	6.9	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.38	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
6C				Map Unit No.	119	11	117	30	71	92						
	12			# Grid Pts.	4	1	3	2	1	1						
				Wtg. Factor	1.00	4.00	1.00	1.00	1.00	2.00						
		31	----	Vegetation Cover Density (%)												
		1.23	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.10	2.43	0.43	0.53	0.33	0.76	0.00	0.00	0.00	0.00	0.00	0.00
		0.96	....	XKSAT (Adj)	0.12	2.43	0.53	0.66	0.40	0.94	0.00	0.00	0.00	0.00	0.00	0.00
		4.4	....	PSIF	7.5	2.2	4.2	4.0	3.9	3.4	0.0	0.0	0.0	0.0	0.0	0.0
		0.39	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
6D				Map Unit No.	117	92	71	20	11							
	16			# Grid Pts.	1	3	1	9	2							
				Wtg. Factor	0.10	1.50	1.00	1.00	1.50							
		31	----	Vegetation Cover Density (%)												
		1.23	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.43	0.76	0.33	0.27	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.85	....	XKSAT (Adj)	0.53	0.94	0.40	0.33	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.3	....	PSIF	4.2	3.4	3.9	3.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.39	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
7A				Map Unit No.	64	62	98	29	47	71	30					
	23			# Grid Pts.	8	7	1	1	1	4	1					
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.07	0.21	0.53	0.12	0.33	0.53	0.00	0.00	0.00	0.00	0.00
		0.21	....	XKSAT (Adj)	0.11	0.09	0.26	0.66	0.15	0.40	0.66	0.00	0.00	0.00	0.00	0.00
		6.8	....	PSIF	7.9	8.2	4.7	4.0	7.2	3.9	4.0	0.0	0.0	0.0	0.0	0.0
		0.32	....	DTHETA	0.31	0.29	0.37	0.35	0.37	0.35	0.35	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
7B				Map Unit No.	1	64	62	117	71	4	119	47				
	26			# Grid Pts.	1	2	3	9	7	1	2	1				
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00				
		29	----	Vegetation Cover Density (%)												
		1.21	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.56	0.09	0.07	0.43	0.33	1.89	0.10	0.12	0.00	0.00	0.00	0.00
		0.41	....	XKSAT (Adj)	0.68	0.10	0.09	0.52	0.39	1.89	0.12	0.14	0.00	0.00	0.00	0.00
		5.2	....	PSIF	3.9	7.9	8.2	4.2	3.9	2.3	7.5	7.2	0.0	0.0	0.0	0.0
		0.34	....	DTHETA	0.35	0.31	0.29	0.35	0.35	0.35	0.35	0.37	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
7C				Map Unit No.	64	62	47	29	91	30	116	117	4	71		
	30			# Grid Pts.	6	6	4	1	4	4	1	1	1	2		
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00		
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.07	0.12	0.53	0.76	0.53	0.51	0.43	1.89	0.33	0.00	0.00
		0.42	....	XKSAT (Adj)	0.10	0.09	0.14	0.65	0.93	0.65	0.63	0.52	1.89	0.40	0.00	0.00
		5.9	....	PSIF	7.9	8.2	7.2	4.0	3.4	4.0	4.0	4.2	2.3	3.9	0.0	0.0
		0.33	....	DTHETA	0.31	0.29	0.37	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
7D				Map Unit No.	1	119	114	71	112	30	4	117	78	50		
	24			# Grid Pts.	1	5	2	5	1	2	1	4	2	1		
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	3.00	1.00	1.00	1.00	1.00		
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.56	0.10	0.51	0.33	0.50	0.53	1.89	0.43	0.08	0.25	0.00	0.00
		0.48	....	XKSAT (Adj)	0.69	0.12	0.63	0.40	0.61	0.65	1.89	0.52	0.10	0.30	0.00	0.00
		4.8	....	PSIF	3.9	7.5	4.0	3.9	4.1	4.0	2.3	4.2	8.0	3.6	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.31	0.35	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
7E				Map Unit No.	117	71	119	56	30	99						
	38			# Grid Pts.	5	25	5	1	1	1						
				Wtg. Factor	1.00	0.90	1.00	1.00	1.00	1.00						
		29	----	Vegetation Cover Density (%)												
		1.21	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.43	0.33	0.10	0.42	0.53	0.21	0.00	0.00	0.00	0.00	0.00	0.00
		0.38	....	XKSAT (Adj)	0.52	0.39	0.12	0.50	0.65	0.25	0.00	0.00	0.00	0.00	0.00	0.00
		4.5	....	PSIF	4.2	3.9	7.5	4.3	4.0	4.7	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.37	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
7F				Map Unit No.	117	39	1	71	60							
	16			# Grid Pts.	7	2	1	5	1							
				Wtg. Factor	2.00	1.00	1.00	1.00	1.00							
		31	----	Vegetation Cover Density (%)												
		1.23	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.43	0.53	0.56	0.33	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.51	....	XKSAT (Adj)	0.53	0.66	0.69	0.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.2	....	PSIF	4.2	4.0	3.9	3.9	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
8A				Map Unit No.	119	71	56	117	20	92	11					
	28			# Grid Pts.	1	11	1	4	5	5	1					
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.10	0.33	0.42	0.43	0.27	0.76	2.43	0.00	0.00	0.00	0.00	0.00
		0.57	....	XKSAT (Adj)	0.12	0.40	0.52	0.53	0.33	0.95	2.43	0.00	0.00	0.00	0.00	0.00
		3.9	....	PSIF	7.5	3.9	4.3	4.2	3.6	3.4	2.2	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
9A				Map Unit No.	52	69	47									
	22			# Grid Pts.	20	1	1									
				Wtg. Factor	1.00	1.00	1.00									
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.33	0.11	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.38	....	XKSAT (Adj)	0.41	0.13	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.2	....	PSIF	3.9	7.4	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.39	....	DTHETA	0.35	0.36	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
9B				Map Unit No.	52	47	11	123	109							
	37			# Grid Pts.	21	12	1	1	2							
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00							
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.33	0.12	2.43	0.49	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.36	....	XKSAT (Adj)	0.41	0.14	2.43	0.59	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5.2	....	PSIF	3.9	7.2	2.2	4.1	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.37	0.35	0.35	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
9C				Map Unit No.	30	47	92	123	11	109	52					
	29			# Grid Pts.	1	14	1	2	1	6	4					
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
		28	----	Vegetation Cover Density (%)												
		1.20	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.53	0.12	0.76	0.49	2.43	0.06	0.33	0.00	0.00	0.00	0.00	0.00
		0.32	....	XKSAT (Adj)	0.64	0.14	0.92	0.58	2.43	0.07	0.40	0.00	0.00	0.00	0.00	0.00
		6.4	....	PSIF	4.0	7.2	3.4	4.1	2.2	8.5	3.9	0.0	0.0	0.0	0.0	0.0
		0.34	....	DTHETA	0.35	0.37	0.35	0.35	0.35	0.25	0.35	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
9D				Map Unit No.	52	48	47	99	109	100						
	27			# Grid Pts.	4	5	5	1	6	6						
				Wtg. Factor	1.00	2.00	1.00	1.00	4.00	1.00						
		28	----	Vegetation Cover Density (%)												
		1.20	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.33	0.10	0.12	0.21	0.06	0.68	0.00	0.00	0.00	0.00	0.00	0.00
		0.21	....	XKSAT (Adj)	0.40	0.12	0.14	0.25	0.07	0.81	0.00	0.00	0.00	0.00	0.00	0.00
		7.1	....	PSIF	3.9	7.5	7.2	4.7	8.5	3.6	0.0	0.0	0.0	0.0	0.0	0.0
		0.30	....	DTHETA	0.35	0.35	0.37	0.37	0.25	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
9E				Map Unit No.	92	76	48	81	100	102	14	69	91	99		
	28			# Grid Pts.	7	3	4	4	5	1	1	1	1	1		
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
		28	----	Vegetation Cover Density (%)												
		1.20	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.76	0.10	0.10	0.13	0.68	0.52	4.04	0.11	0.76	0.21	0.00	0.00
		0.64	....	XKSAT (Adj)	0.92	0.12	0.12	0.16	0.81	0.62	4.04	0.13	0.92	0.25	0.00	0.00
		5.1	....	PSIF	3.4	7.5	7.5	6.9	3.6	4.0	2.0	7.4	3.4	4.7	0.0	0.0
		0.34	....	DTHETA	0.35	0.35	0.35	0.38	0.35	0.35	0.35	0.36	0.35	0.37	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
9F				Map Unit No.	91	100	81	92	48							
	9			# Grid Pts.	2	4	1	1	1							
				Wtg. Factor	1.00	1.00	1.00	1.00	3.00							
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.76	0.68	0.13	0.76	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.58	....	XKSAT (Adj)	0.89	0.79	0.15	0.89	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.9	....	PSIF	3.4	3.6	6.9	3.4	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.38	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
9G				Map Unit No.	102	56	92	117	20							
	8			# Grid Pts.	4	1	1	1	1							
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00							
		30	----	Vegetation Cover Density (%)												
		1.02	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.52	0.42	0.76	0.43	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.60	....	XKSAT (Adj)	0.63	0.51	0.93	0.52	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.0	....	PSIF	4.0	4.3	3.4	4.2	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
9H				Map Unit No.	92	100	11	20	48	117						
	8			# Grid Pts.	1	3	1	1	1	1						
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.50						
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.76	0.68	2.43	0.27	0.10	0.43	0.00	0.00	0.00	0.00	0.00	0.00
		0.81	....	XKSAT (Adj)	0.89	0.79	2.43	0.31	0.12	0.50	0.00	0.00	0.00	0.00	0.00	0.00
		4.0	....	PSIF	3.4	3.6	2.2	3.6	7.5	4.2	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
9I				Map Unit No.	102	20	117	11	123							
	20			# Grid Pts.	1	12	5	1	1							
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00							
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.52	0.27	0.43	2.43	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.51	....	XKSAT (Adj)	0.63	0.33	0.52	2.43	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.7	....	PSIF	4.0	3.6	4.2	2.2	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10A				Map Unit No.	62	121	94	64	110	91	68	108				
	9			# Grid Pts.	2	1	1	1	1	1	1	1				
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
		37	----	Vegetation Cover Density (%)												
		1.30	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.07	0.49	0.33	0.09	0.24	0.76	0.11	0.08	0.00	0.00	0.00	0.00
		0.32	....	XKSAT (Adj)	0.10	0.63	0.44	0.11	0.32	0.99	0.14	0.10	0.00	0.00	0.00	0.00
		6.1	....	PSIF	8.2	4.1	4.0	7.9	3.7	3.4	7.4	8.1	0.0	0.0	0.0	0.0
		0.33	....	DTHETA	0.29	0.35	0.35	0.31	0.35	0.35	0.36	0.29	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10B				Map Unit No.	91	47	116	30	78	99	71	102	68			
	26			# Grid Pts.	4	2	4	11	1	1	1	1	1			
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.50	1.00			
		36	----	Vegetation Cover Density (%)												
		1.29	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.76	0.12	0.51	0.53	0.08	0.21	0.33	0.52	0.11	0.00	0.00	0.00
		0.62	....	XKSAT (Adj)	0.98	0.15	0.66	0.69	0.11	0.27	0.42	0.67	0.14	0.00	0.00	0.00
		4.5	....	PSIF	3.4	7.2	4.0	4.0	8.0	4.7	3.9	4.0	7.4	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.37	0.35	0.35	0.31	0.37	0.35	0.35	0.36	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10C				Map Unit No.	47	116	30	91	112	117	102					
	36			# Grid Pts.	1	2	21	1	1	9	1					
				Wtg. Factor	1.00	3.00	0.80	1.00	1.00	0.70	1.20					
		33	----	Vegetation Cover Density (%)												
		1.26	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.12	0.51	0.53	0.76	0.50	0.43	0.52	0.00	0.00	0.00	0.00	0.00
		0.63	....	XKSAT (Adj)	0.15	0.65	0.67	0.96	0.62	0.54	0.65	0.00	0.00	0.00	0.00	0.00
		4.1	....	PSIF	7.2	4.0	4.0	3.4	4.1	4.2	4.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.37	0.35	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
10C1				Map Unit No.	67	116	30	91	112							
	12			# Grid Pts.	1	2	7	1	1							
				Wtg. Factor	1.00	4.00	1.00	1.00	1.00							
		34	----	Vegetation Cover Density (%)												
		1.27	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.12	0.51	0.53	0.76	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.65	....	XKSAT (Adj)	0.15	0.65	0.68	0.97	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.2	....	PSIF	7.2	4.0	4.0	3.4	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.37	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10C2				Map Unit No.	30	117	102									
	24			# Grid Pts.	14	9	1									
				Wtg. Factor	0.80	0.70	1.30									
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.53	0.43	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.62	....	XKSAT (Adj)	0.66	0.53	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.1	....	PSIF	4.0	4.2	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10D				Map Unit No.	64	62	42	32	48	91	68	98	47	74		
	22			# Grid Pts.	7	5	1	1	2	1	2	1	1	1		
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
		34	----	Vegetation Cover Density (%)												
		1.27	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.07	0.08	0.27	0.10	0.76	0.11	0.21	0.12	0.06	0.00	0.00
		0.17	....	XKSAT (Adj)	0.11	0.09	0.10	0.34	0.13	0.97	0.13	0.27	0.15	0.08	0.00	0.00
		7.3	....	PSIF	7.9	8.2	8.1	3.6	7.5	3.4	7.4	4.7	7.2	8.6	0.0	0.0
		0.32	....	DTHETA	0.31	0.29	0.30	0.35	0.35	0.35	0.36	0.37	0.37	0.25	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10E				Map Unit No.	91	47	116	98	30	114						
	14			# Grid Pts.	1	3	1	2	6	1						
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00						
		34	----	Vegetation Cover Density (%)												
		1.27	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.76	0.12	0.51	0.21	0.53	0.43	0.00	0.00	0.00	0.00	0.00	0.00
		0.51	....	XKSAT (Adj)	0.97	0.15	0.65	0.27	0.68	0.54	0.00	0.00	0.00	0.00	0.00	0.00
		4.8	....	PSIF	3.4	7.2	4.0	4.7	4.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.35	0.37	0.35	0.37	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
10F				Map Unit No.	64	62	73	97	105	42	7					
	22			# Grid Pts.	8	5	4	1	2	1	1					
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.50	1.00					
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.07	0.09	0.08	0.07	0.08	1.04	0.00	0.00	0.00	0.00	0.00
		0.15	....	XKSAT (Adj)	0.10	0.09	0.10	0.09	0.09	0.10	1.27	0.00	0.00	0.00	0.00	0.00
		7.8	....	PSIF	7.9	8.2	7.9	8.1	8.3	8.1	2.8	0.0	0.0	0.0	0.0	0.0
		0.30	....	DTHETA	0.31	0.29	0.31	0.29	0.28	0.30	0.35	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10G				Map Unit No.	64	48	98	91	30	3	108					
	21			# Grid Pts.	2	2	9	1	5	1	1					
				Wtg. Factor	1.00	1.50	1.00	1.00	1.00	1.00	1.00					
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.10	0.21	0.76	0.53	1.89	0.08	0.00	0.00	0.00	0.00	0.00
		0.42	....	XKSAT (Adj)	0.11	0.13	0.26	0.95	0.66	1.89	0.10	0.00	0.00	0.00	0.00	0.00
		5.2	....	PSIF	7.9	7.5	4.7	3.4	4.0	2.3	8.1	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.31	0.35	0.37	0.35	0.35	0.35	0.29	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10H				Map Unit No.	30	117	56	4	99	91						
	34			# Grid Pts.	18	8	3	2	2	1						
				Wtg. Factor	0.80	1.00	1.20	2.00	0.70	1.00						
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.53	0.43	0.42	1.89	0.21	0.76	0.00	0.00	0.00	0.00	0.00	0.00
		0.76	....	XKSAT (Adj)	0.66	0.53	0.52	1.89	0.26	0.95	0.00	0.00	0.00	0.00	0.00	0.00
		3.9	....	PSIF	4.0	4.2	4.3	2.3	4.7	3.4	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.37	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10I				Map Unit No.	73	62	64	42	91	32	48	3	74	97	43	
	33			# Grid Pts.	4	2	14	3	2	3	1	1	1	1	1	
				Wtg. Factor	1.00	1.00	1.00	2.00	1.00	3.00	1.00	1.00	1.00	1.00	1.00	
		39	----	Vegetation Cover Density (%)												
		1.32	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.07	0.09	0.08	0.76	0.27	0.10	1.89	0.06	0.08	0.07	0.00
		0.25	....	XKSAT (Adj)	0.11	0.10	0.11	0.10	1.01	0.35	0.14	1.89	0.08	0.10	0.09	0.00
		6.7	....	PSIF	7.9	8.2	7.9	8.1	3.4	3.6	7.5	2.3	8.6	8.1	8.4	0.0
		0.32	....	DTHETA	0.31	0.29	0.31	0.30	0.35	0.35	0.35	0.35	0.25	0.29	0.27	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
10J				Map Unit No.	91	74	30	108	117	1	6	99				
	17			# Grid Pts.	1	1	9	1	1	2	1	1				
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
		23	----	Vegetation Cover Density (%)												
		1.14	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.76	0.06	0.53	0.08	0.43	0.56	1.89	0.21	0.00	0.00	0.00	0.00
		0.61	....	XKSAT (Adj)	0.87	0.07	0.61	0.09	0.49	0.64	1.89	0.24	0.00	0.00	0.00	0.00
		4.4	....	PSIF	3.4	8.6	4.0	8.1	4.2	3.9	2.3	4.7	0.0	0.0	0.0	0.0
		0.34	....	DTHETA	0.35	0.25	0.35	0.29	0.35	0.35	0.35	0.37	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10K				Map Unit No.	91	48	32	64	99	110	30	108	52			
	26			# Grid Pts.	2	7	1	1	3	1	9	1	1			
				Wtg. Factor	1.00	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00			
		52	----	Vegetation Cover Density (%)												
		1.36	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.76	0.10	0.27	0.09	0.21	0.24	0.53	0.08	0.33	0.00	0.00	0.00
		0.64	....	XKSAT (Adj)	1.04	0.14	0.36	0.12	0.29	0.33	0.72	0.11	0.45	0.00	0.00	0.00
		5.1	....	PSIF	3.4	7.5	3.6	7.9	4.7	3.7	4.0	8.1	3.9	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.31	0.37	0.35	0.35	0.29	0.35	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10K1				Map Unit No.	91	48	32	64								
	7			# Grid Pts.	2	3	1	1								
				Wtg. Factor	1.00	1.00	2.00	1.00								
		65	----	Vegetation Cover Density (%)												
		1.39	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.76	0.10	0.27	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.63	....	XKSAT (Adj)	1.06	0.14	0.37	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5.5	....	PSIF	3.4	7.5	3.6	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10K2				Map Unit No.	48	99	110	30	108	52						
	19			# Grid Pts.	4	3	1	9	1	1						
				Wtg. Factor	1.00	2.00	2.00	1.00	1.00	1.00						
		38	----	Vegetation Cover Density (%)												
		1.31	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.10	0.21	0.24	0.53	0.08	0.33	0.00	0.00	0.00	0.00	0.00	0.00
		0.42	....	XKSAT (Adj)	0.13	0.28	0.32	0.70	0.10	0.44	0.00	0.00	0.00	0.00	0.00	0.00
		4.9	....	PSIF	7.5	4.7	3.7	4.0	8.1	3.9	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.37	0.35	0.35	0.29	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
10L				Map Unit No.	30	117	56	71	4							
	32			# Grid Pts.	6	11	10	1	4							
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00							
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.53	0.43	0.42	0.33	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.69	....	XKSAT (Adj)	0.62	0.50	0.48	0.38	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.9	....	PSIF	4.0	4.2	4.3	3.9	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10M				Map Unit No.	62	64	35	42	48	52	63	32				
	28			# Grid Pts.	1	9	1	3	7	1	1	5				
				Wtg. Factor	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
		44	----	Vegetation Cover Density (%)												
		1.38	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.07	0.09	0.02	0.08	0.10	0.33	0.09	0.27	0.00	0.00	0.00	0.00
		0.17	....	XKSAT (Adj)	0.10	0.12	0.03	0.11	0.14	0.46	0.12	0.37	0.00	0.00	0.00	0.00
		7.0	....	PSIF	8.2	7.9	9.6	8.1	7.5	3.9	7.9	3.6	0.0	0.0	0.0	0.0
		0.32	....	DTHETA	0.29	0.31	0.22	0.30	0.35	0.35	0.31	0.35	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10M1				Map Unit No.	62	64	35									
	8			# Grid Pts.	1	6	1									
				Wtg. Factor	3.00	1.00	1.00									
		40	----	Vegetation Cover Density (%)												
		1.33	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.07	0.09	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.10	....	XKSAT (Adj)	0.10	0.11	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		8.2	....	PSIF	8.2	7.9	9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.30	....	DTHETA	0.29	0.31	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10M2				Map Unit No.	64	42	48	52	63							
	9			# Grid Pts.	2	3	2	1	1							
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00							
		49	----	Vegetation Cover Density (%)												
		1.43	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.08	0.10	0.33	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.16	....	XKSAT (Adj)	0.12	0.11	0.15	0.48	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		7.4	....	PSIF	7.9	8.1	7.5	3.9	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.32	....	DTHETA	0.31	0.30	0.35	0.35	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
10W3				Map Unit No.	64	32	48									
	11			# Grid Pts.	1	5	5									
				Wtg. Factor	1.00	1.00	1.00									
		62	----	Vegetation Cover Density (%)												
		1.36	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.27	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.24	....	XKSAT (Adj)	0.12	0.36	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5.7	....	PSIF	7.9	3.6	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.31	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10W				Map Unit No.	68	98	110	92	30	99	52	81	47	117	56	
	21			# Grid Pts.	1	1	1	2	3	3	1	1	1	1	6	
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	
		33	----	Vegetation Cover Density (%)												
		1.26	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	0.21	0.24	0.76	0.53	0.21	0.33	0.13	0.12	0.43	0.42	0.00
		0.47	....	XKSAT (Adj)	0.13	0.26	0.31	0.96	0.67	0.26	0.42	0.16	0.15	0.54	0.52	0.00
		4.6	....	PSIF	7.4	4.7	3.7	3.4	4.0	4.7	3.9	6.9	7.2	4.2	4.3	0.0
		0.36	....	DTHETA	0.36	0.37	0.35	0.35	0.35	0.37	0.35	0.38	0.37	0.35	0.35	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10G				Map Unit No.	35	73	62	38								
	20			# Grid Pts.	2	13	4	1								
				Wtg. Factor	1.00	0.70	0.90	1.00								
		28	----	Vegetation Cover Density (%)												
		1.20	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.02	0.09	0.07	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.09	....	XKSAT (Adj)	0.03	0.10	0.09	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		8.2	....	PSIF	9.6	7.9	8.2	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.30	....	DTHETA	0.22	0.31	0.29	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10P				Map Unit No.	73	38	64	35	105	98	42	110	48	3	123	43
	26			# Grid Pts.	3	1	11	1	1	3	1	1	1	1	1	1
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00
		42	----	Vegetation Cover Density (%)												
		1.34	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.10	0.09	0.02	0.07	0.21	0.08	0.24	0.10	1.89	0.49	0.07
		0.23	....	XKSAT (Adj)	0.12	0.13	0.12	0.03	0.10	0.29	0.11	0.33	0.14	1.89	0.66	0.09
		7.0	....	PSIF	7.9	7.6	7.9	9.6	8.3	4.7	8.1	3.7	7.5	2.3	4.1	8.4
		0.32	....	DTHETA	0.31	0.34	0.31	0.22	0.28	0.37	0.30	0.35	0.35	0.35	0.35	0.27
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
104				Map Unit No.	64	66	62	95	43	48	3	38				
	12			# Grid Pts.	2	1	3	1	2	1	1	1				
				Wtg. Factor	1.00	3.00	1.00	1.00	2.00	1.00	1.00	4.00				
		38	----	Vegetation Cover Density (%)												
		1.31	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.27	0.08	0.04	0.07	0.10	1.89	0.10	0.00	0.00	0.00	0.00
		0.24	....	XKSAT (Adj)	0.11	0.35	0.10	0.05	0.09	0.13	1.89	0.13	0.00	0.00	0.00	0.00
		7.1	....	PSIF	7.9	3.6	8.1	10.6	8.4	7.5	2.3	7.6	0.0	0.0	0.0	0.0
		0.32	....	DTHETA	0.31	0.35	0.30	0.29	0.27	0.35	0.35	0.34	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
108				Map Unit No.	42	48	98	3	110	29	30	52	99			
	27			# Grid Pts.	1	14	3	1	1	4	1	1	1			
				Wtg. Factor	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	3.00			
		30	----	Vegetation Cover Density (%)												
		1.22	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.08	0.10	0.21	1.89	0.24	0.53	0.53	0.33	0.21	0.00	0.00	0.00
		0.31	....	XKSAT (Adj)	0.10	0.13	0.26	1.89	0.30	0.65	0.65	0.41	0.26	0.00	0.00	0.00
		5.8	....	PSIF	8.1	7.5	4.7	2.3	3.7	4.0	4.0	3.9	4.7	0.0	0.0	0.0
		0.36	....	DTHETA	0.30	0.35	0.37	0.35	0.35	0.35	0.35	0.35	0.37	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
105				Map Unit No.	48	98	99									
	18			# Grid Pts.	5	8	5									
				Wtg. Factor	1.00	1.00	1.00									
		36	----	Vegetation Cover Density (%)												
		1.29	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.10	0.21	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.23	....	XKSAT (Adj)	0.13	0.27	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5.5	....	PSIF	7.5	4.7	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.35	0.37	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
101				Map Unit No.	48	123	47	110	92	99	30	45	29			
	18			# Grid Pts.	3	1	3	1	1	6	1	1	1			
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	4.00			
		36	----	Vegetation Cover Density (%)												
		1.29	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.10	0.49	0.12	0.24	0.76	0.21	0.53	0.04	0.53	0.00	0.00	0.00
		0.36	....	XKSAT (Adj)	0.13	0.63	0.15	0.31	0.98	0.27	0.69	0.05	0.69	0.00	0.00	0.00
		5.4	....	PSIF	7.5	4.1	7.2	3.7	3.4	4.7	4.0	8.2	4.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.37	0.35	0.35	0.37	0.35	0.25	0.35	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
10U				Map Unit No.	99	30	81	4	56	117						
	24			# Grid Pts.	4	11	2	1	1	5						
				Wtg. Factor	1.00	1.00	4.00	1.00	1.00	0.90						
		27	----	Vegetation Cover Density (%)												
		1.19	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.21	0.53	0.13	1.89	0.42	0.43	0.00	0.00	0.00	0.00	0.00	0.00
		0.47	....	XKSAT (Adj)	0.25	0.63	0.16	1.89	0.49	0.51	0.00	0.00	0.00	0.00	0.00	0.00
		4.9	....	PSIF	4.7	4.0	6.9	2.3	4.3	4.2	0.0	0.0	0.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.37	0.35	0.38	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10V				Map Unit No.	48	99	30	75	119	117						
	17			# Grid Pts.	2	6	6	1	1	1						
				Wtg. Factor	4.00	1.00	4.00	1.00	1.00	1.00						
		29	----	Vegetation Cover Density (%)												
		1.21	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.10	0.21	0.53	0.25	0.10	0.43	0.00	0.00	0.00	0.00	0.00	0.00
		0.46	....	XKSAT (Adj)	0.12	0.25	0.65	0.30	0.12	0.52	0.00	0.00	0.00	0.00	0.00	0.00
		4.9	....	PSIF	7.5	4.7	4.0	3.6	7.5	4.2	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.37	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10W				Map Unit No.	63	73	42	74	13	110						
	24			# Grid Pts.	4	10	7	1	1	1						
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00						
		40	----	Vegetation Cover Density (%)												
		1.33	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.07	0.09	0.08	0.06	0.03	0.24	0.00	0.00	0.00	0.00	0.00	0.00
		0.11	....	XKSAT (Adj)	0.09	0.11	0.10	0.08	0.04	0.32	0.00	0.00	0.00	0.00	0.00	0.00
		8.0	....	PSIF	8.4	7.9	8.1	8.6	10.3	3.7	0.0	0.0	0.0	0.0	0.0	0.0
		0.30	....	DTHETA	0.27	0.31	0.30	0.25	0.27	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10X				Map Unit No.	42	48	74	98	30							
	12			# Grid Pts.	1	6	1	3	1							
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00							
		31	----	Vegetation Cover Density (%)												
		1.23	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.08	0.10	0.06	0.21	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.20	....	XKSAT (Adj)	0.10	0.13	0.07	0.26	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		6.6	....	PSIF	8.1	7.5	8.6	4.7	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.34	....	DTHETA	0.30	0.35	0.25	0.37	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
10Y				Map Unit No.	29	30	4	99	114	81	98	48	60	69	71	
	21			# Grid Pts.	2	6	1	2	3	1	1	1	1	2	1	
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		26	----	Vegetation Cover Density (%)												
		1.18	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.53	0.53	1.89	0.21	0.43	0.13	0.21	0.10	0.21	0.11	0.33	0.00
		0.49	....	XKSAT (Adj)	0.63	0.63	1.89	0.25	0.50	0.15	0.25	0.12	0.24	0.12	0.38	0.00
		4.7	....	PSIF	4.0	4.0	2.3	4.7	4.2	6.9	4.7	7.5	4.9	7.4	3.9	0.0
		0.36	....	DTHETA	0.35	0.35	0.35	0.37	0.35	0.38	0.37	0.35	0.37	0.36	0.35	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10Z				Map Unit No.	56	117	30	69	20	4						
	17			# Grid Pts.	1	3	7	3	1	2						
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00						
		28	----	Vegetation Cover Density (%)												
		1.20	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.42	0.43	0.53	0.11	0.27	1.89	0.00	0.00	0.00	0.00	0.00	0.00
		0.65	....	XKSAT (Adj)	0.50	0.51	0.64	0.13	0.32	1.89	0.00	0.00	0.00	0.00	0.00	0.00
		4.4	....	PSIF	4.3	4.2	4.0	7.4	3.6	2.3	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.36	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10AA				Map Unit No.	4	114	81	119	69	60	71					
	11			# Grid Pts.	1	2	1	3	1	2	1					
				Wtg. Factor	1.00	1.00	2.00	3.00	1.00	1.00	1.00					
		26	----	Vegetation Cover Density (%)												
		1.19	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	1.89	0.43	0.13	0.10	0.11	0.21	0.33	0.00	0.00	0.00	0.00	0.00
		0.29	....	XKSAT (Adj)	1.89	0.50	0.15	0.12	0.12	0.24	0.38	0.00	0.00	0.00	0.00	0.00
		6.3	....	PSIF	2.3	4.2	6.9	7.5	7.4	4.9	3.9	0.0	0.0	0.0	0.0	0.0
		0.36	....	DTHETA	0.35	0.35	0.38	0.35	0.36	0.37	0.35	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
10AB				Map Unit No.	69	20	71	102	30	117						
	18			# Grid Pts.	7	4	2	3	1	1						
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00						
		27	----	Vegetation Cover Density (%)												
		1.19	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	0.27	0.33	0.52	0.53	0.43	0.00	0.00	0.00	0.00	0.00	0.00
		0.33	....	XKSAT (Adj)	0.13	0.32	0.39	0.61	0.63	0.51	0.00	0.00	0.00	0.00	0.00	0.00
		5.2	....	PSIF	7.4	3.6	3.9	4.0	4.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.36	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
11A				Map Unit No.	117	102	71	20								
	10			# Grid Pts.	5	3	1	1								
				Wtg. Factor	1.00	1.00	1.00	1.00								
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.43	0.52	0.33	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.50	....	XKSAT (Adj)	0.50	0.60	0.38	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.1	....	PSIF	4.2	4.0	3.9	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
12A				Map Unit No.	64	73	33	43	42							
	26			# Grid Pts.	3	20	1	1	1							
				Wtg. Factor	1.00	0.80	1.00	1.00	1.00							
		38	----	Vegetation Cover Density (%)												
		1.31	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.09	0.09	0.02	0.07	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.11	....	XKSAT (Adj)	0.11	0.11	0.03	0.09	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		8.0	....	PSIF	7.9	7.9	9.6	8.4	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.31	....	DTHETA	0.31	0.31	0.22	0.27	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
12B				Map Unit No.	42	14	98	32	48	110	74	4	13			
	20			# Grid Pts.	1	2	3	3	6	2	1	1	1			
				Wtg. Factor	1.00	1.00	1.00	1.00	1.50	2.00	1.00	1.00	1.00			
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.08	4.04	0.21	0.33	0.10	0.24	0.06	1.89	0.03	0.00	0.00	0.00
		0.58	....	XKSAT (Adj)	0.10	4.04	0.26	0.41	0.13	0.30	0.07	1.89	0.04	0.00	0.00	0.00
		5.6	....	PSIF	8.1	2.0	4.7	3.9	7.5	3.7	8.6	2.3	10.3	0.0	0.0	0.0
		0.34	....	DTHETA	0.30	0.35	0.37	0.35	0.35	0.35	0.25	0.35	0.27	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
12C				Map Unit No.	42	14	98	114	119	48	13	75	56			
	19			# Grid Pts.	2	1	6	5	1	1	1	1	1			
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00			
		32	----	Vegetation Cover Density (%)												
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.08	4.04	0.21	0.43	0.10	0.10	0.03	0.25	0.42	0.00	0.00	0.00
		0.48	....	XKSAT (Adj)	0.10	4.04	0.26	0.53	0.12	0.13	0.04	0.31	0.52	0.00	0.00	0.00
		5.6	....	PSIF	8.1	2.0	4.7	4.2	7.5	7.5	10.3	3.6	4.3	0.0	0.0	0.0
		0.34	....	DTHETA	0.30	0.35	0.37	0.35	0.35	0.35	0.27	0.35	0.35	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
12D				Map Unit No.	114	69	75	13	56	119	4	71	117			
	27			# Grid Pts.	4	8	3	3	1	4	2	1	1			
				Wtg. Factor	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00			
		24	----	Vegetation Cover Density (%)												
		1.16	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.43	0.11	0.25	0.03	0.42	0.10	1.89	0.33	0.43	0.00	0.00	0.00
		0.35	....	XKSAT (Adj)	0.49	0.12	0.29	0.04	0.48	0.12	1.89	0.38	0.49	0.00	0.00	0.00
		3.9	....	PSIF	4.2	7.4	3.6	10.3	4.3	7.5	2.3	3.9	4.2	0.0	0.0	0.0
		0.34	....	DTHETA	0.35	0.36	0.35	0.27	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
12E				Map Unit No.	69	117	20	33	6	92	119	102	71	77		
	33			# Grid Pts.	10	1	3	2	2	2	1	2	9	1		
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.00	1.00	1.00		
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	0.43	0.27	0.04	1.89	0.76	0.10	0.52	0.33	0.10	0.00	0.00
		0.36	....	XKSAT (Adj)	0.12	0.50	0.31	0.04	1.89	0.89	0.12	0.60	0.38	0.11	0.00	0.00
		5.6	....	PSIF	7.4	4.2	3.6	10.6	2.3	3.4	7.5	4.0	3.9	7.6	0.0	0.0
		0.35	....	DTHETA	0.36	0.35	0.35	0.29	0.35	0.35	0.35	0.35	0.35	0.34	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
13A				Map Unit No.	71											
	5			# Grid Pts.	5											
				Wtg. Factor	1.00											
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.38	....	XKSAT (Adj)	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.9	....	PSIF	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
14A				Map Unit No.	71											
	2			# Grid Pts.	2											
				Wtg. Factor	1.00											
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.38	....	XKSAT (Adj)	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.9	....	PSIF	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
14B				Map Unit No.	71											
	1			# Grid Pts.	1											
				Wtg. Factor	1.00											
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.38	....	XKSAT (Adj)	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.9	....	PSIF	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
15A				Map Unit No.	20	117	11	71	100							
	15			# Grid Pts.	2	5	4	3	1							
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00							
		26	----	Vegetation Cover Density (%)												
		1.18	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.27	0.43	2.43	0.33	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.99	....	XKSAT (Adj)	0.31	0.50	2.43	0.38	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.5	....	PSIF	3.6	4.2	2.2	3.9	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
15B				Map Unit No.	117											
	9			# Grid Pts.	9											
				Wtg. Factor	1.00											
		26	----	Vegetation Cover Density (%)												
		1.18	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.50	....	XKSAT (Adj)	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.2	....	PSIF	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
15C				Map Unit No.	100	71	11	117	69							
	8			# Grid Pts.	1	1	3	1	2							
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00							
		28	----	Vegetation Cover Density (%)												
		1.20	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.68	0.33	2.43	0.43	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1.16	....	XKSAT (Adj)	0.81	0.39	2.43	0.51	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.2	....	PSIF	3.6	3.9	2.2	4.2	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
15G				Map Unit No.	20	69	123	11								
	14			# Grid Pts.	7	2	1	4								
				Wtg. Factor	1.00	1.00	1.00	1.00								
		28	----	Vegetation Cover Density (%)												
		1.20	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.27	0.11	0.49	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.91	....	XKSAT (Adj)	0.32	0.13	0.58	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.8	....	PSIF	3.6	7.4	4.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.36	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
16A				Map Unit No.	4	20	71	11								
	8			# Grid Pts.	1	3	2	2								
				Wtg. Factor	1.00	1.00	2.00	1.00								
		26	----	Vegetation Cover Density (%)												
		1.18	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	1.89	0.27	0.33	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.92	....	XKSAT (Adj)	1.89	0.31	0.38	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.3	....	PSIF	2.3	3.6	3.9	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.39	....	DTHETA	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
17A				Map Unit No.	69	11	20	55	26							
	9			# Grid Pts.	5	1	1	1	1							
				Wtg. Factor	1.00	1.00	3.00	1.00	1.00							
		26	----	Vegetation Cover Density (%)												
		1.18	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	2.43	0.27	0.39	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.43	....	XKSAT (Adj)	0.12	2.43	0.31	0.46	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5.3	....	PSIF	7.4	2.2	3.6	4.2	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.36	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18A				Map Unit No.	123	4										
	3			# Grid Pts.	2	1										
				Wtg. Factor	1.00	5.00										
		22	----	Vegetation Cover Density (%)												
		1.15	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.49	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1.50	....	XKSAT (Adj)	0.55	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2.8	....	PSIF	4.1	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
15E				Map Unit No.	117	56	20	18								
	10			# Grid Pts.	1	3	5	1								
				Wtg. Factor	5.00	1.00	1.00	1.00								
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.43	0.42	0.27	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.46	....	XKSAT (Adj)	0.50	0.48	0.31	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.9	....	PSIF	4.2	4.3	3.6	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18C				Map Unit No.	20	56	18	117								
	11			# Grid Pts.	7	2	1	1								
				Wtg. Factor	2.00	1.00	2.00	3.50								
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.27	0.42	0.80	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.48	....	XKSAT (Adj)	0.31	0.48	0.93	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.7	....	PSIF	3.6	4.3	3.3	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18D				Map Unit No.	20	117	100	123								
	18			# Grid Pts.	8	7	2	1								
				Wtg. Factor	1.00	1.00	1.00	1.00								
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.27	0.43	0.68	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.45	....	XKSAT (Adj)	0.31	0.50	0.79	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.9	....	PSIF	3.6	4.2	3.6	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18E				Map Unit No.	20	117	69	71								
	20			# Grid Pts.	6	12	1	1								
				Wtg. Factor	1.00	1.00	1.00	1.00								
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.27	0.43	0.11	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.42	....	XKSAT (Adj)	0.31	0.50	0.12	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.2	....	PSIF	3.6	4.2	7.4	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.36	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
18F				Map Unit No.	117	71	102									
	5			# Grid Pts.	1	3	1									
				Wtg. Factor	1.00	1.00	1.00									
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.43	0.33	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.45	....	XKSAT (Adj)	0.50	0.38	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.0	....	PSIF	4.2	3.9	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18G				Map Unit No.	69	71	56									
	12			# Grid Pts.	5	6	1									
				Wtg. Factor	1.00	1.00	1.50									
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	0.33	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.29	....	XKSAT (Adj)	0.12	0.38	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5.3	....	PSIF	7.4	3.9	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.36	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18H				Map Unit No.	117	100	20	71	69	1						
	12			# Grid Pts.	1	1	1	1	7	1						
				Wtg. Factor	1.00	1.00	2.00	1.00	1.00	6.00						
		27	----	Vegetation Cover Density (%)												
		1.19	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.43	0.68	0.27	0.33	0.11	0.56	0.00	0.00	0.00	0.00	0.00	0.00
		0.40	....	XKSAT (Adj)	0.51	0.80	0.32	0.39	0.13	0.67	0.00	0.00	0.00	0.00	0.00	0.00
		5.2	....	PSIF	4.2	3.6	3.6	3.9	7.4	3.9	0.0	0.0	0.0	0.0	0.0	0.0
		0.39	....	DTHETA	0.35	0.35	0.35	0.35	0.36	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18I				Map Unit No.	69	123	1									
	11			# Grid Pts.	9	1	1									
				Wtg. Factor	1.00	1.00	4.00									
		26	----	Vegetation Cover Density (%)												
		1.18	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	0.49	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.31	....	XKSAT (Adj)	0.12	0.57	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		6.2	....	PSIF	7.4	4.1	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.36	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
18J				Map Unit No.	69	71	102	2								
	12			# Grid Pts.	1	8	2	1								
				Wtg. Factor	1.00	1.00	3.50	1.00								
		26	----	Vegetation Cover Density (%)												
		1.18	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.11	0.33	0.52	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.48	....	XKSAT (Adj)	0.12	0.38	0.61	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.2	....	PSIF	7.4	3.9	4.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.36	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18K				Map Unit No.	71	102										
	4			# Grid Pts.	3	1										
				Wtg. Factor	1.00	3.00										
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.33	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.49	....	XKSAT (Adj)	0.38	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.0	....	PSIF	3.9	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18L				Map Unit No.	123	20	69	1	125	56	102					
	12			# Grid Pts.	3	2	2	2	1	1	1					
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.50	2.00					
		23	----	Vegetation Cover Density (%)												
		1.14	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.49	0.27	0.11	0.56	0.73	0.42	0.52	0.00	0.00	0.00	0.00	0.00
		0.48	....	XKSAT (Adj)	0.56	0.30	0.12	0.64	0.84	0.48	0.59	0.00	0.00	0.00	0.00	0.00
		4.4	....	PSIF	4.1	3.6	7.4	3.9	3.5	4.3	4.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.36	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

NOTE: The following sub-basins contain areas that are not covered under the SOIL SURVEY OF AGUILA-CAREFREE AREA, PARTS OF MARICOPA AND PINAL COUNTIES, ARIZONA. The map units identified by letters are part of the SOIL SURVEY OF MARICOPA COUNTY, ARIZONA, CENTRAL PART.
The Green & Ampt values are from the MCFCD HYDROLOGIC DESIGN MANUAL, based on the soils' Textural Class provided by Maricopa County.

Sub-Basin	Total # Grid Points	Final S-Basin Values	Value Desc.	Individual Soil Map Unit Values											
18M			Map Unit No.	2G	HLC	GXA	GGA								
	7		# Grid Pts.	3	2	1	1								
			Wtg. Factor	1.00	1.00	1.00	1.00								
		25	---- Vegetation Cover Density (%)												
		1.17	---- Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
			XKSAT (Unadj)	0.27	0.04	0.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.25	.... XKSAT (Adj)	0.31	0.05	0.47	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5.0	.... PSIF	3.6	8.2	4.3	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.32	.... DTHETA	0.35	0.25	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	.... RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18N			Map Unit No.	2G	HLC	AGB	GXA	LCA	RhB	HrB	GGA				
	13		# Grid Pts.	3	2	1	2	1	2	1	1				
			Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
		25	---- Vegetation Cover Density (%)												
		1.17	---- Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
			XKSAT (Unadj)	0.27	0.04	0.40	0.40	0.25	0.40	0.04	0.25	0.00	0.00	0.00	0.00
		0.31	.... XKSAT (Adj)	0.31	0.05	0.47	0.47	0.29	0.47	0.05	0.29	0.00	0.00	0.00	0.00
		4.9	.... PSIF	3.6	8.2	4.3	4.3	3.5	4.3	8.2	3.5	0.0	0.0	0.0	0.0
		0.33	.... DTHETA	0.35	0.25	0.35	0.35	0.35	0.35	0.25	0.35	0.00	0.00	0.00	0.00
		0	.... RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18O			Map Unit No.	RhB	GXA	GXB	GGA								
	5		# Grid Pts.	2	1	1	1								
			Wtg. Factor	1.00	1.00	1.00	1.00								
		25	---- Vegetation Cover Density (%)												
		1.17	---- Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
			XKSAT (Unadj)	0.40	0.40	0.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.43	.... XKSAT (Adj)	0.47	0.47	0.47	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.1	.... PSIF	4.3	4.3	4.3	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	.... DTHETA	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	.... RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
18P				Map Unit No.	HLC	GYD	AL									
	7			# Grid Pts.	3	3	1									
				Wtg. Factor	1.00	1.00	1.00									
		22	----	Vegetation Cover Density (%)												
		1.13	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.04	0.40	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.28	....	XKSAT (Adj)	0.05	0.45	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		6.0	....	PSIF	8.2	4.3	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.31	....	DTHETA	0.25	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18Q				Map Unit No.	LcA	FeA	GxA	RbA								
	6			# Grid Pts.	3	1	1	1								
				Wtg. Factor	1.00	1.00	1.00	1.00								
		22	----	Vegetation Cover Density (%)												
		1.13	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.25	0.40	0.40	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.37	....	XKSAT (Adj)	0.28	0.45	0.45	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.9	....	PSIF	3.5	4.3	4.3	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.39	....	DTHETA	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18R				Map Unit No.	20	117	71	HLC	GYD							
	14			# Grid Pts.	9	1	2	1	1							
				Wtg. Factor	1.00	3.00	1.00	2.00	1.00							
		27	----	Vegetation Cover Density (%)												
		1.19	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.27	0.43	0.33	0.04	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.34	....	XKSAT (Adj)	0.32	0.51	0.39	0.05	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.3	....	PSIF	3.6	4.2	3.9	8.2	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.34	....	DTHETA	0.35	0.35	0.35	0.25	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
18S				Map Unit No.	71	56	102	HLC	LcA	GxB						
	8			# Grid Pts.	3	1	1	1	1	1						
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00						
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.33	0.42	0.52	0.04	0.25	0.40	0.00	0.00	0.00	0.00	0.00	0.00
		0.38	....	XKSAT (Adj)	0.38	0.48	0.60	0.05	0.29	0.47	0.00	0.00	0.00	0.00	0.00	0.00
		4.5	....	PSIF	3.9	4.3	4.0	8.2	3.5	4.3	0.0	0.0	0.0	0.0	0.0	0.0
		0.34	....	DTHETA	0.35	0.35	0.35	0.25	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

TABLE S-3
GREEN & AMPT SOIL PARAMETERS BY SUB-BASIN

Sub-Basin	Total # Grid Points	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values											
18T				Map Unit No.	117	4	56									
	4			# Grid Pts.	2	1	1									
				Wtg. Factor	1.00	2.00	1.00									
		22	----	Vegetation Cover Density (%)												
		1.13	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.43	1.89	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1.04	....	XKSAT (Adj)	0.48	1.89	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		3.5	....	PSIF	4.2	2.3	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
19A				Map Unit No.	123											
	1			# Grid Pts.	1											
				Wtg. Factor	1.00											
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.57	....	XKSAT (Adj)	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.1	....	PSIF	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0
19B				Map Unit No.	100	123	19	48								
	5			# Grid Pts.	2	1	1	1								
				Wtg. Factor	1.00	1.00	1.00	1.00								
		25	----	Vegetation Cover Density (%)												
		1.17	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2												
				XKSAT (Unadj)	0.68	0.49	0.27	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.52	....	XKSAT (Adj)	0.79	0.57	0.31	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		4.5	....	PSIF	3.6	4.1	3.6	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH
FLOODPLAIN DELINEATION STUDY

FCD 90-05

Table S-4

TABLE S-4

SUB-BASIN TIME OF CONCENTRATION AND SURFACE LOSS PARAMETERS

Sub-Basin	Drainage Area (sq. mi.)	Flow Path (miles)	Top Elev.	Bottom Elev.	Slope (ft./mi.)	Surface Characteristics (%) Range	Hill	Mountain	S-Graph Lag Time Lca (Mi.)	Kn	Lag (hrs)	Lag (min)	IA Composite (in.)	S-Graph Type
1A	6.69	5.06	2460	2200	51	93	7	0	1.16	0.031	0.57	34	0.34	Valley
1B	5.70	3.75	2284	2195	24	95	5	0	0.87	0.031	0.52	31	0.34	Valley
1C	0.81	2.22	2320	2235	38	98	2	0	0.76	0.030	0.37	22	0.35	Valley
1D	3.27	3.67	2400	2180	60	99	1	0	0.94	0.030	0.44	27	0.35	Valley
1E	1.11	2.23	2305	2205	45	60	40	0	0.75	0.034	0.40	24	0.27	Valley
1F	3.06	3.69	2405	2180	61	0	100	0	1.64	0.040	0.73	44	0.15	Mountain
1G	2.56	3.07	2284	2155	42	75	25	0	0.70	0.033	0.43	26	0.30	Valley
1H	7.55	5.34	3108	2140	181	50	30	20	1.93	0.037	0.67	40	0.27	Valley
1I	6.88	6.21	2800	2130	108	0	90	10	3.37	0.041	1.07	64	0.16	Mountain
1J	2.57	4.05	2255	2050	51	0	65	35	1.36	0.044	0.79	47	0.19	Mountain
1K	5.02	5.72	3108	2050	185	5	35	60	3.03	0.046	1.00	60	0.22	Mountain
1L	5.93	4.81	2205	1970	49	0	98	2	2.31	0.040	0.96	58	0.15	Mountain
Basin 1 =	51.16	sq. mi.												
2A	7.76	3.83	2890	2395	129	0	90	10	1.97	0.041	0.70	42	0.16	Mountain
2B	4.31	3.30	3000	2345	198	0	80	20	1.98	0.042	0.63	38	0.17	Mountain
2C	3.82	2.88	3009	2230	270	0	93	7	1.70	0.041	0.51	31	0.16	Mountain
2D	5.12	7.32	2645	2115	72	0	100	0	2.92	0.040	1.14	68	0.15	Mountain
2E	2.09	2.77	2400	2136	95	0	92	8	1.14	0.041	0.53	32	0.16	Mountain
2F	4.89	6.74	2320	1970	52	0	100	0	3.52	0.040	1.26	75	0.15	Mountain
Basin 2 =	27.98	sq. mi.												
3A	5.97	4.66	3004	2098	194	0	33	67	2.69	0.047	0.90	54	0.22	Mountain
3B	6.25	7.35	2742	1940	109	0	89	11	3.30	0.041	1.13	68	0.16	Mountain
3C	5.70	8.90	2836	1940	101	45	45	10	4.62	0.037	1.25	75	0.25	Mountain
3D	5.01	7.20	3005	2045	133	40	55	5	4.55	0.037	1.08	65	0.24	Mountain
3E	2.90	5.61	2304	1897	73	80	20	0	1.63	0.032	0.66	39	0.31	Valley
Basin 3 =	25.82	sq. mi.												
4A	7.43	9.44	2640	1940	74	0	99	1	5.68	0.040	1.61	96	0.15	Mountain
4B	4.07	6.86	2645	1940	103	0	85	15	4.02	0.042	1.21	73	0.17	Mountain
4C	2.65	4.92	2225	1905	65	92	8	0	2.54	0.031	0.73	44	0.33	Valley
Basin 4 =	14.15	sq. mi.												
5A	8.03	8.83	3028	1795	140	50	45	5	3.60	0.036	1.03	62	0.26	Valley
5B	7.36	6.29	2140	1795	55	20	80	0	2.69	0.038	1.04	62	0.19	Mountain
5C	3.56	5.57	2041	1715	59	98	0	2	2.08	0.030	0.71	43	0.35	Valley
Basin 5 =	18.95	sq. mi.												
6A	3.66	4.93	2000	1712	58	90	0	10	2.58	0.032	0.78	47	0.34	Valley
6B	4.76	7.01	1880	1505	53	98	0	2	4.17	0.030	1.03	62	0.35	Valley
6C	2.23	5.38	1716	1515	37	100	0	0	2.80	0.030	0.85	51	0.35	Valley
6D	3.67	5.30	1561	1355	39	100	0	0	2.46	0.030	0.79	48	0.35	Valley
Basin 6 =	14.33	sq. mi.												
7A	5.19	7.35	2940	2015	128	50	45	5	4.09	0.036	1.03	62	0.26	Valley
7B	6.11	9.07	2641	1830	89	96	4	0	3.79	0.030	0.99	60	0.34	Valley
7C	6.81	9.03	2820	1917	100	60	40	0	3.75	0.034	1.08	65	0.27	Valley
7D	5.84	5.98	2060	1720	57	100	0	0	2.42	0.030	0.77	46	0.35	Valley
7E	8.30	9.09	1726	1419	34	100	0	0	5.87	0.030	1.39	84	0.35	Valley
7F	2.63	6.17	1712	1492	36	100	0	0	3.30	0.030	0.96	57	0.35	Valley
Basin 7 =	34.88	sq. mi.												
8A	6.27	8.83	1660	1355	35	100	0	0	4.43	0.030	1.23	74	0.35	Valley
Basin 8 =	6.27	sq. mi.												
9A	4.64	5.30	2640	1915	137	7	47	46	2.58	0.044	0.93	56	0.21	Mountain

10C = 8.22
3.45
60
.03 — .59 miles

TABLE S-4

SUB-BASIN TIME OF CONCENTRATION AND SURFACE LOSS PARAMETERS

Sub-Basin	Drainage Area (sq. mi.)	Flow Path (miles)	Top Elev.	Bottom Elev.	Slope (ft./mi.)	Surface Characteristics (%) Range	Hill	Mountain	S-Graph Lag Time Lca (Mi.)	Kn	Lag (hrs)	Lag (min)	IA Composite (in.)	S-Graph Type
9B	8.49	6.33	2640	1790	134	32	35	33	3.03	0.040	0.97	58	0.25	Mountain
9C	7.32	6.14	2240	1819	101	65	30	5	2.92	0.034	0.85	51	0.29	Valley
9D	6.24	5.99	2387	1580	135	35	35	30	3.56	0.040	1.00	60	0.25	Mountain
9E	6.08	5.15	3137	1460	326	60	20	20	2.65	0.036	0.65	39	0.29	Valley
9F	1.75	3.05	2600	1460	374	15	40	45	1.25	0.043	0.46	28	0.23	Mountain
9G	1.00	3.56	1571	1440	37	100	0	0	1.55	0.030	0.58	35	0.35	Valley
9H	1.47	3.07	2215	1377	273	27	46	27	1.21	0.040	0.45	27	0.23	Mountain
9I	4.81	4.32	1540	1377	38	100	0	0	1.29	0.030	0.58	35	0.35	Valley
Basin 9 =	41.79	sq. mi.												
10A	2.01	4.72	2780	2185	126	0	100	0	2.31	0.040	0.79	47	0.15	Mountain
10B	5.36	7.90	2280	1708	72	99	1	0	3.26	0.030	0.92	55	0.35	Valley
10C	5.86	8.22	2100	1610	60	100	0	0	3.45	0.030	0.98	59	0.35	Valley
10C1	1.43	4.60	2100	1768	72	100	0	0	1.70	0.030	0.58	35	0.35	Valley
10C2	4.23	5.53	1880	1610	49	100	0	0	2.77	0.030	0.81	49	0.35	Valley
10D	4.54	6.82	2840	2040	117	0	97	3	3.22	0.040	1.05	63	0.15	Mountain
10E	2.72	5.21	2220	1796	81	83	17	0	2.31	0.032	0.71	42	0.32	Valley
10F	5.68	4.55	3040	2350	152	0	38	62	2.42	0.046	0.89	53	0.21	Mountain
10G	4.28	6.94	2740	1840	130	22	70	8	3.22	0.039	1.00	60	0.20	Mountain
10H	6.74	8.31	2080	1588	59	98	2	0	4.92	0.030	1.14	68	0.35	Valley
10I	6.93	6.88	2996	2005	144	1	20	79	3.11	0.048	1.19	71	0.23	Mountain
10J	7.08	8.94	2065	1540	59	98	2	0	4.05	0.030	1.09	65	0.35	Valley
10K	5.44	8.75	2343	1655	79	83	16	1	3.86	0.032	1.06	63	0.32	Valley
10K1	0.88	2.54	2343	2043	118	3	94	3	1.36	0.040	0.52	31	0.16	Mountain
10K2	4.56	6.21	2043	1655	62	99	1	0	3.26	0.030	0.86	52	0.35	Valley
10L	6.34	6.93	1720	1452	39	100	0	0	3.22	0.030	0.98	59	0.35	Valley
10M	6.17	6.06	2915	2015	149	10	46	44	3.33	0.043	1.05	63	0.21	Mountain
10M1	1.85	2.27	2915	2370	240	0	30	70	0.95	0.047	0.44	27	0.22	Mountain
10M2	1.48	3.69	2680	2060	168	2	78	20	2.12	0.042	0.69	41	0.17	Mountain
10M3	2.84	3.79	2370	2015	94	20	40	40	2.31	0.042	0.81	49	0.23	Mountain
10N	3.47	8.41	2100	1560	64	100	0	0	3.30	0.030	0.96	58	0.35	Valley
10O	3.08	2.92	2840	2530	106	0	85	15	1.55	0.042	0.61	36	0.17	Mountain
10P	6.15	6.38	3245	2050	188	1	49	50	3.37	0.045	1.06	64	0.20	Mountain
10Q	2.61	4.05	3040	2005	256	15	50	35	1.89	0.042	0.63	38	0.22	Mountain
10R	4.93	6.36	2280	1717	89	6	93	1	3.11	0.040	1.05	63	0.16	Mountain
10S	3.92	6.16	2320	1775	88	75	25	0	2.73	0.033	0.81	49	0.30	Valley
10T	3.81	6.06	2240	1740	83	95	5	0	3.52	0.031	0.84	51	0.34	Valley
10U	4.26	5.61	1880	1572	51	100	0	0	2.58	0.030	0.78	47	0.35	Valley
10V	3.12	5.42	1860	1588	50	100	0	0	2.85	0.030	0.81	48	0.35	Valley
10W	5.30	6.02	3320	1975	223	6	54	40	3.41	0.043	0.98	59	0.20	Mountain
10X	2.74	5.64	2145	1755	69	70	20	10	2.84	0.034	0.87	52	0.30	Mountain
10Y	3.70	7.34	1895	1547	47	100	0	0	3.79	0.030	1.02	61	0.35	Mountain
10Z	3.69	4.73	1606	1452	33	100	0	0	2.73	0.030	0.82	49	0.35	Mountain
10AA	1.63	4.58	1775	1590	40	100	0	0	2.20	0.030	0.71	43	0.35	Mountain
10AB	4.31	6.55	1623	1418	31	100	0	0	3.41	0.030	1.02	61	0.35	Mountain
Basin 10	125.67	sq. mi.												
11A	2.18	6.34	1485	1371	18	100	0	0	1.36	0.030	0.79	47	0.35	Valley
Basin 11	2.18	sq. mi.												
12A	4.88	4.17	2680	2140	129	0	65	35	3.11	0.044	0.91	55	0.18	Mountain
12B	4.79	8.22	2225	1680	66	55	35	10	3.68	0.036	1.17	70	0.27	Valley
12C	3.64	7.98	2205	1675	66	75	25	0	3.67	0.033	1.06	63	0.30	Valley
12D	5.29	6.02	1800	1670	22	100	0	0	2.73	0.030	0.97	58	0.35	Valley
12E	7.54	8.64	1665	1373	34	100	0	0	3.45	0.030	1.12	67	0.35	Valley
Basin 12	26.14	sq. mi.												
13A	0.90	2.01	1500	1365	67	100	0	0	0.80	0.030	0.32	19	0.35	Valley
Basin 13	0.90	sq. mi.												

TABLE S-4

SUB-BASIN TIME OF CONCENTRATION AND SURFACE LOSS PARAMETERS

Sub-Basin	Drainage Area (sq. mi.)	Flow Path (miles)	Top Elev.	Bottom Elev.	Slope (ft./mi.)	Surface Characteristics (%) Range	Hill	Mountain	S-Graph Lag Time Lca (Mi.)	Kn	Lag (hrs)	Lag (min)	IA Composite (in.)	S-Graph Type
14A	0.09	0.70	1445	1370	107	100	0	0	0.30	0.030	0.14	8	0.35	Valley
14B	0.03	0.30	1408	1370	127	100	0	0	0.08	0.030	0.06	3	0.35	Valley
Basin 14	0.12	sq. mi.												
15A	3.59	2.92	1365	1268	34	100	0	0	1.53	0.030	0.54	33	0.35	Valley
15B	2.08	3.90	1390	1269	31	100	0	0	2.16	0.030	0.70	42	0.35	Valley
15C	1.83	2.16	1560	1238	149	100	0	0	1.59	0.030	0.37	22	0.35	Valley
15D	2.87	5.38	1520	1105	77	100	0	0	2.50	0.030	0.71	42	0.35	Valley
Basin 15	10.37	sq. mi.												
16A	1.94	3.48	1405	1245	46	100	0	0	2.08	0.030	0.62	37	0.35	Valley
Basin 16	1.94	sq. mi.												
17A	2.17	4.62	1378	1160	47	100	0	0	2.42	0.030	0.72	43	0.35	Valley
Basin 17	2.17	sq. mi.												
18A	0.25	1.19	1380	1320	50	100	0	0	0.47	0.030	0.23	14	0.35	Valley
18B	1.81	2.47	1375	1290	34	80	5	15	1.44	0.034	0.55	33	0.33	Valley
18C	1.90	3.90	1375	1235	36	80	5	15	1.89	0.034	0.72	43	0.33	Valley
18D	3.60	4.60	1380	1231	32	100	0	0	2.84	0.030	0.82	49	0.35	Valley
18E	3.83	4.36	1272	1126	33	100	0	0	2.23	0.030	0.73	44	0.35	Valley
18F	0.80	2.23	1150	1085	29	100	0	0	0.98	0.030	0.43	26	0.35	Valley
18G	2.03	4.55	1221	1073	33	100	0	0	2.06	0.030	0.72	43	0.35	Valley
18H	2.63	2.88	1499	1395	36	100	0	0	1.58	0.030	0.54	32	0.35	Valley
18I	2.57	4.02	1245	1118	32	100	0	0	1.74	0.030	0.65	39	0.35	Valley
18J	2.35	3.11	1160	1035	40	100	0	0	1.86	0.030	0.58	35	0.35	Valley
18K	0.80	1.93	1150	1070	41	100	0	0	0.91	0.030	0.37	22	0.35	Valley
18L	2.40	3.45	1225	1070	45	100	0	0	1.48	0.030	0.54	32	0.35	Valley
18M	1.50	4.92	1308	1140	34	100	0	0	2.92	0.030	0.84	51	0.35	Valley
18N	2.40	6.10	1330	1123	34	100	0	0	3.13	0.030	0.94	57	0.35	Valley
18O	0.90	2.84	1190	1112	27	100	0	0	1.23	0.030	0.51	31	0.35	Valley
18P	1.36	4.32	1271	1132	32	100	0	0	1.89	0.030	0.69	41	0.35	Valley
18Q	1.13	2.50	1166	1090	30	100	0	0	1.10	0.030	0.46	28	0.35	Valley
18R	2.17	6.43	1344	1137	32	100	0	0	3.18	0.030	0.98	59	0.35	Valley
18S	1.35	3.14	1180	1083	31	100	0	0	1.28	0.030	0.53	32	0.35	Valley
18T	0.39	1.52	1380	1320	39	100	0	0	0.73	0.030	0.31	19	0.35	Valley
Basin 18	36.19	sq. mi.												
19A	0.06	0.19	1450	1354	505	0	0	100	0.08	0.050	0.06	4	0.25	Mountain
19B	0.77	1.59	2064	1351	448	0	40	60	0.61	0.046	0.29	17	0.21	Mountain
Basin 19	0.83	sq. mi.												
Total	441.84	sq. mi.												

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Table S-5

TABLE S-5

SUMMARY OF SUB-BASIN PARAMETERS

Sub-Basin	Area (s.m.)	IA (in.)	DTHETA (in.)	PSIF (in.)	XKSAT (in./hr.	RTIMP (%)	LAG (min.	S-GRAPH TYPE
1A	6.69	0.34	0.31	6.9	0.16	0	34	Valley
1B	5.70	0.34	0.31	6.8	0.17	0	31	Valley
1C	0.81	0.35	0.36	5.4	0.23	0	22	Valley
1D	3.27	0.35	0.29	7.3	0.14	0	27	Valley
1E	1.11	0.27	0.36	4.9	0.26	0	24	Valley
1F	3.06	0.15	0.34	4.5	0.29	0	44	Mountain
1G	2.56	0.30	0.31	6.0	0.37	0	26	Valley
1H	7.55	0.27	0.34	4.5	0.40	0	40	Valley
1I	6.88	0.16	0.35	4.8	0.40	0	64	Mountain
1J	2.57	0.19	0.36	5.3	0.45	0	47	Mountain
1K	5.02	0.22	0.34	5.5	0.42	0	60	Mountain
1L	5.93	0.15	0.33	7.4	0.21	0	58	Mountain
2A	7.76	0.16	0.36	5.4	0.28	0	42	Mountain
2B	4.31	0.17	0.35	4.3	0.54	0	38	Mountain
2C	3.82	0.16	0.35	5.1	0.75	0	31	Mountain
2D	5.12	0.15	0.36	5.4	0.54	0	68	Mountain
2E	2.09	0.16	0.35	4.8	0.47	0	32	Mountain
2F	4.89	0.15	0.36	5.3	0.49	0	75	Mountain
3A	5.97	0.22	0.32	7.1	0.27	0	54	Mountain
3B	6.25	0.16	0.33	6.1	0.41	0	68	Mountain
3C	5.70	0.25	0.32	6.2	0.38	0	75	Mountain
3D	5.01	0.24	0.32	6.5	0.29	0	65	Mountain
3E	2.90	0.31	0.35	4.0	0.57	0	39	Valley
4A	7.43	0.15	0.35	5.1	0.37	0	96	Mountain
4B	4.07	0.17	0.35	4.7	0.34	0	73	Mountain
4C	2.65	0.33	0.36	6.0	0.19	0	44	Valley
5A	8.03	0.26	0.35	4.8	0.37	0	62	Valley
5B	7.36	0.19	0.35	6.1	0.45	0	62	Mountain
5C	3.56	0.35	0.35	6.2	0.48	0	43	Valley
6A	3.66	0.34	0.36	6.8	0.21	0	47	Valley
6B	4.76	0.35	0.35	4.4	0.58	0	62	Valley
6C	2.23	0.35	0.35	4.4	0.96	0	51	Valley

TABLE S-5

SUMMARY OF SUB-BASIN PARAMETERS

Sub-Basin	Area (s.m.)	IA (in.)	DTHETA (in.)	PSIF (in.)	XKSAT (in./hr.	RTIMP (%)	LAG (min.	S-GRAPH TYPE
6D	3.67	0.35	0.35	3.3	0.85	0	48	Valley
7A	5.19	0.26	0.32	6.8	0.21	0	62	Valley
7B	6.11	0.34	0.34	5.2	0.41	0	60	Valley
7C	6.81	0.27	0.33	5.9	0.42	0	65	Valley
7D	5.84	0.35	0.35	4.8	0.48	0	46	Valley
7E	8.30	0.35	0.35	4.5	0.38	0	84	Valley
7F	2.63	0.35	0.35	4.2	0.51	0	57	Valley
8A	6.27	0.35	0.35	3.9	0.57	0	74	Valley
9A	4.64	0.21	0.35	4.2	0.38	0	56	Mountain
9B	8.49	0.25	0.35	5.2	0.36	0	58	Mountain
9C	7.32	0.29	0.34	6.4	0.32	0	51	Valley
9D	6.24	0.25	0.30	7.1	0.21	0	60	Mountain
9E	6.08	0.29	0.36	5.1	0.64	0	39	Valley
9F	1.75	0.23	0.35	4.9	0.58	0	28	Mountain
9G	1.00	0.35	0.35	4.0	0.60	0	35	Valley
9H	1.47	0.23	0.35	4.0	0.81	0	27	Mountain
9I	4.81	0.35	0.35	3.7	0.51	0	35	Valley
10A	2.01	0.15	0.33	6.1	0.32	0	47	Mountain
10B	5.36	0.35	0.35	4.5	0.62	0	55	Valley
10C	5.66	0.35	0.35	4.1	0.63	0	59	Valley
10C1	1.43	0.35	0.35	4.2	0.65	0	35	Valley
10C2	4.23	0.35	0.35	4.1	0.62	0	49	Valley
10D	4.54	0.15	0.32	7.3	0.17	0	63	Mountain
10E	2.72	0.32	0.36	4.8	0.51	0	42	Valley
10F	5.68	0.21	0.30	7.8	0.15	0	53	Mountain
10G	4.28	0.20	0.35	5.2	0.42	0	60	Mountain
10H	6.74	0.35	0.35	3.9	0.76	0	68	Valley
10I	6.93	0.23	0.32	6.7	0.25	0	71	Mountain
10J	7.08	0.35	0.34	4.4	0.61	0	65	Valley
10K	5.44	0.32	0.35	5.1	0.44	0	63	Valley
10K1	0.88	0.16	0.35	5.5	0.43	0	31	Mountain
10K2	4.56	0.35	0.35	4.9	0.42	0	52	Valley

TABLE S-5

SUMMARY OF SUB-BASIN PARAMETERS

Sub-Basin	Area (s.m.)	IA (in.)	DTHETA (in.)	PSIF (in.)	XKSAT (in./hr.	RTIMP (%)	LAG (min.	S-GRAPH TYPE
10L	6.34	0.35	0.35	3.9	0.69	0	59	Valley
10M	6.17	0.21	0.32	7.0	0.17	0	63	Mountain
10M1	1.85	0.22	0.30	8.2	0.10	0	27	Mountain
10M2	1.48	0.17	0.32	7.4	0.16	0	41	Mountain
10M3	2.84	0.23	0.35	5.7	0.24	0	49	Mountain
10N	3.47	0.35	0.36	4.6	0.47	0	58	Valley
10O	3.08	0.17	0.30	8.2	0.09	0	36	Mountain
10P	6.15	0.20	0.32	7.0	0.23	0	64	Mountain
10Q	2.61	0.22	0.32	7.1	0.24	0	38	Mountain
10R	4.93	0.16	0.36	5.8	0.31	0	63	Mountain
10S	3.92	0.30	0.36	5.5	0.23	0	49	Valley
10T	3.81	0.34	0.35	5.4	0.36	0	51	Valley
10U	4.26	0.35	0.36	4.9	0.47	0	47	Valley
10V	3.12	0.35	0.35	4.9	0.46	0	48	Valley
10W	5.30	0.20	0.30	8.0	0.11	0	59	Mountain
10X	2.74	0.30	0.34	6.6	0.20	0	52	Mountain
10Y	3.70	0.35	0.36	4.7	0.49	0	61	Mountain
10Z	3.69	0.35	0.35	4.4	0.65	0	49	Mountain
10AA	1.63	0.35	0.36	6.3	0.29	0	43	Mountain
10AB	4.31	0.35	0.35	5.2	0.33	0	61	Mountain
11A	2.18	0.35	0.35	4.1	0.50	0	47	Valley
12A	4.88	0.19	0.31	8.0	0.11	0	55	Mountain
12B	4.79	0.27	0.34	5.6	0.58	0	70	Valley
12C	3.64	0.30	0.34	5.6	0.48	0	63	Valley
12D	5.29	0.35	0.34	5.9	0.35	0	58	Valley
12E	7.54	0.35	0.35	5.6	0.38	0	67	Valley
13A	0.90	0.35	0.35	3.9	0.38	0	19	Valley
14A	0.09	0.35	0.35	3.9	0.38	0	8	Valley
14B	0.03	0.35	0.35	3.9	0.38	0	3	Valley
15A	3.59	0.35	0.35	3.5	0.99	0	33	Valley
15B	2.08	0.35	0.35	4.2	0.50	0	42	Valley
15C	1.83	0.35	0.35	4.2	1.16	0	22	Valley

TABLE S-5

SUMMARY OF SUB-BASIN PARAMETERS

Sub-Basin	Area (s.m.)	IA (in.)	DTHETA (in.)	PSIF (in.)	XKSAT (in./hr.	RTIMP (%)	LAG (min.	S-GRAPH TYPE
15D	2.87	0.35	0.35	3.8	0.91	0	42	Valley
16A	1.94	0.35	0.35	3.3	0.92	0	37	Valley
17A	2.17	0.35	0.35	5.3	0.43	0	43	Valley
18A	0.25	0.35	0.35	2.8	1.50	0	14	Valley
18B	1.81	0.33	0.35	3.9	0.46	0	33	Valley
18C	1.90	0.33	0.35	3.7	0.42	0	43	Valley
18D	3.60	0.35	0.35	3.9	0.45	0	49	Valley
18E	3.83	0.35	0.35	4.2	0.42	0	44	Valley
18F	0.80	0.35	0.35	4.0	0.45	0	26	Valley
18G	2.03	0.35	0.35	5.3	0.29	0	43	Valley
18H	2.63	0.35	0.35	5.2	0.40	0	32	Valley
18I	2.57	0.35	0.35	6.2	0.31	0	39	Valley
18J	2.35	0.35	0.35	4.2	0.48	0	35	Valley
18K	0.80	0.35	0.35	4.0	0.49	0	22	Valley
18L	2.40	0.35	0.35	4.4	0.48	0	32	Valley
18M	1.50	0.35	0.33	4.9	0.31	0	51	Valley
18N	2.40	0.35	0.33	4.9	0.31	0	57	Valley
18O	0.90	0.35	0.35	4.1	0.43	0	31	Valley
18P	1.36	0.35	0.31	6.0	0.28	0	41	Valley
18Q	1.13	0.35	0.35	3.9	0.37	0	28	Valley
18R	2.17	0.35	0.34	4.3	0.34	0	59	Valley
18S	1.35	0.35	0.34	4.5	0.38	0	32	Valley
18T	0.39	0.35	0.35	3.5	1.04	0	19	Valley
19A	0.06	0.25	0.35	4.1	0.57	0	4	Mountain
19B	0.77	0.21	0.35	4.5	0.52	0	17	Mountain

TABLE S-5

SUMMARY OF SUB-BASIN PARAMETERS

Sub-Basin	Area (s.m.)	IA (in.)	DTHETA (in.)	PSIF (in.)	XKSAT (in./hr.	RTIMP (%)	LAG (min.	S-GRAPH TYPE

Note:

Average IA for the watershed, based on area, is	0.28	inches
Average XKSAT for the watershed, based on area, is ...	0.41	inches/hour
The smallest LAG for the watershed is	3	min.
The largest LAG for the watershed is	96	min.
The average LAG for the watershed is	47	min.
The standard deviation of the sub-basin LAG values is	17	min.
The selected hydrograph Main Time Interval is	5	min.

Table S-6

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TABLE S-6

CHECK OF GRID SOILS METHOD USING PLANIMETERED AREAS

Sub-Basin	Total Area (sq. mi.)	Final S-Basin Values		Value Desc.	Individual Soil Map Unit Values												
6D				Map Unit No.	11	20	71	92	102	4							
	3.67			Map Unit Area	0.61	1.03	0.56	1.4	0.03	0.04							
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00							
		31	----	Vegetation Cover Density (%)													
		1.23	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2													
				XKSAT (Unadj)	2.43	0.27	0.33	0.76	0.52	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.85	0.94	....	XKSAT (Adj)	2.43	0.33	0.40	0.94	0.64	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.3	3.3	....	PSIF	2.2	3.6	3.9	3.4	4.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.35	0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0	0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0	0
10H				Map Unit No.	30	117	56	4	99	91	3	108					
	6.74			Map Unit Area	4.2	1.5	0.31	0.28	0.18	0.18	0.05	0.04					
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
		32	----	Vegetation Cover Density (%)													
		1.24	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2													
				XKSAT (Unadj)	0.53	0.43	0.42	1.89	0.21	0.76	1.89	0.08	0.00	0.00	0.00	0.00	0.00
	0.76	0.68	....	XKSAT (Adj)	0.66	0.53	0.52	1.89	0.26	0.95	1.89	0.10	0.00	0.00	0.00	0.00	0.00
	3.9	4.0	....	PSIF	4.0	4.2	4.3	2.3	4.7	3.4	2.3	8.1	0.0	0.0	0.0	0.0	0.0
	0.35	0.35	....	DTHETA	0.35	0.35	0.35	0.35	0.37	0.35	0.35	0.29	0.00	0.00	0.00	0.00	0.00
	0	0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0	0
10W				Map Unit No.	43	73	64	42	74	13	110	3	32	48	94	98	105
	5.3			Map Unit Area	0.9	2.26	0.07	1.35	0.05	0.09	0.09	0.03	0.23	0.07	0.08	0.05	0.03
				Wtg. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		40	----	Vegetation Cover Density (%)													
		1.33	----	Ck: XKSAT(Adj)/XKSAT(Unadj) - Applied EXCEPT where XKSAT>=1.2													
				XKSAT (Unadj)	0.07	0.09	0.09	0.08	0.06	0.03	0.24	1.89	0.27	0.10	0.33	0.21	0.07
	0.11	0.14	....	XKSAT (Adj)	0.09	0.11	0.11	0.10	0.08	0.04	0.32	1.89	0.35	0.14	0.45	0.28	0.09
	8.0	7.7	....	PSIF	8.4	7.9	7.9	8.1	8.6	10.3	3.7	2.3	3.6	7.5	4.0	4.7	8.3
	0.30	0.30	....	DTHETA	0.27	0.31	0.31	0.30	0.25	0.27	0.35	0.35	0.35	0.35	0.35	0.37	0.28
	0	0	....	RTIMP	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE:

0.11
8.0
0.30
0

These values, in italics, represent the corresponding parameters calculated using the grid method.

Table S-7

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TABLE S-7

PLANIMETERED AREA COMPARISONS

Major Basin	Areas @ 10000 Scale (sq. mi.)	Areas @ 2000 Scale (sq. mi.)	Area Diff. (sq. mi.)	% Change
1	51.60	51.16	0.44	0.86
2	28.00	27.98	0.02	0.07
3	25.95	25.82	0.13	0.50
4	14.14	14.15	-0.01	-0.07
5	19.05	18.95	0.10	0.53
6	14.31	14.33	-0.02	-0.14
7	34.69	34.88	-0.19	-0.54
8	6.21	6.27	-0.06	-0.96
9	42.07	41.79	0.28	0.67
10	125.89	125.67	0.22	0.18
11	2.16	2.18	-0.02	-0.92
12	26.47	26.14	0.33	1.26
13	0.88	0.90	-0.02	-2.22
14	0.12	0.12	0.00	0.00
15	10.38	10.37	0.01	0.10
16	1.92	1.94	-0.02	-1.03
17	2.15	2.17	-0.02	-0.92
18	36.14	36.19	-0.05	-0.14
19	0.82	0.83	-0.01	-1.20
Totals =	442.95	441.84	1.11	0.25

3.2.2.2 Reach Route Parameters

General

Routing of sub-basin hydrographs was done utilizing the normal depth channel option under HEC-1. The routing reach paths are shown on Exhibit "C". Plots of the cross sections used for each route are shown on Exhibit "E". Refer to Exhibit "F" for a flood routing diagram on which the combination and routing logic is depicted for both the 6-hour and the 24-hour storms.

Field Reconnaissance

The first step in determining cross section data for reach routing was a field reconnaissance. Actual cross sections of representative reaches were taken in the field. The locations of each of these cross sections are identified on Exhibit "C". The original goal under the contract scope of work was to obtain cross sections for at least 20% of the routing reaches in the watershed. During the field reconnaissance, cross sections were taken on approximately 50% of the routing reaches. These cross section were plotted and are shown on Exhibit "D". Also refer to Table R-1 for cross references to photographs taken in the field with each cross section. This table also lists vegetation cover density, which was observed in the field, as well as the results of percolation test data taken at six different locations in the field. The photographs taken at the location of each cross section are available from Burgess & Niple for review, but have not been included in the document. The photographs were used to estimate Mannings "n" values for each cross section. The following photograph is an example of a typical wash in the upper reaches of the watershed. This wash is representative of reach route R17-18. Refer to sheet 4 of Exhibit "C".

Photograph L-8 in Sub-Basin 2F

The wash lies in sub-basin 2F and is named Dead Horse Wash. The picture was taken looking downstream. Note the wide, flat sandy bottom, free of vegetation. The sides of the low flow channel and the first 10 feet of the overbanks are heavily vegetated. The remaining overbanks, not visible in the photograph, match the average vegetation cover density for the sub-basin. This situation is typical of the majority of the routing reaches on the watershed with contributing drainage areas in excess of five square miles. The channel base width typically changes with increasing watershed area, but the channel configuration remains similar. In the lower, flatter reaches of the watershed, many washes have a decrease in base width apparently because of channel transmission losses.

The physical characteristics used for routing in this wash are:

Slope = 0.009 ft./ft.
Length = 5914 ft.
Channel Base Width = 75'
Channel n = 0.029
Left Overbank n = 0.035
Right Overbank n = 0.035
Composite Loss Rate = 1.9 inches per hour

The hydraulic estimates for the wash are:

100-Year 24-Hour Discharge = 7300 cfs
Estimated Flow Depth = 4.8 ft.
Estimated Average Velocity = 7 fps
Estimated Flow Top Width = 440 ft.

The selection of where to take each cross section in the field was primarily based on obtaining a cross section which would be typical of a particular reach. In reality, the location was limited by the ability to obtain access to the cross section location. Because of the problem with access, a large number of cross sections were taken in order to allow for interpolation between sections. This in turn enabled the Engineer to obtain a reasonable average cross section for the reach in question.

Hydraulic Computations

General - The actual cross section used for each routing reach was determined as described under Section 2.1. The description of where each reach route cross section was derived from is listed in Table R-2. The cross sections which are referenced in this table refer to field cross sections which are plotted on Exhibit "D". Plots of the actual cross sections used in the HEC-1 model are shown on Exhibit "E". The physical data necessary for the reach route computations is also summarized in Table R-2. The length of each routing reach and the top and bottom elevation were determined from Exhibit "C". The calculated average slope for each reach is listed in Table R-2.

Reach Route Hydraulic Data - Table R-3 contains hydraulic data used to estimate reach travel time and the number of route computation steps for input to the HEC-1 models. The hydraulic data was derived from the HEC-1 RX and RY cards by use of a computer program. The program calculations were done using the Manning equation for two conditions, the 6-hour and 24-hour storms. The cross section top width and flow depth, as well as cross section area and average velocity for both storms, is summarized for each reach in Table R-3. This data

was arrived at by an iterative process where an HEC-1 run was done for each storm using assumed values for the number of steps. The resultant peak discharge for each storm was then put back into the program and physical parameters for each reach were recalculated. Then the corresponding travel time and number of steps (NSTEPS) for each reach for each storm was determined. A new number of steps was then put back into the HEC-1 model and the process was repeated until a reasonably stable solution was obtained. The computer program used the Manning equation to estimate the average velocity in the reach, given an input discharge. The "n" value used was an average value for the entire section. The average velocities listed in Table R-3 are based on the final step in the iteration process. They are not representative of the final peak discharge estimates. Do not assume that the peak discharges listed in Table R-3 match the final results. Refer to Tables F-1 through F-4 for final peak discharges.

Routing Steps and Main Time Interval - The computation time interval used in determining the number of steps was 5 minutes. This time interval, which is the interval used in both HEC-1 models as a main time increment, was determined by an evaluation of lag times for the watershed. Refer to the note at the end of Table S-5. The smallest lag for the watershed was found to be 3 minutes, while the largest lag for the watershed was found to be 96 minutes. The main time interval of 5 minutes meets the majority of the conditions for all sub-basins. The reach route data for the 100-year 24-hour storm is summarized in Table R-5.

Channel Infiltration Losses

Channel infiltration loss rates were included in each routing computation. The loss rate for each routing reach was determined by calculating a composite of the XKSAT values for the left and right overbanks and channel. The XKSAT values for the left and right overbank and the channel were determined by estimating a typical SCS map unit for each area. This was done by visually examining the SCS soil maps with Exhibit "C" overlaid. The resultant values for each reach are shown in Table R-4. The composite loss rates for the 6-hour and 24-hour

storms are also tabulated. The composite values for each storm were calculated by an iterative process. An average rate was determined using the top width of flow in the section for each storm, which is shown in Table R-3. The resultant loss rates check very closely with the values listed in Table 19-1 of the SCS National Engineering Handbook, Section 4 Hydrology, Chapter 19. However, percolation tests taken during the field reconnaissance yielded much higher loss rates. Refer to the data in Table R-1. In addition, the Arizona Department of Water Resources (ADWR) ran falling head permeameter tests on channel bed soils samples taken at concentration point 33. This point is on Jackrabbit Wash at the crossing of Vulture Mine Road. Refer to Exhibit "C". The results of the ADWR analysis yield a rate for the overbanks at this location of approximately 2" per hour. The stabilized rate for the channel bed soils was approximately 40" per hour. The overbank rate of 2" per hour checks fairly closely with the 2.45" per hour XKSAT values derived from SCS soil maps. However, the ADWR channel bed loss rate of 40" per hour is substantially higher than the 2.45" per hour rate for the channel taken from the SCS soil maps. It would appear there is sufficient justification to increase the infiltration loss rates over and above what has been estimated using the SCS values derived from the soil map units. However, for this report the rates have been left in accordance with the values derived from the SCS maps. There is insufficient geologic data available for the watershed as a whole to justify an arbitrary increase in the channel bed loss rates. There is also not sufficient flow gage data, in combination with precipitation data, available to provide a confidence factor for such an increase.

Table R-1

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TABLE R-1

FIELD PHOTOGRAPHS CROSS REFERENCE TABLE

I.D.	Location	Field Book Page #	VCD PHOTO	VCD (%)	Cross Section Photographs			Percolation Test Infiltration Rates		
					Left	Channel	Right	Left	Channel	Right
01D1	CP 2	40	L20	31	L17	L18	L19			
01H1	CP 8	39	L12	27		L11				
01L1	CP 11-12	38	K24	38	K21	K22	K23			
02C1	CP 14-15	40	L27	34	L21	L22	L25			
02C1	CP 14-15	40			L23	L24	L26			
02D1	CP 15-17	41			L28	L29	L30			
02F1	CP 17	38			L9	L8	L7			
03B1	CP 12-21	35			K7	K8	K9			
03B2	CP 19-21	35		30	K10	K11	K12			
03C1	CP 20-21	37			K13	K14	K15			
03E1	CP 21-22	37			K18	K17	K16			
03E1	CP 21-22	37				K19				
03E1	CP 21-22	37				K20				
05B1	CP 22-25	34	K6	36	J20	J21	J22			
06B1	CP 35-36	30				I21				
06B2	CP 35	31	J5	29	J5	J6	J7			
06C1	CP 33-34	30			I22	I23	I24			
06C2	CP 33	11			C6	C10	C8			
07B1	CP 26-27	30	J4	29	J1	J2	J3			
07E1	CP 30-31	10			C1	C3	C4			
09B1	CP 40	32	J18	30	J15	J16	J17			
09C1	CP 40-41	31				J8				
09E1	CP 41	30		30	I18	I19	I20			
09I1	CP 45-46	10				B31				
10AB1	CP 83-84	12				D3				
10AB2	CP 82	12			D1		D2			
10B1	CP 50-51	29			I15	I16	I17			
10B2	CP 50	28	I14	37	I11	I12	I13			
10E1	CP 55	24			H1	H2	H3			
10E2	CP 52-55	27				I7				
10G1	CP 53-54	28	I10	32	I8		I9			

TABLE R-1

FIELD PHOTOGRAPHS CROSS REFERENCE TABLE

I.D.	Location	Field Book Page #	VCD PHOTO	VCD (%)	Cross Section Photographs			Percolation Test Infiltration Rates		
					Left	Channel	Right	Left	Channel	Right
10H1	CP 58-59	11				C5				
10J1	CP 60-61	18	F6	21	F3	F4	F5			
10J2	CP 60-61	23			H4	H5	H6			
10L1	CP 61-82	19	F36	24	F33	F34	F35	15	>20	6
10N1	CP 67-68	15A	G8	30	G5	G6	G7			
10N2	CP 67-68	18	F1	23	E22	E23	E24			
10P1	CP 73-74	26			H20	H21	H22			
10P2	CP 73	27	I4	49	I1	I2	I3			
10R1	CP 74-76	14B			D21	D22	D23			
10R2	CP 74-76	25			H9	H10	H11			
10R3	CP 75-76	14B				D20				
10R4	CP 75	26			H12	H13	H14			
10U1	CP 70-71	17			E16	E17	E18			
10U2	CP 69-71	17			E19	E20	E21			
10V1	CP 76	14A				D17				
10V2	CP 76-77	16	E15	30	E12	E13	E14			
10X1	CP 78-79	14A	D19	25		D18				
10Y1	CP 79-80	16			E9	E10	E11			
12C1	CP 86-88	14A			D14	D15	D16			
12C2	CP 86-88	15A	F15	36	F9	F10	F11			
12C3	CP 86-88	26	H19	38	H15	H16	H17			
12D1	CP 88-89	13			D7	D8	D9			
12D2	CP 88	13	D10	24	D10	D11	D12			
12E1	CP 89-90	12			D4	D5	D6			
15A1E	CP 46-94	8			B21	B22	B23			
15D1E	CP97-98	9			B25	B26	B27			
15D1W	CP97-98	9			B28	B29	B30			
18A1	CP 48-101	42				L31				
18A2	CP 49-101	42				L32				
18E1	CP 104	4			B9		B8			
18F1	CP 105	1				A19				

TABLE R-1

FIELD PHOTOGRAPHS CROSS REFERENCE TABLE

I.D.	Location	Field Book Page #	VCD PHOTO	VCD (%)	Cross Section Photographs			Percolation Test Infiltration Rates		
					Left	Channel	Right	Left	Channel	Right
18T1	CP 47-119	43	M6	22	M6	M7	M8			
18T2	CP 47-119	43				M9				
CAP 2	OUTLET	42			L33	L34				
CAP 3	OUTLET	42			M2					
CAP 3	OUTLET	42			L35	L36	M1			
CAP 5	CP 38	22			F31					
CAP 5	CP 38	22			F28	F29	F30			
CAP 6		22			F26	F27				
CAP 6		22			F23	F24	F25			
CAP 7	CP 85	22			F16	F17	F18			
CAP 7	CP 85	22			F19	F20	F21			
CAP 7	CP 85	22			F22					
DAM	SB 10J	18				F2				
DAM	SB 10E	6			B17	B18				
DAM	SB 10Y	19				F7				
DPVMT	SB 18C	6			B15	B16				
MTN	CP 73-74	27			H23	H24				
MTN	SB 9D	32				J12				
MTN	SB 9D	32				J14				
MTN	SB 6B	33				J19				
MTN	SB 9D	32				J13				
MTN	SB 6B	33				J19				
PERC	CP 22-25	34			K2	J23	K4	12	1200	12
PERC	CP33	24				G10			240	
PERC	CP 33	24				G9	G11		120	12
PERC	CP 105	4				B5	B6		70	9
PERC	CP30-31	10			C1	C2	C4	12	>20	9
TANK	SB 18T	42			M3	M4	M5			
TC	CP 109	2				B2				
TC	SB 9C	31				J9				
TC	SB 18G	2				A22				

TABLE R-1

FIELD PHOTOGRAPHS CROSS REFERENCE TABLE

I.D.	Location	Field Book Page #	VCD PHOTO	VCD (%)	Cross Section Photographs			Percolation Test Infiltration Rates		
					Left	Channel	Right	Left	Channel	Right
TC	SB 18J	2			A24	B4				
TC	CP 62	27				I6				
TC	SB 18C	5			B12	B13				
TC	CP 102	6				B14				
TC	CP 66	27				I5				
TC	SB 18M	5				B11				
TC	SB 7F	19				F32				
TC	CP 112	3				B3				
TC	SB 18N	5		10		B10				
TC	CP 67	25				H8				
TC	SB 18H	8				B20				
TC	SB 18G	8				B19				
TC	SB 10L	21	G1							
TC	CP 60	25				H7				
TC	SB 15D	9				B24				
TC	SB 12D	13				D13				
TC	SB 18R	4				B7				
TC	CP 16	39				L21				
TC	CP 8	39				L10				
TC	CP 118	1				A16				
TC	CP 105	1				A18				
TC	SB 9D	32				J10				
VCD	CP 108	1	A17	33						
VCD	SB 9D	32	J14	25						

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Table R-2

TABLE R-2

REACH ROUTE PHYSICAL DATA

Reach	In Sub-Basin	Cross Section Source	Length Miles	Length Feet	Elevation Top	Elevation Bottom	Slope (ft/ft)
R1-2	1B	REPRESENTATIVE OF X-SECT. 1D1	0.80	4224.0	2200	2195	0.001
R2-4	1D	X-SECT. 1D1	1.31	6917.0	2195	2180	0.002
R3-4	1D	REPRESENTATIVE OF X-SECT. 1D1	2.14	11299.0	2235	2180	0.005
R4-7	1G	INTERPOLATE BETWEEN X-SECT. 1D1 AND 1H1	1.14	6019.0	2180	2155	0.004
R5-7	1G	REPRESENTATIVE OF X-SECT. 2C1	1.36	7181.0	2205	2155	0.007
R6-7	1G	REPRESENTATIVE OF X-SECT. 2C1	1.04	5491.0	2180	2155	0.005
R7-8	1H	X-SECT. 1H1	0.76	4013.0	2155	2140	0.004
R8-10	1J	REPRESENTATIVE OF X-SECT. 1H1	0.64	3379.0	2140	2125	0.004
R9-10	1J	REPRESENTATIVE OF X-SECT. 9B1	0.15	792.0	2130	2125	0.006
R10-11	1J	INTERPOLATE BETWEEN X-SECT. 1H1 AND 1L1	2.69	14203.0	2125	2050	0.005
R11-12	1L	X-SECT. 1L1	3.18	16790.0	2050	1970	0.005
R13-14	2B	REPRESENTATIVE OF X-SECT. 9B1	1.33	7022.0	2395	2345	0.007
R14-15	2C	X-SECT. 2C1	2.13	11246.0	2345	2230	0.010
R15-17	2D	X-SECT. 2D1	2.82	14890.0	2230	2115	0.008
R16-18	2F	REPRESENTATIVE OF X-SECT. 2C1	2.10	11088.0	2136	2060	0.007
R17-18	2F	X-SECT. 2F1	1.12	5914.0	2115	2060	0.009
R18-12	2F	INTERPOLATE BETWEEN X-SECT. 3B1 AND 2F1	2.75	14520.0	2060	1970	0.006
R12-21	3B	X-SECT. 3B1	0.85	4488.0	1970	1940	0.007
R19-21	3B	X-SECT. 3B2	3.03	15998.0	2098	1940	0.010
R20-21	3C	X-SECT. 3C1	1.70	8976.0	2045	1940	0.012
R21-22	3E	X-SECT. 3E1, USE BASE WIDTH = 180'	1.19	6283.0	1940	1897	0.007
R22-25	5B	X-SECT. 5B1	0.57	3010.0	1897	1885	0.004
R23-24	4C	REPRESENTATIVE OF X-SECT. 2C1	0.81	4277.0	1940	1905	0.008
R24-25	5B	REPRESENTATIVE OF X-SECT. 5B1	0.57	3010.0	1905	1885	0.007
R25-32	5B	INTERPOLATE BETWEEN X-SECT. 6C2 AND 5B1	2.92	15418.0	1885	1795	0.006
R26-27	7B	X-SECT. 7B1	4.05	21384.0	2015	1830	0.009
R27-29	7D	INTERPOLATE BETWEEN X-SECT. 7B1 AND 7E1	2.46	12989.0	1830	1755	0.006
R28-29	7D	INTERPOLATE BETWEEN X-SECT. 7B1 AND 7E1	3.52	18586.0	1917	1755	0.009
R29-30	7D	REPRESENTATIVE OF XSECT. 7E1	0.61	3221.0	1755	1720	0.011
R30-31	7E	X-SECT. 7E1	6.93	36590.0	1720	1492	0.006
R31-84	7E	REPRESENTATIVE OF X-SECT. 7E1	2.65	13992.0	1492	1419	0.005
R32-33	5C	REPRESENTATIVE OF X-SECT. 6C2	2.16	11405.0	1795	1715	0.007
R33-34	6C	JACKRABBIT WASH HEC-2 SECTION 14.232	5.34	28195.0	1715	1515	0.007
R34-37	6D	JACKRABBIT WASH HEC-2 SECTION 11.608	2.16	11405.0	1515	1442	0.006
R35-36	6B	W. FORK JACKRABBIT WASH HEC-2 SECTION 2.550	5.34	28195.0	1712	1505	0.007
R36-37	6D	W. FORK JACKRABBIT WASH HEC-2 SECTION 1.064	1.70	8976.0	1505	1442	0.007
R37-38	6D	JACKRABBIT WASH HEC-2 SECTION 8.870	2.50	13200.0	1442	1355	0.007
R38-94	15A	REP. X-Sect. 15D1, USE BASE WIDTH = 200'	2.80	14784.0	1355	1266	0.006
R39-40	9B	X-SECT. 9B1	1.78	9398.0	1915	1790	0.013
R40-41	9C	X-SECT. 9C1	4.02	21226.0	1790	1619	0.008

TABLE R-2

REACH ROUTE PHYSICAL DATA

Reach	In Sub-Basin	Cross Section Source	Length Miles	Length Feet	Elevation Top	Elevation Bottom	Slope (ft/ft)
R41-43	9E	X-SECT. 9E1	3.03	15998.0	1619	1490	0.008
R42-43	9E	REPRESENTATIVE OF X-SECT. 9E1	2.20	11616.0	1580	1490	0.008
R43-44	9E	INTERPOLATE BETWEEN X-SECT. 3B1 AND 2F1	0.81	4277.0	1490	1460	0.007
R44-45	9G	REPRESENTATIVE OF X-SECT. 9I1	0.64	3379.0	1460	1440	0.006
R44-47	9H	REPRESENTATIVE OF X-SECT. 9I1	2.37	12514.0	1460	1377	0.007
R45-46	9I	X-SECT. 9I1	1.97	10402.0	1440	1377	0.006
R46-94	15A	X-SECT. FROM 1' CI BELMONT MAPPING	3.09	16315.0	1377	1266	0.007
R47-119	18T	X-SECT. 18T1	1.55	8184.0	1377	1320	0.007
R48-101	18A	X-SECT. 18A1	0.85	4488.0	1351	1320	0.007
R49-101	18A	X-SECT. 18A2	0.64	3379.0	1354	1320	0.010
R50-51	10B	X-SECT. 10B1	7.12	37594.0	2185	1708	0.013
R51-57	10C2	INTERPOLATE BETWEEN X-SECT. 10H1 AND 10B1	1.52	8026.0	1708	1648	0.007
R52-55	10E	X-SECT. 10E2	3.45	18216.0	2040	1796	0.013
R53-54	10G	X-SECT. 10G1	6.40	33792.0	2350	1840	0.015
R54-59	10H	INTERPOLATE BETWEEN X-SECT. 10H1 AND 10G1	5.23	27614.0	1840	1588	0.009
R55-57	10C2	INTERPOLATE BETWEEN X-SECT. 10E1 AND 10H1	2.94	15523.0	1796	1648	0.010
R57-58	10C2	REPRESENTATIVE OF X-SECT. 10H1	1.06	5597.0	1648	1610	0.007
R58-59	10H	X-SECT. 10H1	0.76	4013.0	1610	1588	0.005
R59-61	10J	REPRESENTATIVE OF X-SECT. 10H1	1.36	7181.0	1588	1540	0.007
R60-61	10J	X-SECT. 10J2	8.39	44299.0	2005	1540	0.010
R61-82	10L	X-SECT. 10L1	3.26	17213.0	1540	1452	0.005
R63-68	10N	REPRESENTATIVE OF X-SECT. 10R1	2.27	11986.0	1655	1560	0.008
R67-68	10N	INTERPOLATE BETWEEN X-SECT. 10N1 AND 10N2	8.22	43402.0	2015	1560	0.010
R68-72	10Z	REPRESENTATIVE OF X-SECT. 10N2	0.91	4805.0	1560	1535	0.005
R69-71	10U	X-SECT. 10U2	3.52	18586.0	1740	1572	0.009
R70-71	10U	X-SECT. 10U1	4.39	23179.0	1775	1572	0.009
R71-72	10Z	REPRESENTATIVE OF X-SECT. 10U2	1.36	7181.0	1572	1535	0.005
R72-81	10Z	REPRESENTATIVE OF X-SECT. 10U2	1.17	6178.0	1535	1505	0.005
R73-74	10P	X-SECT. 10P2	4.72	24922.0	2530	2050	0.019
R74-76	10R	X-SECT. 10R1	4.96	26189.0	2050	1717	0.013
R75-76	10R	X-SECT. 10R3	4.81	25397.0	2005	1717	0.011
R76-77	10V	INTERPOLATE BETWEEN X-SECT. 10V1 AND 10V2	3.22	17002.0	1717	1588	0.008
R77-80	10Z	REPRESENTATIVE OF X-SECT. 10V2	1.17	6178.0	1588	1547	0.007
R78-79	10X	X-SECT. 10X1	3.54	18691.0	1975	1755	0.012
R79-80	10Y	X-SECT. 10Y1	5.23	27614.0	1755	1547	0.008
R80-81	10Z	REPRESENTATIVE OF X-SECT. 10Y1	1.50	7920.0	1547	1505	0.005
R81-82	10Z	REPRESENTATIVE OF X-SECT. 10AB2	1.78	9398.0	1505	1452	0.006
R82-84	10AB	X-SECT. 10AB2, USE BASE WIDTH = 200'	1.33	7022.0	1452	1419	0.005
R83-84	10AB	X-SECT. 10AB1	5.72	30202.0	1590	1419	0.006
R84-38	8A	STAR WASH HEC-2 SECTION 1.100	2.08	10982.0	1419	1355	0.006

TABLE R-2

REACH ROUTE PHYSICAL DATA

Reach	In Sub-Basin	Cross Section Source	Length		Elevation		Slope
			Miles	Feet	Top	Bottom	(ft/ft)
R85-95	15B	X-SECT. FROM 1' CI BELMONT MAPPING	3.62	19114.0	1371	1269	0.005
R86-88	12C	X-SECT. 12C2	7.86	41501.0	2140	1675	0.011
R87-88	12D	REPRESENTATIVE OF X-SECT. 12C1	0.38	2006.0	1680	1675	0.002
R88-89	12D	INTERPOLATE BETWEEN X-SECT. 12D1 AND 12D2	3.09	16315.0	1675	1670	0.000
R89-90	12E	X-SECT. 12E1	6.16	32525.0	1670	1373	0.009
R90-99	16A	REPRESENTATIVE OF X-SECT. 15A1, BASE = 50'	3.33	17582.0	1373	1245	0.007
R94-96	15C	REP. X-SECT. 15D1,USE BASE WIDTH = 250'	1.02	5386.0	1266	1238	0.005
R95-96	15C	X-SECT. FROM 1' CI BELMONT MAPPING	0.95	5016.0	1269	1238	0.006
R96-97	15C	REP. X-SECT. 15D1,USE BASE WIDTH,=,260'	1.17	6178.0	1238	1201	0.006
R97-98	15D	X-SECT. 15D1, USE BASE WIDTH = 260'	2.80	14784.0	1201	1105	0.006
R104-105	18E	INTERPOLATE BETWEEN X-SECT. 18E1 AND 18F1	3.47	18322.0	1231	1126	0.006
R105-106	18F	X-SECT. 18F1	1.82	9610.0	1126	1085	0.004
R108-109	18I	REPRESENTATIVE OF X-SECT. 18F1	3.07	16210.0	1395	1118	0.017
R109-110	18J	REPRESENTATIVE OF X-SECT. 18E1	2.69	14203.0	1118	1035	0.006
R116-117	18Q	REPRESENTATIVE OF X-SECT. 18E1	1.40	7392.0	1132	1090	0.006
R118-64	18S	REPRESENTATIVE OF X-SECT. 18E1	1.67	8818.0	1137	1083	0.006

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Table R-3

TABLE R-3

REACH ROUTE HYDRAULIC DATA

Reach	Slope (ft/ft)	Length (ft)	Section Top Width and Depth: 6-Hour Storm Width (ft)	6-Hour Storm Depth (ft)	24-Hour Storm Width (ft)	24-Hour Storm Depth (ft)	Channel Base Width (ft)	Cross Section Area (sq ft): 6-Hour Storm	Cross Section Area: 24-Hour Storm	Discharge (cfs): 6-Hour Storm	Discharge: 24-Hour Storm	Average n Value	Average Velocity (fps): 6-Hour Storm	Average Velocity: 24-Hour Storm	Reach Travel Time (hrs): 6-Hour Storm	Reach Travel Time: 24-Hour Storm	NSTEPS: 6-Hour Storm	NSTEPS: 24-Hour Storm
R1-2	0.001	4224.0	955.6	6.4	1009.1	6.7	4.0	2538.5	2833.2	6498	7432	0.036	2.5	2.6	0.5	0.5	6	5
R2-4	0.002	6917.0	919.9	6.2	955.6	6.4	4.0	2351.0	2538.5	8096	8964	0.036	3.4	3.5	0.6	0.5	7	7
R3-4	0.005	11299.0	402.0	3.3	366.3	3.1	4.0	434.3	357.4	1451	1106	0.036	3.1	2.9	1.0	1.1	12	13
R4-7	0.004	6019.0	787.0	8.4	827.0	8.6	9.0	1656.0	1817.4	7790	8924	0.033	4.7	4.8	0.4	0.4	4	4
R5-7	0.007	7181.0	139.0	3.4	132.8	3.1	40.0	318.4	277.7	1756	1446	0.039	5.5	5.2	0.4	0.4	4	5
R6-7	0.005	5491.0	147.4	3.8	147.4	3.8	40.0	375.7	375.7	2294	2329	0.032	6.1	6.1	0.3	0.3	3	3
R7-8	0.004	4013.0	532.0	12.1	572.0	12.5	15.0	1568.9	1789.7	7514	9024	0.040	4.8	5.0	0.2	0.2	3	3
R8-10	0.004	3379.0	522.0	12.0	632.0	13.1	15.0	1516.2	2150.9	7333	11478	0.040	4.7	5.3	0.2	0.2	2	2
R9-10	0.006	792.0	359.2	3.8	405.0	4.1	105.0	628.4	743.0	2826	3424	0.040	4.2	4.4	0.1	0.1	1	1
R10-11	0.005	14203.0	307.0	9.7	381.8	11.4	52.0	1233.1	1818.5	8164	13636	0.040	6.6	7.4	0.6	0.5	7	6
R11-12	0.005	16790.0	245.1	6.9	313.7	8.9	90.0	979.1	1538.0	7638	13448	0.035	7.6	8.7	0.6	0.5	7	6
R12-21	0.007	4488.0	256.2	4.6	279.6	7.3	200.0	1002.0	1741.5	8352	18389	0.038	8.1	11.0	0.2	0.1	2	1
R13-14	0.007	7022.0	405.0	4.1	450.9	4.4	105.0	743.0	871.4	4811	5739	0.029	6.4	6.6	0.3	0.3	4	4
R14-15	0.010	11246.0	166.4	4.8	168.2	5.5	40.0	533.4	650.5	5606	7577	0.032	10.0	11.4	0.3	0.3	4	3
R15-17	0.008	14890.0	408.2	5.4	523.0	6.1	60.0	883.3	1201.3	5419	7675	0.037	6.0	6.2	0.7	0.7	8	8
R16-18	0.007	11088.0	130.7	3.0	130.7	3.0	40.0	264.5	264.5	1637	1644	0.032	6.2	6.2	0.5	0.5	6	6
R17-18	0.009	5914.0	356.5	4.1	438.5	4.9	75.0	720.0	1036.0	4742	7654	0.035	6.5	7.2	0.3	0.2	3	3
R18-12	0.006	14520.0	160.8	4.0	184.0	5.6	140.0	600.9	876.8	4740	7934	0.036	7.7	9.0	0.5	0.5	6	5
R19-21	0.010	15998.0	115.1	4.8	116.0	5.1	45.0	384.1	418.8	3141	3621	0.041	8.0	8.4	0.6	0.5	7	6
R20-21	0.012	8978.0	293.8	4.2	306.7	4.3	36.0	410.8	440.8	2365	2660	0.036	5.6	5.8	0.4	0.4	5	5
R21-22	0.007	6283.0	467.3	4.8	593.3	7.2	180.0	1253.6	2526.2	8241	21834	0.038	6.3	8.5	0.3	0.2	3	2
R22-25	0.004	3010.0	337.0	5.7	507.0	9.1	168.0	1232.6	2667.4	7915	21577	0.035	6.3	8.0	0.1	0.1	2	1
R23-24	0.008	4277.0	153.6	4.1	162.0	4.5	40.0	420.9	464.0	3411	4274	0.032	8.1	8.6	0.2	0.1	2	2
R24-25	0.007	3010.0	231.0	3.6	257.0	4.0	168.0	631.6	730.7	4317	5279	0.035	6.8	7.0	0.1	0.1	1	1
R25-32	0.006	15418.0	327.2	4.8	409.0	7.9	132.0	1083.7	2254.8	7790	22766	0.036	7.1	10.0	0.6	0.4	7	5
R26-27	0.009	21384.0	377.9	5.6	388.0	5.7	5.0	634.8	673.1	3339	3603	0.039	5.1	5.2	1.2	1.1	14	14
R27-29	0.006	12989.0	358.9	4.6	378.7	4.8	15.0	612.5	686.3	2861	3424	0.036	4.5	4.7	0.8	0.8	10	9
R28-29	0.009	18586.0	329.1	4.3	358.9	4.6	15.0	509.3	612.5	2754	3578	0.036	5.2	5.5	1.0	0.9	12	11
R29-30	0.011	3221.0	174.4	4.4	193.6	5.3	39.0	451.4	617.1	3709	5721	0.037	8.0	9.2	0.1	0.1	1	1
R30-31	0.006	36590.0	185.2	4.9	208.9	6.0	39.0	541.3	758.0	3628	5688	0.037	6.4	7.4	1.6	1.4	19	16
R31-84	0.005	13992.0	183.0	4.8	208.9	6.0	39.0	522.9	758.0	3063	5213	0.037	5.8	6.8	0.7	0.6	8	7
R32-33	0.007	11405.0	401.6	4.2	450.3	6.8	97.0	1108.6	2239.9	7542	22469	0.036	6.7	9.9	0.5	0.3	6	4
R33-34	0.007	28195.0	306.1	5.6	380.5	8.9	16.0	967.7	2100.5	7017	22318	0.037	7.2	10.5	1.1	0.8	13	9
R34-37	0.006	11405.0	394.6	6.1	769.0	9.0	19.0	1059.2	2840.1	6670	21840	0.036	6.2	7.7	0.5	0.4	6	5
R35-36	0.007	28195.0	151.4	5.3	151.8	5.4	34.0	412.2	427.4	2834	3015	0.035	6.8	7.0	1.1	1.1	14	13
R36-37	0.007	8978.0	450.0	4.8	470.0	5.0	30.0	546.5	638.6	2447	3040	0.035	4.0	4.3	0.6	0.6	7	7
R37-38	0.007	13200.0	468.5	3.2	522.8	5.5	89.0	975.5	2116.1	6535	21761	0.031	6.5	10.2	0.6	0.4	7	4
R38-94	0.006	14784.0	346.2	3.5	754.1	8.4	200.0	863.9	3602.4	5706	36343	0.033	6.5	10.0	0.6	0.4	8	5
R39-40	0.013	9398.0	227.4	2.7	248.9	2.9	105.0	311.2	358.8	2413	2721	0.029	7.1	7.4	0.4	0.4	4	4
R40-41	0.008	21226.0	366.2	4.5	418.2	5.0	75.0	748.0	944.1	4971	6561	0.034	6.4	6.8	0.9	0.9	11	10
R41-43	0.008	15998.0	508.9	6.7	579.1	7.2	36.0	856.6	1130.8	4416	6161	0.038	4.9	5.4	0.9	0.8	11	10
R42-43	0.008	11616.0	466.7	6.4	480.6	6.5	36.0	712.3	759.7	3442	3777	0.038	4.6	4.7	0.7	0.7	8	8

TABLE R-3

REACH ROUTE HYDRAULIC DATA

Reach	Slope (ft/ft)	Length (ft)	Section Top Width and Depth: 6-Hour Storm Width (ft)	6-Hour Storm Depth (ft)	24-Hour Storm Width (ft)	24-Hour Storm Depth (ft)	Channel Base Width (ft)	Cross Section Area (sq ft): 6-Hour Storm	Cross Section Area (sq ft): 24-Hour Storm	Discharge (cfs): 6-Hour Storm	Discharge (cfs): 24-Hour Storm	Average n Value	Average Velocity (fps): 6-Hour Storm	Average Velocity (fps): 24-Hour Storm	Reach Travel Time (hrs): 6-Hour Storm	Reach Travel Time (hrs): 24-Hour Storm	NSTEPS: 6-Hour Storm	NSTEPS: 24-Hour Storm
R43-44	0.007	4277.0	163.7	4.2	181.1	5.4	140.0	633.4	840.3	5487	8060	0.036	8.5	9.6	0.1	0.1	2	1
R44-47	0.007	12514.0	373.4	3.9	476.4	4.4	45.0	602.1	814.6	2593	3681	0.040	4.3	4.4	0.8	0.8	10	9
R44-45	0.006	3379.0	415.3	2.7	511.3	3.4	40.0	614.7	839.2	2385	4272	0.040	3.7	4.3	0.3	0.2	3	3
R45-46	0.006	10402.0	337.0	4.4	417.0	5.2	22.0	563.3	864.9	2353	4225	0.041	4.0	4.6	0.7	0.6	9	8
R46-94	0.007	16315.0	480.0	2.7	550.0	3.4	25.0	597.8	958.3	2101	4008	0.044	3.3	4.1	1.4	1.1	17	13
R47-119	0.007	8184.0	469.1	5.9	459.2	5.8	17.0	786.1	739.7	4607	4143	0.032	5.5	5.3	0.4	0.4	5	5
R48-101	0.007	4488.0	231.0	3.3	201.0	3.0	2.0	261.6	196.6	1201	829	0.031	4.3	3.9	0.3	0.3	3	4
R49-101	0.010	3379.0	120.0	2.7	90.0	2.4	2.0	69.5	38.0	181	78	0.042	2.4	2.0	0.4	0.5	5	6
R50-51	0.013	37584.0	237.2	2.5	228.4	2.4	8.0	262.4	239.1	1432	1350	0.034	5.3	5.1	2.0	2.1	24	25
R51-57	0.007	8026.0	211.3	3.5	251.8	4.1	40.0	347.4	486.3	1703	2631	0.036	4.8	5.4	0.5	0.4	6	5
R52-55	0.013	18216.0	347.0	4.8	347.0	4.8	8.0	462.6	462.6	2778	2859	0.035	5.8	5.8	0.9	0.9	11	11
R53-54	0.015	33792.0	320.0	5.4	330.0	5.5	10.0	606.7	639.2	3849	4088	0.046	6.1	6.2	1.5	1.5	18	18
R54-59	0.009	27614.0	210.0	4.9	220.0	5.1	42.0	496.1	539.1	3176	3450	0.041	6.1	6.2	1.3	1.2	15	15
R55-57	0.010	15523.0	266.0	3.9	266.0	3.9	41.0	413.9	413.9	2445	2486	0.036	5.6	5.6	0.8	0.8	9	9
R57-58	0.007	5597.0	123.5	3.2	237.0	4.9	76.0	325.0	585.4	2227	3738	0.036	6.6	6.3	0.2	0.3	3	3
R58-59	0.005	4013.0	124.5	3.4	327.0	5.8	76.0	349.8	839.2	2091	4630	0.036	5.8	5.5	0.2	0.2	2	2
R59-61	0.007	7181.0	227.0	4.8	357.0	6.1	76.0	562.2	941.8	3556	6410	0.036	6.3	6.6	0.3	0.3	4	4
R60-61	0.010	44299.0	337.0	4.3	357.0	4.5	5.0	524.8	594.2	3103	3500	0.036	5.5	5.7	2.2	2.2	27	26
R61-62	0.005	17213.0	494.6	5.1	518.4	5.7	45.0	929.5	1233.4	4217	6717	0.036	4.5	5.2	1.1	0.9	13	11
R63-68	0.008	11986.0	214.0	6.1	254.0	6.5	10.0	386.2	479.8	2328	2951	0.034	5.8	6.0	0.6	0.6	7	7
R67-68	0.010	43402.0	403.0	5.4	413.0	5.5	7.0	655.3	696.1	3580	3824	0.039	5.3	5.4	2.3	2.2	27	27
R68-72	0.005	4805.0	349.0	6.2	389.0	6.6	6.0	581.3	728.9	2579	3329	0.035	4.2	4.6	0.3	0.3	4	4
R69-71	0.009	18586.0	288.3	4.6	295.8	4.7	1.0	416.8	446.0	2296	2625	0.034	5.4	5.5	1.0	0.9	12	11
R70-71	0.009	23179.0	255.6	6.6	255.6	6.6	9.0	467.5	467.5	3046	3207	0.032	6.5	6.5	1.0	1.0	12	12
R71-72	0.005	7181.0	363.0	5.6	392.8	6.0	1.0	742.4	893.6	3854	4928	0.034	5.0	5.4	0.4	0.4	5	4
R72-81	0.005	6178.0	377.9	5.8	445.1	6.7	1.0	816.5	1186.9	4394	7237	0.034	5.2	6.0	0.3	0.3	4	3
R73-74	0.019	24922.0	222.4	3.4	222.4	3.4	72.0	343.5	343.5	3192	3181	0.030	9.0	9.0	0.8	0.8	9	9
R74-76	0.013	26189.0	314.0	7.1	324.0	7.2	10.0	650.2	682.1	5351	5912	0.034	8.1	8.2	0.9	0.9	11	11
R75-76	0.011	25397.0	299.0	5.8	299.0	5.8	5.0	452.7	452.7	2112	2149	0.046	4.5	4.5	1.6	1.6	19	19
R76-77	0.008	17002.0	751.0	5.9	751.0	5.9	26.0	1502.8	1502.8	5678	6670	0.036	5.8	5.8	0.8	0.8	10	10
R77-80	0.007	6178.0	425.0	5.6	455.0	5.9	35.0	677.7	1009.7	5279	6093	0.035	5.7	6.0	0.3	0.3	4	3
R78-79	0.012	18691.0	238.0	5.7	238.0	5.7	9.0	537.2	537.2	3685	3751	0.042	6.6	6.6	0.8	0.8	9	9
R79-80	0.008	27614.0	445.0	5.3	455.0	5.4	16.0	801.2	846.2	3914	3996	0.043	4.6	4.7	1.7	1.6	20	20
R80-81	0.005	7920.0	575.0	6.6	625.0	7.1	16.0	1464.2	1764.2	6980	8797	0.043	4.6	4.9	0.5	0.5	6	5
R81-82	0.006	9398.0	613.0	5.3	753.0	6.0	104.0	1223.6	1701.7	7310	10899	0.032	5.7	6.2	0.5	0.4	6	5
R82-84	0.005	7022.0	633.0	4.9	1033.0	6.9	204.0	1484.4	3150.4	8653	14654	0.033	5.6	6.7	0.4	0.3	4	3
R83-84	0.006	30202.0	139.2	4.2	136.2	4.1	10.0	313.4	299.6	1226	1136	0.053	3.7	3.7	2.3	2.3	27	27
R84-38	0.006	10962.0	1158.4	4.2	1183.2	5.2	74.0	1564.2	2735.0	7676	18406	0.030	4.6	6.6	0.7	0.5	8	6
R85-95	0.005	19114.0	277.5	3.5	285.0	3.6	15.0	511.9	540.0	1447	1477	0.059	2.7	2.7	2.0	2.0	24	23
R86-88	0.011	41501.0	366.4	4.6	366.4	4.6	13.0	576.0	576.0	3565	3641	0.034	6.1	6.1	1.9	1.9	23	23
R87-88	0.002	2006.0	292.3	3.8	309.3	4.2	11.0	501.9	622.2	1449	2028	0.034	2.8	3.1	0.2	0.2	2	2
R88-89	0.003	16315.0	395.2	4.2	400.4	4.4	44.0	743.0	822.6	2768	3300	0.033	3.7	3.9	1.2	1.2	15	14

TABLE R-3

REACH ROUTE HYDRAULIC DATA

Reach	Slope (ft/ft)	Length (ft)	Section Top Width and Depth				Channel Base Width (ft)	Cross Section Area (sq ft)		Discharge (cfs)		Average n Value	Average Velocity (fps)		Reach Travel Time (hrs)		NSTEPS	
			6-Hour Storm		24-Hour Storm			6-Hour Storm	24-Hour Storm	6-Hour Storm	24-Hour Storm		6-Hour Storm	24-Hour Storm	6-Hour Storm	24-Hour Storm	6-Hour Storm	24-Hour Storm
			Width (ft)	Depth (ft)	Width (ft)	Depth (ft)												
R89-90	0.009	32525.0	66.3	4.9	165.0	6.5	43.0	253.6	415.0	2335	2949	0.037	9.1	6.9	1.0	1.3	12	16
R90-99	0.007	17582.0	405.0	6.2	685.0	7.6	50.0	629.5	1392.5	2637	4996	0.043	3.9	4.7	1.3	1.0	15	13
R94-96	0.005	5386.0	410.0	2.5	718.0	7.9	250.0	807.5	3900.0	4208	37508	0.034	4.9	9.6	0.3	0.2	4	2
R95-96	0.006	5016.0	257.0	3.5	280.2	3.7	15.0	312.0	365.7	1237	1510	0.035	3.8	4.0	0.4	0.4	4	4
R96-97	0.006	6178.0	296.2	1.8	783.0	8.0	260.0	495.9	3787.0	2469	37420	0.034	4.8	9.7	0.4	0.2	4	2
R97-98	0.006	14784.0	285.0	1.5	783.0	8.0	260.0	408.8	3787.0	1888	37294	0.034	4.3	9.7	1.0	0.4	11	5
R104-105	0.006	18322.0	275.9	7.0	305.6	7.3	22.0	587.4	674.6	2227	2518	0.053	3.8	3.7	1.4	1.4	17	17
R105-106	0.004	9610.0	190.0	8.3	260.0	9.0	20.0	546.3	703.8	2227	2841	0.046	4.1	3.9	0.7	0.7	8	8
R108-109	0.017	16210.0	66.0	5.3	72.0	5.6	20.0	232.7	253.4	2222	2413	0.046	9.5	9.5	0.5	0.5	6	6
R109-110	0.006	14203.0	405.0	8.0	445.0	8.4	24.0	875.0	1045.0	2989	3798	0.058	3.3	3.5	1.2	1.1	14	14
R116-117	0.006	7392.0	295.0	4.9	275.0	4.7	24.0	490.0	433.0	1387	1206	0.058	2.8	2.7	0.7	0.8	9	9
R118-64	0.006	8818.0	305.0	5.0	295.0	4.9	24.0	520.0	490.0	1503	1447	0.058	2.8	2.8	0.9	0.9	10	11

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Table R-4

TABLE R-4

ROUTING REACH CHANNEL INFILTRATION LOSS DATA

Reach	In Sub-Basin	SCS Soil Map Unit			XKSAT			Composite Loss Rate (cfs/acre)	
		Left O/B	Channel	Right O/B	Left O/B (in/hr)	Channel (in/hr)	Right O/B (in/hr)	6-Hour Storm	24-Hour Storm
R1-2	1B	67	67	67	0.03	0.03	0.03	0.03	0.03
R2-4	1D	67	67	67	0.03	0.03	0.03	0.03	0.03
R3-4	1D	87	88	88	0.22	0.12	0.12	0.17	0.17
R4-7	1G	10	10	10	2.43	2.43	2.43	2.45	2.45
R5-7	1G	66	66	66	0.27	0.27	0.27	0.27	0.27
R6-7	1G	66	66	66	0.27	0.27	0.27	0.27	0.27
R7-8	1H	10	10	10	2.43	2.43	2.43	2.45	2.45
R8-10	1J	10	10	10	2.43	2.43	2.43	2.45	2.45
R9-10	1J	10	10	10	2.43	2.43	2.43	2.45	2.45
R10-11	1J	10	10	10	2.43	2.43	2.43	2.45	2.45
R11-12	1L	4	4	4	1.89	1.89	1.89	1.90	1.90
R13-14	2B	116	116	116	0.51	0.51	0.51	0.52	0.52
R14-15	2C	10	10	10	2.43	2.43	2.43	2.45	2.45
R15-17	2D	123	10	10	0.49	2.43	2.43	1.71	1.70
R16-18	2F	51	51	51	0.11	0.11	0.11	0.11	0.11
R17-18	2F	10	10	10	2.43	2.43	2.43	2.45	2.45
R18-12	2F	4	4	4	1.89	1.89	1.89	1.90	1.90
R12-21	3B	4	4	4	1.89	1.89	1.89	1.90	1.90
R19-21	3B	3	3	3	1.89	1.89	1.89	1.90	1.90
R20-21	3C	4	4	4	1.89	1.89	1.89	1.90	1.90
R21-22	3E	4	4	4	1.89	1.89	1.89	1.90	1.90
R22-25	5B	4	4	4	1.89	1.89	1.89	1.90	1.90
R23-24	4C	4	4	4	1.89	1.89	1.89	1.90	1.90
R24-25	5B	4	4	4	1.89	1.89	1.89	1.90	1.90
R25-32	5B	4	4	4	1.89	1.89	1.89	1.90	1.90
R26-27	7B	117	119	119	0.43	0.10	0.10	0.26	0.26
R27-29	7D	119	119	119	0.10	0.10	0.10	0.10	0.10
R28-29	7D	117	30	119	0.43	0.53	0.10	0.28	0.28
R29-30	7D	117	119	119	0.43	0.10	0.10	0.23	0.23
R30-31	7E	71	71	71	0.33	0.33	0.33	0.33	0.33
R31-84	7E	71	71	71	0.33	0.33	0.33	0.33	0.33
R32-33	5C	11	11	11	2.43	2.43	2.43	2.45	2.45
R33-34	6C	11	11	11	2.43	2.43	2.43	2.45	2.45
R34-37	6D	11	11	11	2.43	2.43	2.43	2.45	2.45
R35-36	6B	71	71	102	0.33	0.33	0.52	0.40	0.40
R36-37	6D	71	4	20	0.33	1.89	0.27	0.41	0.40
R37-38	6D	11	11	11	2.43	2.43	2.43	2.45	2.45
R38-94	15A	11	11	11	2.43	2.43	2.43	2.45	2.45
R39-40	9B	30	11	47	0.53	2.43	0.12	1.31	1.22

TABLE R-4

ROUTING REACH CHANNEL INFILTRATION LOSS DATA

Reach	In Sub-Basin	SCS Soil Map Unit			XKSAT			Composite Loss Rate (cfs/acre)	
		Left O/B	Channel	Right O/B	Left O/B (in/hr)	Channel (in/hr)	Right O/B (in/hr)	6-Hour Storm	24-Hour Storm
R40-41	9C	11	11	11	2.43	2.43	2.43	2.45	2.45
R41-43	9E	92	92	92	0.76	0.76	0.76	0.77	0.77
R42-43	9E	92	92	92	0.76	0.76	0.76	0.77	0.77
R43-44	9E	20	11	92	0.27	2.43	0.76	2.17	2.01
R44-45	9G	20	11	92	0.27	2.43	0.76	0.75	0.70
R44-47	9H	117	11	48	0.43	2.43	0.10	0.48	0.44
R45-46	9I	117	11	117	0.43	2.43	0.43	0.56	0.54
R46-94	15A	71	11	117	0.33	2.43	0.43	0.49	0.47
R47-119	18T	117	4	4	0.43	1.89	1.89	1.19	1.19
R48-101	18A	4	4	4	1.89	1.89	1.89	1.90	1.90
R49-101	18A	123	4	123	0.49	1.89	0.49	0.51	0.52
R50-51	10B	30	116	30	0.53	0.51	0.53	0.54	0.54
R51-57	10C2	30	30	30	0.53	0.53	0.53	0.54	0.54
R52-55	10E	30	30	30	0.53	0.53	0.53	0.54	0.54
R53-54	10G	30	30	98	0.53	0.53	0.21	0.38	0.38
R54-59	10H	30	30	30	0.53	0.53	0.53	0.54	0.54
R55-57	10C2	30	30	30	0.53	0.53	0.53	0.54	0.54
R57-58	10C2	117	117	117	0.43	0.43	0.43	0.43	0.43
R58-59	10H	4	4	4	1.89	1.89	1.89	1.90	1.90
R59-61	10J	4	4	4	4.00	1.89	1.89	2.61	2.74
R60-61	10J	30	30	30	0.53	0.53	0.53	0.54	0.54
R61-82	10L	4	4	4	1.89	1.89	1.89	1.90	1.90
R63-68	10N	56	30	56	0.42	0.53	0.42	0.42	0.42
R67-68	10N	92	30	30	0.76	0.53	0.53	0.65	0.65
R68-72	10Z	30	30	30	0.53	0.53	0.53	0.54	0.54
R69-71	10U	30	30	56	0.53	0.53	0.42	0.48	0.48
R70-71	10U	30	30	30	0.53	0.53	0.53	0.54	0.54
R71-72	10Z	30	30	30	0.53	0.53	0.53	0.54	0.54
R72-81	10Z	30	30	30	0.53	0.53	0.53	0.54	0.54
R73-74	10P	98	98	98	0.21	0.21	0.21	0.21	0.21
R74-76	10R	99	30	48	0.21	0.53	0.10	0.17	0.17
R75-76	10R	79	79	79	0.08	0.08	0.08	0.08	0.08
R76-77	10V	30	30	30	0.53	0.53	0.53	0.54	0.54
R77-80	10Z	30	30	30	0.53	0.53	0.53	0.54	0.54
R78-79	10X	98	98	98	0.21	0.21	0.21	0.21	0.21
R79-80	10Y	30	30	30	0.53	0.53	0.53	0.54	0.54
R80-81	10Z	69	30	30	0.11	0.53	0.53	0.33	0.33
R81-82	10Z	4	4	4	1.89	1.89	1.89	1.90	1.90
R82-84	10AB	4	4	4	1.89	1.89	1.89	1.90	1.90

TABLE R-4

ROUTING REACH CHANNEL INFILTRATION LOSS DATA

Reach	In Sub-Basin	SCS Soil Map Unit			XKSAT			Composite Loss Rate (cfs/acre)	
		Left O/B	Channel	Right O/B	Left O/B (in/hr)	Channel (in/hr)	Right O/B (in/hr)	6-Hour Storm	24-Hour Storm
R83-84	10AB	60	60	60	0.21	0.21	0.21	0.21	0.21
R84-38	8A	117	11	11	0.43	2.43	2.43	1.51	1.50
R85-95	15B	117	117	117	0.43	0.43	0.43	0.43	0.43
R86-88	12C	98	98	98	0.21	0.21	0.21	0.21	0.21
R87-88	12D	56	56	56	0.42	0.42	0.42	0.42	0.42
R88-89	12D	4	4	69	1.89	1.89	0.11	1.10	1.10
R89-90	12E	92	92	92	0.76	0.76	0.76	0.77	0.77
R90-99	16A	11	11	11	2.43	2.43	2.43	2.45	2.45
R94-96	15C	11	11	11	2.43	2.43	2.43	2.45	2.45
R95-96	15C	117	117	117	0.43	0.43	0.43	0.43	0.43
R96-97	15C	11	11	11	2.43	2.43	2.43	2.45	2.45
R97-98	15D	11	11	11	2.43	2.43	2.43	2.45	2.45
R104-105	18E	117	117	117	0.43	0.43	0.43	0.43	0.43
R105-106	18F	71	71	71	0.33	0.33	0.33	0.33	0.33
R108-109	18I	1	69	69	0.56	0.11	0.11	0.27	0.27
R109-110	18J	102	102	102	0.52	0.52	0.52	0.52	0.52
R116-117	18Q	RbA	LcA	RbA	0.40	0.25	0.40	0.39	0.39
R118-64	18S	RbA	RbA	RbA	0.40	0.40	0.40	0.40	0.40

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Table R-5

TABLE R-5

REACH ROUTE DATA SUMMARY TABLE
100-Year 24-Hour Storm

Reach	Length (ft)	Elevation Top	Elevation Bottom	Slope (ft/ft)	Channel Base Width (ft)	Average n Value	Velocity (fps)	Reach Travel Time (hrs)	NSTEPS	Channel Loss Rate (cfs/ac)
R1-2	4224.0	2200	2195	0.001	4.0	0.036	2.6	0.5	5	0.03
R2-4	6917.0	2195	2180	0.002	4.0	0.036	3.5	0.5	7	0.03
R3-4	11299.0	2235	2180	0.005	4.0	0.036	2.9	1.1	13	0.17
R4-7	6019.0	2180	2155	0.004	9.0	0.033	4.8	0.4	4	2.45
R5-7	7181.0	2205	2155	0.007	40.0	0.039	5.2	0.4	5	0.27
R6-7	5491.0	2180	2155	0.005	40.0	0.032	6.1	0.3	3	0.27
R7-8	4013.0	2155	2140	0.004	15.0	0.040	5.0	0.2	3	2.45
R8-10	3379.0	2140	2125	0.004	15.0	0.040	5.3	0.2	2	2.45
R9-10	792.0	2130	2125	0.006	105.0	0.040	4.4	0.1	1	2.45
R10-11	14203.0	2125	2050	0.005	52.0	0.040	7.4	0.5	6	2.45
R11-12	16790.0	2050	1970	0.005	90.0	0.035	8.7	0.5	6	1.90
R12-21	4488.0	2395	2345	0.011	200.0	0.038	11.0	0.1	1	0.52
R13-14	7022.0	2345	2230	0.016	105.0	0.029	6.6	0.3	4	2.45
R14-15	11246.0	2230	2115	0.010	40.0	0.032	11.4	0.3	3	1.70
R15-17	14890.0	2136	2060	0.005	60.0	0.037	6.2	0.7	8	0.11
R16-18	11088.0	2115	2060	0.005	40.0	0.032	6.2	0.5	6	2.45
R17-18	5914.0	2060	1970	0.015	75.0	0.035	7.2	0.2	3	1.90
R18-12	14520.0	1970	1940	0.002	140.0	0.036	9.0	0.5	5	1.90
R19-21	15998.0	2098	1940	0.010	45.0	0.041	8.4	0.5	6	1.90
R20-21	8976.0	2045	1940	0.012	36.0	0.036	5.8	0.4	5	1.90
R21-22	6283.0	1940	1897	0.007	180.0	0.038	8.5	0.2	2	1.90
R22-25	3010.0	1897	1885	0.004	168.0	0.035	8.0	0.1	1	1.90
R23-24	4277.0	1940	1905	0.008	40.0	0.032	8.6	0.1	2	1.90
R24-25	3010.0	1905	1885	0.007	168.0	0.035	7.0	0.1	1	1.90
R25-32	15418.0	1885	1795	0.006	132.0	0.036	10.0	0.4	5	1.90
R26-27	21384.0	2015	1830	0.009	5.0	0.039	5.2	1.1	14	0.26
R27-29	12989.0	1830	1755	0.006	15.0	0.036	4.7	0.8	9	0.10
R28-29	18586.0	1917	1755	0.009	15.0	0.036	5.5	0.9	11	0.28
R29-30	3221.0	1755	1720	0.011	39.0	0.037	9.2	0.1	1	0.23
R30-31	36590.0	1720	1492	0.006	39.0	0.037	7.4	1.4	16	0.33
R31-84	13992.0	1492	1419	0.005	39.0	0.037	6.8	0.6	7	0.33
R32-33	11405.0	1795	1715	0.007	97.0	0.036	9.9	0.3	4	2.45
R33-34	28195.0	1715	1515	0.007	16.0	0.037	10.5	0.8	9	2.45
R34-37	11405.0	1515	1442	0.006	19.0	0.036	7.7	0.4	5	2.45
R35-36	28195.0	1712	1505	0.007	34.0	0.035	7.0	1.1	13	0.40
R36-37	8976.0	1505	1442	0.007	30.0	0.035	4.3	0.6	7	0.40
R37-38	13200.0	1442	1355	0.007	89.0	0.031	10.2	0.4	4	2.45

TABLE R-5

REACH ROUTE DATA SUMMARY TABLE
100-Year 24-Hour Storm

Reach	Length (ft)	Elevation Top	Elevation Bottom	Slope (ft/ft)	Channel Base Width (ft)	Average n Value	Velocity (fps)	Reach Travel Time (hrs)	NSTEPS	Channel Loss Rate (cfs/ac)
R38-94	14784.0	1355	1266	0.006	200.0	0.033	10.0	0.4	5	2.45
R39-40	9398.0	1915	1790	0.013	105.0	0.029	7.4	0.4	4	1.22
R40-41	21226.0	1790	1619	0.008	75.0	0.034	6.8	0.9	10	2.45
R41-43	15998.0	1619	1490	0.008	36.0	0.038	5.4	0.8	10	0.77
R42-43	11616.0	1580	1490	0.008	36.0	0.038	4.7	0.7	8	0.77
R43-44	4277.0	1490	1460	0.007	140.0	0.036	9.6	0.1	1	2.01
R44-47	12514.0	1460	1440	0.002	45.0	0.040	4.4	0.8	9	0.70
R44-45	3379.0	1460	1377	0.025	40.0	0.040	4.3	0.2	3	0.44
R45-46	10402.0	1440	1377	0.006	22.0	0.041	4.6	0.6	8	0.54
R46-94	16315.0	1377	1266	0.007	25.0	0.044	4.1	1.1	13	0.47
R47-119	8184.0	1377	1320	0.007	17.0	0.032	5.3	0.4	5	1.19
R48-101	4488.0	1351	1320	0.007	2.0	0.031	3.9	0.3	4	1.90
R49-101	3379.0	1354	1320	0.010	2.0	0.042	2.0	0.5	6	0.52
R50-51	37594.0	2185	1708	0.013	8.0	0.034	5.1	2.1	25	0.54
R51-57	8026.0	1708	1648	0.007	40.0	0.036	5.4	0.4	5	0.54
R52-55	18216.0	2040	1796	0.013	8.0	0.035	5.8	0.9	11	0.54
R53-54	33792.0	2350	1840	0.015	10.0	0.046	6.2	1.5	18	0.38
R54-59	27614.0	1840	1588	0.009	42.0	0.041	6.2	1.2	15	0.54
R55-57	15523.0	1796	1648	0.010	41.0	0.036	5.6	0.8	9	0.54
R57-58	5597.0	1648	1610	0.007	76.0	0.036	6.3	0.3	3	0.43
R58-59	4013.0	1610	1588	0.005	76.0	0.036	5.5	0.2	2	1.90
R59-61	7181.0	1588	1540	0.007	76.0	0.036	6.6	0.3	4	2.74
R60-61	44299.0	2005	1540	0.010	5.0	0.036	5.7	2.2	26	0.54
R61-82	17213.0	1540	1452	0.005	45.0	0.036	5.2	0.9	11	1.90
R63-68	11986.0	1655	1560	0.008	10.0	0.034	6.0	0.6	7	0.42
R67-68	43402.0	2015	1560	0.010	7.0	0.039	5.4	2.2	27	0.65
R68-72	4805.0	1560	1535	0.005	6.0	0.035	4.6	0.3	4	0.54
R69-71	18586.0	1740	1572	0.009	1.0	0.034	5.5	0.9	11	0.48
R70-71	23179.0	1775	1572	0.009	9.0	0.032	6.5	1.0	12	0.54
R71-72	7181.0	1572	1535	0.005	1.0	0.034	5.4	0.4	4	0.54
R72-81	6178.0	1535	1505	0.005	1.0	0.034	6.0	0.3	3	0.54
R73-74	24922.0	2530	2050	0.019	72.0	0.030	9.0	0.8	9	0.21
R74-76	26189.0	2050	1717	0.013	10.0	0.034	8.2	0.9	11	0.17
R75-76	25397.0	2005	1717	0.011	5.0	0.046	4.5	1.6	19	0.08
R76-77	17002.0	1717	1588	0.008	26.0	0.036	5.8	0.8	10	0.54
R77-80	6178.0	1588	1547	0.007	35.0	0.035	6.0	0.3	3	0.54
R78-79	18691.0	1975	1755	0.012	9.0	0.042	6.6	0.8	9	0.21

TABLE R-5

REACH ROUTE DATA SUMMARY TABLE
100-Year 24-Hour Storm

Reach	Length (ft)	Elevation Top	Elevation Bottom	Slope (ft/ft)	Channel Base Width (ft)	Average n Value	Velocity (fps)	Reach Travel Time (hrs)	NSTEPS	Channel Loss Rate (cfs/ac)
R79-80	27614.0	1755	1547	0.008	16.0	0.043	4.7	1.6	20	0.54
R80-81	7920.0	1547	1505	0.005	16.0	0.043	4.9	0.5	5	0.33
R81-82	9398.0	1505	1452	0.006	104.0	0.032	6.2	0.4	5	1.90
R82-84	7022.0	1452	1419	0.005	204.0	0.033	6.7	0.3	3	1.90
R83-84	30202.0	1590	1419	0.006	10.0	0.053	3.7	2.3	27	0.21
R84-38	10982.0	1419	1355	0.006	74.0	0.030	6.6	0.5	6	1.50
R85-95	19114.0	1371	1269	0.005	15.0	0.059	2.7	2.0	23	0.43
R86-88	41501.0	2140	1675	0.011	13.0	0.034	6.1	1.9	23	0.21
R87-88	2006.0	1680	1675	0.002	11.0	0.034	3.1	0.2	2	0.42
R88-89	16315.0	1675	1670	0.000	44.0	0.033	3.9	1.2	14	1.10
R89-90	32525.0	1670	1373	0.009	43.0	0.037	6.9	1.3	16	0.77
R90-99	17582.0	1373	1245	0.007	50.0	0.043	4.7	1.0	13	2.45
R94-96	5386.0	1266	1238	0.005	250.0	0.034	9.6	0.2	2	2.45
R95-96	5016.0	1269	1238	0.006	15.0	0.035	4.0	0.4	4	0.43
R96-97	6178.0	1238	1201	0.006	260.0	0.034	9.7	0.2	2	2.45
R97-98	14784.0	1201	1105	0.006	260.0	0.034	9.7	0.4	5	2.45
R104-105	18322.0	1231	1126	0.006	22.0	0.053	3.7	1.4	17	0.43
R105-106	9610.0	1126	1085	0.004	20.0	0.046	3.9	0.7	8	0.33
R108-109	16210.0	1395	1118	0.017	20.0	0.046	9.5	0.5	6	0.27
R109-110	14203.0	1118	1035	0.006	24.0	0.058	3.5	1.1	14	0.52
R116-117	7392.0	1132	1090	0.006	24.0	0.058	2.7	0.8	9	0.39
R118-64	8818.0	1137	1083	0.006	24.0	0.058	2.8	0.9	11	0.40

3.2.2.3 Storage Route Parameters

General

Reservoir storage routing computations were done for each drainage structure crossing of the Central Arizona Project canal (CAP) except Jackrabbit Wash as the hydraulics of this crossing are included in the floodplain "Hydraulics" portion of this study. The hydraulics of each structure were modelled to obtain stage versus discharge curves. The storage characteristics of the impoundment areas were determined and the effects of storage upstream of the canal were then modelled in HEC-1 using the Modified Puls Method.

Field Reconnaissance

Contour mapping of the area available for ponding upstream of the CAP canal was mapped at a scale of 1"=400' with a 4' contour interval. Refer to Section 2.4. In addition, a field survey was done to obtain as-built physical information for each structure. The physical information gathered consisted of size, type and length of structure, inlet and outlet invert elevations, height and configuration of inlet and outlet structures, a cross section typical of the downstream channel, and heights of the concrete box flume overchute walls.

Hydraulic Computations

The hydraulics of each CAP structure were modelled using the Hydraulics of Bridge and Culvert Waterways (HOBCW) computer program. Refer to Section 6.5: Bibliography Reference Number 12. Program version 3.0 was used for this analysis. The program is based upon the Bureau of Public Roads publication Hydraulics of Bridge Waterways and the U.S Department of Transportation Hydraulic Design of Highway Culverts. Refer to Section 6.5: Bibliography Reference Number 29.

The results of the HOBCW runs are contained in the following sections, organized by CAP structure. Refer to Sheet 3 of Exhibit "C" for the location of each structure. A stage versus discharge curve for each structure is located at the end of each HOBCW results printout.

Each structure was checked under inlet and outlet control. The highest stage resultant from the two conditions was used. The flow rates corresponding to even foot stage increments were tabulated from the stage versus discharge curves and used for input to the HEC-1 models.

Surface Area Computations

The ponding surface areas upstream of each CAP structure were planimetered from the 4' contour interval 1"=400' scale mapping. The area for each 4' contour up to the top of the canal embankment or levees was measured. These areas were input to the HEC-1 computer models with corresponding outflow discharges calculated as described above.

Plots of the discharge and storage volume data calculated and used by HEC-1 for each reservoir route are included as Figures 3 through 11. Data pertinent to each structure is included on each figure.

Central Arizona Project Canal Cross Drain Structures

The USBR station, identifier, and description of each CAP canal cross drain structure is contained in Table F-4a. The storage effects of the ponding areas upstream of each structure were modelled, with the exception of the Jackrabbit Wash crossing which is wide enough to minimize the effects of ponding. The USBR did not include storage routing in the design computations for all of the structures. The design storm and routing status used by the USBR is as follows. Refer to Section 6.5: Bibliography Reference Number 23, Table F-4a, and Sheet 3 of Exhibit "C".

Identifier	USBR Reservoir Route	USBR Design Storm
CAP-1	No	50-Year 6-Hour
CAP-2	Yes	50-Year 6-Hour
CAP-3	Yes	100-Year 6-Hour
CAP-4	Yes	100-Year 6-Hour
CAP-5	No	100-Year 6-Hour
CAP-6	Yes	50-Year 6-Hour
CAP-7	Yes	50-Year 6-Hour
CAP-8	Yes	50-Year 6-Hour
CAP-9	Yes	50-Year 6-Hour
CAP-10	No	50-Year 6-Hour
CAP-11	No	50-Year 6-Hour

Percolation Loss

Percolation loss rates were included in the routing computations. The loss rate at each structure was selected using the following method:

1. The highest anticipated ponding stage was plotted on the 1"=400' scale contour mapping.

2. The SCS soil maps were overlaid on the contour mapping. The most dominate soil map unit in the ponding area was selected.

3. The XKSAT value for the selected soil map unit was converted into a loss rate in cubic feet per second per acre.

The soil map unit chosen for each structure, and the corresponding calculated loss rate, are shown in Table R-6. There is overlap between the percolation losses simulated in the channel routing and those simulated in the reservoir routing. However, the overlap was judged to be negligible.

```
 ************************************************
*  H    H    0000    BBBBB     CCCCC    W      W  *
*  H    H   0    0   B    B   C         W  WW  W  *
*  HHHHHH   0    0   BBBBB    C         W W  W W  *
*  H    H   0    0   B    B   C         WW    WW  *
*  H    H    0000    BBBBB     CCCCC    W      W  *
 ************************************************
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HYDRAULICS OF BRIDGE AND CULVERT WATERWAYS

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GALILEO SOFTWARE
16 RANCH ROAD
CHELMSFORD, MA 01824

VERSION 3.02
SERIAL NUMBER 1003

CAP Structure CAP-1 Hydraulic Calculations

--- HOBCW PROJECT DATA ---

NUMBER OF GROUND STATIONS	:	4
NUMBER OF ROAD STATIONS	:	0
NUMBER OF ROUGNESS COEFFICIENTS	:	4
STREAM SLOPE (ft/ft)	:	.01000
MINIMUM FLOW (cfs)	:	2.00
MAXIMUM FLOW (cfs)	:	100.00
FLOW INCREMENT (cfs)	:	2.00
NUMBER OF CULVERTS	:	1
CULVERT CODE	:	21534
CULVERT SLOPE (ft/ft)	:	.04480
CULVERT LENGTH (ft)	:	190.00
DOWNSTREAM CULVERT INVERT (ft)	:	1350.75
CIRCULAR CULVERT DIAMETER	:	2.50
ENTRANCE LOSS COEFFICIENT Ke	:	.5
CULVERT ROUGHNESS COEFFICIENT	:	.012

--- CROSS SECTION DESCRIPTION ---

STATION NUMBER	STATION (ft)	GROUND ELEVATION (ft)	ROUGNESS FACTOR	ROAD ELEVATION (ft)
1	489.75	1355.75	.0400	
2	497.25	1350.75	.0400	
3	502.75	1350.75	.0400	
4	510.25	1355.75	.0400	

--- HOBCW OUTPUT DATA ---

****

STAGE ELEVATION = 1350.99

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.89	497.25	.0400	.0	.44	.10	.36	.04	.81
497.25	502.75	.0400	1.3	5.50	.24	19.36	1.94	1.45
502.75	503.11	.0400	.0	.44	.10	.36	.04	.81
TOTALS			1.4			20.07	2.01	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .526 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2.01
HEADWATER (ft) : 1359.81
VELOCITY (fps) : 7.76

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2.01
HEADWATER (ft) : 1359.96
VELOCITY (fps) : 7.76

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 8.972
UPSTREAM STAGE (ft) : 1359.965

****

STAGE ELEVATION = 1351.11

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.70	497.25	.0400	.1	.66	.15	1.05	.10	1.06
497.25	502.75	.0400	2.0	5.50	.36	37.92	3.79	1.89
502.75	503.30	.0400	.1	.66	.15	1.05	.10	1.06
TOTALS			2.2			40.02	4.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .567 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4.00
HEADWATER (ft) : 1360.10
VELOCITY (fps) : 9.54

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4.00
HEADWATER (ft) : 1360.27
VELOCITY (fps) : 9.54

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.157
UPSTREAM STAGE (ft) : 1360.271

****

STAGE ELEVATION = 1351.21

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.56	497.25	.0400	.2	.83	.19	1.97	.20	1.24
497.25	502.75	.0400	2.5	5.50	.46	56.17	5.62	2.22
502.75	503.44	.0400	.2	.83	.19	1.97	.20	1.24
TOTALS			2.9			60.11	6.01	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .593 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 6.01
HEADWATER (ft) : 1360.36
VELOCITY (fps) : 10.76

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 6.01
HEADWATER (ft) : 1360.51
VELOCITY (fps) : 10.76

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.305
UPSTREAM STAGE (ft) : 1360.515

****

STAGE ELEVATION = 1351.29

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.43	497.25	.0400	.2	.98	.23	3.05	.31	1.38
497.25	502.75	.0400	3.0	5.50	.54	73.92	7.39	2.47
502.75	503.57	.0400	.2	.98	.23	3.05	.31	1.38
TOTALS			3.4			80.03	8.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .612 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 8.00
HEADWATER (ft) : 1360.58
VELOCITY (fps) : 11.70

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 8.00
HEADWATER (ft) : 1360.73
VELOCITY (fps) : 11.70

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.432
UPSTREAM STAGE (ft) : 1360.726

****

STAGE ELEVATION = 1351.37

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.32	497.25	.0400	.3	1.11	.26	4.29	.43	1.50
497.25	502.75	.0400	3.4	5.50	.62	91.44	9.14	2.69
502.75	503.68	.0400	.3	1.11	.26	4.29	.43	1.50
TOTALS			4.0			100.02	10.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .627 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 10.00
HEADWATER (ft) : 1360.78
VELOCITY (fps) : 12.49

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 10.00
HEADWATER (ft) : 1360.92
VELOCITY (fps) : 12.49

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.550
UPSTREAM STAGE (ft) : 1360.917

****

STAGE ELEVATION = 1351.43

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.22	497.25	.0400	.4	1.23	.28	5.65	.57	1.61
497.25	502.75	.0400	3.8	5.50	.68	108.68	10.87	2.89
502.75	503.78	.0400	.4	1.23	.28	5.65	.57	1.61
TOTALS			4.5			119.99	12.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .639 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 12.00
HEADWATER (ft) : 1360.96
VELOCITY (fps) : 13.17

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 12.00
HEADWATER (ft) : 1361.10
VELOCITY (fps) : 13.17

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.661
UPSTREAM STAGE (ft) : 1361.096

****

STAGE ELEVATION = 1351.50

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.13	497.25	.0400	.4	1.35	.31	7.15	.72	1.71
497.25	502.75	.0400	4.1	5.50	.75	125.88	12.59	3.06
502.75	503.87	.0400	.4	1.35	.31	7.15	.72	1.71
TOTALS			5.0			140.19	14.02	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .650 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 14.02
HEADWATER (ft) : 1361.12
VELOCITY (fps) : 13.79

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 14.02
HEADWATER (ft) : 1361.27
VELOCITY (fps) : 13.79

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.769
DOWNSTREAM STAGE (ft) : 1361.266

****

STAGE ELEVATION = 1351.56

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.04	497.25	.0400	.5	1.45	.34	8.73	.87	1.79
497.25	502.75	.0400	4.4	5.50	.81	142.60	14.26	3.22
502.75	503.96	.0400	.5	1.45	.34	8.73	.87	1.79
TOTALS			5.4			160.07	16.01	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .660 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 16.01
HEADWATER (ft) : 1361.28
VELOCITY (fps) : 14.33

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 16.01
HEADWATER (ft) : 1361.43
VELOCITY (fps) : 14.33

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.872
UPSTREAM STAGE (ft) : 1361.428

****

STAGE ELEVATION = 1351.61

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.96	497.25	.0400	.6	1.55	.36	10.42	1.04	1.87
497.25	502.75	.0400	4.7	5.50	.86	159.21	15.92	3.36
502.75	504.04	.0400	.6	1.55	.36	10.42	1.04	1.87
TOTALS			5.8			180.04	18.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .668 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 18.00
HEADWATER (ft) : 1361.44
VELOCITY (fps) : 14.80

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 18.00
HEADWATER (ft) : 1361.58
VELOCITY (fps) : 14.80

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.974
UPSTREAM STAGE (ft) : 1361.585

****

STAGE ELEVATION = 1351.66

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.88	497.25	.0400	.6	1.65	.38	12.22	1.22	1.95
497.25	502.75	.0400	5.0	5.50	.91	175.91	17.59	3.50
502.75	504.12	.0400	.6	1.65	.38	12.22	1.22	1.95
TOTALS			6.3			200.34	20.03	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .676 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 20.03
HEADWATER (ft) : 1361.59
VELOCITY (fps) : 15.27

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 20.03
HEADWATER (ft) : 1361.74
VELOCITY (fps) : 15.27

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 10.077
UPSTREAM STAGE (ft) : 1361.740

****

STAGE ELEVATION = 1351.71

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.80	497.25	.0400	.7	1.74	.40	14.06	1.41	2.02
497.25	502.75	.0400	5.3	5.50	.96	192.01	19.20	3.62
502.75	504.20	.0400	.7	1.74	.40	14.06	1.41	2.02
TOTALS			6.7			220.12	22.01	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .683 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 22.01
HEADWATER (ft) : 1361.74
VELOCITY (fps) : 15.66

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 22.01
HEADWATER (ft) : 1361.89
VELOCITY (fps) : 15.66

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 10.177
UPSTREAM STAGE (ft) : 1361.890

****

STAGE ELEVATION = 1351.76

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.73	497.25	.0400	.8	1.82	.42	15.99	1.60	2.09
497.25	502.75	.0400	5.6	5.50	1.01	208.08	20.81	3.74
502.75	504.27	.0400	.8	1.82	.42	15.99	1.60	2.09
TOTALS			7.1			240.05	24.01	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .689 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 24.01
HEADWATER (ft) : 1361.90
VELOCITY (fps) : 16.05

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 24.01
HEADWATER (ft) : 1362.04
VELOCITY (fps) : 16.05

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 10.278
UPSTREAM STAGE (ft) : 1362.038

****

STAGE ELEVATION = 1351.81

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
495.66	497.25	.0400	.8	1.91	.44	18.01	1.80	2.15
497.25	502.75	.0400	5.8	5.50	1.06	224.15	22.41	3.86
502.75	504.34	.0400	.8	1.91	.44	18.01	1.80	2.15
TOTALS			7.5			260.16	26.02	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .695 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 26.02
HEADWATER (ft) : 1362.07
VELOCITY (fps) : 16.41

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 26.02
HEADWATER (ft) : 1362.19
VELOCITY (fps) : 16.41

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 10.381
UPSTREAM STAGE (ft) : 1362.188

****

STAGE ELEVATION = 1351.85

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.60	497.25	.0400	.9	1.99	.46	20.11	2.01	2.21
497.25	502.75	.0400	6.1	5.50	1.10	240.20	24.02	3.96
502.75	504.40	.0400	.9	1.99	.46	20.11	2.01	2.21
TOTALS			7.9			280.43	28.04	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .701 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 28.04
HEADWATER (ft) : 1362.25
VELOCITY (fps) : 16.75

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 28.04
HEADWATER (ft) : 1362.34
VELOCITY (fps) : 16.75

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 10.487
UPSTREAM STAGE (ft) : 1362.338

****

STAGE ELEVATION = 1351.89

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.53	497.25	.0400	1.0	2.06	.48	22.21	2.22	2.26
497.25	502.75	.0400	6.3	5.50	1.14	255.56	25.56	4.06
502.75	504.47	.0400	1.0	2.06	.48	22.21	2.22	2.26
TOTALS			8.3			299.98	30.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .706 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 30.00
HEADWATER (ft) : 1362.43
VELOCITY (fps) : 17.07

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 30.00
HEADWATER (ft) : 1362.48
VELOCITY (fps) : 17.07

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 10.591
UPSTREAM STAGE (ft) : 1362.485

****

STAGE ELEVATION = 1351.94

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.47	497.25	.0400	1.1	2.14	.49	24.41	2.44	2.32
497.25	502.75	.0400	6.5	5.50	1.18	271.11	27.11	4.16
502.75	504.53	.0400	1.1	2.14	.49	24.41	2.44	2.32
TOTALS			8.6			319.94	31.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .711 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 31.99
HEADWATER (ft) : 1362.63
VELOCITY (fps) : 17.36

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 31.99
HEADWATER (ft) : 1362.64
VELOCITY (fps) : 17.36

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 10.701
UPSTREAM STAGE (ft) : 1362.636

****

STAGE ELEVATION = 1351.98

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.41	497.25	.0400	1.1	2.21	.51	26.68	2.67	2.37
497.25	502.75	.0400	6.7	5.50	1.22	286.55	28.66	4.25
502.75	504.59	.0400	1.1	2.21	.51	26.68	2.67	2.37
TOTALS			9.0			339.90	33.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .715 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 33.99
HEADWATER (ft) : 1362.84
VELOCITY (fps) : 17.63

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 33.99
HEADWATER (ft) : 1362.79
VELOCITY (fps) : 17.63

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 10.862
UPSTREAM STAGE (ft) : 1362.837

****

STAGE ELEVATION = 1352.01

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.35	497.25	.0400	1.2	2.28	.53	29.00	2.90	2.42
497.25	502.75	.0400	7.0	5.50	1.26	301.89	30.19	4.34
502.75	504.65	.0400	1.2	2.28	.53	29.00	2.90	2.42
TOTALS			9.3			359.89	35.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .719 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 35.99
HEADWATER (ft) : 1363.06
VELOCITY (fps) : 17.92

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 35.99
HEADWATER (ft) : 1362.94
VELOCITY (fps) : 17.92

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 11.047
UPSTREAM STAGE (ft) : 1363.061

****

STAGE ELEVATION = 1352.05

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.30	497.25	.0400	1.3	2.35	.54	31.37	3.14	2.47
497.25	502.75	.0400	7.2	5.50	1.30	317.11	31.71	4.43
502.75	504.70	.0400	1.3	2.35	.54	31.37	3.14	2.47
TOTALS			9.7			379.85	37.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .723 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 37.98
HEADWATER (ft) : 1363.30
VELOCITY (fps) : 18.17

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 37.98
HEADWATER (ft) : 1363.10
VELOCITY (fps) : 18.17

--- INLET CONTROL GOVERNS ---

HEADWATER (ft) : 11.247
UPSTREAM STAGE (ft) : 1363.299

****

STAGE ELEVATION = 1352.09

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.24	497.25	.0400	1.3	2.41	.56	33.80	3.38	2.51
497.25	502.75	.0400	7.4	5.50	1.34	332.21	33.22	4.51
502.75	504.76	.0400	1.3	2.41	.56	33.80	3.38	2.51
TOTALS			10.1			399.81	39.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .727 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 39.98
HEADWATER (ft) : 1363.55
VELOCITY (fps) : 18.43

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 39.98
HEADWATER (ft) : 1363.27
VELOCITY (fps) : 18.43

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 11.463
UPSTREAM STAGE (ft) : 1363.552

****

STAGE ELEVATION = 1352.13

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.19	497.25	.0400	1.4	2.48	.57	36.27	3.63	2.56
497.25	502.75	.0400	7.6	5.50	1.37	347.19	34.72	4.59
502.75	504.81	.0400	1.4	2.48	.57	36.27	3.63	2.56
TOTALS			10.4			419.72	41.97	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .731 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 41.97
HEADWATER (ft) : 1363.82
VELOCITY (fps) : 18.64

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 41.97
HEADWATER (ft) : 1363.44
VELOCITY (fps) : 18.64

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 11.694
UPSTREAM STAGE (ft) : 1363.819

****

STAGE ELEVATION = 1352.16

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.14	497.25	.0400	1.5	2.54	.59	38.79	3.88	2.60
497.25	502.75	.0400	7.8	5.50	1.41	362.12	36.21	4.67
502.75	504.86	.0400	1.5	2.54	.59	38.79	3.88	2.60
TOTALS			10.7			439.70	43.97	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .734 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 43.97
HEADWATER (ft) : 1364.10
VELOCITY (fps) : 18.86

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 43.97
HEADWATER (ft) : 1363.61
VELOCITY (fps) : 18.86

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 11.942
UPSTREAM STAGE (ft) : 1364.102

****

STAGE ELEVATION = 1352.19

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.08	497.25	.0400	1.6	2.60	.60	41.36	4.14	2.64
497.25	502.75	.0400	7.9	5.50	1.44	376.92	37.69	4.75
502.75	504.92	.0400	1.6	2.60	.60	41.36	4.14	2.64
TOTALS			11.1			459.64	45.96	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .738 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 45.96
HEADWATER (ft) : 1364.40
VELOCITY (fps) : 19.10

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 45.96
HEADWATER (ft) : 1363.79
VELOCITY (fps) : 19.10

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 12.204
UPSTREAM STAGE (ft) : 1364.399

****

STAGE ELEVATION = 1352.23

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
495.03	497.25	.0400	1.6	2.66	.61	43.97	4.40	2.69
497.25	502.75	.0400	8.1	5.50	1.48	391.59	39.16	4.82
502.75	504.97	.0400	1.6	2.66	.61	43.97	4.40	2.69
TOTALS			11.4			479.52	47.95	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .741 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 47.95
HEADWATER (ft) : 1364.71
VELOCITY (fps) : 19.29

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 47.95
HEADWATER (ft) : 1363.97
VELOCITY (fps) : 19.29

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 12.481
UPSTREAM STAGE (ft) : 1364.709

****

STAGE ELEVATION = 1352.26

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.98	497.25	.0400	1.7	2.72	.63	46.63	4.66	2.73
497.25	502.75	.0400	8.3	5.50	1.51	406.25	40.63	4.89
502.75	505.02	.0400	1.7	2.72	.63	46.63	4.66	2.73
TOTALS			11.7			499.51	49.95	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .744 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 49.95
HEADWATER (ft) : 1365.03
VELOCITY (fps) : 19.49

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 49.95
HEADWATER (ft) : 1364.17
VELOCITY (fps) : 19.49

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 12.774
UPSTREAM STAGE (ft) : 1365.035

****

STAGE ELEVATION = 1352.29

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.94	497.25	.0400	1.8	2.78	.64	49.32	4.93	2.76
497.25	502.75	.0400	8.5	5.50	1.54	420.75	42.07	4.96
502.75	505.06	.0400	1.8	2.78	.64	49.32	4.93	2.76
TOTALS			12.1			519.39	51.94	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .747 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 51.94
HEADWATER (ft) : 1365.37
VELOCITY (fps) : 19.68

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 51.94
HEADWATER (ft) : 1364.36
VELOCITY (fps) : 19.68

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.079
UPSTREAM STAGE (ft) : 1365.373

****

STAGE ELEVATION = 1352.33

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.89	497.25	.0400	1.9	2.84	.66	52.15	5.21	2.80
497.25	502.75	.0400	8.7	5.50	1.58	435.67	43.57	5.03
502.75	505.11	.0400	1.9	2.84	.66	52.15	5.21	2.80
TOTALS			12.4			539.96	54.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .750 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 54.00
HEADWATER (ft) : 1365.74
VELOCITY (fps) : 19.87

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 54.00
HEADWATER (ft) : 1364.58
VELOCITY (fps) : 19.87

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.411
UPSTREAM STAGE (ft) : 1365.737

****

STAGE ELEVATION = 1352.36

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.84	497.25	.0400	1.9	2.90	.67	54.94	5.49	2.84
497.25	502.75	.0400	8.8	5.50	1.61	450.11	45.01	5.10
502.75	505.16	.0400	1.9	2.90	.67	54.94	5.49	2.84
TOTALS			12.7			560.00	56.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .753 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 56.00
HEADWATER (ft) : 1366.10
VELOCITY (fps) : 20.02

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 56.00
HEADWATER (ft) : 1364.79
VELOCITY (fps) : 20.02

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.748
UPSTREAM STAGE (ft) : 1366.104

****

STAGE ELEVATION = 1352.39

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.79	497.25	.0400	2.0	2.95	.68	57.77	5.78	2.88
497.25	502.75	.0400	9.0	5.50	1.64	464.46	46.45	5.16
502.75	505.21	.0400	2.0	2.95	.68	57.77	5.78	2.88
TOTALS			13.0			580.00	58.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .755 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 58.00
HEADWATER (ft) : 1366.48
VELOCITY (fps) : 20.19

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 58.00
HEADWATER (ft) : 1365.01
VELOCITY (fps) : 20.19

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 14.097
UPSTREAM STAGE (ft) : 1366.483

****

STAGE ELEVATION = 1352.42

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.75	497.25	.0400	2.1	3.00	.69	60.64	6.06	2.91
497.25	502.75	.0400	9.2	5.50	1.67	478.75	47.87	5.22
502.75	505.25	.0400	2.1	3.00	.69	60.64	6.06	2.91
TOTALS			13.3			600.02	60.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .758 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 60.00
HEADWATER (ft) : 1366.88
VELOCITY (fps) : 20.35

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 60.00
HEADWATER (ft) : 1365.24
VELOCITY (fps) : 20.35

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 14.459
UPSTREAM STAGE (ft) : 1366.876

****

STAGE ELEVATION = 1352.45

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.71	497.25	.0400	2.2	3.06	.71	63.54	6.35	2.94
497.25	502.75	.0400	9.3	5.50	1.70	492.91	49.29	5.28
502.75	505.29	.0400	2.2	3.06	.71	63.54	6.35	2.94
TOTALS			13.6			619.98	62.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .760 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 62.00
HEADWATER (ft) : 1367.28
VELOCITY (fps) : 20.51

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 62.00
HEADWATER (ft) : 1365.48
VELOCITY (fps) : 20.51

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 14.833
UPSTREAM STAGE (ft) : 1367.279

****

STAGE ELEVATION = 1352.48

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.66	497.25	.0400	2.2	3.11	.72	66.48	6.65	2.98
497.25	502.75	.0400	9.5	5.50	1.73	507.06	50.71	5.34
502.75	505.34	.0400	2.2	3.11	.72	66.48	6.65	2.98
TOTALS			14.0			640.02	64.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .762 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 64.00
HEADWATER (ft) : 1367.70
VELOCITY (fps) : 20.66

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 64.00
HEADWATER (ft) : 1365.72
VELOCITY (fps) : 20.66

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 15.220
UPSTREAM STAGE (ft) : 1367.696

****

STAGE ELEVATION = 1352.50

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.62	497.25	.0400	2.3	3.16	.73	69.44	6.94	3.01
497.25	502.75	.0400	9.6	5.50	1.75	521.07	52.11	5.40
502.75	505.38	.0400	2.3	3.16	.73	69.44	6.94	3.01
TOTALS			14.3			659.96	66.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .765 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 66.00
HEADWATER (ft) : 1368.12
VELOCITY (fps) : 20.78

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 66.00
HEADWATER (ft) : 1365.97
VELOCITY (fps) : 20.78

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 15.618
UPSTREAM STAGE (ft) : 1368.122

****

STAGE ELEVATION = 1352.53

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.58	497.25	.0400	2.4	3.21	.74	72.46	7.25	3.04
497.25	502.75	.0400	9.8	5.50	1.78	535.11	53.51	5.46
502.75	505.42	.0400	2.4	3.21	.74	72.46	7.25	3.04
TOTALS			14.6			680.03	68.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .767 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 68.00
HEADWATER (ft) : 1368.56
VELOCITY (fps) : 20.91

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 68.00
HEADWATER (ft) : 1366.23
VELOCITY (fps) : 20.91

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.032
UPSTREAM STAGE (ft) : 1368.564

****

STAGE ELEVATION = 1352.56

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.54	497.25	.0400	2.5	3.26	.75	75.49	7.55	3.07
497.25	502.75	.0400	10.0	5.50	1.81	548.99	54.90	5.52
502.75	505.46	.0400	2.5	3.26	.75	75.49	7.55	3.07
TOTALS			14.9			699.97	70.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .769 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 70.00
HEADWATER (ft) : 1369.01
VELOCITY (fps) : 21.05

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 70.00
HEADWATER (ft) : 1366.50
VELOCITY (fps) : 21.05

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.455
UPSTREAM STAGE (ft) : 1369.015

****

STAGE ELEVATION = 1352.59

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.49	497.25	.0400	2.5	3.31	.76	78.57	7.86	3.11
497.25	502.75	.0400	10.1	5.50	1.84	562.89	56.29	5.57
502.75	505.51	.0400	2.5	3.31	.76	78.57	7.86	3.11
TOTALS			15.2			720.03	72.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .771 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 72.00
HEADWATER (ft) : 1369.48
VELOCITY (fps) : 21.17

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 72.00
HEADWATER (ft) : 1366.77
VELOCITY (fps) : 21.17

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.895
UPSTREAM STAGE (ft) : 1369.481

****

STAGE ELEVATION = 1352.61

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.45	497.25	.0400	2.6	3.36	.78	81.67	8.17	3.14
497.25	502.75	.0400	10.3	5.50	1.86	576.67	57.67	5.63
502.75	505.55	.0400	2.6	3.36	.78	81.67	8.17	3.14
TOTALS			15.5			740.01	74.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .773 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 74.00
HEADWATER (ft) : 1369.96
VELOCITY (fps) : 21.27

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 74.00
HEADWATER (ft) : 1367.06
VELOCITY (fps) : 21.27

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 17.346
UPSTREAM STAGE (ft) : 1369.960

****

STAGE ELEVATION = 1352.64

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.41	497.25	.0400	2.7	3.41	.79	84.80	8.48	3.16
497.25	502.75	.0400	10.4	5.50	1.89	590.40	59.04	5.68
502.75	505.59	.0400	2.7	3.41	.79	84.80	8.48	3.16
TOTALS			15.8			760.00	76.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .775 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 76.00
HEADWATER (ft) : 1370.45
VELOCITY (fps) : 21.37

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 76.00
HEADWATER (ft) : 1367.35
VELOCITY (fps) : 21.37

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 17.813
UPSTREAM STAGE (ft) : 1370.453

****

STAGE ELEVATION = 1352.67

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.38	497.25	.0400	2.8	3.45	.80	87.97	8.80	3.19
497.25	502.75	.0400	10.5	5.50	1.92	604.06	60.41	5.73
502.75	505.62	.0400	2.8	3.45	.80	87.97	8.80	3.19
TOTALS			16.0			779.99	78.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .777 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 78.00
HEADWATER (ft) : 1370.96
VELOCITY (fps) : 21.47

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 78.00
HEADWATER (ft) : 1367.64
VELOCITY (fps) : 21.47

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.296
UPSTREAM STAGE (ft) : 1370.962

****

STAGE ELEVATION = 1352.69

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.34	497.25	.0400	2.8	3.50	.81	91.15	9.12	3.22
497.25	502.75	.0400	10.7	5.50	1.94	617.65	61.77	5.78
502.75	505.66	.0400	2.8	3.50	.81	91.15	9.12	3.22
TOTALS			16.3			799.96	80.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .779 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 80.00
HEADWATER (ft) : 1371.49
VELOCITY (fps) : 21.55

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 80.00
HEADWATER (ft) : 1367.95
VELOCITY (fps) : 21.55

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.796
UPSTREAM STAGE (ft) : 1371.488

****

STAGE ELEVATION = 1352.72

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.30	497.25	.0400	2.9	3.55	.82	94.38	9.44	3.25
497.25	502.75	.0400	10.8	5.50	1.97	631.23	63.12	5.83
502.75	505.70	.0400	2.9	3.55	.82	94.38	9.44	3.25
TOTALS			16.6			820.00	82.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .781 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 82.00
HEADWATER (ft) : 1372.04
VELOCITY (fps) : 21.64

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 82.00
HEADWATER (ft) : 1368.26
VELOCITY (fps) : 21.64

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.318
UPSTREAM STAGE (ft) : 1372.036

****

STAGE ELEVATION = 1352.74

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.26	497.25	.0400	3.0	3.59	.83	97.63	9.76	3.28
497.25	502.75	.0400	11.0	5.50	1.99	644.74	64.47	5.88
502.75	505.74	.0400	3.0	3.59	.83	97.63	9.76	3.28
TOTALS			16.9			840.00	84.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .783 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 84.00
HEADWATER (ft) : 1372.60
VELOCITY (fps) : 21.72

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 84.00
HEADWATER (ft) : 1368.58
VELOCITY (fps) : 21.72

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.861
UPSTREAM STAGE (ft) : 1372.604

****

STAGE ELEVATION = 1352.77

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.22	497.25	.0400	3.1	3.64	.84	100.90	10.09	3.31
497.25	502.75	.0400	11.1	5.50	2.02	658.16	65.82	5.93
502.75	505.78	.0400	3.1	3.64	.84	100.90	10.09	3.31
TOTALS			17.2			859.96	86.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .784 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 86.00
HEADWATER (ft) : 1373.19
VELOCITY (fps) : 21.77

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 86.00
HEADWATER (ft) : 1368.91
VELOCITY (fps) : 21.77

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.427
UPSTREAM STAGE (ft) : 1373.195

****

STAGE ELEVATION = 1352.79

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.19	497.25	.0400	3.1	3.68	.85	104.21	10.42	3.33
497.25	502.75	.0400	11.2	5.50	2.04	671.55	67.15	5.98
502.75	505.81	.0400	3.1	3.68	.85	104.21	10.42	3.33
TOTALS			17.5			879.97	88.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .786 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 88.00
HEADWATER (ft) : 1373.81
VELOCITY (fps) : 21.83

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 88.00
HEADWATER (ft) : 1369.25
VELOCITY (fps) : 21.83

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 21.023
UPSTREAM STAGE (ft) : 1373.815

****

STAGE ELEVATION = 1352.82

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.15	497.25	.0400	3.2	3.73	.86	107.55	10.75	3.36
497.25	502.75	.0400	11.4	5.50	2.07	684.92	68.49	6.03
502.75	505.85	.0400	3.2	3.73	.86	107.55	10.75	3.36
TOTALS			17.8			900.02	90.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .788 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 90.00
HEADWATER (ft) : 1374.47
VELOCITY (fps) : 21.87

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 90.00
HEADWATER (ft) : 1369.59
VELOCITY (fps) : 21.87

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 21.650
UPSTREAM STAGE (ft) : 1374.467

****

STAGE ELEVATION = 1352.84

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.11	497.25	.0400	3.3	3.77	.87	110.90	11.09	3.38
497.25	502.75	.0400	11.5	5.50	2.09	698.19	69.82	6.07
502.75	505.89	.0400	3.3	3.77	.87	110.90	11.09	3.38
TOTALS			18.0			919.99	92.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .789 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 92.00
HEADWATER (ft) : 1375.15
VELOCITY (fps) : 21.89

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 92.00
HEADWATER (ft) : 1369.94
VELOCITY (fps) : 21.89

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 22.311
UPSTREAM STAGE (ft) : 1375.151

****

STAGE ELEVATION = 1352.86

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.08	497.25	.0400	3.4	3.81	.88	114.28	11.43	3.41
497.25	502.75	.0400	11.6	5.50	2.11	711.42	71.14	6.12
502.75	505.92	.0400	3.4	3.81	.88	114.28	11.43	3.41
TOTALS			18.3			939.99	94.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .791 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 94.00
HEADWATER (ft) : 1375.88
VELOCITY (fps) : 21.90

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 94.00
HEADWATER (ft) : 1370.30
VELOCITY (fps) : 21.90

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 23.011
UPSTREAM STAGE (ft) : 1375.875

****

STAGE ELEVATION = 1352.89

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.04	497.25	.0400	3.4	3.85	.89	117.69	11.77	3.44
497.25	502.75	.0400	11.8	5.50	2.14	724.61	72.46	6.16
502.75	505.96	.0400	3.4	3.85	.89	117.69	11.77	3.44
TOTALS			18.6			960.00	96.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .792 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1359.183000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1359.183000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 96.00
HEADWATER (ft) : 1376.64
VELOCITY (fps) : 19.56

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 96.00
HEADWATER (ft) : 1370.95
VELOCITY (fps) : 19.58

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 23.757
UPSTREAM STAGE (ft) : 1376.644

****

STAGE ELEVATION = 1352.91

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
494.01	497.25	.0400	3.5	3.89	.90	121.13	12.11	3.46
497.25	502.75	.0400	11.9	5.50	2.16	737.77	73.78	6.21
502.75	505.99	.0400	3.5	3.89	.90	121.13	12.11	3.46
TOTALS			18.9			980.03	98.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .794 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1359.434000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1359.434000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 98.00
HEADWATER (ft) : 1377.46
VELOCITY (fps) : 19.97

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 98.00
HEADWATER (ft) : 1371.71
VELOCITY (fps) : 19.98

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 24.553
UPSTREAM STAGE (ft) : 1377.463

****

STAGE ELEVATION = 1352.93

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
493.97	497.25	.0400	3.6	3.94	.91	124.57	12.46	3.48
497.25	502.75	.0400	12.0	5.50	2.18	750.80	75.08	6.25
502.75	506.03	.0400	3.6	3.94	.91	124.57	12.46	3.48
TOTALS			19.2			999.95	100.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .795 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1359.689000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1359.689000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 100.00
HEADWATER (ft) : 1378.33
VELOCITY (fps) : 20.37

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 100.00
HEADWATER (ft) : 1372.47
VELOCITY (fps) : 20.39

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 25.400
UPSTREAM STAGE (ft) : 1378.333

--- SUMMARY OF RESULTS ---

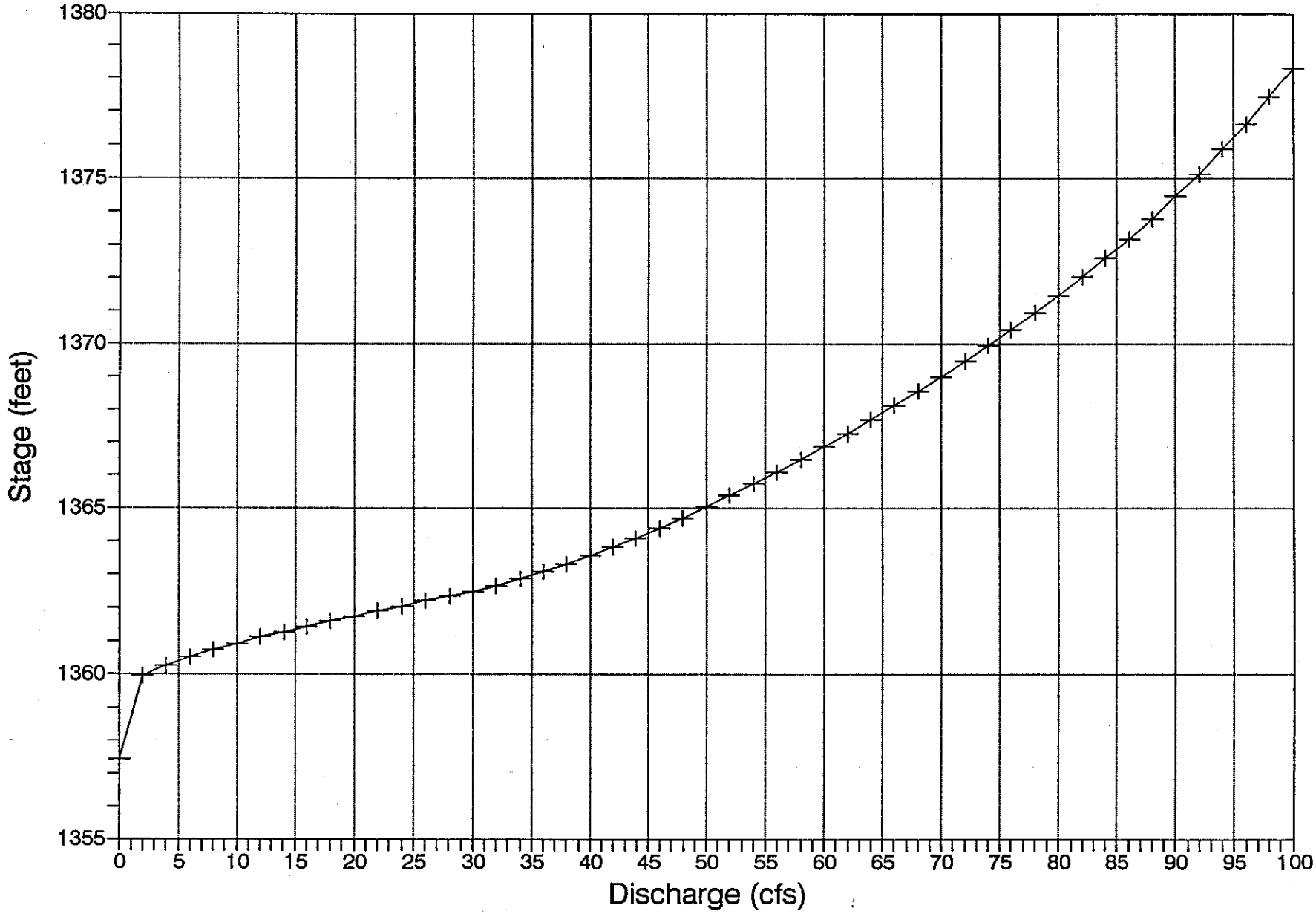
FLOW (cfs)	TAILWATER ELEVATION (ft)	HEADWATER ELEVATION (ft)	BACKWATER (ft)
2.01	1350.99	1359.96	8.97
4.00	1351.11	1360.27	9.16
6.01	1351.21	1360.51	9.30
8.00	1351.29	1360.73	9.43
10.00	1351.37	1360.92	9.55
12.00	1351.43	1361.10	9.66
14.02	1351.50	1361.27	9.77
16.01	1351.56	1361.43	9.87
18.00	1351.61	1361.58	9.97
20.03	1351.66	1361.74	10.08
22.01	1351.71	1361.89	10.18
24.01	1351.76	1362.04	10.28
26.02	1351.81	1362.19	10.38
28.04	1351.85	1362.34	10.49
30.00	1351.89	1362.48	10.59
31.99	1351.94	1362.64	10.70
33.99	1351.98	1362.84	10.86
35.99	1352.01	1363.06	11.05
37.98	1352.05	1363.30	11.25
39.98	1352.09	1363.55	11.46
41.97	1352.13	1363.82	11.69
43.97	1352.16	1364.10	11.94
45.96	1352.19	1364.40	12.20
47.95	1352.23	1364.71	12.48
49.95	1352.26	1365.03	12.77
51.94	1352.29	1365.37	13.08
54.00	1352.33	1365.74	13.41
56.00	1352.36	1366.10	13.75
58.00	1352.39	1366.48	14.10
60.00	1352.42	1366.88	14.46
62.00	1352.45	1367.28	14.83
64.00	1352.48	1367.70	15.22
66.00	1352.50	1368.12	15.62
68.00	1352.53	1368.56	16.03
70.00	1352.56	1369.01	16.46
72.00	1352.59	1369.48	16.89
74.00	1352.61	1369.96	17.35
76.00	1352.64	1370.45	17.81
78.00	1352.67	1370.96	18.30
80.00	1352.69	1371.49	18.80
82.00	1352.72	1372.04	19.32
84.00	1352.74	1372.60	19.86

CAP Structure CAP-1 Hydraulic Calculations

86.00	1352.77	1373.19	20.43
88.00	1352.79	1373.81	21.02
90.00	1352.82	1374.47	21.65
92.00	1352.84	1375.15	22.31
94.00	1352.86	1375.88	23.01
96.00	1352.89	1376.64	23.76
98.00	1352.91	1377.46	24.55
100.00	1352.93	1378.33	25.40

CAP CANAL STAGE-DISCHARGE CURVE

CAP-1, Sta. 121+60



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*  H    H   0    0   B    B   C         WW    WW  *
*  H    H    0000    BBBBB     CCCCC    W      W  *
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GALILEO SOFTWARE
16 RANCH ROAD
CHELMSFORD, MA 01824

VERSION 3.02
SERIAL NUMBER 1003

CAP Structure CAP-2 Hydraulic Calculations

--- HOBCW PROJECT DATA ---

NUMBER OF GROUND STATIONS	:	4
NUMBER OF ROAD STATIONS	:	0
NUMBER OF ROUGNESS COEFFICIENTS	:	4
STREAM SLOPE (ft/ft)	:	.00700
MINIMUM FLOW (cfs)	:	25.00
MAXIMUM FLOW (cfs)	:	650.00
FLOW INCREMENT (cfs)	:	25.00
NUMBER OF CULVERTS	:	2
CULVERT CODE	:	21534
CULVERT SLOPE (ft/ft)	:	.02600
CULVERT LENGTH (ft)	:	199.00
DOWNSTREAM CULVERT INVERT (ft)	:	1349.16
CIRCULAR CULVERT DIAMETER	:	4.00
ENTRANCE LOSS COEFFICIENT Ke	:	.5
CULVERT ROUGHNESS COEFFICIENT	:	.012

--- CROSS SECTION DESCRIPTION ---

STATION NUMBER	STATION (ft)	GROUND ELEVATION (ft)	ROUGNESS FACTOR	ROAD ELEVATION (ft)
1	481.70	1359.16	.0440	
2	491.70	1349.16	.0440	
3	508.30	1349.16	.0440	
4	518.30	1359.16	.0440	

--- HOBCW OUTPUT DATA ---

****

STAGE ELEVATION = 1349.84

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
491.02	491.70	.0440	.2	.96	.24	2.99	.25	1.09
491.70	508.30	.0440	11.2	16.60	.68	292.81	24.50	2.18
508.30	508.98	.0440	.2	.96	.24	2.99	.25	1.09
TOTALS			11.7			298.78	25.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .472 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 12.50
HEADWATER (ft) : 1355.65
VELOCITY (fps) : 10.42

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 12.50
HEADWATER (ft) : 1355.92
VELOCITY (fps) : 10.42

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 6.080
UPSTREAM STAGE (ft) : 1355.917

****

STAGE ELEVATION = 1350.18

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
490.68	491.70	.0440	.5	1.44	.36	8.91	.75	1.43
491.70	508.30	.0440	16.9	16.60	1.02	579.92	48.52	2.86
508.30	509.32	.0440	.5	1.44	.36	8.91	.75	1.43
TOTALS			18.0			597.74	50.01	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .508 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 25.01
HEADWATER (ft) : 1356.39
VELOCITY (fps) : 12.77

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 25.01
HEADWATER (ft) : 1356.63
VELOCITY (fps) : 12.77

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 6.450
UPSTREAM STAGE (ft) : 1356.631

****

STAGE ELEVATION = 1350.46

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
490.41	491.70	.0440	.8	1.83	.46	16.82	1.41	1.68
491.70	508.30	.0440	21.5	16.60	1.29	862.47	72.16	3.36
508.30	509.59	.0440	.8	1.83	.46	16.82	1.41	1.68
TOTALS			23.2			896.11	74.97	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .531 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 37.49
HEADWATER (ft) : 1356.99
VELOCITY (fps) : 14.37

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 37.49
HEADWATER (ft) : 1357.21
VELOCITY (fps) : 14.37

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 6.754
UPSTREAM STAGE (ft) : 1357.209

****

STAGE ELEVATION = 1350.69

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
490.17	491.70	.0440	1.2	2.17	.54	26.37	2.21	1.88
491.70	508.30	.0440	25.4	16.60	1.53	1142.44	95.58	3.76
508.30	509.83	.0440	1.2	2.17	.54	26.37	2.21	1.88
TOTALS			27.8			1195.19	100.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .548 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 50.00
HEADWATER (ft) : 1357.50
VELOCITY (fps) : 15.60

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 50.00
HEADWATER (ft) : 1357.73
VELOCITY (fps) : 15.60

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 7.033
UPSTREAM STAGE (ft) : 1357.726

****

STAGE ELEVATION = 1350.91

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
489.95	491.70	.0440	1.5	2.47	.62	37.33	3.12	2.05
491.70	508.30	.0440	29.0	16.60	1.75	1419.45	118.76	4.10
508.30	510.05	.0440	1.5	2.47	.62	37.33	3.12	2.05
TOTALS			32.0			1494.10	125.01	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .561 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 62.50
HEADWATER (ft) : 1357.97
VELOCITY (fps) : 16.61

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 62.50
HEADWATER (ft) : 1358.21
VELOCITY (fps) : 16.61

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 7.304
UPSTREAM STAGE (ft) : 1358.210

****

STAGE ELEVATION = 1351.10

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
489.76	491.70	.0440	1.9	2.75	.69	49.52	4.14	2.20
491.70	508.30	.0440	32.2	16.60	1.94	1693.82	141.72	4.40
508.30	510.24	.0440	1.9	2.75	.69	49.52	4.14	2.20
TOTALS			36.0			1792.87	150.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .572 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 75.00
HEADWATER (ft) : 1358.45
VELOCITY (fps) : 17.46

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 75.00
HEADWATER (ft) : 1358.68
VELOCITY (fps) : 17.46

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 7.574
UPSTREAM STAGE (ft) : 1358.676

****

STAGE ELEVATION = 1351.28

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
489.58	491.70	.0440	2.3	3.00	.75	62.85	5.26	2.33
491.70	508.30	.0440	35.2	16.60	2.12	1965.91	164.48	4.67
508.30	510.42	.0440	2.3	3.00	.75	62.85	5.26	2.33
TOTALS			39.7			2091.62	175.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .582 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 87.50
HEADWATER (ft) : 1358.97
VELOCITY (fps) : 18.22

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 87.50
HEADWATER (ft) : 1359.13
VELOCITY (fps) : 18.22

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 7.852
UPSTREAM STAGE (ft) : 1359.135

****

STAGE ELEVATION = 1351.45

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
489.41	491.70	.0440	2.6	3.24	.81	77.22	6.46	2.46
491.70	508.30	.0440	38.1	16.60	2.29	2235.90	187.07	4.91
508.30	510.59	.0440	2.6	3.24	.81	77.22	6.46	2.46
TOTALS			43.3			2390.35	199.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .591 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 100.00
HEADWATER (ft) : 1359.54
VELOCITY (fps) : 18.87

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 100.00
HEADWATER (ft) : 1359.60
VELOCITY (fps) : 18.87

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 8.144
UPSTREAM STAGE (ft) : 1359.597

****

STAGE ELEVATION = 1351.61

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
489.25	491.70	.0440	3.0	3.47	.87	92.57	7.74	2.57
491.70	508.30	.0440	40.7	16.60	2.45	2504.02	209.50	5.14
508.30	510.75	.0440	3.0	3.47	.87	92.57	7.74	2.57
TOTALS			46.8			2689.16	224.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .598 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 112.50
HEADWATER (ft) : 1360.19
VELOCITY (fps) : 19.46

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 112.50
HEADWATER (ft) : 1360.07
VELOCITY (fps) : 19.46

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 8.571
UPSTREAM STAGE (ft) : 1360.186

****

STAGE ELEVATION = 1351.77

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
489.09	491.70	.0440	3.4	3.69	.92	108.81	9.10	2.68
491.70	508.30	.0440	43.3	16.60	2.61	2770.31	231.78	5.35
508.30	510.91	.0440	3.4	3.69	.92	108.81	9.10	2.68
TOTALS			50.1			2987.93	249.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .605 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 124.99
HEADWATER (ft) : 1360.92
VELOCITY (fps) : 19.99

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 124.99
HEADWATER (ft) : 1360.56
VELOCITY (fps) : 19.99

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.148
UPSTREAM STAGE (ft) : 1360.916

****

STAGE ELEVATION = 1351.91

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
488.95	491.70	.0440	3.8	3.90	.97	125.91	10.53	2.78
491.70	508.30	.0440	45.7	16.60	2.75	3034.92	253.92	5.55
508.30	511.05	.0440	3.8	3.90	.97	125.91	10.53	2.78
TOTALS			53.3			3286.74	274.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .612 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 137.49
HEADWATER (ft) : 1361.73
VELOCITY (fps) : 20.46

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 137.49
HEADWATER (ft) : 1361.08
VELOCITY (fps) : 20.46

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.819
UPSTREAM STAGE (ft) : 1361.734

****

STAGE ELEVATION = 1352.06

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
488.80	491.70	.0440	4.2	4.10	1.02	143.82	12.03	2.87
491.70	508.30	.0440	48.1	16.60	2.90	3297.96	275.93	5.74
508.30	511.20	.0440	4.2	4.10	1.02	143.82	12.03	2.87
TOTALS			56.5			3585.60	299.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .618 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 150.00
HEADWATER (ft) : 1362.64
VELOCITY (fps) : 20.90

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 150.00
HEADWATER (ft) : 1361.63
VELOCITY (fps) : 20.90

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 10.585
UPSTREAM STAGE (ft) : 1362.640

****

STAGE ELEVATION = 1352.19

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
488.67	491.70	.0440	4.6	4.29	1.07	162.49	13.60	2.96
491.70	508.30	.0440	50.3	16.60	3.03	3559.40	297.80	5.92
508.30	511.33	.0440	4.6	4.29	1.07	162.49	13.60	2.96
TOTALS			59.5			3884.38	324.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .623 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 162.50
HEADWATER (ft) : 1363.63
VELOCITY (fps) : 21.29

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 162.50
HEADWATER (ft) : 1362.22
VELOCITY (fps) : 21.29

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 11.441
UPSTREAM STAGE (ft) : 1363.632

****

STAGE ELEVATION = 1352.32

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
488.54	491.70	.0440	5.0	4.47	1.12	181.90	15.22	3.04
491.70	508.30	.0440	52.5	16.60	3.16	3819.41	319.55	6.09
508.30	511.46	.0440	5.0	4.47	1.12	181.90	15.22	3.04
TOTALS			62.5			4183.20	349.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .628 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 175.00
HEADWATER (ft) : 1364.71
VELOCITY (fps) : 21.63

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 175.00
HEADWATER (ft) : 1362.84
VELOCITY (fps) : 21.63

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 12.384
UPSTREAM STAGE (ft) : 1364.706

****

STAGE ELEVATION = 1352.45

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
488.41	491.70	.0440	5.4	4.65	1.16	202.01	16.90	3.12
491.70	508.30	.0440	54.6	16.60	3.29	4078.12	341.20	6.25
508.30	511.59	.0440	5.4	4.65	1.16	202.01	16.90	3.12
TOTALS			65.4			4482.14	375.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .633 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 187.50
HEADWATER (ft) : 1365.86
VELOCITY (fps) : 21.95

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 187.50
HEADWATER (ft) : 1363.52
VELOCITY (fps) : 21.95

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.410
UPSTREAM STAGE (ft) : 1365.859

****

STAGE ELEVATION = 1352.57

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
488.29	491.70	.0440	5.8	4.83	1.21	222.77	18.64	3.20
491.70	508.30	.0440	56.6	16.60	3.41	4335.30	362.72	6.40
508.30	511.71	.0440	5.8	4.83	1.21	222.77	18.64	3.20
TOTALS			68.3			4780.84	399.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .637 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 200.00
HEADWATER (ft) : 1367.08
VELOCITY (fps) : 22.22

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 200.00
HEADWATER (ft) : 1364.23
VELOCITY (fps) : 22.22

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 14.512
UPSTREAM STAGE (ft) : 1367.084

****

STAGE ELEVATION = 1352.69

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
488.17	491.70	.0440	6.2	4.99	1.25	244.19	20.43	3.28
491.70	508.30	.0440	58.6	16.60	3.53	4591.32	384.14	6.55
508.30	511.83	.0440	6.2	4.99	1.25	244.19	20.43	3.28
TOTALS			71.1			5079.70	425.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .642 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 212.50
HEADWATER (ft) : 1368.38
VELOCITY (fps) : 22.45

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 212.50
HEADWATER (ft) : 1364.99
VELOCITY (fps) : 22.45

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 15.690
UPSTREAM STAGE (ft) : 1368.381

****

STAGE ELEVATION = 1352.81

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
488.05	491.70	.0440	6.7	5.16	1.29	266.21	22.27	3.35
491.70	508.30	.0440	60.6	16.60	3.65	4845.89	405.44	6.70
508.30	511.95	.0440	6.7	5.16	1.29	266.21	22.27	3.35
TOTALS			73.9			5378.31	449.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .646 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 224.99
HEADWATER (ft) : 1369.75
VELOCITY (fps) : 22.64

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 224.99
HEADWATER (ft) : 1365.80
VELOCITY (fps) : 22.64

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.942
UPSTREAM STAGE (ft) : 1369.750

****

STAGE ELEVATION = 1352.92

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
487.94	491.70	.0440	7.1	5.32	1.33	288.86	24.17	3.42
491.70	508.30	.0440	62.4	16.60	3.76	5099.57	426.66	6.83
508.30	512.06	.0440	7.1	5.32	1.33	288.86	24.17	3.42
TOTALS			76.6			5677.28	475.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .650 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 237.50
HEADWATER (ft) : 1371.20
VELOCITY (fps) : 22.77

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 237.50
HEADWATER (ft) : 1366.65
VELOCITY (fps) : 22.77

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.275
UPSTREAM STAGE (ft) : 1371.196

****

STAGE ELEVATION = 1353.03

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
487.83	491.70	.0440	7.5	5.48	1.37	312.07	26.11	3.48
491.70	508.30	.0440	64.3	16.60	3.87	5351.93	447.77	6.97
508.30	512.17	.0440	7.5	5.48	1.37	312.07	26.11	3.48
TOTALS			79.3			5976.06	499.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .653 ---

PIPE SLOPE IS SUPERCRITICAL
PROBABLE HYDRAULIC JUMP DOWNSTREAM OF PIPE
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 250.00
HEADWATER (ft) : 1372.73
VELOCITY (fps) : 22.83

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 250.00
HEADWATER (ft) : 1367.55
VELOCITY (fps) : 22.83

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.695
UPSTREAM STAGE (ft) : 1372.727

****

STAGE ELEVATION = 1353.14

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
487.72	491.70	.0440	7.9	5.63	1.41	335.83	28.10	3.55
491.70	508.30	.0440	66.1	16.60	3.98	5603.13	468.79	7.10
508.30	512.28	.0440	7.9	5.63	1.41	335.83	28.10	3.55
TOTALS			81.9			6274.79	524.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .657 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1359.917000
CULVERT NORMAL DEPTH > TW DEPTH > CULVERT CRITICAL DEPTH
STARTING DOWNSTREAM EGL = 1359.923000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 262.49
HEADWATER (ft) : 1374.36
VELOCITY (fps) : 20.89

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 262.49
HEADWATER (ft) : 1368.94
VELOCITY (fps) : 20.90

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 21.218
UPSTREAM STAGE (ft) : 1374.358

****

STAGE ELEVATION = 1353.25

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
487.61	491.70	.0440	8.3	5.78	1.44	360.15	30.13	3.61
491.70	508.30	.0440	67.8	16.60	4.09	5853.38	489.73	7.22
508.30	512.39	.0440	8.3	5.78	1.44	360.15	30.13	3.61
TOTALS			84.5			6573.67	549.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .660 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1360.581000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1360.682000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 275.00
HEADWATER (ft) : 1376.11
VELOCITY (fps) : 21.88

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 275.00
HEADWATER (ft) : 1370.61
VELOCITY (fps) : 21.88

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 22.868
UPSTREAM STAGE (ft) : 1376.113

****

STAGE ELEVATION = 1353.35

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
487.51	491.70	.0440	8.8	5.92	1.48	385.00	32.21	3.67
491.70	508.30	.0440	69.5	16.60	4.19	6102.64	510.58	7.34
508.30	512.49	.0440	8.8	5.92	1.48	385.00	32.21	3.67
TOTALS			87.1			6872.64	575.01	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .663 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1361.276000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1361.477000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 287.50
HEADWATER (ft) : 1378.02
VELOCITY (fps) : 22.88

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 287.50
HEADWATER (ft) : 1372.33
VELOCITY (fps) : 22.88

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 24.673
UPSTREAM STAGE (ft) : 1378.022

****

STAGE ELEVATION = 1353.45

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
487.41	491.70	.0440	9.2	6.07	1.52	410.33	34.33	3.73
491.70	508.30	.0440	71.2	16.60	4.29	6350.63	531.33	7.46
508.30	512.59	.0440	9.2	6.07	1.52	410.33	34.33	3.73
TOTALS			89.6			7171.29	599.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .666 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1361.999000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1362.300000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 300.00
HEADWATER (ft) : 1380.12
VELOCITY (fps) : 23.87

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 300.00
HEADWATER (ft) : 1374.11
VELOCITY (fps) : 23.87

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 26.672
UPSTREAM STAGE (ft) : 1380.123

****

STAGE ELEVATION = 1353.55

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
487.31	491.70	.0440	9.6	6.21	1.55	436.17	36.49	3.79
491.70	508.30	.0440	72.9	16.60	4.39	6597.66	552.00	7.58
508.30	512.69	.0440	9.6	6.21	1.55	436.17	36.49	3.79
TOTALS			92.1			7469.99	624.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .669 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1362.753000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1363.152000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 312.49
HEADWATER (ft) : 1382.47
VELOCITY (fps) : 24.87

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 312.49
HEADWATER (ft) : 1375.97
VELOCITY (fps) : 24.87

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 28.916
UPSTREAM STAGE (ft) : 1382.466

****

STAGE ELEVATION = 1353.65

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
487.21	491.70	.0440	10.1	6.35	1.59	462.49	38.69	3.84
491.70	508.30	.0440	74.5	16.60	4.49	6843.79	572.59	7.69
508.30	512.79	.0440	10.1	6.35	1.59	462.49	38.69	3.84
TOTALS			94.6			7768.77	649.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .672 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1363.538000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1364.033000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 324.99
HEADWATER (ft) : 1385.11
VELOCITY (fps) : 25.86

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 324.99
HEADWATER (ft) : 1377.90
VELOCITY (fps) : 25.86

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 31.468
UPSTREAM STAGE (ft) : 1385.115

--- SUMMARY OF RESULTS ---

FLOW (cfs)	TAILWATER ELEVATION (ft)	HEADWATER ELEVATION (ft)	BACKWATER (ft)
25.00	1349.84	1355.92	6.08
50.01	1350.18	1356.63	6.45
74.97	1350.46	1357.21	6.75
100.00	1350.69	1357.73	7.03
125.01	1350.91	1358.21	7.30
150.00	1351.10	1358.68	7.57
175.00	1351.28	1359.13	7.85
199.99	1351.45	1359.60	8.14
224.99	1351.61	1360.19	8.57
249.99	1351.77	1360.92	9.15
274.99	1351.91	1361.73	9.82
299.99	1352.06	1362.64	10.58
324.99	1352.19	1363.63	11.44
349.99	1352.32	1364.71	12.38
375.00	1352.45	1365.86	13.41
399.99	1352.57	1367.08	14.51
425.00	1352.69	1368.38	15.69
449.98	1352.81	1369.75	16.94
475.00	1352.92	1371.20	18.27
499.99	1353.03	1372.73	19.70
524.99	1353.14	1374.36	21.22
549.99	1353.25	1376.11	22.87
575.01	1353.35	1378.02	24.67
599.99	1353.45	1380.12	26.67
624.98	1353.55	1382.47	28.92
649.98	1353.65	1385.11	31.47

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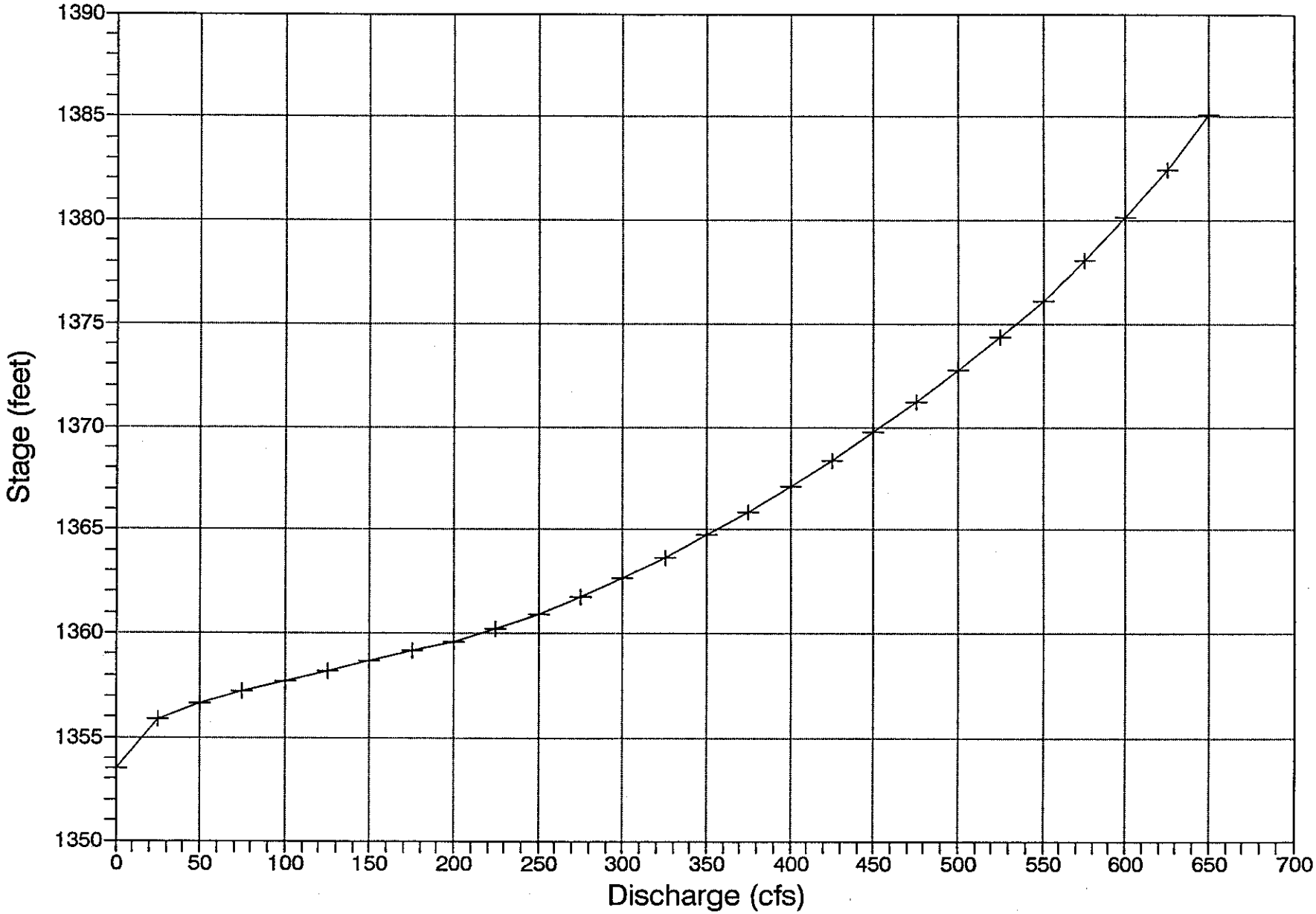
CAP CANAL STAGE-DISCHARGE CURVE

CAP-2, Sta. 146+50



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HYDRAULICS OF BRIDGE AND CULVERT WATERWAYS

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GALILEO SOFTWARE
16 RANCH ROAD
CHELMSFORD, MA 01824

VERSION 3.02
SERIAL NUMBER 1003

--- HOBCW PROJECT DATA ---

NUMBER OF GROUND STATIONS	:	6
NUMBER OF ROAD STATIONS	:	0
NUMBER OF ROUGNESS COEFFICIENTS	:	6
STREAM SLOPE (ft/ft)	:	.00700
MINIMUM FLOW (cfs)	:	250.00
MAXIMUM FLOW (cfs)	:	5000.00
FLOW INCREMENT (cfs)	:	250.00
NUMBER OF CULVERTS	:	1
CULVERT CODE	:	41554
CULVERT SLOPE (ft/ft)	:	.00010
CULVERT LENGTH (ft)	:	156.00
DOWNSTREAM CULVERT INVERT (ft)	:	1377.17
BOX CULVERT WIDTH (ft)	:	67.70
BOX CULVERT HEIGHT (ft)	:	7.00
ENTRANCE LOSS COEFFICIENT Ke	:	.2
CULVERT ROUGHNESS COEFFICIENT	:	.012

--- CROSS SECTION DESCRIPTION ---

STATION NUMBER	STATION (ft)	GROUND ELEVATION (ft)	ROUGNESS FACTOR	ROAD ELEVATION (ft)
1	.00	1372.83	.0400	
2	491.00	1366.10	.0400	
3	494.75	1362.00	.0400	
4	505.25	1362.00	.0400	
5	509.00	1366.10	.0400	
6	1000.00	1372.83	.0400	

--- HOBCW OUTPUT DATA ---

****

STAGE ELEVATION = 1365.15

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
491.87	494.75	.0400	4.5	4.27	1.06	175.28	14.66	3.24
494.75	505.25	.0400	33.1	10.50	3.15	2637.51	220.67	6.68
505.25	508.13	.0400	4.5	4.27	1.06	175.28	14.66	3.24
TOTALS			42.1			2988.07	250.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .697 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1378.297000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1378.297000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 250.00
HEADWATER (ft) : 1378.27
VELOCITY (fps) : 1.88

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 250.00
HEADWATER (ft) : 1378.44
VELOCITY (fps) : 4.91

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.288
UPSTREAM STAGE (ft) : 1378.436

****

STAGE ELEVATION = 1366.53

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
459.95	491.00	.0400	6.6	31.06	.21	87.52	7.32	1.11
491.00	494.75	.0400	9.3	5.56	1.67	485.63	40.63	4.38
494.75	505.25	.0400	47.5	10.50	4.53	4830.00	404.11	8.50
505.25	509.00	.0400	9.3	5.56	1.67	485.63	40.63	4.38
509.00	540.05	.0400	6.6	31.06	.21	87.52	7.32	1.11
TOTALS			79.3			5976.30	500.01	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.390 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1378.958000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1378.958000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 500.01
HEADWATER (ft) : 1378.83
VELOCITY (fps) : 2.45

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 500.01
HEADWATER (ft) : 1379.14
VELOCITY (fps) : 6.18

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 12.610
UPSTREAM STAGE (ft) : 1379.136

****

STAGE ELEVATION = 1367.10

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
418.18	491.00	.0400	36.3	72.83	.50	849.49	71.07	1.96
491.00	494.75	.0400	11.4	5.56	2.06	686.88	57.47	5.03
494.75	505.25	.0400	53.5	10.50	5.10	5890.72	492.85	9.21
505.25	509.00	.0400	11.4	5.56	2.06	686.88	57.47	5.03
509.00	581.82	.0400	36.3	72.83	.50	849.49	71.07	1.96
TOTALS			149.1			8963.47	749.94	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.434 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.513000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1379.513000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 749.94
HEADWATER (ft) : 1379.35
VELOCITY (fps) : 2.85

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 749.94
HEADWATER (ft) : 1379.72
VELOCITY (fps) : 7.08

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 12.622
UPSTREAM STAGE (ft) : 1379.721

****

STAGE ELEVATION = 1367.44

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
393.06	491.00	.0400	65.7	97.95	.67	1872.01	156.62	2.38
491.00	494.75	.0400	12.7	5.56	2.29	820.98	68.69	5.40
494.75	505.25	.0400	57.1	10.50	5.44	6568.46	549.56	9.62
505.25	509.00	.0400	12.7	5.56	2.29	820.98	68.69	5.40
509.00	606.94	.0400	65.7	97.95	.67	1872.01	156.62	2.38
TOTALS			214.1			11954.43	1000.18	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.325 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.009000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1380.009000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1000.18
HEADWATER (ft) : 1379.85
VELOCITY (fps) : 3.18

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1000.18
HEADWATER (ft) : 1380.24
VELOCITY (fps) : 7.79

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 12.801
UPSTREAM STAGE (ft) : 1380.243

****

STAGE ELEVATION = 1367.70

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
374.23	491.00	.0400	93.4	116.78	.80	2991.84	250.32	2.68
491.00	494.75	.0400	13.7	5.56	2.46	927.68	77.62	5.67
494.75	505.25	.0400	59.9	10.50	5.70	7095.70	593.67	9.92
505.25	509.00	.0400	13.7	5.56	2.46	927.68	77.62	5.67
509.00	625.77	.0400	93.4	116.78	.80	2991.84	250.32	2.68
TOTALS			274.1			14934.74	1249.53	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.236 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.463000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1380.463000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1249.53
HEADWATER (ft) : 1380.32
VELOCITY (fps) : 3.45

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1249.53
HEADWATER (ft) : 1380.72
VELOCITY (fps) : 8.39

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.020
UPSTREAM STAGE (ft) : 1380.721

****

STAGE ELEVATION = 1367.91

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
358.71	491.00	.0400	119.9	132.30	.91	4173.42	349.17	2.91
491.00	494.75	.0400	14.5	5.56	2.61	1019.54	85.30	5.89
494.75	505.25	.0400	62.1	10.50	5.91	7542.58	631.06	10.16
505.25	509.00	.0400	14.5	5.56	2.61	1019.54	85.30	5.89
509.00	641.29	.0400	119.9	132.30	.91	4173.42	349.17	2.91
TOTALS			330.9			17928.50	1500.01	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.167 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.890000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1380.890000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1500.01
HEADWATER (ft) : 1380.76
VELOCITY (fps) : 3.17

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1500.01
HEADWATER (ft) : 1381.17
VELOCITY (fps) : 8.92

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.257
UPSTREAM STAGE (ft) : 1381.170

****

STAGE ELEVATION = 1368.10

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
345.43	491.00	.0400	145.2	145.58	1.00	5386.04	450.63	3.10
491.00	494.75	.0400	15.2	5.56	2.73	1100.84	92.10	6.07
494.75	505.25	.0400	64.0	10.50	6.10	7933.47	663.76	10.37
505.25	509.00	.0400	15.2	5.56	2.73	1100.84	92.10	6.07
509.00	654.57	.0400	145.2	145.58	1.00	5386.04	450.63	3.10
TOTALS			384.8			20907.23	1749.22	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.113 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.291000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1381.291000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1749.22
HEADWATER (ft) : 1381.19
VELOCITY (fps) : 3.69

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1749.22
HEADWATER (ft) : 1381.59
VELOCITY (fps) : 9.39

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.497
UPSTREAM STAGE (ft) : 1381.593

****

STAGE ELEVATION = 1368.26

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
333.61	491.00	.0400	169.8	157.40	1.08	6632.41	554.91	3.27
491.00	494.75	.0400	15.8	5.56	2.84	1175.29	98.33	6.23
494.75	505.25	.0400	65.7	10.50	6.26	8287.97	693.42	10.55
505.25	509.00	.0400	15.8	5.56	2.84	1175.29	98.33	6.23
509.00	666.39	.0400	169.8	157.40	1.08	6632.41	554.91	3.27
TOTALS			436.8			23903.38	1999.90	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.070 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.676000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1381.676000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1999.90
HEADWATER (ft) : 1381.60
VELOCITY (fps) : 4.22

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1999.90
HEADWATER (ft) : 1382.00
VELOCITY (fps) : 9.81

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.741
UPSTREAM STAGE (ft) : 1381.998

****

STAGE ELEVATION = 1368.40

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
323.02	491.00	.0400	193.4	168.00	1.15	7891.21	660.23	3.41
491.00	494.75	.0400	16.3	5.56	2.94	1243.70	104.06	6.38
494.75	505.25	.0400	67.2	10.50	6.40	8611.13	720.46	10.72
505.25	509.00	.0400	16.3	5.56	2.94	1243.70	104.06	6.38
509.00	676.98	.0400	193.4	168.00	1.15	7891.21	660.23	3.41
TOTALS			486.6			26880.95	2249.02	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.035 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.042000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1382.042000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2249.02
HEADWATER (ft) : 1382.00
VELOCITY (fps) : 4.75

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2249.02
HEADWATER (ft) : 1382.38
VELOCITY (fps) : 10.21

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.981
UPSTREAM STAGE (ft) : 1382.384

****

STAGE ELEVATION = 1368.54

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
313.25	491.00	.0400	216.5	177.77	1.22	9175.14	767.65	3.55
491.00	494.75	.0400	16.8	5.56	3.03	1308.13	109.45	6.51
494.75	505.25	.0400	68.6	10.50	6.54	8913.40	745.75	10.87
505.25	509.00	.0400	16.8	5.56	3.03	1308.13	109.45	6.51
509.00	686.75	.0400	216.5	177.77	1.22	9175.14	767.65	3.55
TOTALS			535.4			29879.93	2499.93	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.005 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.398000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1382.398000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2499.93
HEADWATER (ft) : 1382.39
VELOCITY (fps) : 5.28

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2499.93
HEADWATER (ft) : 1382.76
VELOCITY (fps) : 10.57

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 14.223
UPSTREAM STAGE (ft) : 1382.759

****

STAGE ELEVATION = 1368.66

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
304.30	491.00	.0400	238.9	186.72	1.28	10459.41	875.10	3.66
491.00	494.75	.0400	17.3	5.56	3.11	1368.29	114.48	6.62
494.75	505.25	.0400	69.9	10.50	6.66	9193.96	769.22	11.00
505.25	509.00	.0400	17.3	5.56	3.11	1368.29	114.48	6.62
509.00	695.70	.0400	238.9	186.72	1.28	10459.41	875.10	3.66
TOTALS			582.3			32849.36	2748.37	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .981 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.739000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1382.739000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2748.37
HEADWATER (ft) : 1382.76
VELOCITY (fps) : 5.80

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2748.37
HEADWATER (ft) : 1383.12
VELOCITY (fps) : 10.91

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 14.459
UPSTREAM STAGE (ft) : 1383.119

****

STAGE ELEVATION = 1368.78

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
295.85	491.00	.0400	261.0	195.16	1.34	11768.69	984.64	3.77
491.00	494.75	.0400	17.7	5.56	3.19	1426.02	119.31	6.73
494.75	505.25	.0400	71.1	10.50	6.77	9461.79	791.63	11.13
505.25	509.00	.0400	17.7	5.56	3.19	1426.02	119.31	6.73
509.00	704.15	.0400	261.0	195.16	1.34	11768.69	984.64	3.77
TOTALS			628.5			35851.22	2999.53	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .960 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.074000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1383.074000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2999.53
HEADWATER (ft) : 1383.14
VELOCITY (fps) : 6.33

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2999.53
HEADWATER (ft) : 1383.47
VELOCITY (fps) : 11.23

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 14.696
UPSTREAM STAGE (ft) : 1383.471

****

STAGE ELEVATION = 1368.88

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
287.94	491.00	.0400	282.6	203.08	1.39	13085.39	1094.80	3.87
491.00	494.75	.0400	18.1	5.56	3.26	1481.03	123.91	6.84
494.75	505.25	.0400	72.3	10.50	6.88	9715.74	812.88	11.25
505.25	509.00	.0400	18.1	5.56	3.26	1481.03	123.91	6.84
509.00	712.06	.0400	282.6	203.08	1.39	13085.39	1094.80	3.87
TOTALS			673.7			38848.57	3250.30	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .941 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.398000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.398000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3250.30
HEADWATER (ft) : 1383.51
VELOCITY (fps) : 6.86

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3250.30
HEADWATER (ft) : 1383.81
VELOCITY (fps) : 11.54

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 14.931
UPSTREAM STAGE (ft) : 1383.814

****

STAGE ELEVATION = 1368.99

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
280.51	491.00	.0400	303.6	210.51	1.44	14400.95	1204.87	3.97
491.00	494.75	.0400	18.5	5.56	3.33	1533.38	128.29	6.93
494.75	505.25	.0400	73.3	10.50	6.99	9956.42	833.01	11.36
505.25	509.00	.0400	18.5	5.56	3.33	1533.38	128.29	6.93
509.00	719.49	.0400	303.6	210.51	1.44	14400.95	1204.87	3.97
TOTALS			717.7			41825.08	3499.34	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .925 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.713000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.713000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3499.34
HEADWATER (ft) : 1383.88
VELOCITY (fps) : 7.38

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3499.34
HEADWATER (ft) : 1384.15
VELOCITY (fps) : 11.83

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 15.160
UPSTREAM STAGE (ft) : 1384.145

****

STAGE ELEVATION = 1369.08

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
273.47	491.00	.0400	324.3	217.55	1.49	15720.57	1315.28	4.06
491.00	494.75	.0400	18.9	5.56	3.40	1583.65	132.50	7.02
494.75	505.25	.0400	74.4	10.50	7.08	10186.57	852.27	11.46
505.25	509.00	.0400	18.9	5.56	3.40	1583.65	132.50	7.02
509.00	726.53	.0400	324.3	217.55	1.49	15720.57	1315.28	4.06
TOTALS			760.7			44795.01	3747.82	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .911 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.019000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1384.019000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3747.82
HEADWATER (ft) : 1384.24
VELOCITY (fps) : 7.91

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3747.82
HEADWATER (ft) : 1384.47
VELOCITY (fps) : 12.10

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 15.386
UPSTREAM STAGE (ft) : 1384.468

****

STAGE ELEVATION = 1369.17

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
266.67	491.00	.0400	344.9	224.35	1.54	17066.27	1427.87	4.14
491.00	494.75	.0400	19.2	5.56	3.46	1632.87	136.62	7.11
494.75	505.25	.0400	75.3	10.50	7.17	10411.14	871.06	11.56
505.25	509.00	.0400	19.2	5.56	3.46	1632.87	136.62	7.11
509.00	733.33	.0400	344.9	224.35	1.54	17066.27	1427.87	4.14
TOTALS			803.6			47809.42	4000.02	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .899 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.323000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1384.323000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4000.02
HEADWATER (ft) : 1384.61
VELOCITY (fps) : 8.44

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4000.02
HEADWATER (ft) : 1384.79
VELOCITY (fps) : 12.36

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 15.614
UPSTREAM STAGE (ft) : 1384.789

****

STAGE ELEVATION = 1369.26

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
260.19	491.00	.0400	365.1	230.84	1.58	18413.46	1540.58	4.22
491.00	494.75	.0400	19.6	5.56	3.52	1680.33	140.59	7.19
494.75	505.25	.0400	76.3	10.50	7.26	10626.95	889.11	11.66
505.25	509.00	.0400	19.6	5.56	3.52	1680.33	140.59	7.19
509.00	739.81	.0400	365.1	230.84	1.58	18413.46	1540.58	4.22
TOTALS			845.6			50814.54	4251.45	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .888 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.619000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1384.619000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4251.45
HEADWATER (ft) : 1384.99
VELOCITY (fps) : 8.97

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4251.45
HEADWATER (ft) : 1385.10
VELOCITY (fps) : 12.62

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 15.839
UPSTREAM STAGE (ft) : 1385.102

****

STAGE ELEVATION = 1369.35

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
254.03	491.00	.0400	384.8	236.99	1.62	19751.89	1652.56	4.29
491.00	494.75	.0400	19.9	5.56	3.58	1725.89	144.40	7.27
494.75	505.25	.0400	77.2	10.50	7.35	10833.42	906.39	11.75
505.25	509.00	.0400	19.9	5.56	3.58	1725.89	144.40	7.27
509.00	745.97	.0400	384.8	236.99	1.62	19751.89	1652.56	4.29
TOTALS			886.6			53788.98	4500.31	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .878 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.907000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1384.907000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4500.31
HEADWATER (ft) : 1385.37
VELOCITY (fps) : 9.50

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4500.31
HEADWATER (ft) : 1385.41
VELOCITY (fps) : 12.86

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.058
UPSTREAM STAGE (ft) : 1385.406

****

STAGE ELEVATION = 1369.43

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
248.13	491.00	.0400	404.3	242.90	1.66	21091.73	1764.66	4.37
491.00	494.75	.0400	20.2	5.56	3.63	1770.05	148.09	7.34
494.75	505.25	.0400	78.0	10.50	7.43	11033.02	923.09	11.83
505.25	509.00	.0400	20.2	5.56	3.63	1770.05	148.09	7.34
509.00	751.87	.0400	404.3	242.90	1.66	21091.73	1764.66	4.37
TOTALS			926.9			56756.59	4748.60	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .869 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1385.189000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1385.189000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4748.60
HEADWATER (ft) : 1385.75
VELOCITY (fps) : 10.02

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4748.60
HEADWATER (ft) : 1385.70
VELOCITY (fps) : 13.09

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.321
UPSTREAM STAGE (ft) : 1385.751

****

STAGE ELEVATION = 1369.51

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
242.37	491.00	.0400	423.6	248.65	1.70	22450.51	1878.34	4.43
491.00	494.75	.0400	20.5	5.56	3.68	1813.51	151.73	7.41
494.75	505.25	.0400	78.8	10.50	7.51	11228.90	939.48	11.92
505.25	509.00	.0400	20.5	5.56	3.68	1813.51	151.73	7.41
509.00	757.63	.0400	423.6	248.65	1.70	22450.51	1878.34	4.43
TOTALS			967.0			59756.93	4999.62	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .861 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1385.469000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1385.469000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4999.62
HEADWATER (ft) : 1386.15
VELOCITY (fps) : 10.55

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4999.62
HEADWATER (ft) : 1386.00
VELOCITY (fps) : 13.32

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.639
UPSTREAM STAGE (ft) : 1386.147

--- SUMMARY OF RESULTS ---

FLOW (cfs)	TAILWATER ELEVATION (ft)	HEADWATER ELEVATION (ft)	BACKWATER (ft)
250.00	1365.15	1378.44	13.29
500.01	1366.53	1379.14	12.61
749.94	1367.10	1379.72	12.62
1000.18	1367.44	1380.24	12.80
1249.53	1367.70	1380.72	13.02
1500.01	1367.91	1381.17	13.26
1749.22	1368.10	1381.59	13.50
1999.90	1368.26	1382.00	13.74
2249.02	1368.40	1382.38	13.98
2499.93	1368.54	1382.76	14.22
2748.37	1368.66	1383.12	14.46
2999.53	1368.78	1383.47	14.70
3250.30	1368.88	1383.81	14.93
3499.34	1368.99	1384.15	15.16
3747.82	1369.08	1384.47	15.39
4000.02	1369.17	1384.79	15.61
4251.45	1369.26	1385.10	15.84
4500.31	1369.35	1385.41	16.06
4748.60	1369.43	1385.75	16.32
4999.62	1369.51	1386.15	16.64

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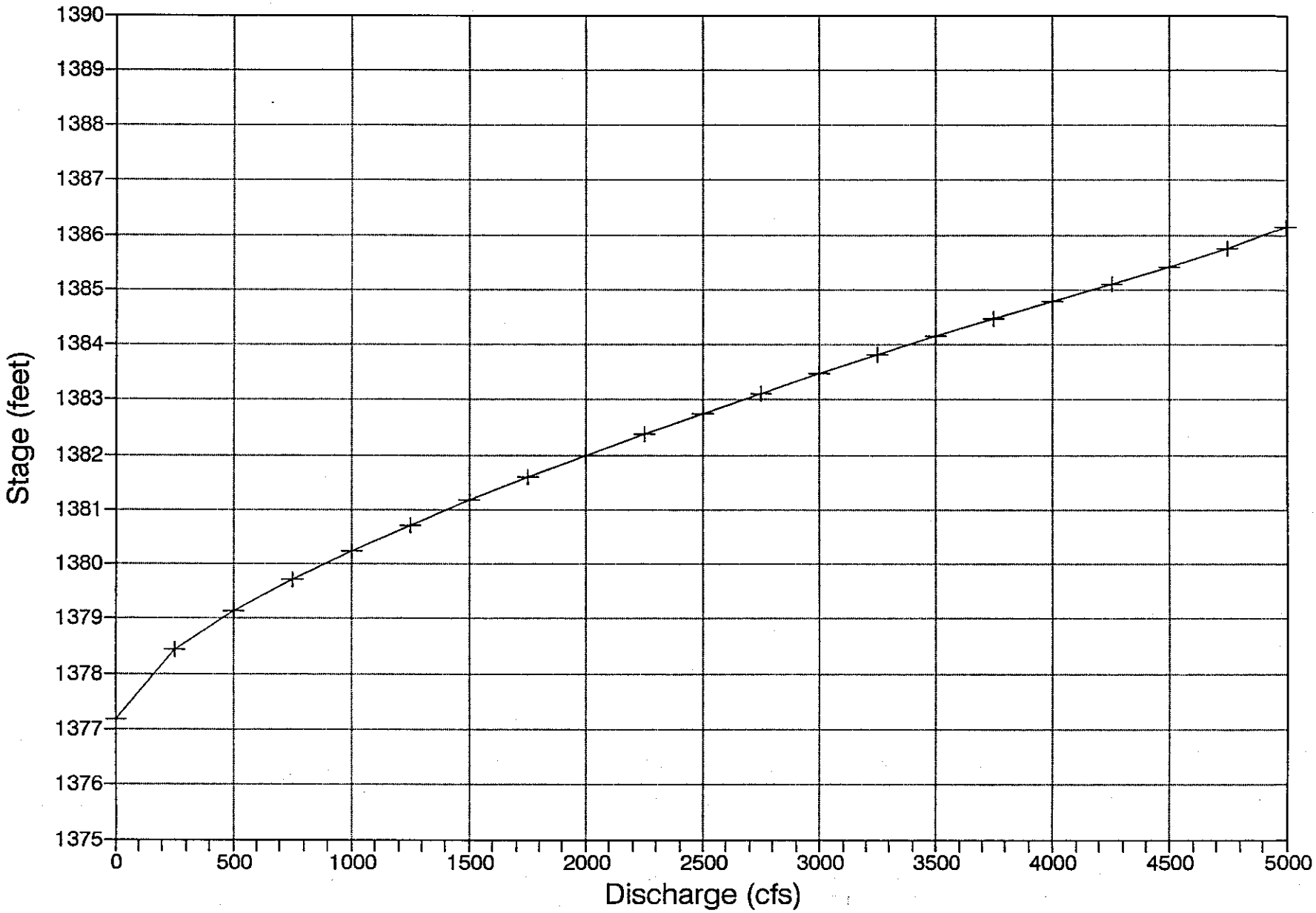
CAP CANAL STAGE-DISCHARGE CURVE

CAP-3, Sta. 180+50



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VERSION 3.02
SERIAL NUMBER 1003

CAP Structure CAP-4 Hydraulic Calculations

--- HOBCW PROJECT DATA ---

NUMBER OF GROUND STATIONS	:	11
NUMBER OF ROAD STATIONS	:	0
NUMBER OF ROUGNESS COEFFICIENTS	:	11
STREAM SLOPE (ft/ft)	:	.00700
MINIMUM FLOW (cfs)	:	100.00
MAXIMUM FLOW (cfs)	:	4500.00
FLOW INCREMENT (cfs)	:	100.00
NUMBER OF CULVERTS	:	1
CULVERT CODE	:	41554
CULVERT SLOPE (ft/ft)	:	.00070
CULVERT LENGTH (ft)	:	157.00
DOWNSTREAM CULVERT INVERT (ft)	:	1376.60
BOX CULVERT WIDTH (ft)	:	67.50
BOX CULVERT HEIGHT (ft)	:	7.00
ENTRANCE LOSS COEFFICIENT Ke	:	.2
CULVERT ROUGHNESS COEFFICIENT	:	.012

--- CROSS SECTION DESCRIPTION ---

STATION NUMBER	STATION (ft)	GROUND ELEVATION (ft)	ROUGNESS FACTOR	ROAD ELEVATION (ft)
1	348.00	1368.65	.0400	
2	375.00	1366.50	.0400	
3	398.00	1363.10	.0400	
4	417.00	1361.90	.0400	
5	425.00	1359.60	.0400	
6	434.00	1360.60	.0400	
7	453.00	1361.10	.0400	
8	454.00	1357.40	.0400	
9	500.00	1357.00	.0400	
10	511.00	1365.80	.0400	
11	531.00	1368.80	.0400	

--- HOBCW OUTPUT DATA ---

****

STAGE ELEVATION = 1358.00

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
453.84	454.00	.0400	.0	.62	.08	.33	.03	.57
454.00	500.00	.0400	36.8	46.00	.80	1178.99	98.64	2.68
500.00	501.25	.0400	.6	1.60	.39	12.42	1.04	1.66
TOTALS			37.5			1191.73	99.71	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .529 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1377.212000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1377.212000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 99.71
HEADWATER (ft) : 1377.44
VELOCITY (fps) : 2.37

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 99.71
HEADWATER (ft) : 1377.27
VELOCITY (fps) : 3.62

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.439
UPSTREAM STAGE (ft) : 1377.440

****

STAGE ELEVATION = 1358.41

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
453.73	454.00	.0400	.1	1.05	.13	1.34	.11	.81
454.00	500.00	.0400	55.8	46.00	1.21	2357.86	197.27	3.54
500.00	501.77	.0400	1.2	2.26	.55	31.19	2.61	2.09
TOTALS			57.2			2390.38	199.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .568 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1377.573000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1377.573000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 199.99
HEADWATER (ft) : 1377.68
VELOCITY (fps) : 3.12

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 199.99
HEADWATER (ft) : 1377.64
VELOCITY (fps) : 4.56

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.265
UPSTREAM STAGE (ft) : 1377.678

****

STAGE ELEVATION = 1358.74

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
453.64	454.00	.0400	.2	1.39	.18	2.84	.24	.97
454.00	500.00	.0400	71.1	46.00	1.54	3527.48	295.13	4.15
500.00	502.18	.0400	1.9	2.79	.68	54.72	4.58	2.41
TOTALS			73.2			3585.04	299.95	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .593 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1377.874000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1377.874000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 299.95
HEADWATER (ft) : 1377.91
VELOCITY (fps) : 3.66

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 299.95
HEADWATER (ft) : 1377.96
VELOCITY (fps) : 5.22

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.212
UPSTREAM STAGE (ft) : 1377.957

****

STAGE ELEVATION = 1359.03

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
453.56	454.00	.0400	.4	1.69	.21	4.78	.40	1.11
454.00	500.00	.0400	84.3	46.00	1.83	4692.81	392.63	4.66
500.00	502.54	.0400	2.6	3.25	.79	82.30	6.89	2.66
TOTALS			87.3			4779.90	399.91	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .611 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1378.144000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1378.144000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 399.91
HEADWATER (ft) : 1378.13
VELOCITY (fps) : 4.09

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 399.91
HEADWATER (ft) : 1378.24
VELOCITY (fps) : 5.74

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.204
UPSTREAM STAGE (ft) : 1378.238

****

STAGE ELEVATION = 1359.29

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
453.49	454.00	.0400	.5	1.96	.25	7.08	.59	1.22
454.00	500.00	.0400	96.3	46.00	2.09	5853.16	489.71	5.09
500.00	502.87	.0400	3.3	3.67	.90	113.43	9.49	2.89
TOTALS			100.1			5973.67	499.79	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .625 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1378.391000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1378.391000
PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 499.79
HEADWATER (ft) : 1378.35
VELOCITY (fps) : 4.46

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 499.79
HEADWATER (ft) : 1378.50
VELOCITY (fps) : 6.19

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.202
UPSTREAM STAGE (ft) : 1378.495

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*******************************************************************************

 STAGE ELEVATION =   1359.53

STARTING ENDING  ROUGHNESS CHANNEL  WETTED    HYDRAULIC CONVEYANCE DISCHARGE VELOCITY
STATION  STATION FACTOR    AREA     PERIMETER RADIUS
(ft)     (ft)              (sq ft)  (ft)      (ft)                (cfs)     (fps)
-------------------------------------------------------------------------------------
   453.42  454.00    .0400      .6       2.21       .28       9.73       .81     1.32
   454.00  500.00    .0400   107.3      46.00      2.33    7010.79    586.56     5.47
   500.00  503.17    .0400     4.0       4.05       .99     147.81     12.37     3.08
                            -------                        ----------- ---------
TOTALS                       111.9                          7168.33   599.75

*******************************************************************************

 --- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER =   .637 ---

PIPE SLOPE IS SUBCRITICAL
 EGLCRIT =     1378.623000
 TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
 STARTING DOWNSTREAM EGL =     1378.623000
 PARTIAL PIPE FLOW

  INLET CONTROL RESULTS
          DISCHARGE (cfs) :     599.75
          HEADWATER (ft)  :    1378.57
          VELOCITY (fps)  :       4.79

 OUTLET CONTROL RESULTS
          DISCHARGE (cfs) :     599.75
          HEADWATER (ft)  :    1378.74
          VELOCITY (fps)  :       6.58

          --- OUTLET CONTROL GOVERNS ---

    BACKWATER (ft)      :    19.204
    UPSTREAM STAGE (ft) :  1378.737
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****

STAGE ELEVATION = 1359.76

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
424.46	425.00	.0400	.0	.56	.07	.28	.02	.55
425.00	426.40	.0400	.1	1.41	.08	.74	.06	.56
453.36	454.00	.0400	.7	2.44	.31	12.69	1.06	1.42
454.00	500.00	.0400	117.6	46.00	2.56	8163.22	682.98	5.81
500.00	503.44	.0400	4.7	4.41	1.08	185.12	15.49	3.26
TOTALS			123.2			8362.03	699.62	

--- DIVIDED FLOW ---

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .660 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1378.841000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1378.841000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 699.62
HEADWATER (ft) : 1378.78
VELOCITY (fps) : 5.08

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 699.62
HEADWATER (ft) : 1378.97
VELOCITY (fps) : 6.92

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.209
UPSTREAM STAGE (ft) : 1378.966

****

STAGE ELEVATION = 1359.97

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
423.73	425.00	.0400	.2	1.32	.18	2.71	.23	.97
425.00	428.29	.0400	.6	3.31	.18	7.16	.60	1.00
453.31	454.00	.0400	.9	2.66	.33	15.93	1.33	1.50
454.00	500.00	.0400	127.2	46.00	2.77	9310.65	778.98	6.12
500.00	503.71	.0400	5.5	4.75	1.16	225.14	18.84	3.43
TOTALS			134.4			9561.58	799.98	

--- DIVIDED FLOW ---

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .684 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.051000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1379.051000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 799.98
HEADWATER (ft) : 1378.98
VELOCITY (fps) : 5.35

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 799.98
HEADWATER (ft) : 1379.18
VELOCITY (fps) : 7.24

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.219
UPSTREAM STAGE (ft) : 1379.185

****

STAGE ELEVATION = 1360.16

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
423.05	425.00	.0400	.5	2.03	.27	8.53	.71	1.30
425.00	430.06	.0400	1.4	5.09	.28	22.56	1.89	1.33
453.25	454.00	.0400	1.0	2.86	.36	19.39	1.62	1.57
454.00	500.00	.0400	136.3	46.00	2.96	10439.38	873.42	6.41
500.00	503.95	.0400	6.2	5.06	1.23	267.15	22.35	3.58
TOTALS			145.5			10757.01	900.00	

--- DIVIDED FLOW ---

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .704 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.251000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1379.251000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 900.00
HEADWATER (ft) : 1379.18
VELOCITY (fps) : 5.60

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 900.00
HEADWATER (ft) : 1379.39
VELOCITY (fps) : 7.53

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.232
UPSTREAM STAGE (ft) : 1379.394

****

STAGE ELEVATION = 1360.35

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
422.40	425.00	.0400	1.0	2.71	.36	18.25	1.53	1.57
425.00	431.73	.0400	2.5	6.77	.37	48.28	4.04	1.61
453.20	454.00	.0400	1.2	3.05	.38	23.06	1.93	1.64
454.00	500.00	.0400	144.8	46.00	3.15	11551.91	966.50	6.68
500.00	504.18	.0400	7.0	5.36	1.31	311.03	26.02	3.72
TOTALS			156.5			11952.52	1000.02	

--- DIVIDED FLOW ---

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .721 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.444000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1379.444000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1000.02
HEADWATER (ft) : 1379.38
VELOCITY (fps) : 5.83

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1000.02
HEADWATER (ft) : 1379.60
VELOCITY (fps) : 7.80

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.249
UPSTREAM STAGE (ft) : 1379.596

****

STAGE ELEVATION = 1360.52

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
421.79	425.00	.0400	1.5	3.34	.44	32.04	2.68	1.81
425.00	433.31	.0400	3.8	8.36	.46	84.79	7.09	1.85
453.16	454.00	.0400	1.3	3.24	.41	26.92	2.25	1.71
454.00	500.00	.0400	152.9	46.00	3.32	12647.04	1058.13	6.92
500.00	504.40	.0400	7.8	5.64	1.38	356.51	29.83	3.84
TOTALS			167.3			13147.30	1099.98	

--- DIVIDED FLOW ---

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .736 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.631000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1379.631000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1099.98
HEADWATER (ft) : 1379.57
VELOCITY (fps) : 6.04

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1099.98
HEADWATER (ft) : 1379.79
VELOCITY (fps) : 8.05

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.268
UPSTREAM STAGE (ft) : 1379.791

****

STAGE ELEVATION = 1360.69

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
421.21	425.00	.0400	2.1	3.94	.52	49.84	4.17	2.02
425.00	434.00	.0400	5.3	9.06	.59	138.09	11.55	2.18
434.00	437.41	.0400	.2	3.41	.04	.72	.06	.39
453.11	454.00	.0400	1.5	3.41	.43	30.91	2.59	1.77
454.00	500.00	.0400	160.5	46.00	3.49	13719.85	1147.89	7.15
500.00	504.61	.0400	8.5	5.91	1.44	403.19	33.73	3.96
TOTALS			178.0			14342.61	1199.99	

--- DIVIDED FLOW ---

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .764 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.812000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1379.812000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1199.99
HEADWATER (ft) : 1379.76
VELOCITY (fps) : 6.25

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1199.99
HEADWATER (ft) : 1379.98
VELOCITY (fps) : 8.29

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.291
UPSTREAM STAGE (ft) : 1379.980

****

STAGE ELEVATION = 1360.85

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
420.66	425.00	.0400	2.7	4.51	.60	71.40	5.97	2.21
425.00	434.00	.0400	6.7	9.06	.74	204.76	17.13	2.55
434.00	443.38	.0400	1.2	9.39	.12	10.67	.89	.77
453.07	454.00	.0400	1.6	3.57	.45	35.01	2.93	1.82
454.00	500.00	.0400	167.8	46.00	3.65	14765.49	1235.37	7.36
500.00	504.81	.0400	9.2	6.16	1.50	450.65	37.70	4.08
TOTALS			189.2			15537.97	1300.00	

--- DIVIDED FLOW ---

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .798 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.988000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1379.988000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1300.00
HEADWATER (ft) : 1379.94
VELOCITY (fps) : 6.44

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1300.00
HEADWATER (ft) : 1380.16
VELOCITY (fps) : 8.51

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.318
UPSTREAM STAGE (ft) : 1380.165

****

STAGE ELEVATION = 1361.00

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
420.14	425.00	.0400	3.4	5.05	.67	96.46	8.07	2.38
425.00	434.00	.0400	8.1	9.06	.89	277.23	23.19	2.88
434.00	449.04	.0400	3.0	15.05	.20	37.56	3.14	1.06
453.03	454.00	.0400	1.7	3.72	.47	39.19	3.28	1.88
454.00	500.00	.0400	174.6	46.00	3.80	15784.05	1320.59	7.56
500.00	504.99	.0400	10.0	6.40	1.56	498.68	41.72	4.18
TOTALS			200.8			16733.17	1400.00	

--- DIVIDED FLOW ---

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .827 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.159000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1380.159000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1400.00
HEADWATER (ft) : 1380.12
VELOCITY (fps) : 6.63

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1400.00
HEADWATER (ft) : 1380.34
VELOCITY (fps) : 8.72

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.348
UPSTREAM STAGE (ft) : 1380.344

****

STAGE ELEVATION = 1361.14

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
419.65	425.00	.0400	4.1	5.56	.74	124.65	10.43	2.54
425.00	434.00	.0400	9.3	9.06	1.03	353.63	29.59	3.17
434.00	453.00	.0400	5.4	19.01	.29	87.99	7.36	1.35
453.00	454.00	.0400	1.9	3.83	.49	43.70	3.66	1.94
454.00	500.00	.0400	181.1	46.00	3.94	16772.36	1403.28	7.75
500.00	505.17	.0400	10.7	6.62	1.62	546.95	45.76	4.28
TOTALS			212.6			17929.28	1500.07	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .844 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.327000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1380.327000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1500.07
HEADWATER (ft) : 1380.30
VELOCITY (fps) : 6.80

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1500.07
HEADWATER (ft) : 1380.52
VELOCITY (fps) : 8.93

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.383
UPSTREAM STAGE (ft) : 1380.520

****

STAGE ELEVATION = 1361.27

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
419.19	425.00	.0400	4.8	6.04	.80	155.49	13.01	2.68
425.00	434.00	.0400	10.5	9.06	1.16	432.31	36.17	3.44
434.00	453.00	.0400	8.0	19.01	.42	165.93	13.88	1.74
453.00	454.00	.0400	2.0	3.83	.53	48.94	4.10	2.03
454.00	500.00	.0400	187.2	46.00	4.07	17726.00	1483.06	7.92
500.00	505.34	.0400	11.4	6.83	1.67	595.04	49.78	4.37
TOTALS			224.0			19123.72	1600.01	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .840 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.491000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1380.491000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1600.01
HEADWATER (ft) : 1380.47
VELOCITY (fps) : 6.97

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1600.01
HEADWATER (ft) : 1380.69
VELOCITY (fps) : 9.12

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.421
UPSTREAM STAGE (ft) : 1380.691

****

STAGE ELEVATION = 1361.40

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
418.75	425.00	.0400	5.6	6.50	.86	189.19	15.83	2.82
425.00	434.00	.0400	11.7	9.06	1.29	513.64	42.97	3.68
434.00	453.00	.0400	10.4	19.01	.55	258.18	21.60	2.08
453.00	454.00	.0400	2.1	3.83	.56	54.20	4.53	2.11
454.00	500.00	.0400	193.1	46.00	4.20	18660.81	1561.28	8.09
500.00	505.50	.0400	12.1	7.04	1.72	643.59	53.85	4.46
TOTALS			235.0			20319.61	1700.06	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .837 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.651000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1380.651000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1700.06
HEADWATER (ft) : 1380.64
VELOCITY (fps) : 7.13

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1700.06
HEADWATER (ft) : 1380.86
VELOCITY (fps) : 9.31

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.462
UPSTREAM STAGE (ft) : 1380.859

****

STAGE ELEVATION = 1361.52

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
418.32	425.00	.0400	6.4	6.95	.92	225.58	18.87	2.95
425.00	434.00	.0400	12.8	9.06	1.41	597.05	49.95	3.91
434.00	453.00	.0400	12.7	19.01	.67	361.62	30.26	2.38
453.00	454.00	.0400	2.3	3.83	.59	59.45	4.97	2.19
454.00	500.00	.0400	198.7	46.00	4.32	19577.84	1638.00	8.24
500.00	505.65	.0400	12.8	7.23	1.76	692.55	57.94	4.54
TOTALS			245.6			21514.09	1800.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .835 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.808000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1380.808000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1800.00
HEADWATER (ft) : 1380.81
VELOCITY (fps) : 7.28

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1800.00
HEADWATER (ft) : 1381.02
VELOCITY (fps) : 9.48

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.504
UPSTREAM STAGE (ft) : 1381.024

****

STAGE ELEVATION = 1361.64

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
417.91	425.00	.0400	7.2	7.38	.98	264.66	22.14	3.07
425.00	434.00	.0400	13.8	9.06	1.53	682.43	57.10	4.12
434.00	453.00	.0400	15.0	19.01	.79	474.50	39.70	2.65
453.00	454.00	.0400	2.4	3.83	.62	64.72	5.41	2.27
454.00	500.00	.0400	204.2	46.00	4.44	20481.38	1713.60	8.39
500.00	505.80	.0400	13.4	7.42	1.81	742.05	62.08	4.62
TOTALS			256.0			22709.74	1900.03	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .833 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.963000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1380.963000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1900.03
HEADWATER (ft) : 1380.97
VELOCITY (fps) : 7.43

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1900.03
HEADWATER (ft) : 1381.19
VELOCITY (fps) : 9.66

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.548
UPSTREAM STAGE (ft) : 1381.186

****

STAGE ELEVATION = 1361.75

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
417.51	425.00	.0400	8.1	7.79	1.03	306.28	25.63	3.18
425.00	434.00	.0400	14.9	9.06	1.64	769.38	64.37	4.33
434.00	453.00	.0400	17.2	19.01	.90	595.15	49.79	2.90
453.00	454.00	.0400	2.5	3.83	.65	69.98	5.86	2.34
454.00	500.00	.0400	209.4	46.00	4.55	21371.54	1788.07	8.54
500.00	505.94	.0400	14.1	7.61	1.86	792.02	66.26	4.69
TOTALS			266.1			23904.36	1999.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .831 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.115000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1381.115000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1999.98
HEADWATER (ft) : 1381.14
VELOCITY (fps) : 7.58

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1999.98
HEADWATER (ft) : 1381.34
VELOCITY (fps) : 9.82

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.592
UPSTREAM STAGE (ft) : 1381.345

****

STAGE ELEVATION = 1361.86

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
417.12	425.00	.0400	8.9	8.20	1.09	350.46	29.32	3.29
425.00	434.00	.0400	15.9	9.06	1.75	857.87	71.77	4.52
434.00	453.00	.0400	19.3	19.01	1.01	722.71	60.47	3.14
453.00	454.00	.0400	2.6	3.83	.68	75.26	6.30	2.41
454.00	500.00	.0400	214.6	46.00	4.66	22251.55	1861.70	8.68
500.00	506.08	.0400	14.8	7.79	1.90	842.57	70.49	4.77
TOTALS			276.0			25100.43	2100.05	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .829 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.264000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1381.264000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2100.05
HEADWATER (ft) : 1381.30
VELOCITY (fps) : 7.72

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2100.05
HEADWATER (ft) : 1381.50
VELOCITY (fps) : 9.98

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.637
UPSTREAM STAGE (ft) : 1381.501

****

STAGE ELEVATION = 1361.97

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
415.86	417.00	.0400	.0	1.14	.04	.17	.01	.34
417.00	425.00	.0400	9.8	8.32	1.17	404.36	33.83	3.46
425.00	434.00	.0400	16.8	9.06	1.86	946.98	79.23	4.70
434.00	453.00	.0400	21.3	19.01	1.12	855.18	71.55	3.36
453.00	454.00	.0400	2.7	3.83	.71	80.50	6.74	2.47
454.00	500.00	.0400	219.5	46.00	4.77	23115.15	1933.95	8.81
500.00	506.22	.0400	15.5	7.96	1.94	893.28	74.74	4.84
TOTALS			285.7			26295.63	2200.05	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .831 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.411000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1381.411000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2200.05
HEADWATER (ft) : 1381.46
VELOCITY (fps) : 7.85

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2200.05
HEADWATER (ft) : 1381.66
VELOCITY (fps) : 10.14

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.683
UPSTREAM STAGE (ft) : 1381.655

****

STAGE ELEVATION = 1362.08

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
414.20	417.00	.0400	.2	2.80	.09	1.82	.15	.62
417.00	425.00	.0400	10.6	8.32	1.28	463.68	38.79	3.65
425.00	434.00	.0400	17.8	9.06	1.96	1036.81	86.75	4.88
434.00	453.00	.0400	23.3	19.01	1.23	992.14	83.01	3.56
453.00	454.00	.0400	2.8	3.83	.74	85.73	7.17	2.54
454.00	500.00	.0400	224.3	46.00	4.88	23965.85	2005.13	8.94
500.00	506.35	.0400	16.1	8.13	1.98	944.29	79.00	4.90
TOTALS			295.2			27490.31	2300.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .836 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.556000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1381.556000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2300.00
HEADWATER (ft) : 1381.61
VELOCITY (fps) : 7.98

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2300.00
HEADWATER (ft) : 1381.81
VELOCITY (fps) : 10.29

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.730
UPSTREAM STAGE (ft) : 1381.807

****

STAGE ELEVATION = 1362.18

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
412.59	417.00	.0400	.6	4.42	.14	6.14	.51	.83
417.00	425.00	.0400	11.4	8.32	1.37	524.63	43.89	3.84
425.00	434.00	.0400	18.7	9.06	2.07	1127.54	94.34	5.04
434.00	453.00	.0400	25.2	19.01	1.33	1133.47	94.83	3.76
453.00	454.00	.0400	2.9	3.83	.76	90.95	7.61	2.60
454.00	500.00	.0400	229.0	46.00	4.98	24807.51	2075.55	9.06
500.00	506.47	.0400	16.8	8.29	2.02	995.76	83.31	4.97
TOTALS			304.7			28685.99	2400.04	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .840 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.698000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1381.698000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2400.04
HEADWATER (ft) : 1381.77
VELOCITY (fps) : 8.11

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2400.04
HEADWATER (ft) : 1381.96
VELOCITY (fps) : 10.44

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.778
UPSTREAM STAGE (ft) : 1381.956

****

STAGE ELEVATION = 1362.28

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
411.01	417.00	.0400	1.1	6.00	.19	13.85	1.16	1.02
417.00	425.00	.0400	12.2	8.32	1.47	586.92	49.10	4.02
425.00	434.00	.0400	19.6	9.06	2.17	1218.90	101.98	5.20
434.00	453.00	.0400	27.1	19.01	1.43	1278.40	106.96	3.94
453.00	454.00	.0400	3.0	3.83	.79	96.15	8.04	2.66
454.00	500.00	.0400	233.6	46.00	5.08	25639.18	2145.13	9.18
500.00	506.60	.0400	17.4	8.45	2.06	1047.59	87.65	5.03
TOTALS			314.1			29880.99	2500.02	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .844 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.839000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1381.839000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2500.02
HEADWATER (ft) : 1381.92
VELOCITY (fps) : 8.23

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2500.02
HEADWATER (ft) : 1382.10
VELOCITY (fps) : 10.58

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.825
UPSTREAM STAGE (ft) : 1382.104

****

STAGE ELEVATION = 1362.38

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
409.47	417.00	.0400	1.8	7.54	.24	25.48	2.13	1.19
417.00	425.00	.0400	13.0	8.32	1.56	650.42	54.42	4.18
425.00	434.00	.0400	20.5	9.06	2.26	1310.86	109.67	5.36
434.00	453.00	.0400	29.0	19.01	1.52	1426.61	119.36	4.12
453.00	454.00	.0400	3.1	3.83	.82	101.35	8.48	2.71
454.00	500.00	.0400	238.1	46.00	5.18	26462.01	2213.97	9.30
500.00	506.72	.0400	18.1	8.60	2.10	1099.80	92.02	5.10
TOTALS			323.5			31076.54	2600.05	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .847 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.978000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1381.978000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2600.05
HEADWATER (ft) : 1382.08
VELOCITY (fps) : 8.36

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2600.05
HEADWATER (ft) : 1382.25
VELOCITY (fps) : 10.72

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.874
UPSTREAM STAGE (ft) : 1382.249

****

STAGE ELEVATION = 1362.47

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
407.97	417.00	.0400	2.6	9.05	.28	41.39	3.46	1.34
417.00	425.00	.0400	13.8	8.32	1.65	714.89	59.81	4.35
425.00	434.00	.0400	21.3	9.06	2.36	1403.19	117.40	5.50
434.00	453.00	.0400	30.8	19.01	1.62	1577.49	131.98	4.29
453.00	454.00	.0400	3.2	3.83	.84	106.53	8.91	2.77
454.00	500.00	.0400	242.4	46.00	5.27	27275.20	2282.01	9.41
500.00	506.84	.0400	18.7	8.76	2.14	1152.32	96.41	5.15
TOTALS			332.8			32271.00	2699.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .851 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.115000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1382.115000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2699.99
HEADWATER (ft) : 1382.23
VELOCITY (fps) : 8.47

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2699.99
HEADWATER (ft) : 1382.39
VELOCITY (fps) : 10.86

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.922
UPSTREAM STAGE (ft) : 1382.393

****

STAGE ELEVATION = 1362.56

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
406.50	417.00	.0400	3.5	10.52	.33	61.86	5.18	1.49
417.00	425.00	.0400	14.5	8.32	1.74	780.29	65.28	4.50
425.00	434.00	.0400	22.2	9.06	2.45	1495.91	125.16	5.65
434.00	453.00	.0400	32.5	19.01	1.71	1730.87	144.82	4.45
453.00	454.00	.0400	3.3	3.83	.86	111.69	9.34	2.82
454.00	500.00	.0400	246.7	46.00	5.36	28080.10	2349.35	9.52
500.00	506.95	.0400	19.3	8.91	2.17	1205.17	100.83	5.21
TOTALS			342.1			33465.90	2799.96	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .854 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.250000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1382.250000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2799.96
HEADWATER (ft) : 1382.38
VELOCITY (fps) : 8.59

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2799.96
HEADWATER (ft) : 1382.53
VELOCITY (fps) : 10.99

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.972
UPSTREAM STAGE (ft) : 1382.535

****

STAGE ELEVATION = 1362.65

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
405.06	417.00	.0400	4.5	11.96	.38	87.12	7.29	1.62
417.00	425.00	.0400	15.2	8.32	1.83	846.52	70.82	4.65
425.00	434.00	.0400	23.0	9.06	2.54	1588.96	132.94	5.78
434.00	453.00	.0400	34.3	19.01	1.80	1886.49	157.84	4.60
453.00	454.00	.0400	3.4	3.83	.89	116.84	9.78	2.87
454.00	500.00	.0400	250.9	46.00	5.45	28877.09	2416.03	9.63
500.00	507.07	.0400	20.0	9.05	2.21	1258.35	105.28	5.27
TOTALS			351.3			34661.38	2899.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .857 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.384000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1382.384000
NORMAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2899.98
HEADWATER (ft) : 1382.53
VELOCITY (fps) : 8.70

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2899.98
HEADWATER (ft) : 1382.68
VELOCITY (fps) : 11.12

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.021
UPSTREAM STAGE (ft) : 1382.675

****

STAGE ELEVATION = 1362.74

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
403.67	417.00	.0400	5.6	13.36	.42	116.94	9.78	1.74
417.00	425.00	.0400	15.9	8.32	1.91	912.74	76.37	4.79
425.00	434.00	.0400	23.8	9.06	2.63	1681.27	140.67	5.92
434.00	453.00	.0400	35.9	19.01	1.89	2042.37	170.88	4.75
453.00	454.00	.0400	3.5	3.83	.91	121.92	10.20	2.92
454.00	500.00	.0400	254.9	46.00	5.54	29657.94	2481.36	9.73
500.00	507.18	.0400	20.6	9.19	2.24	1311.27	109.71	5.32
TOTALS			360.3			35844.45	2998.96	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .860 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.515000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1382.515000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2998.96
HEADWATER (ft) : 1382.68
VELOCITY (fps) : 8.81

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2998.96
HEADWATER (ft) : 1382.81
VELOCITY (fps) : 11.24

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.069
UPSTREAM STAGE (ft) : 1382.812

****

STAGE ELEVATION = 1362.83

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
402.29	417.00	.0400	6.8	14.74	.46	152.13	12.73	1.86
417.00	425.00	.0400	16.6	8.32	2.00	980.36	82.02	4.93
425.00	434.00	.0400	24.6	9.06	2.71	1774.86	148.50	6.05
434.00	453.00	.0400	37.6	19.01	1.98	2201.81	184.22	4.90
453.00	454.00	.0400	3.6	3.83	.93	127.04	10.63	2.97
454.00	500.00	.0400	258.9	46.00	5.63	30440.49	2546.83	9.84
500.00	507.29	.0400	21.2	9.33	2.28	1365.10	114.21	5.38
TOTALS			369.4			37041.78	3099.14	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .863 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.646000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1382.646000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3099.14
HEADWATER (ft) : 1382.82
VELOCITY (fps) : 8.91

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3099.14
HEADWATER (ft) : 1382.95
VELOCITY (fps) : 11.37

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.120
UPSTREAM STAGE (ft) : 1382.950

****

STAGE ELEVATION = 1362.92

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
400.93	417.00	.0400	8.2	16.10	.51	192.35	16.09	1.97
417.00	425.00	.0400	17.3	8.32	2.08	1048.43	87.72	5.07
425.00	434.00	.0400	25.3	9.06	2.80	1868.43	156.32	6.17
434.00	453.00	.0400	39.2	19.01	2.06	2362.51	197.66	5.04
453.00	454.00	.0400	3.7	3.83	.96	132.13	11.06	3.02
454.00	500.00	.0400	262.9	46.00	5.71	31214.51	2611.59	9.93
500.00	507.39	.0400	21.9	9.47	2.31	1419.11	118.73	5.43
TOTALS			378.4			38237.47	3199.18	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .866 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.775000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1382.775000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3199.18
HEADWATER (ft) : 1382.97
VELOCITY (fps) : 9.02

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3199.18
HEADWATER (ft) : 1383.09
VELOCITY (fps) : 11.49

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.170
UPSTREAM STAGE (ft) : 1383.086

****

STAGE ELEVATION = 1363.00

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
399.61	417.00	.0400	9.6	17.43	.55	237.65	19.88	2.08
417.00	425.00	.0400	18.0	8.32	2.16	1116.89	93.45	5.20
425.00	434.00	.0400	26.1	9.06	2.88	1962.00	164.15	6.29
434.00	453.00	.0400	40.8	19.01	2.15	2524.35	211.20	5.17
453.00	454.00	.0400	3.7	3.83	.98	137.20	11.48	3.06
454.00	500.00	.0400	266.7	46.00	5.80	31980.56	2675.69	10.03
500.00	507.50	.0400	22.5	9.60	2.34	1473.32	123.27	5.48
TOTALS			387.4			39431.98	3299.12	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .869 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.903000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1382.903000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3299.12
HEADWATER (ft) : 1383.12
VELOCITY (fps) : 9.12

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3299.12
HEADWATER (ft) : 1383.22
VELOCITY (fps) : 11.61

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.221
UPSTREAM STAGE (ft) : 1383.220

****

STAGE ELEVATION = 1363.08

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
398.31	417.00	.0400	11.0	18.73	.59	288.13	24.11	2.18
417.00	425.00	.0400	18.6	8.32	2.24	1185.84	99.21	5.32
425.00	434.00	.0400	26.8	9.06	2.96	2055.69	171.99	6.41
434.00	453.00	.0400	42.4	19.01	2.23	2687.52	224.85	5.31
453.00	454.00	.0400	3.8	3.83	1.00	142.26	11.90	3.11
454.00	500.00	.0400	270.5	46.00	5.88	32740.44	2739.26	10.13
500.00	507.60	.0400	23.1	9.73	2.37	1527.83	127.83	5.53
TOTALS			396.3			40627.71	3399.16	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .871 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.030000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.030000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3399.16
HEADWATER (ft) : 1383.27
VELOCITY (fps) : 7.19

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3399.16
HEADWATER (ft) : 1383.35
VELOCITY (fps) : 11.72

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.272
UPSTREAM STAGE (ft) : 1383.353

****

STAGE ELEVATION = 1363.16

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
397.59	398.00	.0400	.0	.42	.03	.05	.00	.30
398.00	417.00	.0400	12.6	19.04	.66	353.58	29.58	2.36
417.00	425.00	.0400	19.3	8.32	2.32	1254.73	104.98	5.44
425.00	434.00	.0400	27.5	9.06	3.04	2148.85	179.79	6.53
434.00	453.00	.0400	43.9	19.01	2.31	2850.73	238.51	5.43
453.00	454.00	.0400	3.9	3.83	1.02	147.27	12.32	3.15
454.00	500.00	.0400	274.2	46.00	5.96	33489.14	2801.90	10.22
500.00	507.70	.0400	23.7	9.86	2.41	1582.24	132.38	5.58
TOTALS			405.2			41826.59	3499.46	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .871 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.156000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.156000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3499.46
HEADWATER (ft) : 1383.41
VELOCITY (fps) : 7.41

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3499.46
HEADWATER (ft) : 1383.49
VELOCITY (fps) : 11.84

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.324
UPSTREAM STAGE (ft) : 1383.485

****

STAGE ELEVATION = 1363.24

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
397.06	398.00	.0400	.1	.95	.07	.41	.03	.52
398.00	417.00	.0400	14.1	19.04	.74	426.40	35.68	2.54
417.00	425.00	.0400	19.9	8.32	2.39	1323.65	110.74	5.56
425.00	434.00	.0400	28.3	9.06	3.12	2241.61	187.55	6.64
434.00	453.00	.0400	45.4	19.01	2.39	3014.18	252.18	5.55
453.00	454.00	.0400	4.0	3.83	1.04	152.23	12.74	3.19
454.00	500.00	.0400	277.8	46.00	6.04	34228.46	2863.76	10.31
500.00	507.80	.0400	24.3	9.99	2.44	1636.65	136.93	5.63
TOTALS			413.8			43023.61	3599.61	

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--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .871 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.280000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.280000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3599.61
HEADWATER (ft) : 1383.56
VELOCITY (fps) : 7.62

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3599.61
HEADWATER (ft) : 1383.62
VELOCITY (fps) : 11.95

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.376
UPSTREAM STAGE (ft) : 1383.616

****

STAGE ELEVATION = 1363.32

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
396.53	398.00	.0400	.2	1.48	.11	1.34	.11	.70
398.00	417.00	.0400	15.5	19.04	.82	503.21	42.10	2.71
417.00	425.00	.0400	20.5	8.32	2.47	1392.83	116.53	5.67
425.00	434.00	.0400	29.0	9.06	3.20	2334.31	195.30	6.75
434.00	453.00	.0400	46.9	19.01	2.47	3178.36	265.92	5.67
453.00	454.00	.0400	4.1	3.83	1.06	157.18	13.15	3.23
454.00	500.00	.0400	281.4	46.00	6.12	34961.43	2925.08	10.40
500.00	507.90	.0400	24.9	10.11	2.47	1691.26	141.50	5.67
TOTALS			422.4			44219.92	3699.70	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .870 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.403000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.403000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3699.70
HEADWATER (ft) : 1383.71
VELOCITY (fps) : 7.83

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3699.70
HEADWATER (ft) : 1383.75
VELOCITY (fps) : 12.06

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.428
UPSTREAM STAGE (ft) : 1383.745

****

STAGE ELEVATION = 1363.39

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
396.02	398.00	.0400	.3	2.00	.14	2.97	.25	.86
398.00	417.00	.0400	17.0	19.04	.89	583.55	48.82	2.88
417.00	425.00	.0400	21.1	8.32	2.54	1462.17	122.33	5.79
425.00	434.00	.0400	29.6	9.06	3.27	2426.86	203.05	6.85
434.00	453.00	.0400	48.3	19.01	2.54	3343.07	279.70	5.79
453.00	454.00	.0400	4.1	3.83	1.08	162.10	13.56	3.27
454.00	500.00	.0400	284.9	46.00	6.19	35687.71	2985.85	10.48
500.00	507.99	.0400	25.5	10.23	2.50	1746.02	146.08	5.72
TOTALS			430.9			45414.45	3799.65	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .870 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.525000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1383.525000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3799.65
HEADWATER (ft) : 1383.86
VELOCITY (fps) : 8.04

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3799.65
HEADWATER (ft) : 1383.87
VELOCITY (fps) : 12.17

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.480
UPSTREAM STAGE (ft) : 1383.873

****

STAGE ELEVATION = 1363.47

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
395.51	398.00	.0400	.5	2.51	.18	5.45	.46	1.00
398.00	417.00	.0400	18.4	19.04	.97	667.32	55.83	3.04
417.00	425.00	.0400	21.7	8.32	2.61	1531.82	128.16	5.89
425.00	434.00	.0400	30.3	9.06	3.35	2519.47	210.79	6.95
434.00	453.00	.0400	49.7	19.01	2.62	3508.64	293.55	5.90
453.00	454.00	.0400	4.2	3.83	1.10	167.01	13.97	3.31
454.00	500.00	.0400	288.3	46.00	6.27	36409.30	3046.22	10.57
500.00	508.08	.0400	26.1	10.35	2.53	1801.05	150.69	5.76
TOTALS			439.3			46610.05	3899.68	

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--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .870 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.646000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.646000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3899.68
HEADWATER (ft) : 1384.01
VELOCITY (fps) : 8.25

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3899.68
HEADWATER (ft) : 1384.00
VELOCITY (fps) : 12.27

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.539
UPSTREAM STAGE (ft) : 1384.007

****

STAGE ELEVATION = 1363.54

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
395.01	398.00	.0400	.7	3.02	.22	8.88	.74	1.13
398.00	417.00	.0400	19.8	19.04	1.04	754.20	63.10	3.19
417.00	425.00	.0400	22.3	8.32	2.68	1601.71	134.01	6.00
425.00	434.00	.0400	31.0	9.06	3.42	2612.07	218.54	7.06
434.00	453.00	.0400	51.1	19.01	2.69	3674.89	307.46	6.01
453.00	454.00	.0400	4.3	3.83	1.12	171.90	14.38	3.35
454.00	500.00	.0400	291.7	46.00	6.34	37125.94	3106.18	10.65
500.00	508.18	.0400	26.7	10.47	2.55	1856.32	155.31	5.81
TOTALS			447.6			47805.91	3999.73	

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--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .869 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.766000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.766000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3999.73
HEADWATER (ft) : 1384.16
VELOCITY (fps) : 8.47

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3999.73
HEADWATER (ft) : 1384.13
VELOCITY (fps) : 12.38

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.614
UPSTREAM STAGE (ft) : 1384.156

****

STAGE ELEVATION = 1363.61

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
394.52	398.00	.0400	.9	3.52	.25	13.33	1.12	1.25
398.00	417.00	.0400	21.2	19.04	1.11	844.05	70.62	3.34
417.00	425.00	.0400	22.9	8.32	2.75	1671.89	139.88	6.10
425.00	434.00	.0400	31.6	9.06	3.49	2704.75	226.30	7.16
[illegible]4.00	453.00	.0400	52.5	19.01	2.76	3841.94	321.44	6.12
[illegible]00	454.00	.0400	4.4	3.83	1.14	176.79	14.79	3.39
[illegible]00	500.00	.0400	295.0	46.00	6.41	37838.56	3165.80	10.73
500.00	508.27	.0400	27.3	10.59	2.58	1911.89	159.96	5.85
TOTALS			455.9			49003.20	4099.90	

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--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .869 ---

[illegible]PE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.885000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.885000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4099.90
HEADWATER (ft) : 1384.31
VELOCITY (fps) : 8.68

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4099.90
HEADWATER (ft) : 1384.25
VELOCITY (fps) : 12.48

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.691
UPSTREAM STAGE (ft) : 1384.305

****

STAGE ELEVATION = 1363.69

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
394.04	398.00	.0400	1.2	4.01	.29	18.87	1.58	1.36
398.00	417.00	.0400	22.5	19.04	1.18	936.29	78.34	3.48
417.00	425.00	.0400	23.5	8.32	2.82	1742.06	145.75	6.21
425.00	434.00	.0400	32.3	9.06	3.56	2797.14	234.03	7.25
434.00	453.00	.0400	53.9	19.01	2.83	4009.08	335.42	6.23
453.00	454.00	.0400	4.4	3.83	1.16	181.64	15.20	3.43
454.00	500.00	.0400	298.3	46.00	6.49	38544.49	3224.86	10.81
500.00	508.36	.0400	27.9	10.70	2.61	1967.53	164.62	5.89
TOTALS			464.0			50197.09	4199.79	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .869 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.003000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1384.003000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4199.79
HEADWATER (ft) : 1384.46
VELOCITY (fps) : 8.89

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4199.79
HEADWATER (ft) : 1384.38
VELOCITY (fps) : 12.58

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.769
UPSTREAM STAGE (ft) : 1384.455

****

STAGE ELEVATION = 1363.76

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
393.56	398.00	.0400	1.5	4.49	.32	25.57	2.14	1.47
398.00	417.00	.0400	23.9	19.04	1.25	1031.14	86.27	3.61
417.00	425.00	.0400	24.1	8.32	2.89	1812.52	151.65	6.31
425.00	434.00	.0400	32.9	9.06	3.63	2889.63	241.76	7.35
434.00	453.00	.0400	55.2	19.01	2.91	4177.00	349.47	6.33
453.00	454.00	.0400	4.5	3.83	1.18	186.49	15.60	3.46
454.00	500.00	.0400	301.6	46.00	6.56	39247.11	3283.65	10.89
500.00	508.45	.0400	28.5	10.82	2.64	2023.48	169.30	5.93
TOTALS			472.1			51392.95	4299.84	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .869 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.120000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1384.120000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4299.84
HEADWATER (ft) : 1384.61
VELOCITY (fps) : 9.10

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4299.84
HEADWATER (ft) : 1384.50
VELOCITY (fps) : 12.68

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.850
UPSTREAM STAGE (ft) : 1384.606

****

STAGE ELEVATION = 1363.83

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
393.09	398.00	.0400	1.8	4.97	.36	33.47	2.80	1.57
398.00	417.00	.0400	25.2	19.04	1.32	1128.24	94.40	3.75
417.00	425.00	.0400	24.6	8.32	2.96	1883.10	157.55	6.40
425.00	434.00	.0400	33.5	9.06	3.70	2982.02	249.49	7.44
434.00	453.00	.0400	56.5	19.01	2.98	4345.29	363.55	6.43
453.00	454.00	.0400	4.6	3.83	1.19	191.33	16.01	3.50
454.00	500.00	.0400	304.8	46.00	6.63	39944.98	3342.04	10.96
500.00	508.53	.0400	29.1	10.93	2.67	2079.63	173.99	5.97
TOTALS			480.2			52588.06	4399.83	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .869 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.236000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1384.237000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4399.83
HEADWATER (ft) : 1384.76
VELOCITY (fps) : 9.31

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4399.83
HEADWATER (ft) : 1384.62
VELOCITY (fps) : 12.78

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.932
UPSTREAM STAGE (ft) : 1384.758

****

STAGE ELEVATION = 1363.90

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
392.62	398.00	.0400	2.1	5.44	.39	42.61	3.57	1.67
398.00	417.00	.0400	26.5	19.04	1.39	1227.55	102.70	3.88
417.00	425.00	.0400	25.2	8.32	3.02	1953.87	163.47	6.50
425.00	434.00	.0400	34.2	9.06	3.77	3074.42	257.22	7.53
434.00	453.00	.0400	57.9	19.01	3.04	4514.11	377.68	6.53
453.00	454.00	.0400	4.6	3.83	1.21	196.15	16.41	3.53
454.00	500.00	.0400	308.0	46.00	6.69	40639.12	3400.11	11.04
500.00	508.62	.0400	29.7	11.04	2.69	2136.04	178.71	6.01
TOTALS			488.1			53783.87	4499.88	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .869 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.352000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1384.352000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4499.88
HEADWATER (ft) : 1384.91
VELOCITY (fps) : 9.52

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4499.88
HEADWATER (ft) : 1384.79
VELOCITY (fps) : 12.87

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 21.016
UPSTREAM STAGE (ft) : 1384.911

--- SUMMARY OF RESULTS ---

FLOW (cfs)	TAILWATER ELEVATION (ft)	HEADWATER ELEVATION (ft)	BACKWATER (ft)
99.71	1358.00	1377.44	19.44
199.99	1358.41	1377.68	19.26
299.95	1358.74	1377.96	19.21
399.91	1359.03	1378.24	19.20
499.79	1359.29	1378.50	19.20
599.75	1359.53	1378.74	19.20
699.62	1359.76	1378.97	19.21
799.98	1359.97	1379.18	19.22
900.00	1360.16	1379.39	19.23
1000.02	1360.35	1379.60	19.25
1099.98	1360.52	1379.79	19.27
1199.99	1360.69	1379.98	19.29
1300.00	1360.85	1380.16	19.32
1400.00	1361.00	1380.34	19.35
1500.07	1361.14	1380.52	19.38
1600.01	1361.27	1380.69	19.42
1700.06	1361.40	1380.86	19.46
1800.00	1361.52	1381.02	19.50
1900.03	1361.64	1381.19	19.55
1999.98	1361.75	1381.34	19.59
2100.05	1361.86	1381.50	19.64
2200.05	1361.97	1381.66	19.68
2300.00	1362.08	1381.81	19.73
2400.04	1362.18	1381.96	19.78
2500.02	1362.28	1382.10	19.83
2600.05	1362.38	1382.25	19.87
2699.99	1362.47	1382.39	19.92
2799.96	1362.56	1382.53	19.97
2899.98	1362.65	1382.68	20.02
2998.96	1362.74	1382.81	20.07
3099.14	1362.83	1382.95	20.12
3199.18	1362.92	1383.09	20.17
3299.12	1363.00	1383.22	20.22
3399.16	1363.08	1383.35	20.27
3499.46	1363.16	1383.49	20.32
3599.61	1363.24	1383.62	20.38
3699.70	1363.32	1383.75	20.43
3799.65	1363.39	1383.87	20.48
3899.68	1363.47	1384.01	20.54
3999.73	1363.54	1384.16	20.61
4099.90	1363.61	1384.31	20.69
4199.79	1363.69	1384.46	20.77

CAP Structure CAP-4 Hydraulic Calculations

4299.84	1363.76	1384.61	20.85
4399.83	1363.83	1384.76	20.93
4499.88	1363.90	1384.91	21.02

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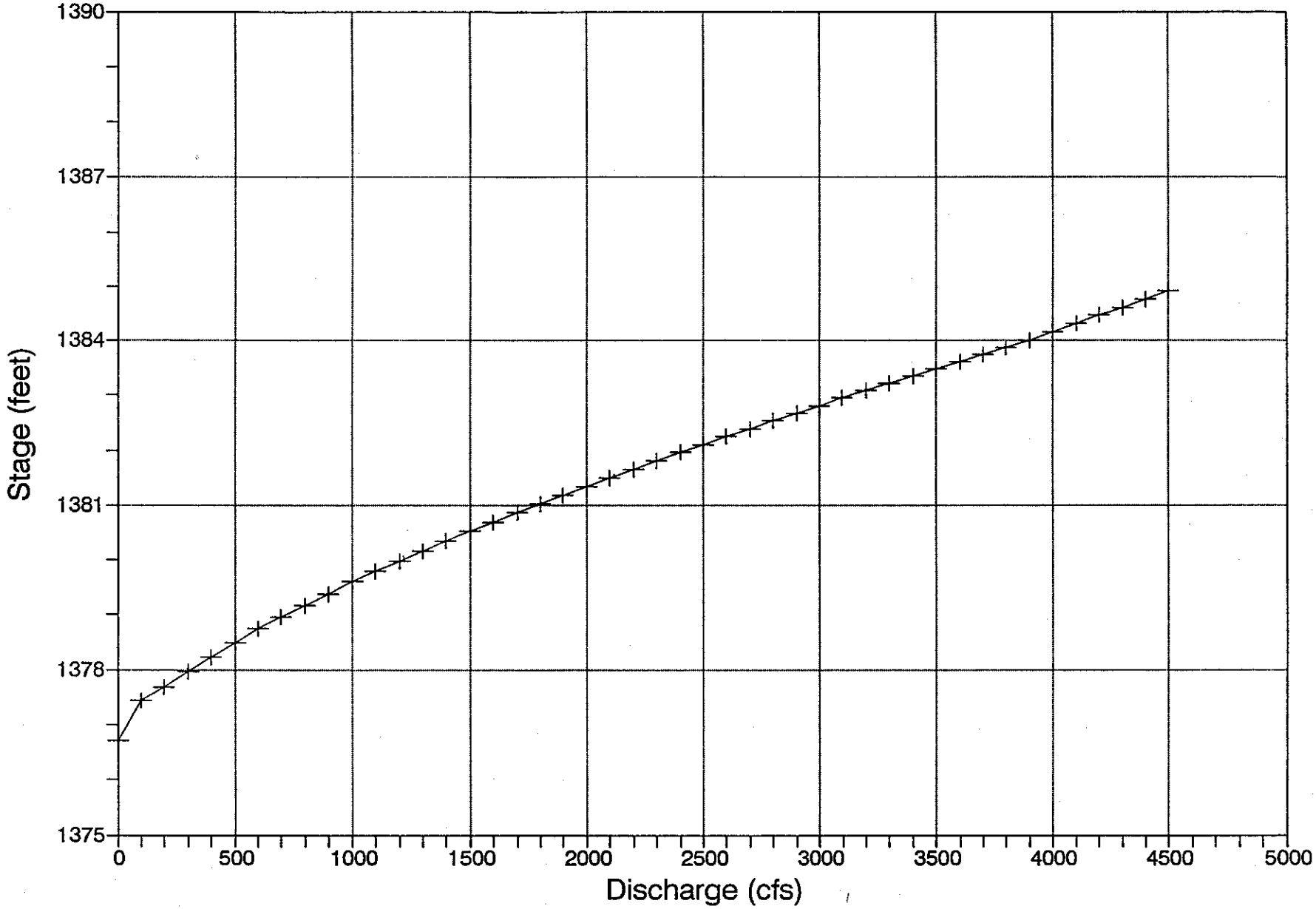
CAP CANAL STAGE-DISCHARGE CURVE

CAP-4, Sta. 293+50



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*  H    H    OOOO    BBBBB     CCCCC    W      W  *
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HYDRAULICS OF BRIDGE AND CULVERT WATERWAYS

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GALILEO SOFTWARE
16 RANCH ROAD
CHELMSFORD, MA 01824

VERSION 3.02
SERIAL NUMBER 1003

CAP Structure CAP-6 Hydraulic Calculations

--- HOBCW PROJECT DATA ---

NUMBER OF GROUND STATIONS	:	4
NUMBER OF ROAD STATIONS	:	0
NUMBER OF ROUGNESS COEFFICIENTS	:	4
STREAM SLOPE (ft/ft)	:	.00500
MINIMUM FLOW (cfs)	:	100.00
MAXIMUM FLOW (cfs)	:	1600.00
FLOW INCREMENT (cfs)	:	100.00
NUMBER OF CULVERTS	:	1
CULVERT CODE	:	21534
CULVERT SLOPE (ft/ft)	:	.00640
CULVERT LENGTH (ft)	:	172.60
DOWNSTREAM CULVERT INVERT (ft)	:	1371.07
CIRCULAR CULVERT DIAMETER	:	5.50
ENTRANCE LOSS COEFFICIENT Ke	:	.5
CULVERT ROUGHNESS COEFFICIENT	:	.012

--- CROSS SECTION DESCRIPTION ---

STATION NUMBER	STATION (ft)	GROUND ELEVATION (ft)	ROUGNESS FACTOR	ROAD ELEVATION (ft)
1	479.00	1381.07	.0440	
2	494.00	1371.07	.0440	
3	506.00	1371.07	.0440	
4	521.00	1381.07	.0440	

--- HOBCW OUTPUT DATA ---

****

STAGE ELEVATION = 1373.03

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
491.06	494.00	.0440	2.9	3.53	.82	84.94	6.01	2.08
494.00	506.00	.0440	23.5	12.00	1.96	1244.15	87.97	3.74
506.00	508.94	.0440	2.9	3.53	.82	84.94	6.01	2.08
TOTALS			29.3			1414.02	99.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .493 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 99.99
HEADWATER (ft) : 1376.26
VELOCITY (fps) : 11.13

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 99.99
HEADWATER (ft) : 1376.57
VELOCITY (fps) : 11.13

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 3.538
UPSTREAM STAGE (ft) : 1376.568

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 ************************************************
*  H    H    OOOO    BBBBB     CCCCC    W      W  *
*  H    H   O    O   B    B   C         W  WW  W  *
*  HHHHHH   O    O   BBBBB    C         W W  W W  *
*  H    H   O    O   B    B   C         WW    WW  *
*  H    H    OOOO    BBBBB     CCCCC    W      W  *
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HYDRAULICS OF BRIDGE AND CULVERT WATERWAYS

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16 RANCH ROAD
CHELMSFORD, MA 01824

VERSION 3.02
SERIAL NUMBER 1003

CAP Structure CAP-6 Hydraulic Calculations

--- HOBCW PROJECT DATA ---

NUMBER OF GROUND STATIONS	:	4
NUMBER OF ROAD STATIONS	:	0
NUMBER OF ROUGNESS COEFFICIENTS	:	4
STREAM SLOPE (ft/ft)	:	.00500
MINIMUM FLOW (cfs)	:	100.00
MAXIMUM FLOW (cfs)	:	1600.00
FLOW INCREMENT (cfs)	:	100.00
NUMBER OF CULVERTS	:	1
CULVERT CODE	:	21534
CULVERT SLOPE (ft/ft)	:	.00640
CULVERT LENGTH (ft)	:	172.60
DOWNSTREAM CULVERT INVERT (ft)	:	1371.07
CIRCULAR CULVERT DIAMETER	:	5.50
ENTRANCE LOSS COEFFICIENT Ke	:	.5
CULVERT ROUGHNESS COEFFICIENT	:	.012

--- CROSS SECTION DESCRIPTION ---

STATION NUMBER	STATION (ft)	GROUND ELEVATION (ft)	ROUGNESS FACTOR	ROAD ELEVATION (ft)
1	479.00	1381.07	.0440	
2	494.00	1371.07	.0440	
3	506.00	1371.07	.0440	
4	521.00	1381.07	.0440	

--- HOBCW OUTPUT DATA ---

****

STAGE ELEVATION = 1373.03

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
491.06	494.00	.0440	2.9	3.53	.82	84.94	6.01	2.08
494.00	506.00	.0440	23.5	12.00	1.96	1244.15	87.97	3.74
506.00	508.94	.0440	2.9	3.53	.82	84.94	6.01	2.08
TOTALS			29.3			1414.02	99.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .493 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 99.99
HEADWATER (ft) : 1376.26
VELOCITY (fps) : 11.13

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 99.99
HEADWATER (ft) : 1376.57
VELOCITY (fps) : 11.13

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 3.538
UPSTREAM STAGE (ft) : 1376.568

****

STAGE ELEVATION = 1373.95

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
489.69	494.00	.0440	6.2	5.18	1.20	235.96	16.68	2.69
494.00	506.00	.0440	34.5	12.00	2.88	2356.16	166.61	4.83
506.00	510.31	.0440	6.2	5.18	1.20	235.96	16.68	2.69
TOTALS			46.9			2828.08	199.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .531 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 199.98
HEADWATER (ft) : 1378.71
VELOCITY (fps) : 13.23

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 199.98
HEADWATER (ft) : 1378.91
VELOCITY (fps) : 13.23

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 4.967
UPSTREAM STAGE (ft) : 1378.912

****

STAGE ELEVATION = 1374.65

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
488.63	494.00	.0440	9.6	6.45	1.49	423.40	29.94	3.11
494.00	506.00	.0440	43.0	12.00	3.58	3395.48	240.10	5.59
506.00	511.37	.0440	9.6	6.45	1.49	423.40	29.94	3.11
TOTALS			62.2			4242.29	299.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .553 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1378.757000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1378.757000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 299.98
HEADWATER (ft) : 1382.14
VELOCITY (fps) : 12.63

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 299.98
HEADWATER (ft) : 1381.12
VELOCITY (fps) : 13.72

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 7.494
UPSTREAM STAGE (ft) : 1382.144

****

STAGE ELEVATION = 1375.24

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
487.74	494.00	.0440	13.1	7.52	1.74	636.93	45.04	3.45
494.00	506.00	.0440	50.1	12.00	4.17	4382.67	309.90	6.19
506.00	512.26	.0440	13.1	7.52	1.74	636.93	45.04	3.45
TOTALS			76.2			5656.53	399.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .569 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.864000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1380.864000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 399.98
HEADWATER (ft) : 1387.11
VELOCITY (fps) : 16.84

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 399.98
HEADWATER (ft) : 1385.10
VELOCITY (fps) : 17.21

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 11.868
UPSTREAM STAGE (ft) : 1387.111

****

STAGE ELEVATION = 1375.76

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
486.96	494.00	.0440	16.5	8.46	1.95	870.90	61.58	3.73
494.00	506.00	.0440	56.3	12.00	4.69	5329.19	376.83	6.69
506.00	513.04	.0440	16.5	8.46	1.95	870.90	61.58	3.73
TOTALS			89.3			7070.99	499.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .581 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.402000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.402000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 499.99
HEADWATER (ft) : 1393.45
VELOCITY (fps) : 21.05

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 499.99
HEADWATER (ft) : 1390.06
VELOCITY (fps) : 21.18

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 17.693
UPSTREAM STAGE (ft) : 1393.455

****

STAGE ELEVATION = 1376.23

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
486.26	494.00	.0440	20.0	9.30	2.15	1121.61	79.31	3.97
494.00	506.00	.0440	61.9	12.00	5.16	6242.10	441.38	7.13
506.00	513.74	.0440	20.0	9.30	2.15	1121.61	79.31	3.97
TOTALS			101.8			8485.31	600.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .590 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1386.452000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1386.452000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 600.00
HEADWATER (ft) : 1401.26
VELOCITY (fps) : 25.25

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 600.00
HEADWATER (ft) : 1396.05
VELOCITY (fps) : 25.31

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 25.030
UPSTREAM STAGE (ft) : 1401.259

****

STAGE ELEVATION = 1376.66

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
485.62	494.00	.0440	23.4	10.07	2.32	1386.48	98.04	4.19
494.00	506.00	.0440	67.0	12.00	5.59	7126.49	503.92	7.52
506.00	514.38	.0440	23.4	10.07	2.32	1386.48	98.04	4.19
TOTALS			113.8			9899.45	700.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .598 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1390.038000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1390.135000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 700.00
HEADWATER (ft) : 1411.76
VELOCITY (fps) : 29.46

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 700.00
HEADWATER (ft) : 1403.26
VELOCITY (fps) : 29.46

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 35.105
UPSTREAM STAGE (ft) : 1411.760

****

STAGE ELEVATION = 1377.05

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
485.03	494.00	.0440	26.8	10.78	2.49	1662.96	117.59	4.38
494.00	506.00	.0440	71.8	12.00	5.98	7984.21	564.57	7.87
506.00	514.97	.0440	26.8	10.78	2.49	1662.96	117.59	4.38
TOTALS			125.4			11310.14	799.75	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .605 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1394.158000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1394.646000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 799.75
HEADWATER (ft) : 1428.22
VELOCITY (fps) : 33.66

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 799.75
HEADWATER (ft) : 1411.78
VELOCITY (fps) : 33.66

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 51.170
UPSTREAM STAGE (ft) : 1428.221

****

STAGE ELEVATION = 1377.42

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
484.48	494.00	.0440	30.2	11.45	2.64	1951.39	137.98	4.56
494.00	506.00	.0440	76.2	12.00	6.35	8823.59	623.92	8.19
506.00	515.52	.0440	30.2	11.45	2.64	1951.39	137.98	4.56
TOTALS			136.7			12726.36	899.89	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .611 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1398.843000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1399.697000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 899.89
HEADWATER (ft) : 1457.07
VELOCITY (fps) : 37.88

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 899.89
HEADWATER (ft) : 1421.39
VELOCITY (fps) : 37.88

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 79.646
UPSTREAM STAGE (ft) : 1457.066

****

STAGE ELEVATION = 1377.77

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
483.95	494.00	.0440	33.6	12.07	2.79	2249.25	159.05	4.73
494.00	506.00	.0440	80.4	12.00	6.70	9642.81	681.85	8.48
506.00	516.05	.0440	33.6	12.07	2.79	2249.25	159.05	4.73
TOTALS			147.6			14141.31	999.94	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .616 ---

PIPE SLOPE IS SUBCRITICAL
TAILWATER EXCEEDS UPSTREAM PIPE CROWN, FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 999.94
HEADWATER (ft) : 1508.45
VELOCITY (fps) : 42.09

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 999.94
HEADWATER (ft) : 1432.05
VELOCITY (fps) : 42.09

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 130.679
UPSTREAM STAGE (ft) : 1508.446

****

STAGE ELEVATION = 1378.10

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
483.46	494.00	.0440	37.0	12.67	2.92	2555.85	180.73	4.88
494.00	506.00	.0440	84.3	12.00	7.03	10444.56	738.54	8.76
506.00	516.54	.0440	37.0	12.67	2.92	2555.85	180.73	4.88
TOTALS			158.3			15556.26	1099.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .621 ---

PIPE SLOPE IS SUBCRITICAL
TAILWATER EXCEEDS UPSTREAM PIPE CROWN, FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1099.99
HEADWATER (ft) : 1597.46
VELOCITY (fps) : 46.30

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1099.99
HEADWATER (ft) : 1443.79
VELOCITY (fps) : 46.30

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 219.365
UPSTREAM STAGE (ft) : 1597.460

****

STAGE ELEVATION = 1378.41

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
482.99	494.00	.0440	40.4	13.23	3.05	2870.23	202.96	5.03
494.00	506.00	.0440	88.1	12.00	7.34	11229.96	794.08	9.02
506.00	517.01	.0440	40.4	13.23	3.05	2870.23	202.96	5.03
TOTALS			168.8			16970.41	1199.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .625 ---

PIPE SLOPE IS SUBCRITICAL
TAILWATER EXCEEDS UPSTREAM PIPE CROWN, FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1199.99
HEADWATER (ft) : 1744.85
VELOCITY (fps) : 50.51

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1199.99
HEADWATER (ft) : 1456.59
VELOCITY (fps) : 50.51

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 366.446
UPSTREAM STAGE (ft) : 1744.854

****

STAGE ELEVATION = 1378.71

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
482.55	494.00	.0440	43.7	13.77	3.18	3191.91	225.70	5.16
494.00	506.00	.0440	91.6	12.00	7.64	12000.86	848.59	9.26
506.00	517.45	.0440	43.7	13.77	3.18	3191.91	225.70	5.16
TOTALS			179.1			18384.69	1299.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .628 ---

PIPE SLOPE IS SUBCRITICAL
TAILWATER EXCEEDS UPSTREAM PIPE CROWN, FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1299.99
HEADWATER (ft) : 1978.18
VELOCITY (fps) : 54.72

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1299.99
HEADWATER (ft) : 1470.46
VELOCITY (fps) : 54.72

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 599.473
UPSTREAM STAGE (ft) : 1978.179

****

STAGE ELEVATION = 1378.99

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
482.12	494.00	.0440	47.1	14.28	3.30	3521.04	248.98	5.29
494.00	506.00	.0440	95.1	12.00	7.92	12759.97	902.27	9.49
506.00	517.88	.0440	47.1	14.28	3.30	3521.04	248.98	5.29
TOTALS			189.2			19802.05	1400.22	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .632 ---

PIPE SLOPE IS SUBCRITICAL
TAILWATER EXCEEDS UPSTREAM PIPE CROWN, FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1400.22
HEADWATER (ft) : 2333.46
VELOCITY (fps) : 58.94

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1400.22
HEADWATER (ft) : 1485.44
VELOCITY (fps) : 58.94

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 954.469
UPSTREAM STAGE (ft) : 2333.460

****

STAGE ELEVATION = 1379.27

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
481.71	494.00	.0440	50.4	14.78	3.41	3855.11	272.60	5.41
494.00	506.00	.0440	98.4	12.00	8.20	13503.73	954.86	9.71
506.00	518.29	.0440	50.4	14.78	3.41	3855.11	272.60	5.41
TOTALS			199.1			21213.95	1500.05	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .635 ---

PIPE SLOPE IS SUBCRITICAL
TAILWATER EXCEEDS UPSTREAM PIPE CROWN, FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1500.05
HEADWATER (ft) : 2851.82
VELOCITY (fps) : 63.14

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1500.05
HEADWATER (ft) : 1501.43
VELOCITY (fps) : 63.14

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 1472.550
UPSTREAM STAGE (ft) : 2851.816

****

STAGE ELEVATION = 1379.53

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
481.31	494.00	.0440	53.7	15.25	3.52	4195.23	296.65	5.53
494.00	506.00	.0440	101.5	12.00	8.46	14236.50	1006.67	9.92
506.00	518.69	.0440	53.7	15.25	3.52	4195.23	296.65	5.53
TOTALS			208.9			22626.96	1599.97	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .638 ---

PIPE SLOPE IS SUBCRITICAL
TAILWATER EXCEEDS UPSTREAM PIPE CROWN, FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1599.97
HEADWATER (ft) : 3587.84
VELOCITY (fps) : 67.34

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1599.97
HEADWATER (ft) : 1518.51
VELOCITY (fps) : 67.34

--- INLET CONTROL GOVERNS ---

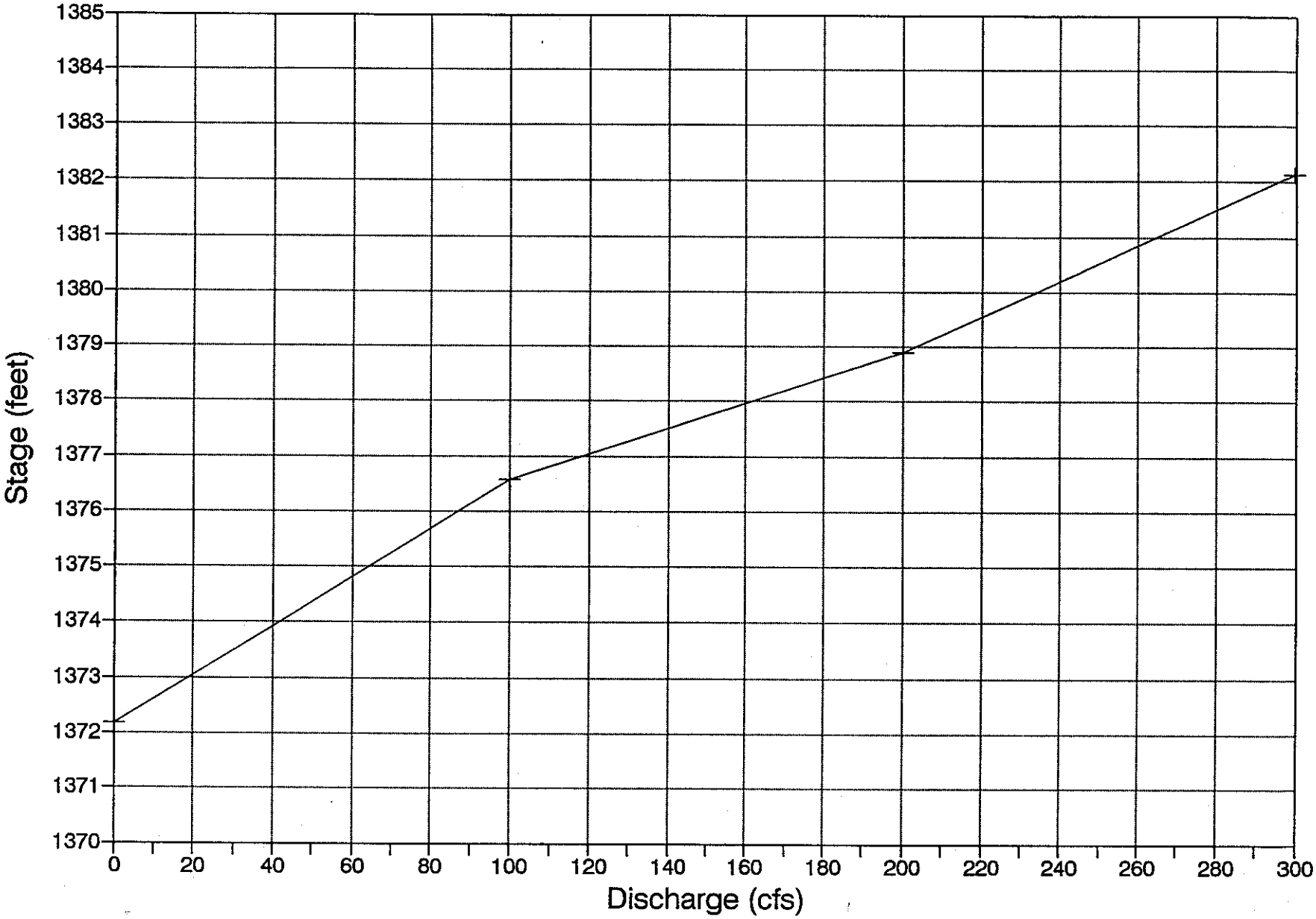
BACKWATER (ft) : 2208.313
UPSTREAM STAGE (ft) : 3587.843

--- SUMMARY OF RESULTS ---

FLOW (cfs)	TAILWATER ELEVATION (ft)	HEADWATER ELEVATION (ft)	BACKWATER (ft)
99.99	1373.03	1376.57	3.54
199.98	1373.95	1378.91	4.97
299.98	1374.65	1382.14	7.49
399.98	1375.24	1387.11	11.87
499.99	1375.76	1393.45	17.69
600.00	1376.23	1401.26	25.03
700.00	1376.66	1411.76	35.10
799.75	1377.05	1428.22	51.17
899.89	1377.42	1457.07	79.65
999.94	1377.77	1508.45	130.68
1099.99	1378.10	1597.46	219.36
1199.99	1378.41	1744.85	366.45
1299.99	1378.71	1978.18	599.47
1400.22	1378.99	2333.46	954.47
1500.05	1379.27	2851.82	1472.55
1599.97	1379.53	3587.84	2208.31

CAP CANAL STAGE-DISCHARGE CURVE

CAP-6, Sta. 393+00



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*  H    H    OOOO    BBBBB     CCCCC    W      W  *
*  H    H   O    O   B    B   C         W  WW  W  *
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*  H    H   O    O   B    B   C         WW    WW  *
*  H    H    OOOO    BBBBB     CCCCC    W      W  *
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HYDRAULICS OF BRIDGE AND CULVERT WATERWAYS

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GALILEO SOFTWARE
16 RANCH ROAD
CHELMSFORD, MA 01824

VERSION 3.02
SERIAL NUMBER 1003

CAP Structure CAP-7 Hydraulic Calculations

--- HOBCW PROJECT DATA ---

NUMBER OF GROUND STATIONS	:	6
NUMBER OF ROAD STATIONS	:	0
NUMBER OF ROUGNESS COEFFICIENTS	:	6
STREAM SLOPE (ft/ft)	:	.00500
MINIMUM FLOW (cfs)	:	100.00
MAXIMUM FLOW (cfs)	:	1600.00
FLOW INCREMENT (cfs)	:	100.00
NUMBER OF CULVERTS	:	1
CULVERT CODE	:	21534
CULVERT SLOPE (ft/ft)	:	.00540
CULVERT LENGTH (ft)	:	172.80
DOWNSTREAM CULVERT INVERT (ft)	:	1370.87
CIRCULAR CULVERT DIAMETER	:	5.50
ENTRANCE LOSS COEFFICIENT Ke	:	.5
CULVERT ROUGHNESS COEFFICIENT	:	.012

--- CROSS SECTION DESCRIPTION ---

STATION NUMBER	STATION (ft)	GROUND ELEVATION (ft)	ROUGNESS FACTOR	ROAD ELEVATION (ft)
1	.00	1388.00	.0400	
2	497.00	1372.07	.0400	
3	499.50	1370.87	.0400	
4	500.50	1370.87	.0400	
5	503.00	1372.07	.0400	
6	1000.00	1388.00	.0400	

--- HOBCW OUTPUT DATA ---

****

STAGE ELEVATION = 1373.14

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
463.78	497.00	.0400	17.7	33.23	.53	431.36	30.50	1.72
497.00	499.50	.0400	4.2	2.77	1.50	202.66	14.33	3.44
499.50	500.50	.0400	2.3	1.00	2.26	145.09	10.26	4.53
500.50	503.00	.0400	4.2	2.77	1.50	202.66	14.33	3.44
503.00	536.22	.0400	17.7	33.23	.53	431.36	30.50	1.72
TOTALS			46.0			1413.12	99.92	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .599 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 99.92
HEADWATER (ft) : 1375.88
VELOCITY (fps) : 10.45

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 99.92
HEADWATER (ft) : 1376.19
VELOCITY (fps) : 10.45

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 3.060
UPSTREAM STAGE (ft) : 1376.195

****

STAGE ELEVATION = 1373.54

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
451.04	497.00	.0400	33.9	45.99	.74	1025.61	72.52	2.14
497.00	499.50	.0400	5.2	2.77	1.87	292.17	20.66	3.99
499.50	500.50	.0400	2.7	1.00	2.67	191.29	13.53	5.06
500.50	503.00	.0400	5.2	2.77	1.87	292.17	20.66	3.99
503.00	548.96	.0400	33.9	45.99	.74	1025.61	72.52	2.14
TOTALS			80.8			2826.85	199.89	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .561 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 199.89
HEADWATER (ft) : 1378.33
VELOCITY (fps) : 12.37

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 199.89
HEADWATER (ft) : 1378.54
VELOCITY (fps) : 12.37

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 4.996
UPSTREAM STAGE (ft) : 1378.539

****

STAGE ELEVATION = 1373.83

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
442.12	497.00	.0400	48.3	54.90	.88	1645.19	116.33	2.41
497.00	499.50	.0400	5.9	2.77	2.13	362.30	25.62	4.34
499.50	500.50	.0400	3.0	1.00	2.96	226.55	16.02	5.41
500.50	503.00	.0400	5.9	2.77	2.13	362.30	25.62	4.34
503.00	557.88	.0400	48.3	54.90	.88	1645.19	116.33	2.41
TOTALS			111.3			4241.53	299.92	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .548 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1378.556000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1378.556000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 299.92
HEADWATER (ft) : 1381.77
VELOCITY (fps) : 12.62

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 299.92
HEADWATER (ft) : 1380.96
VELOCITY (fps) : 13.71

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 7.942
UPSTREAM STAGE (ft) : 1381.771

****

STAGE ELEVATION = 1374.06

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
435.02	497.00	.0400	61.6	62.01	.99	2276.03	160.94	2.61
497.00	499.50	.0400	6.5	2.77	2.33	422.43	29.87	4.62
499.50	500.50	.0400	3.2	1.00	3.19	256.34	18.13	5.69
500.50	503.00	.0400	6.5	2.77	2.33	422.43	29.87	4.62
503.00	564.98	.0400	61.6	62.01	.99	2276.03	160.94	2.61
TOTALS			139.2			5653.26	399.75	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .543 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.659000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1380.659000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 399.75
HEADWATER (ft) : 1386.73
VELOCITY (fps) : 16.83

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 399.75
HEADWATER (ft) : 1384.91
VELOCITY (fps) : 17.21

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 12.669
UPSTREAM STAGE (ft) : 1386.726

****

STAGE ELEVATION = 1374.25

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
428.97	497.00	.0400	74.2	68.06	1.09	2917.47	206.30	2.78
497.00	499.50	.0400	7.0	2.77	2.51	476.50	33.69	4.85
499.50	500.50	.0400	3.4	1.00	3.38	282.86	20.00	5.92
500.50	503.00	.0400	7.0	2.77	2.51	476.50	33.69	4.85
503.00	571.03	.0400	74.2	68.06	1.09	2917.47	206.30	2.78
TOTALS			165.6			7070.80	499.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .540 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.202000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.202000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 499.98
HEADWATER (ft) : 1393.08
VELOCITY (fps) : 21.04

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 499.98
HEADWATER (ft) : 1389.87
VELOCITY (fps) : 21.18

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.832
UPSTREAM STAGE (ft) : 1393.082

****

STAGE ELEVATION = 1374.42

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
423.68	497.00	.0400	86.1	73.35	1.17	3562.34	251.90	2.92
497.00	499.50	.0400	7.4	2.77	2.66	525.91	37.19	5.04
499.50	500.50	.0400	3.5	1.00	3.55	306.90	21.70	6.11
500.50	503.00	.0400	7.4	2.77	2.66	525.91	37.19	5.04
503.00	576.32	.0400	86.1	73.35	1.17	3562.34	251.90	2.92
TOTALS			190.6			8483.39	599.87	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .539 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1386.247000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1386.247000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 599.87
HEADWATER (ft) : 1400.88
VELOCITY (fps) : 25.25

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 599.87
HEADWATER (ft) : 1395.85
VELOCITY (fps) : 25.30

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 26.455
UPSTREAM STAGE (ft) : 1400.876

****

STAGE ELEVATION = 1374.57

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
418.90	497.00	.0400	97.8	78.14	1.25	4216.30	298.14	3.05
497.00	499.50	.0400	7.8	2.77	2.80	572.25	40.46	5.22
499.50	500.50	.0400	3.7	1.00	3.70	329.30	23.29	6.29
500.50	503.00	.0400	7.8	2.77	2.80	572.25	40.46	5.22
503.00	581.10	.0400	97.8	78.14	1.25	4216.30	298.14	3.05
TOTALS			214.7			9906.41	700.49	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .539 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1389.857000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1389.857000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 700.49
HEADWATER (ft) : 1411.45
VELOCITY (fps) : 29.48

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 700.49
HEADWATER (ft) : 1402.97
VELOCITY (fps) : 29.51

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 36.879
UPSTREAM STAGE (ft) : 1411.452

****

STAGE ELEVATION = 1374.71

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
414.58	497.00	.0400	108.9	82.46	1.32	4866.45	344.11	3.16
497.00	499.50	.0400	8.1	2.77	2.92	615.38	43.51	5.37
499.50	500.50	.0400	3.8	1.00	3.84	350.06	24.75	6.44
500.50	503.00	.0400	8.1	2.77	2.92	615.38	43.51	5.37
503.00	585.42	.0400	108.9	82.46	1.32	4866.45	344.11	3.16
TOTALS			237.8			11313.72	800.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .539 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1393.969000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1393.969000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 800.00
HEADWATER (ft) : 1427.90
VELOCITY (fps) : 33.67

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 800.00
HEADWATER (ft) : 1411.08
VELOCITY (fps) : 33.69

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 53.192
UPSTREAM STAGE (ft) : 1427.903

****

STAGE ELEVATION = 1374.84

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
410.59	497.00	.0400	119.7	86.46	1.38	5521.85	390.45	3.26
497.00	499.50	.0400	8.4	2.77	3.04	656.47	46.42	5.51
499.50	500.50	.0400	4.0	1.00	3.97	369.74	26.14	6.59
500.50	503.00	.0400	8.4	2.77	3.04	656.47	46.42	5.51
503.00	589.41	.0400	119.7	86.46	1.38	5521.85	390.45	3.26
TOTALS			260.2			12726.38	899.89	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .539 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1398.643000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1398.643000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 899.89
HEADWATER (ft) : 1456.69
VELOCITY (fps) : 37.88

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 899.89
HEADWATER (ft) : 1420.30
VELOCITY (fps) : 37.88

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 81.855
UPSTREAM STAGE (ft) : 1456.695

****

STAGE ELEVATION = 1374.96

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
406.87	497.00	.0400	130.2	90.18	1.44	6178.16	436.86	3.36
497.00	499.50	.0400	8.7	2.77	3.15	695.61	49.19	5.64
499.50	500.50	.0400	4.1	1.00	4.09	388.42	27.47	6.72
500.50	503.00	.0400	8.7	2.77	3.15	695.61	49.19	5.64
503.00	593.13	.0400	130.2	90.18	1.44	6178.16	436.86	3.36
TOTALS			281.9			14135.95	999.56	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .540 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1403.855000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1403.855000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 999.56
HEADWATER (ft) : 1507.82
VELOCITY (fps) : 42.07

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 999.56
HEADWATER (ft) : 1430.63
VELOCITY (fps) : 42.07

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 132.861
UPSTREAM STAGE (ft) : 1507.820

****

STAGE ELEVATION = 1375.07

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
403.36	497.00	.0400	140.5	93.69	1.50	6841.03	483.73	3.44
497.00	499.50	.0400	9.0	2.77	3.25	733.41	51.86	5.76
499.50	500.50	.0400	4.2	1.00	4.20	406.40	28.74	6.84
500.50	503.00	.0400	9.0	2.77	3.25	733.41	51.86	5.76
503.00	596.64	.0400	140.5	93.69	1.50	6841.03	483.73	3.44
TOTALS			303.3			15555.27	1099.92	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .541 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1409.652000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1409.652000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1099.92
HEADWATER (ft) : 1597.01
VELOCITY (fps) : 46.30

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1099.92
HEADWATER (ft) : 1442.08
VELOCITY (fps) : 46.30

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 221.938
UPSTREAM STAGE (ft) : 1597.010

****

STAGE ELEVATION = 1375.18

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
400.04	497.00	.0400	150.7	97.01	1.55	7507.27	530.84	3.52
497.00	499.50	.0400	9.3	2.77	3.34	769.89	54.44	5.87
499.50	500.50	.0400	4.3	1.00	4.31	423.70	29.96	6.95
500.50	503.00	.0400	9.3	2.77	3.34	769.89	54.44	5.87
503.00	599.96	.0400	150.7	97.01	1.55	7507.27	530.84	3.52
TOTALS			324.2			16978.02	1200.53	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .542 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1416.019000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1416.019000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1200.53
HEADWATER (ft) : 1745.48
VELOCITY (fps) : 50.53

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1200.53
HEADWATER (ft) : 1454.65
VELOCITY (fps) : 50.53

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 370.302
UPSTREAM STAGE (ft) : 1745.479

****

STAGE ELEVATION = 1375.28

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
396.92	497.00	.0400	160.5	100.13	1.60	8167.81	577.55	3.60
497.00	499.50	.0400	9.5	2.77	3.43	804.76	56.90	5.98
499.50	500.50	.0400	4.4	1.00	4.41	440.20	31.13	7.06
500.50	503.00	.0400	9.5	2.77	3.43	804.76	56.90	5.98
503.00	603.08	.0400	160.5	100.13	1.60	8167.81	577.55	3.60
TOTALS			344.5			18385.33	1300.04	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .542 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1422.864000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1422.864000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1300.04
HEADWATER (ft) : 1977.94
VELOCITY (fps) : 54.72

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1300.04
HEADWATER (ft) : 1468.16
VELOCITY (fps) : 54.72

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 602.661
UPSTREAM STAGE (ft) : 1977.938

****

STAGE ELEVATION = 1375.37

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
393.94	497.00	.0400	170.2	103.11	1.65	8833.03	624.59	3.67
497.00	499.50	.0400	9.8	2.77	3.52	838.71	59.31	6.08
499.50	500.50	.0400	4.5	1.00	4.50	456.22	32.26	7.16
500.50	503.00	.0400	9.8	2.77	3.52	838.71	59.31	6.08
503.00	606.06	.0400	170.2	103.11	1.65	8833.03	624.59	3.67
TOTALS			364.5			19799.70	1400.05	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .543 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1430.293000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1430.293000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1400.05
HEADWATER (ft) : 2332.37
VELOCITY (fps) : 58.93

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1400.05
HEADWATER (ft) : 1482.83
VELOCITY (fps) : 58.93

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 957.001
UPSTREAM STAGE (ft) : 2332.374

****

STAGE ELEVATION = 1375.46

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
391.10	497.00	.0400	179.7	105.96	1.70	9497.38	671.57	3.74
497.00	499.50	.0400	10.0	2.77	3.60	871.57	61.63	6.17
499.50	500.50	.0400	4.6	1.00	4.59	471.70	33.35	7.26
500.50	503.00	.0400	10.0	2.77	3.60	871.57	61.63	6.17
503.00	608.90	.0400	179.7	105.96	1.70	9497.38	671.57	3.74
TOTALS			384.0			21209.60	1499.75	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .544 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1438.245000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1438.245000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1499.75
HEADWATER (ft) : 2849.54
VELOCITY (fps) : 63.13

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1499.75
HEADWATER (ft) : 1498.53
VELOCITY (fps) : 63.13

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 1474.080
UPSTREAM STAGE (ft) : 2849.545

****

STAGE ELEVATION = 1375.55

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
388.36	497.00	.0400	189.2	108.70	1.74	10166.43	718.88	3.80
497.00	499.50	.0400	10.2	2.77	3.68	903.72	63.90	6.26
499.50	500.50	.0400	4.7	1.00	4.68	486.82	34.42	7.35
500.50	503.00	.0400	10.2	2.77	3.68	903.72	63.90	6.26
503.00	611.64	.0400	189.2	108.70	1.74	10166.43	718.88	3.80
TOTALS			403.4			22627.12	1599.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .545 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1446.793000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1446.793000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1599.98
HEADWATER (ft) : 3587.57
VELOCITY (fps) : 67.34

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1599.98
HEADWATER (ft) : 1515.40
VELOCITY (fps) : 67.34

--- INLET CONTROL GOVERNS ---

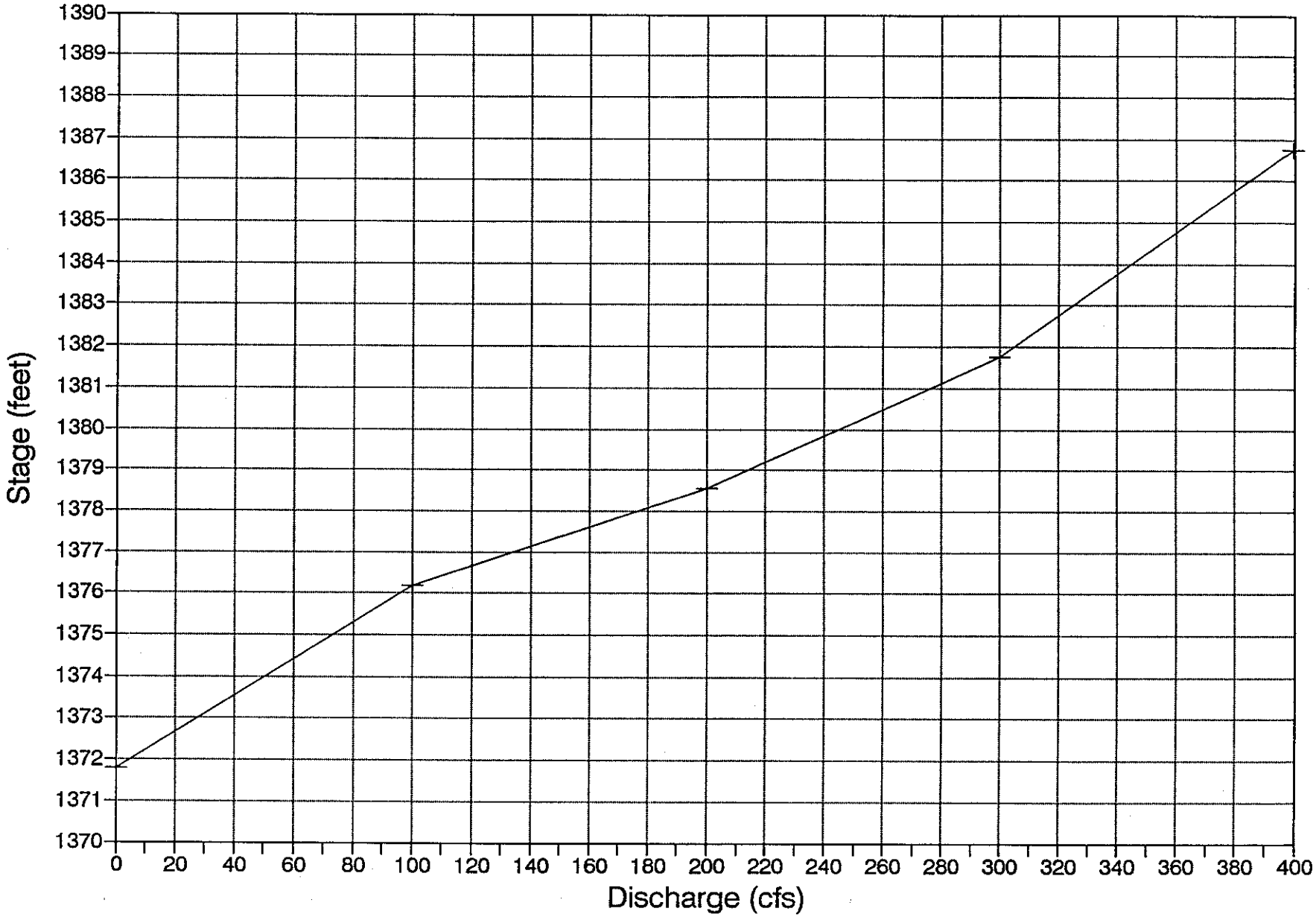
BACKWATER (ft) : 2212.014
UPSTREAM STAGE (ft) : 3587.566

--- SUMMARY OF RESULTS ---

FLOW (cfs)	TAILWATER ELEVATION (ft)	HEADWATER ELEVATION (ft)	BACKWATER (ft)
99.92	1373.14	1376.19	3.06
199.89	1373.54	1378.54	5.00
299.92	1373.83	1381.77	7.94
399.75	1374.06	1386.73	12.67
499.98	1374.25	1393.08	18.83
599.87	1374.42	1400.88	26.46
700.49	1374.57	1411.45	36.88
800.00	1374.71	1427.90	53.19
899.89	1374.84	1456.69	81.86
999.56	1374.96	1507.82	132.86
1099.92	1375.07	1597.01	221.94
1200.53	1375.18	1745.48	370.30
1300.04	1375.28	1977.94	602.66
1400.05	1375.37	2332.37	957.00
1499.75	1375.46	2849.54	1474.08
1599.98	1375.55	3587.57	2212.01

CAP CANAL STAGE-DISCHARGE CURVE

CAP-7, Sta. 402+50



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HYDRAULICS OF BRIDGE AND CULVERT WATERWAYS

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VERSION 3.02
SERIAL NUMBER 1003

CAP Structure CAP-8 Hydraulic Calculations

--- HOBCW PROJECT DATA ---

NUMBER OF GROUND STATIONS	:	6
NUMBER OF ROAD STATIONS	:	0
NUMBER OF ROUGNESS COEFFICIENTS	:	6
STREAM SLOPE (ft/ft)	:	.00700
MINIMUM FLOW (cfs)	:	100.00
MAXIMUM FLOW (cfs)	:	6000.00
FLOW INCREMENT (cfs)	:	100.00
NUMBER OF CULVERTS	:	1
CULVERT CODE	:	41554
CULVERT SLOPE (ft/ft)	:	.00020
CULVERT LENGTH (ft)	:	156.00
DOWNSTREAM CULVERT INVERT (ft)	:	1373.30
BOX CULVERT WIDTH (ft)	:	47.50
BOX CULVERT HEIGHT (ft)	:	7.00
ENTRANCE LOSS COEFFICIENT Ke	:	.2
CULVERT ROUGHNESS COEFFICIENT	:	.012

--- CROSS SECTION DESCRIPTION ---

STATION NUMBER	STATION (ft)	GROUND ELEVATION (ft)	ROUGNESS FACTOR	ROAD ELEVATION (ft)
1	.00	1364.70	.0400	
2	446.50	1360.70	.0400	
3	452.50	1358.00	.0400	
4	547.50	1358.00	.0400	
5	553.50	1360.70	.0400	
6	1000.00	1364.70	.0400	

--- HOBCW OUTPUT DATA ---

****

STAGE ELEVATION = 1358.52

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
451.34	452.50	.0400	.3	1.27	.24	4.28	.36	1.19
452.50	547.50	.0400	49.4	95.00	.52	1187.74	99.37	2.01
547.50	548.66	.0400	.3	1.27	.24	4.28	.36	1.19
TOTALS			50.0			1196.30	100.09	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .493 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1374.075000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1374.075000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 100.09
HEADWATER (ft) : 1374.16
VELOCITY (fps) : 1.85

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 100.09
HEADWATER (ft) : 1374.17
VELOCITY (fps) : 4.07

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 15.646
UPSTREAM STAGE (ft) : 1374.166

****

STAGE ELEVATION = 1358.79

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
450.75	452.50	.0400	.7	1.92	.36	12.90	1.08	1.57
452.50	547.50	.0400	74.8	95.00	.79	2366.92	198.03	2.65
547.50	549.25	.0400	.7	1.92	.36	12.90	1.08	1.57
TOTALS			76.1			2392.73	200.19	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .529 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1374.530000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1374.530000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 200.19
HEADWATER (ft) : 1374.50
VELOCITY (fps) : 2.42

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 200.19
HEADWATER (ft) : 1374.65
VELOCITY (fps) : 5.13

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 15.861
UPSTREAM STAGE (ft) : 1374.648

****

STAGE ELEVATION = 1359.00

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
450.28	452.50	.0400	1.1	2.44	.46	24.47	2.05	1.84
452.50	547.50	.0400	95.0	95.00	1.00	3530.69	295.40	3.11
547.50	549.72	.0400	1.1	2.44	.46	24.47	2.05	1.84
TOTALS			97.2			3579.63	299.49	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .552 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1374.909000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1374.909000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 299.49
HEADWATER (ft) : 1374.81
VELOCITY (fps) : 2.82

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 299.49
HEADWATER (ft) : 1375.05
VELOCITY (fps) : 5.86

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.047
UPSTREAM STAGE (ft) : 1375.047

```
*******************************************************************************

 STAGE ELEVATION =   1359.19

STARTING ENDING  ROUGHNESS CHANNEL  WETTED    HYDRAULIC CONVEYANCE DISCHARGE VELOCITY
STATION  STATION FACTOR    AREA     PERIMETER RADIUS
(ft)     (ft)              (sq ft)  (ft)      (ft)                (cfs)     (fps)
-------------------------------------------------------------------------------------
   449.86  452.50    .0400     1.6       2.89       .54      38.70      3.24     2.07
   452.50  547.50    .0400   112.8      95.00      1.19    4702.13    393.41     3.49
   547.50  550.14    .0400     1.6       2.89       .54      38.70      3.24     2.07
                            -------                        ---------- ---------
TOTALS                       116.0                          4779.54   399.88

*******************************************************************************

 --- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER =   .568 ---

PIPE SLOPE IS SUBCRITICAL
 EGLCRIT =     1375.251000
 TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
 STARTING DOWNSTREAM EGL =     1375.251000
 PARTIAL PIPE FLOW

  INLET CONTROL RESULTS
          DISCHARGE (cfs) :     399.88
          HEADWATER (ft)  :    1375.12
          VELOCITY (fps)  :       3.15

 OUTLET CONTROL RESULTS
          DISCHARGE (cfs) :     399.88
          HEADWATER (ft)  :    1375.41
          VELOCITY (fps)  :       6.46

          --- OUTLET CONTROL GOVERNS ---

    BACKWATER (ft)       :    16.220
    UPSTREAM STAGE (ft) :  1375.408
```

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*******************************************************************************

 STAGE ELEVATION =   1359.36

STARTING ENDING  ROUGHNESS CHANNEL  WETTED    HYDRAULIC CONVEYANCE DISCHARGE VELOCITY
STATION  STATION FACTOR    AREA     PERIMETER RADIUS
(ft)     (ft)              (sq ft)  (ft)      (ft)                (cfs)     (fps)
-------------------------------------------------------------------------------------
   449.49  452.50    .0400     2.0      3.30       .62      55.03      4.60     2.26
   452.50  547.50    .0400   128.8     95.00      1.36    5859.11    490.21     3.81
   547.50  550.51    .0400     2.0      3.30       .62      55.03      4.60     2.26
                            -------                        ---------- ---------
TOTALS                       132.9                          5969.17   499.42

*******************************************************************************

 --- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER =   .582 ---

PIPE SLOPE IS SUBCRITICAL
 EGLCRIT =     1375.563000
 TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
 STARTING DOWNSTREAM EGL =     1375.563000
 PARTIAL PIPE FLOW

  INLET CONTROL RESULTS
          DISCHARGE (cfs) :     499.42
          HEADWATER (ft)  :    1375.42
          VELOCITY (fps)  :       3.42

 OUTLET CONTROL RESULTS
          DISCHARGE (cfs) :     499.42
          HEADWATER (ft)  :    1375.74
          VELOCITY (fps)  :       6.95

          --- OUTLET CONTROL GOVERNS ---

    BACKWATER (ft)       :    16.380
    UPSTREAM STAGE (ft)  :  1375.736
```

****

STAGE ELEVATION = 1359.51

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
449.14	452.50	.0400	2.5	3.68	.69	73.55	6.15	2.42
452.50	547.50	.0400	143.6	95.00	1.51	7023.72	587.65	4.09
547.50	550.86	.0400	2.5	3.68	.69	73.55	6.15	2.42
TOTALS			148.6			7170.81	599.95	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .593 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1375.857000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1375.857000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 599.95
HEADWATER (ft) : 1375.71
VELOCITY (fps) : 3.66

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 599.95
HEADWATER (ft) : 1376.05
VELOCITY (fps) : 7.39

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.535
UPSTREAM STAGE (ft) : 1376.046

****

STAGE ELEVATION = 1359.66

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
448.82	452.50	.0400	3.0	4.03	.75	93.83	7.85	2.58
452.50	547.50	.0400	157.3	95.00	1.66	8178.60	684.27	4.35
547.50	551.18	.0400	3.0	4.03	.75	93.83	7.85	2.58
TOTALS			163.4			8366.26	699.97	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .602 ---

EGL SLOPE IS SUBCRITICAL
EGLCRIT = 1376.134000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1376.134000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 699.97
HEADWATER (ft) : 1375.99
VELOCITY (fps) : 3.87

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 699.97
HEADWATER (ft) : 1376.34
VELOCITY (fps) : 7.78

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.682
UPSTREAM STAGE (ft) : 1376.338

****

STAGE ELEVATION = 1359.79

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
448.52	452.50	.0400	3.6	4.37	.82	115.83	9.69	2.72
452.50	547.50	.0400	170.2	95.00	1.79	9329.53	780.56	4.59
547.50	551.48	.0400	3.6	4.37	.82	115.83	9.69	2.72
TOTALS			177.4			9561.20	799.95	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .611 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1376.398000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1376.398000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 799.95
HEADWATER (ft) : 1376.26
VELOCITY (fps) : 4.07

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 799.95
HEADWATER (ft) : 1376.61
VELOCITY (fps) : 8.14

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.823
UPSTREAM STAGE (ft) : 1376.615

****

STAGE ELEVATION = 1359.92

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
448.23	452.50	.0400	4.1	4.68	.88	139.45	11.67	2.85
452.50	547.50	.0400	182.5	95.00	1.92	10476.97	876.57	4.80
547.50	551.77	.0400	4.1	4.68	.88	139.45	11.67	2.85
TOTALS			190.7			10755.88	899.90	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .618 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1376.651000
TW DEPTH < CULVERT CRIT DEPTH, SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1376.651000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 899.90
HEADWATER (ft) : 1376.52
VELOCITY (fps) : 4.24

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 899.90
HEADWATER (ft) : 1376.88
VELOCITY (fps) : 8.46

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.960
UPSTREAM STAGE (ft) : 1376.882

****

STAGE ELEVATION = 1360.04

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
447.96	452.50	.0400	4.6	4.98	.93	164.61	13.77	2.97
452.50	547.50	.0400	194.2	95.00	2.04	11621.46	972.32	5.01
547.50	552.04	.0400	4.6	4.98	.93	164.61	13.77	2.97
TOTALS			203.5			11950.70	999.87	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .625 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1376.895000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1376.895000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 999.87
HEADWATER (ft) : 1376.78
VELOCITY (fps) : 4.41

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 999.87
HEADWATER (ft) : 1377.14
VELOCITY (fps) : 8.77

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 17.094
UPSTREAM STAGE (ft) : 1377.138

****

STAGE ELEVATION = 1360.16

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
447.69	452.50	.0400	5.2	5.27	.99	191.25	16.00	3.08
452.50	547.50	.0400	205.4	95.00	2.16	12763.66	1067.88	5.20
547.50	552.31	.0400	5.2	5.27	.99	191.25	16.00	3.08
TOTALS			215.8			13146.17	1099.89	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .632 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1377.130000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1377.130000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1099.89
HEADWATER (ft) : 1377.03
VELOCITY (fps) : 4.56

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1099.89
HEADWATER (ft) : 1377.39
VELOCITY (fps) : 9.05

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 17.224
UPSTREAM STAGE (ft) : 1377.386

```
*******************************************************************************

 STAGE ELEVATION =   1360.28

STARTING ENDING  ROUGHNESS CHANNEL  WETTED    HYDRAULIC CONVEYANCE DISCHARGE VELOCITY
STATION  STATION FACTOR    AREA     PERIMETER RADIUS
(ft)     (ft)              (sq ft)  (ft)      (ft)                (cfs)     (fps)
-------------------------------------------------------------------------------------
   447.44  452.50    .0400     5.8      5.55      1.04     219.28     18.35     3.19
   452.50  547.50    .0400   216.3     95.00      2.28   13902.29   1163.15     5.38
   547.50  552.56    .0400     5.8      5.55      1.04     219.28     18.35     3.19
                             -------                      ----------- ---------
TOTALS                        227.8                        14340.84  1199.84

*******************************************************************************

 --- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER =   .637 ---

PIPE SLOPE IS SUBCRITICAL
 EGLCRIT =     1377.359000
 TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
 COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
 STARTING DOWNSTREAM EGL =     1377.359000
 PARTIAL PIPE FLOW

  INLET CONTROL RESULTS
          DISCHARGE (cfs) :    1199.84
          HEADWATER (ft)  :    1377.27
          VELOCITY (fps)  :       4.70

 OUTLET CONTROL RESULTS
          DISCHARGE (cfs) :    1199.84
          HEADWATER (ft)  :    1377.63
          VELOCITY (fps)  :       9.31

          --- OUTLET CONTROL GOVERNS ---

    BACKWATER (ft)      :    17.351
    UPSTREAM STAGE (ft) :  1377.627
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****

STAGE ELEVATION = 1360.39

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
447.20	452.50	.0400	6.3	5.81	1.09	248.64	20.80	3.29
452.50	547.50	.0400	226.7	95.00	2.39	15038.45	1258.21	5.55
547.50	552.80	.0400	6.3	5.81	1.09	248.64	20.80	3.29
TOTALS			239.3			15535.74	1299.81	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .643 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1377.582000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1377.582000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1299.81
HEADWATER (ft) : 1377.51
VELOCITY (fps) : 3.91

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1299.81
HEADWATER (ft) : 1377.86
VELOCITY (fps) : 9.57

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 17.475
UPSTREAM STAGE (ft) : 1377.861

****

STAGE ELEVATION = 1360.49

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
446.96	452.50	.0400	6.9	6.07	1.14	279.29	23.37	3.38
452.50	547.50	.0400	236.8	95.00	2.49	16171.74	1353.02	5.71
547.50	553.04	.0400	6.9	6.07	1.14	279.29	23.37	3.38
TOTALS			250.6			16730.32	1399.76	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .648 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1377.798000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1377.798000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1399.76
HEADWATER (ft) : 1377.74
VELOCITY (fps) : 4.21

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1399.76
HEADWATER (ft) : 1378.09
VELOCITY (fps) : 9.81

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 17.597
UPSTREAM STAGE (ft) : 1378.089

```
*******************************************************************************

 STAGE ELEVATION =   1360.60

STARTING ENDING  ROUGHNESS CHANNEL  WETTED    HYDRAULIC CONVEYANCE DISCHARGE VELOCITY
STATION  STATION FACTOR    AREA     PERIMETER RADIUS
(ft)     (ft)              (sq ft)  (ft)      (ft)                (cfs)     (fps)
-------------------------------------------------------------------------------------
   446.73  452.50    .0400     7.5      6.33      1.18     311.15     26.03     3.48
   452.50  547.50    .0400   246.6     95.00      2.60   17301.09   1447.51     5.87
   547.50  553.27    .0400     7.5      6.33      1.18     311.15     26.03     3.48
                             -------                      ----------- ---------
TOTALS                        261.6                       17923.38  1499.58

*******************************************************************************

 --- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER =   .653 ---

PIPE SLOPE IS SUBCRITICAL
 EGLCRIT =     1378.010000
 TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
 COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
 STARTING DOWNSTREAM EGL =     1378.010000
 PARTIAL PIPE FLOW

  INLET CONTROL RESULTS
          DISCHARGE (cfs) :    1499.58
          HEADWATER (ft)  :    1377.97
          VELOCITY (fps)  :       4.51

 OUTLET CONTROL RESULTS
          DISCHARGE (cfs) :    1499.58
          HEADWATER (ft)  :    1378.31
          VELOCITY (fps)  :      10.03

          --- OUTLET CONTROL GOVERNS ---

    BACKWATER (ft)      :    17.716
    UPSTREAM STAGE (ft) :  1378.312
```

****

STAGE ELEVATION = 1360.70

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
446.51	452.50	.0400	8.1	6.57	1.23	344.10	28.79	3.57
452.50	547.50	.0400	256.1	95.00	2.70	18424.56	1541.51	6.02
547.50	553.49	.0400	8.1	6.57	1.23	344.10	28.79	3.57
TOTALS			272.2			19112.76	1599.09	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .657 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1378.216000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1378.216000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1599.09
HEADWATER (ft) : 1378.19
VELOCITY (fps) : 4.81

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1599.09
HEADWATER (ft) : 1378.53
VELOCITY (fps) : 10.25

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 17.833
UPSTREAM STAGE (ft) : 1378.529

****

STAGE ELEVATION = 1360.79

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
436.19	446.50	.0400	.5	10.32	.05	2.28	.19	.40
446.50	452.50	.0400	8.7	6.58	1.32	385.97	32.29	3.73
452.50	547.50	.0400	265.3	95.00	2.79	19541.94	1635.00	6.16
547.50	553.50	.0400	8.7	6.58	1.32	385.97	32.29	3.73
553.50	563.81	.0400	.5	10.32	.05	2.28	.19	.40
TOTALS			283.5			20318.43	1699.96	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .720 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1378.420000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1378.420000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1699.96
HEADWATER (ft) : 1378.42
VELOCITY (fps) : 5.11

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1699.96
HEADWATER (ft) : 1378.74
VELOCITY (fps) : 10.46

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 17.952
UPSTREAM STAGE (ft) : 1378.745

****

STAGE ELEVATION = 1360.88

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
425.88	446.50	.0400	1.9	20.62	.09	14.45	1.21	.64
446.50	452.50	.0400	9.2	6.58	1.40	428.00	35.81	3.89
452.50	547.50	.0400	274.0	95.00	2.88	20630.16	1726.04	6.30
547.50	553.50	.0400	9.2	6.58	1.40	428.00	35.81	3.89
553.50	574.12	.0400	1.9	20.62	.09	14.45	1.21	.64
TOTALS			296.3			21515.05	1800.08	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .775 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1378.620000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1378.620000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1800.08
HEADWATER (ft) : 1378.63
VELOCITY (fps) : 5.41

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1800.08
HEADWATER (ft) : 1378.95
VELOCITY (fps) : 10.66

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.070
UPSTREAM STAGE (ft) : 1378.954

****

STAGE ELEVATION = 1360.97

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
416.07	446.50	.0400	4.1	30.43	.14	40.80	3.41	.82
446.50	452.50	.0400	9.7	6.58	1.48	469.62	39.29	4.04
452.50	547.50	.0400	282.4	95.00	2.97	21688.38	1814.58	6.43
547.50	553.50	.0400	9.7	6.58	1.48	469.62	39.29	4.04
553.50	583.93	.0400	4.1	30.43	.14	40.80	3.41	.82
TOTALS			310.2			22709.23	1899.99	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .821 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1378.815000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1378.815000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1899.99
HEADWATER (ft) : 1378.85
VELOCITY (fps) : 5.71

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1899.99
HEADWATER (ft) : 1379.16
VELOCITY (fps) : 10.86

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.188
UPSTREAM STAGE (ft) : 1379.160

****

STAGE ELEVATION = 1361.06

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
406.73	446.50	.0400	7.1	39.78	.18	83.35	6.97	.98
446.50	452.50	.0400	10.2	6.58	1.56	510.71	42.73	4.17
452.50	547.50	.0400	290.3	95.00	3.06	22716.23	1900.58	6.55
547.50	553.50	.0400	10.2	6.58	1.56	510.71	42.73	4.17
553.50	593.27	.0400	7.1	39.78	.18	83.35	6.97	.98
TOTALS			325.0			23904.36	1999.98	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .860 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.006000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1379.006000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 1999.98
HEADWATER (ft) : 1379.06
VELOCITY (fps) : 6.01

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 1999.98
HEADWATER (ft) : 1379.36
VELOCITY (fps) : 11.04

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.306
UPSTREAM STAGE (ft) : 1379.362

****

STAGE ELEVATION = 1361.14

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
397.83	446.50	.0400	10.6	48.67	.22	142.80	11.95	1.13
446.50	452.50	.0400	10.7	6.58	1.63	551.09	46.11	4.30
452.50	547.50	.0400	297.9	95.00	3.14	23712.25	1983.91	6.66
547.50	553.50	.0400	10.7	6.58	1.63	551.09	46.11	4.30
553.50	602.17	.0400	10.6	48.67	.22	142.80	11.95	1.13
TOTALS			340.6			25100.02	2100.02	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .892 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.195000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1379.195000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2100.02
HEADWATER (ft) : 1379.28
VELOCITY (fps) : 6.32

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2100.02
HEADWATER (ft) : 1379.56
VELOCITY (fps) : 11.23

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.425
UPSTREAM STAGE (ft) : 1379.561

****

STAGE ELEVATION = 1361.21

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
389.35	446.50	.0400	14.6	57.15	.26	219.09	18.33	1.25
446.50	452.50	.0400	11.2	6.58	1.70	590.69	49.42	4.42
452.50	547.50	.0400	305.1	95.00	3.21	24676.81	2064.61	6.77
547.50	553.50	.0400	11.2	6.58	1.70	590.69	49.42	4.42
553.50	610.65	.0400	14.6	57.15	.26	219.09	18.33	1.25
TOTALS			356.7			26296.37	2200.11	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .919 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.381000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1379.381000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2200.11
HEADWATER (ft) : 1379.49
VELOCITY (fps) : 6.62

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2200.11
HEADWATER (ft) : 1379.76
VELOCITY (fps) : 11.40

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.545
UPSTREAM STAGE (ft) : 1379.757

****

STAGE ELEVATION = 1361.28

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
381.27	446.50	.0400	19.1	65.23	.29	311.74	26.08	1.37
446.50	452.50	.0400	11.6	6.58	1.76	629.46	52.66	4.54
452.50	547.50	.0400	312.0	95.00	3.28	25610.66	2142.74	6.87
547.50	553.50	.0400	11.6	6.58	1.76	629.46	52.66	4.54
553.50	618.73	.0400	19.1	65.23	.29	311.74	26.08	1.37
TOTALS			373.3			27493.05	2300.23	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .942 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.564000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1379.564000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2300.23
HEADWATER (ft) : 1379.70
VELOCITY (fps) : 6.92

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2300.23
HEADWATER (ft) : 1379.95
VELOCITY (fps) : 11.57

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.666
UPSTREAM STAGE (ft) : 1379.950

****

STAGE ELEVATION = 1361.35

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
373.56	446.50	.0400	23.8	72.94	.33	419.96	35.14	1.47
446.50	452.50	.0400	12.0	6.58	1.83	667.37	55.84	4.65
452.50	547.50	.0400	318.6	95.00	3.35	26514.90	2218.40	6.96
547.50	553.50	.0400	12.0	6.58	1.83	667.37	55.84	4.65
553.50	626.44	.0400	23.8	72.94	.33	419.96	35.14	1.47
TOTALS			390.3			28689.57	2400.34	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .961 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.745000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1379.745000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2400.34
HEADWATER (ft) : 1379.91
VELOCITY (fps) : 7.22

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2400.34
HEADWATER (ft) : 1380.14
VELOCITY (fps) : 11.74

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.787
UPSTREAM STAGE (ft) : 1380.140

****

STAGE ELEVATION = 1361.42

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
366.19	446.50	.0400	28.9	80.32	.36	542.89	45.42	1.57
446.50	452.50	.0400	12.4	6.58	1.89	704.44	58.94	4.75
452.50	547.50	.0400	324.8	95.00	3.42	27390.88	2291.69	7.05
547.50	553.50	.0400	12.4	6.58	1.89	704.44	58.94	4.75
553.50	633.81	.0400	28.9	80.32	.36	542.89	45.42	1.57
TOTALS			407.5			29885.54	2500.40	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .977 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.922000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1379.922000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2500.40
HEADWATER (ft) : 1380.12
VELOCITY (fps) : 7.52

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2500.40
HEADWATER (ft) : 1380.33
VELOCITY (fps) : 11.90

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 18.908
UPSTREAM STAGE (ft) : 1380.328

****

STAGE ELEVATION = 1361.48

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
359.13	446.50	.0400	34.2	87.37	.39	679.62	56.86	1.66
446.50	452.50	.0400	12.8	6.58	1.94	740.68	61.97	4.84
452.50	547.50	.0400	330.9	95.00	3.48	28240.27	2362.75	7.14
547.50	553.50	.0400	12.8	6.58	1.94	740.68	61.97	4.84
553.50	640.87	.0400	34.2	87.37	.39	679.62	56.86	1.66
TOTALS			424.8			31080.87	2600.41	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .990 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.098000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1380.098000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2600.41
HEADWATER (ft) : 1380.33
VELOCITY (fps) : 7.82

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2600.41
HEADWATER (ft) : 1380.51
VELOCITY (fps) : 12.05

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.030
UPSTREAM STAGE (ft) : 1380.513

****

STAGE ELEVATION = 1361.54

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
352.34	446.50	.0400	39.7	94.16	.42	829.65	69.41	1.75
446.50	452.50	.0400	13.2	6.58	2.00	776.20	64.94	4.93
452.50	547.50	.0400	336.6	95.00	3.54	29066.61	2431.89	7.22
547.50	553.50	.0400	13.2	6.58	2.00	776.20	64.94	4.93
553.50	647.66	.0400	39.7	94.16	.42	829.65	69.41	1.75
TOTALS			442.4			32278.30	2700.60	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.001 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.271000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1380.271000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2700.60
HEADWATER (ft) : 1380.54
VELOCITY (fps) : 8.12

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2700.60
HEADWATER (ft) : 1380.70
VELOCITY (fps) : 12.21

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.153
UPSTREAM STAGE (ft) : 1380.696

****

STAGE ELEVATION = 1361.60

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
345.82	446.50	.0400	45.4	100.69	.45	992.01	83.00	1.83
446.50	452.50	.0400	13.5	6.58	2.05	810.99	67.85	5.02
452.50	547.50	.0400	342.2	95.00	3.60	29870.39	2499.14	7.30
547.50	553.50	.0400	13.5	6.58	2.05	810.99	67.85	5.02
553.50	654.18	.0400	45.4	100.69	.45	992.01	83.00	1.83
TOTALS			460.0			33476.38	2800.84	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.010 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.443000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1380.443000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2800.84
HEADWATER (ft) : 1380.75
VELOCITY (fps) : 8.42

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2800.84
HEADWATER (ft) : 1380.88
VELOCITY (fps) : 12.36

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.275
UPSTREAM STAGE (ft) : 1380.876

****

STAGE ELEVATION = 1361.66

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
339.54	446.50	.0400	51.2	106.97	.48	1165.75	97.53	1.90
446.50	452.50	.0400	13.8	6.58	2.10	845.05	70.70	5.11
452.50	547.50	.0400	347.5	95.00	3.66	30652.23	2564.55	7.38
547.50	553.50	.0400	13.8	6.58	2.10	845.05	70.70	5.11
553.50	660.46	.0400	51.2	106.97	.48	1165.75	97.53	1.90
TOTALS			477.7			34673.82	2901.02	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.018 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.612000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1380.612000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 2901.02
HEADWATER (ft) : 1380.96
VELOCITY (fps) : 8.72

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 2901.02
HEADWATER (ft) : 1381.06
VELOCITY (fps) : 12.50

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.398
UPSTREAM STAGE (ft) : 1381.055

****

STAGE ELEVATION = 1361.71

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
333.49	446.50	.0400	57.2	113.02	.51	1349.97	112.95	1.97
446.50	452.50	.0400	14.2	6.58	2.15	878.37	73.49	5.18
452.50	547.50	.0400	352.7	95.00	3.71	31412.86	2628.19	7.45
547.50	553.50	.0400	14.2	6.58	2.15	878.37	73.49	5.18
553.50	666.51	.0400	57.2	113.02	.51	1349.97	112.95	1.97
TOTALS			495.4			35869.54	3001.06	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.024 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.779000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1380.779000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3001.06
HEADWATER (ft) : 1381.17
VELOCITY (fps) : 9.03

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3001.06
HEADWATER (ft) : 1381.23
VELOCITY (fps) : 12.64

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.520
UPSTREAM STAGE (ft) : 1381.231

****

STAGE ELEVATION = 1361.76

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
327.64	446.50	.0400	63.3	118.87	.53	1544.29	129.20	2.04
446.50	452.50	.0400	14.5	6.58	2.20	911.07	76.23	5.26
452.50	547.50	.0400	357.7	95.00	3.76	32154.86	2690.27	7.52
547.50	553.50	.0400	14.5	6.58	2.20	911.07	76.23	5.26
553.50	672.36	.0400	63.3	118.87	.53	1544.29	129.20	2.04
TOTALS			513.2			37065.56	3101.13	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.029 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1380.945000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1380.945000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3101.13
HEADWATER (ft) : 1381.39
VELOCITY (fps) : 9.33

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3101.13
HEADWATER (ft) : 1381.41
VELOCITY (fps) : 12.78

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.642
UPSTREAM STAGE (ft) : 1381.406

****

STAGE ELEVATION = 1361.81

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
321.98	446.50	.0400	69.4	124.52	.56	1748.06	146.25	2.11
446.50	452.50	.0400	14.8	6.58	2.25	943.14	78.91	5.33
452.50	547.50	.0400	362.5	95.00	3.82	32879.22	2750.87	7.59
547.50	553.50	.0400	14.8	6.58	2.25	943.14	78.91	5.33
553.50	678.02	.0400	69.4	124.52	.56	1748.06	146.25	2.11
TOTALS			530.9			38261.62	3201.20	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.034 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.108000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1381.108000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3201.20
HEADWATER (ft) : 1381.61
VELOCITY (fps) : 9.63

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3201.20
HEADWATER (ft) : 1381.58
VELOCITY (fps) : 12.92

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.794
UPSTREAM STAGE (ft) : 1381.609

****

STAGE ELEVATION = 1361.86

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
316.51	446.50	.0400	75.7	130.00	.58	1960.71	164.05	2.17
446.50	452.50	.0400	15.1	6.58	2.29	974.64	81.54	5.40
452.50	547.50	.0400	367.1	95.00	3.86	33587.04	2810.09	7.65
547.50	553.50	.0400	15.1	6.58	2.29	974.64	81.54	5.40
553.50	683.49	.0400	75.7	130.00	.58	1960.71	164.05	2.17
TOTALS			548.7			39457.74	3301.27	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.037 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.270000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1381.270000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3301.27
HEADWATER (ft) : 1381.83
VELOCITY (fps) : 9.93

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3301.27
HEADWATER (ft) : 1381.75
VELOCITY (fps) : 13.05

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 19.965
UPSTREAM STAGE (ft) : 1381.829

****

STAGE ELEVATION = 1361.91

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
311.19	446.50	.0400	82.0	135.31	.61	2181.81	182.54	2.23
446.50	452.50	.0400	15.4	6.58	2.34	1005.59	84.13	5.47
452.50	547.50	.0400	371.7	95.00	3.91	34279.47	2868.03	7.72
547.50	553.50	.0400	15.4	6.58	2.34	1005.59	84.13	5.47
553.50	688.81	.0400	82.0	135.31	.61	2181.81	182.54	2.23
TOTALS			566.4			40654.26	3401.38	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.040 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.431000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1381.431000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3401.38
HEADWATER (ft) : 1382.05
VELOCITY (fps) : 10.23

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3401.38
HEADWATER (ft) : 1381.92
VELOCITY (fps) : 13.18

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.140
UPSTREAM STAGE (ft) : 1382.052

****

STAGE ELEVATION = 1361.96

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
306.04	446.50	.0400	88.4	140.46	.63	2410.37	201.67	2.28
446.50	452.50	.0400	15.6	6.58	2.38	1035.95	86.67	5.54
452.50	547.50	.0400	376.0	95.00	3.96	34955.98	2924.63	7.78
547.50	553.50	.0400	15.6	6.58	2.38	1035.95	86.67	5.54
553.50	693.96	.0400	88.4	140.46	.63	2410.37	201.67	2.28
TOTALS			584.1			41848.62	3501.31	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.042 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.589000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1381.589000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3501.31
HEADWATER (ft) : 1382.28
VELOCITY (fps) : 10.53

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3501.31
HEADWATER (ft) : 1382.09
VELOCITY (fps) : 13.31

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.320
UPSTREAM STAGE (ft) : 1382.277

****

STAGE ELEVATION = 1362.00

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
301.03	446.50	.0400	94.8	145.48	.65	2646.72	221.44	2.34
446.50	452.50	.0400	15.9	6.58	2.42	1065.86	89.18	5.60
452.50	547.50	.0400	380.3	95.00	4.00	35619.66	2980.16	7.84
547.50	553.50	.0400	15.9	6.58	2.42	1065.86	89.18	5.60
553.50	698.97	.0400	94.8	145.48	.65	2646.72	221.44	2.34
TOTALS			601.7			43044.82	3601.39	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.044 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.746000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1381.746000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3601.39
HEADWATER (ft) : 1382.51
VELOCITY (fps) : 10.83

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3601.39
HEADWATER (ft) : 1382.31
VELOCITY (fps) : 13.44

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.504
UPSTREAM STAGE (ft) : 1382.506

****

STAGE ELEVATION = 1362.05

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
296.16	446.50	.0400	101.2	150.34	.67	2889.36	241.74	2.39
446.50	452.50	.0400	16.2	6.58	2.46	1095.19	91.63	5.66
452.50	547.50	.0400	384.4	95.00	4.05	36268.28	3034.42	7.89
547.50	553.50	.0400	16.2	6.58	2.46	1095.19	91.63	5.66
553.50	703.84	.0400	101.2	150.34	.67	2889.36	241.74	2.39
TOTALS			619.3			44237.39	3701.17	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.045 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1381.901000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1381.901000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3701.17
HEADWATER (ft) : 1382.74
VELOCITY (fps) : 11.13

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3701.17
HEADWATER (ft) : 1382.51
VELOCITY (fps) : 13.56

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.691
UPSTREAM STAGE (ft) : 1382.737

****

STAGE ELEVATION = 1362.09

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
291.41	446.50	.0400	107.7	155.10	.69	3139.56	262.67	2.44
446.50	452.50	.0400	16.4	6.58	2.50	1124.18	94.06	5.72
452.50	547.50	.0400	388.5	95.00	4.09	36906.87	3087.85	7.95
547.50	553.50	.0400	16.4	6.58	2.50	1124.18	94.06	5.72
553.50	708.59	.0400	107.7	155.10	.69	3139.56	262.67	2.44
TOTALS			636.8			45434.34	3801.31	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.046 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.056000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1382.056000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3801.31
HEADWATER (ft) : 1382.97
VELOCITY (fps) : 11.43

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3801.31
HEADWATER (ft) : 1382.70
VELOCITY (fps) : 13.68

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 20.884
UPSTREAM STAGE (ft) : 1382.973

****

STAGE ELEVATION = 1362.13

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
286.79	446.50	.0400	114.3	159.72	.72	3395.14	284.06	2.49
446.50	452.50	.0400	16.7	6.58	2.54	1152.63	96.44	5.78
452.50	547.50	.0400	392.4	95.00	4.13	37531.43	3140.10	8.00
547.50	553.50	.0400	16.7	6.58	2.54	1152.63	96.44	5.78
553.50	713.21	.0400	114.3	159.72	.72	3395.14	284.06	2.49
TOTALS			654.3			46626.96	3901.09	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.046 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.208000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1382.208000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 3901.09
HEADWATER (ft) : 1383.21
VELOCITY (fps) : 11.73

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 3901.09
HEADWATER (ft) : 1382.90
VELOCITY (fps) : 13.80

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 21.081
UPSTREAM STAGE (ft) : 1383.211

****

STAGE ELEVATION = 1362.17

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
282.28	446.50	.0400	120.8	164.23	.74	3656.87	305.96	2.53
446.50	452.50	.0400	16.9	6.58	2.57	1180.68	98.78	5.84
452.50	547.50	.0400	396.3	95.00	4.17	38145.28	3191.46	8.05
547.50	553.50	.0400	16.9	6.58	2.57	1180.68	98.78	5.84
553.50	717.72	.0400	120.8	164.23	.74	3656.87	305.96	2.53
TOTALS			671.7			47820.38	4000.94	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.047 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.360000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1382.360000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4000.94
HEADWATER (ft) : 1383.45
VELOCITY (fps) : 12.03

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4000.94
HEADWATER (ft) : 1383.09
VELOCITY (fps) : 13.92

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 21.283
UPSTREAM STAGE (ft) : 1383.454

****

STAGE ELEVATION = 1362.21

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
277.88	446.50	.0400	127.4	168.63	.76	3924.09	328.31	2.58
446.50	452.50	.0400	17.2	6.58	2.61	1208.31	101.09	5.89
452.50	547.50	.0400	400.0	95.00	4.21	38748.14	3241.90	8.10
547.50	553.50	.0400	17.2	6.58	2.61	1208.31	101.09	5.89
553.50	722.12	.0400	127.4	168.63	.76	3924.09	328.31	2.58
TOTALS			689.1			49012.93	4100.72	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.047 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.510000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1382.510000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4100.72
HEADWATER (ft) : 1383.70
VELOCITY (fps) : 12.33

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4100.72
HEADWATER (ft) : 1383.29
VELOCITY (fps) : 14.03

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 21.490
UPSTREAM STAGE (ft) : 1383.700

****

STAGE ELEVATION = 1362.25

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
273.57	446.50	.0400	134.0	172.94	.77	4197.02	351.15	2.62
446.50	452.50	.0400	17.4	6.58	2.64	1235.58	103.38	5.94
452.50	547.50	.0400	403.7	95.00	4.25	39341.58	3291.55	8.15
547.50	553.50	.0400	17.4	6.58	2.64	1235.58	103.38	5.94
553.50	726.43	.0400	134.0	172.94	.77	4197.02	351.15	2.62
TOTALS			706.4			50206.79	4200.60	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.046 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.659000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1382.659000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4200.60
HEADWATER (ft) : 1383.95
VELOCITY (fps) : 12.63

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4200.60
HEADWATER (ft) : 1383.47
VELOCITY (fps) : 14.14

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 21.701
UPSTREAM STAGE (ft) : 1383.950

****

STAGE ELEVATION = 1362.29

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
269.35	446.50	.0400	140.6	177.16	.79	4476.00	374.49	2.66
446.50	452.50	.0400	17.6	6.58	2.68	1262.58	105.63	5.99
452.50	547.50	.0400	407.3	95.00	4.29	39927.25	3340.55	8.20
547.50	553.50	.0400	17.6	6.58	2.68	1262.58	105.63	5.99
553.50	730.65	.0400	140.6	177.16	.79	4476.00	374.49	2.66
TOTALS			723.7			51404.41	4300.80	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.046 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.807000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1382.807000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4300.80
HEADWATER (ft) : 1384.21
VELOCITY (fps) : 12.93

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4300.80
HEADWATER (ft) : 1383.66
VELOCITY (fps) : 14.26

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 21.919
UPSTREAM STAGE (ft) : 1384.206

****

STAGE ELEVATION = 1362.32

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
265.23	446.50	.0400	147.2	181.28	.81	4758.66	398.14	2.71
446.50	452.50	.0400	17.8	6.58	2.71	1289.10	107.85	6.04
452.50	547.50	.0400	410.8	95.00	4.32	40501.14	3388.57	8.25
547.50	553.50	.0400	17.8	6.58	2.71	1289.10	107.85	6.04
553.50	734.77	.0400	147.2	181.28	.81	4758.66	398.14	2.71
TOTALS			740.8			52596.66	4400.55	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.045 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1382.953000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1382.954000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4400.55
HEADWATER (ft) : 1384.46
VELOCITY (fps) : 13.23

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4400.55
HEADWATER (ft) : 1383.86
VELOCITY (fps) : 14.36

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 22.141
UPSTREAM STAGE (ft) : 1384.464

****

STAGE ELEVATION = 1362.36

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
261.20	446.50	.0400	153.8	185.31	.83	5046.27	422.20	2.75
446.50	452.50	.0400	18.1	6.58	2.74	1315.31	110.05	6.09
452.50	547.50	.0400	414.2	95.00	4.36	41066.80	3435.89	8.30
547.50	553.50	.0400	18.1	6.58	2.74	1315.31	110.05	6.09
553.50	738.80	.0400	153.8	185.31	.83	5046.27	422.20	2.75
TOTALS			757.9			53789.97	4500.39	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.045 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.099000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1383.099000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4500.39
HEADWATER (ft) : 1384.73
VELOCITY (fps) : 13.54

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4500.39
HEADWATER (ft) : 1384.05
VELOCITY (fps) : 14.47

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 22.368
UPSTREAM STAGE (ft) : 1384.728

****

STAGE ELEVATION = 1362.40

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
257.25	446.50	.0400	160.4	189.26	.85	5338.36	446.64	2.78
446.50	452.50	.0400	18.3	6.58	2.78	1341.20	112.21	6.14
452.50	547.50	.0400	417.6	95.00	4.40	41624.03	3482.52	8.34
547.50	553.50	.0400	18.3	6.58	2.78	1341.20	112.21	6.14
553.50	742.75	.0400	160.4	189.26	.85	5338.36	446.64	2.78
TOTALS			775.0			54983.14	4600.22	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.044 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.243000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.243000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4600.22
HEADWATER (ft) : 1385.00
VELOCITY (fps) : 13.84

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4600.22
HEADWATER (ft) : 1384.23
VELOCITY (fps) : 14.58

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 22.601
UPSTREAM STAGE (ft) : 1384.996

****

STAGE ELEVATION = 1362.43

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
253.36	446.50	.0400	167.1	193.14	.87	5635.49	471.50	2.82
446.50	452.50	.0400	18.5	6.58	2.81	1366.83	114.36	6.19
452.50	547.50	.0400	420.9	95.00	4.43	42174.57	3528.58	8.38
547.50	553.50	.0400	18.5	6.58	2.81	1366.83	114.36	6.19
553.50	746.64	.0400	167.1	193.14	.87	5635.49	471.50	2.82
TOTALS			792.0			56179.22	4700.29	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.043 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.387000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.387000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4700.29
HEADWATER (ft) : 1385.27
VELOCITY (fps) : 14.14

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4700.29
HEADWATER (ft) : 1384.44
VELOCITY (fps) : 14.68

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 22.839
UPSTREAM STAGE (ft) : 1385.270

****

STAGE ELEVATION = 1362.46

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
249.56	446.50	.0400	173.7	196.95	.88	5936.18	496.66	2.86
446.50	452.50	.0400	18.7	6.58	2.84	1392.11	116.47	6.23
452.50	547.50	.0400	424.1	95.00	4.46	42716.33	3573.90	8.43
547.50	553.50	.0400	18.7	6.58	2.84	1392.11	116.47	6.23
553.50	750.44	.0400	173.7	196.95	.88	5936.18	496.66	2.86
TOTALS			808.9			57372.90	4800.16	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.042 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.529000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1383.530000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4800.16
HEADWATER (ft) : 1385.55
VELOCITY (fps) : 14.44

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4800.16
HEADWATER (ft) : 1384.63
VELOCITY (fps) : 14.79

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 23.083
UPSTREAM STAGE (ft) : 1385.547

****

STAGE ELEVATION = 1362.50

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
245.83	446.50	.0400	180.4	200.68	.90	6241.04	522.16	2.89
446.50	452.50	.0400	18.9	6.58	2.87	1417.12	118.56	6.28
452.50	547.50	.0400	427.3	95.00	4.50	43251.06	3618.64	8.47
547.50	553.50	.0400	18.9	6.58	2.87	1417.12	118.56	6.28
553.50	754.17	.0400	180.4	200.68	.90	6241.04	522.16	2.89
TOTALS			825.8			58567.38	4900.10	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.041 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.671000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1383.671000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 4900.10
HEADWATER (ft) : 1385.83
VELOCITY (fps) : 14.74

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 4900.10
HEADWATER (ft) : 1384.82
VELOCITY (fps) : 14.89

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 23.332
UPSTREAM STAGE (ft) : 1385.830

****

STAGE ELEVATION = 1362.53

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
242.16	446.50	.0400	187.0	204.35	.92	6549.68	547.99	2.93
446.50	452.50	.0400	19.1	6.58	2.90	1441.84	120.63	6.32
452.50	547.50	.0400	430.4	95.00	4.53	43778.63	3662.78	8.51
547.50	553.50	.0400	19.1	6.58	2.90	1441.84	120.63	6.32
553.50	757.84	.0400	187.0	204.35	.92	6549.68	547.99	2.93
TOTALS			842.6			59761.67	5000.02	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.040 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.811000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1383.811000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5000.02
HEADWATER (ft) : 1386.12
VELOCITY (fps) : 15.04

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5000.02
HEADWATER (ft) : 1385.03
VELOCITY (fps) : 15.04

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 23.588
UPSTREAM STAGE (ft) : 1386.118

****

STAGE ELEVATION = 1362.56

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
238.55	446.50	.0400	193.7	207.96	.93	6862.89	574.19	2.96
446.50	452.50	.0400	19.3	6.58	2.93	1466.37	122.69	6.36
452.50	547.50	.0400	433.5	95.00	4.56	44300.84	3706.47	8.55
547.50	553.50	.0400	19.3	6.58	2.93	1466.37	122.69	6.36
553.50	761.45	.0400	193.7	207.96	.93	6862.89	574.19	2.96
TOTALS			859.4			60959.35	5100.23	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.038 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1383.953000
TW DEPTH < CULVERT CRIT DEPTH, SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1383.953000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5100.23
HEADWATER (ft) : 1386.41
VELOCITY (fps) : 15.34

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5100.23
HEADWATER (ft) : 1385.22
VELOCITY (fps) : 15.34

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 23.849
UPSTREAM STAGE (ft) : 1386.412

****

STAGE ELEVATION = 1362.59

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
235.01	446.50	.0400	200.4	211.50	.95	7179.12	600.65	3.00
446.50	452.50	.0400	19.5	6.58	2.96	1490.59	124.71	6.41
452.50	547.50	.0400	436.5	95.00	4.59	44815.61	3749.54	8.59
547.50	553.50	.0400	19.5	6.58	2.96	1490.59	124.71	6.41
553.50	764.99	.0400	200.4	211.50	.95	7179.12	600.65	3.00
TOTALS			876.1			62155.03	5200.26	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.037 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.098000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1384.098000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5200.26
HEADWATER (ft) : 1386.71
VELOCITY (fps) : 15.64

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5200.26
HEADWATER (ft) : 1385.42
VELOCITY (fps) : 15.64

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 24.116
UPSTREAM STAGE (ft) : 1386.710

****

STAGE ELEVATION = 1362.63

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
231.53	446.50	.0400	207.0	214.97	.96	7497.97	627.33	3.03
446.50	452.50	.0400	19.7	6.58	2.99	1514.50	126.71	6.45
452.50	547.50	.0400	439.4	95.00	4.63	45322.79	3791.98	8.63
547.50	553.50	.0400	19.7	6.58	2.99	1514.50	126.71	6.45
553.50	768.47	.0400	207.0	214.97	.96	7497.97	627.33	3.03
TOTALS			892.7			63347.73	5300.05	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.036 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.245000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1384.245000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5300.05
HEADWATER (ft) : 1387.01
VELOCITY (fps) : 15.94

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5300.05
HEADWATER (ft) : 1385.62
VELOCITY (fps) : 15.94

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 24.388
UPSTREAM STAGE (ft) : 1387.013

****

STAGE ELEVATION = 1362.66

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
228.11	446.50	.0400	213.6	218.39	.98	7820.33	654.30	3.06
446.50	452.50	.0400	19.8	6.58	3.02	1538.18	128.69	6.49
452.50	547.50	.0400	442.4	95.00	4.66	45824.23	3833.93	8.67
547.50	553.50	.0400	19.8	6.58	3.02	1538.18	128.69	6.49
553.50	771.89	.0400	213.6	218.39	.98	7820.33	654.30	3.06
TOTALS			909.3			64541.25	5399.91	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.034 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.396000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1384.396000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5399.91
HEADWATER (ft) : 1387.32
VELOCITY (fps) : 16.24

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5399.91
HEADWATER (ft) : 1385.82
VELOCITY (fps) : 16.24

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 24.665
UPSTREAM STAGE (ft) : 1387.322

****

STAGE ELEVATION = 1362.69

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
224.74	446.50	.0400	220.3	221.77	.99	8147.20	681.64	3.09
446.50	452.50	.0400	20.0	6.58	3.04	1561.73	130.66	6.53
452.50	547.50	.0400	445.2	95.00	4.69	46321.86	3875.56	8.70
547.50	553.50	.0400	20.0	6.58	3.04	1561.73	130.66	6.53
553.50	775.26	.0400	220.3	221.77	.99	8147.20	681.64	3.09
TOTALS			925.9			65739.70	5500.18	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.033 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.549000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1384.549000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5500.18
HEADWATER (ft) : 1387.64
VELOCITY (fps) : 16.54

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5500.18
HEADWATER (ft) : 1386.03
VELOCITY (fps) : 16.54

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 24.950
UPSTREAM STAGE (ft) : 1387.637

****

STAGE ELEVATION = 1362.72

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
221.42	446.50	.0400	226.9	225.08	1.01	8475.63	709.12	3.13
446.50	452.50	.0400	20.2	6.58	3.07	1584.93	132.61	6.57
452.50	547.50	.0400	448.0	95.00	4.72	46811.52	3916.53	8.74
547.50	553.50	.0400	20.2	6.58	3.07	1584.93	132.61	6.57
553.50	778.58	.0400	226.9	225.08	1.01	8475.63	709.12	3.13
TOTALS			942.3			66932.66	5599.99	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.032 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.705000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1384.705000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5599.99
HEADWATER (ft) : 1387.96
VELOCITY (fps) : 16.84

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5599.99
HEADWATER (ft) : 1386.24
VELOCITY (fps) : 16.84

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 25.240
UPSTREAM STAGE (ft) : 1387.956

****

STAGE ELEVATION = 1362.75

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
218.15	446.50	.0400	233.6	228.36	1.02	8808.01	736.93	3.16
446.50	452.50	.0400	20.4	6.58	3.10	1607.99	134.53	6.60
452.50	547.50	.0400	450.8	95.00	4.75	47297.17	3957.17	8.78
547.50	553.50	.0400	20.4	6.58	3.10	1607.99	134.53	6.60
553.50	781.85	.0400	233.6	228.36	1.02	8808.01	736.93	3.16
TOTALS			958.7			68129.17	5700.10	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.030 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1384.864000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1384.864000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5700.10
HEADWATER (ft) : 1388.28
VELOCITY (fps) : 17.14

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5700.10
HEADWATER (ft) : 1386.45
VELOCITY (fps) : 17.14

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 25.536
UPSTREAM STAGE (ft) : 1388.281

****

STAGE ELEVATION = 1362.77

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
214.94	446.50	.0400	240.2	231.57	1.04	9142.69	764.93	3.18
446.50	452.50	.0400	20.5	6.58	3.12	1630.79	136.44	6.64
452.50	547.50	.0400	453.6	95.00	4.77	47776.67	3997.28	8.81
547.50	553.50	.0400	20.5	6.58	3.12	1630.79	136.44	6.64
553.50	785.06	.0400	240.2	231.57	1.04	9142.69	764.93	3.18
TOTALS			975.0			69323.63	5800.03	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.029 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1385.025000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1385.025000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5800.03
HEADWATER (ft) : 1388.61
VELOCITY (fps) : 17.44

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5800.03
HEADWATER (ft) : 1386.67
VELOCITY (fps) : 17.44

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 25.837
UPSTREAM STAGE (ft) : 1388.612

****

STAGE ELEVATION = 1362.80

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
211.87	446.50	.0400	246.6	234.64	1.05	9469.05	792.24	3.21
446.50	452.50	.0400	20.7	6.58	3.15	1652.65	138.27	6.68
452.50	547.50	.0400	456.2	95.00	4.80	48235.63	4035.68	8.85
547.50	553.50	.0400	20.7	6.58	3.15	1652.65	138.27	6.68
553.50	788.13	.0400	246.6	234.64	1.05	9469.05	792.24	3.21
TOTALS			990.8			70479.03	5896.70	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.027 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1385.184000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1385.184000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5896.70
HEADWATER (ft) : 1388.94
VELOCITY (fps) : 17.73

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5896.70
HEADWATER (ft) : 1386.88
VELOCITY (fps) : 17.73

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 26.134
UPSTREAM STAGE (ft) : 1388.937

****

STAGE ELEVATION = 1362.83

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
208.74	446.50	.0400	253.2	237.77	1.06	9810.10	820.77	3.24
446.50	452.50	.0400	20.9	6.58	3.17	1675.11	140.15	6.71
452.50	547.50	.0400	458.8	95.00	4.83	48706.59	4075.09	8.88
547.50	553.50	.0400	20.9	6.58	3.17	1675.11	140.15	6.71
553.50	791.26	.0400	253.2	237.77	1.06	9810.10	820.77	3.24
TOTALS			1007.0			71677.02	5996.93	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.026 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1385.351000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1385.351000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5996.93
HEADWATER (ft) : 1389.28
VELOCITY (fps) : 18.04

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5996.93
HEADWATER (ft) : 1387.11
VELOCITY (fps) : 18.04

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 26.448
UPSTREAM STAGE (ft) : 1389.279

--- SUMMARY OF RESULTS ---

FLOW (cfs)	TAILWATER ELEVATION (ft)	HEADWATER ELEVATION (ft)	BACKWATER (ft)
100.09	1358.52	1374.17	15.65
200.19	1358.79	1374.65	15.86
299.49	1359.00	1375.05	16.05
399.88	1359.19	1375.41	16.22
499.42	1359.36	1375.74	16.38
599.95	1359.51	1376.05	16.53
699.97	1359.66	1376.34	16.68
799.95	1359.79	1376.61	16.82
899.90	1359.92	1376.88	16.96
999.87	1360.04	1377.14	17.09
1099.89	1360.16	1377.39	17.22
1199.84	1360.28	1377.63	17.35
1299.81	1360.39	1377.86	17.47
1399.76	1360.49	1378.09	17.60
1499.58	1360.60	1378.31	17.72
1599.09	1360.70	1378.53	17.83
1699.96	1360.79	1378.74	17.95
1800.08	1360.88	1378.95	18.07
1899.99	1360.97	1379.16	18.19
1999.98	1361.06	1379.36	18.31
2100.02	1361.14	1379.56	18.43
2200.11	1361.21	1379.76	18.55
2300.23	1361.28	1379.95	18.67
2400.34	1361.35	1380.14	18.79
2500.40	1361.42	1380.33	18.91
2600.41	1361.48	1380.51	19.03
2700.60	1361.54	1380.70	19.15
2800.84	1361.60	1380.88	19.28
2901.02	1361.66	1381.06	19.40
3001.06	1361.71	1381.23	19.52
3101.13	1361.76	1381.41	19.64
3201.20	1361.81	1381.61	19.79
3301.27	1361.86	1381.83	19.96
3401.38	1361.91	1382.05	20.14
3501.31	1361.96	1382.28	20.32
3601.39	1362.00	1382.51	20.50
3701.17	1362.05	1382.74	20.69
3801.31	1362.09	1382.97	20.88
3901.09	1362.13	1383.21	21.08
4000.94	1362.17	1383.45	21.28
4100.72	1362.21	1383.70	21.49
4200.60	1362.25	1383.95	21.70

CAP Structure CAP-8 Hydraulic Calculations

4300.80	1362.29	1384.21	21.92
4400.55	1362.32	1384.46	22.14
4500.39	1362.36	1384.73	22.37
4600.22	1362.40	1385.00	22.60
4700.29	1362.43	1385.27	22.84
4800.16	1362.46	1385.55	23.08
4900.10	1362.50	1385.83	23.33
5000.02	1362.53	1386.12	23.59
5100.23	1362.56	1386.41	23.85
5200.26	1362.59	1386.71	24.12
5300.05	1362.63	1387.01	24.39
5399.91	1362.66	1387.32	24.67
5500.18	1362.69	1387.64	24.95
5599.99	1362.72	1387.96	25.24
5700.10	1362.75	1388.28	25.54
5800.03	1362.77	1388.61	25.84
5896.70	1362.80	1388.94	26.13
5996.93	1362.83	1389.28	26.45

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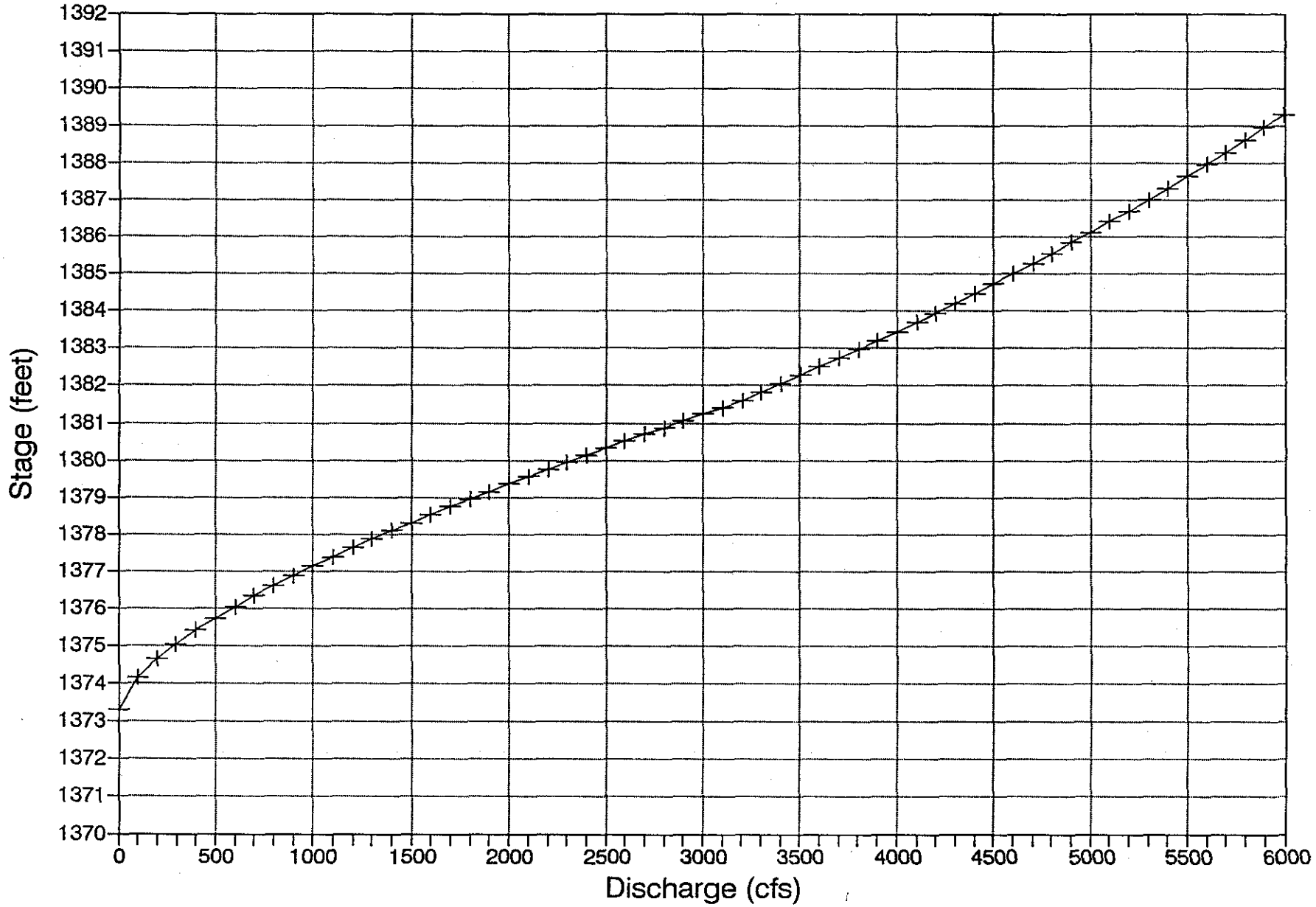
CAP CANAL STAGE-DISCHARGE CURVE

CAP-8, Sta. 485+00



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HYDRAULICS OF BRIDGE AND CULVERT WATERWAYS

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GALILEO SOFTWARE
16 RANCH ROAD
CHELMSFORD, MA 01824

VERSION 3.02
SERIAL NUMBER 1003

CAP Structure CAP-9 Hydraulic Calculations

--- HOBCW PROJECT DATA ---

NUMBER OF GROUND STATIONS	:	6
NUMBER OF ROAD STATIONS	:	0
NUMBER OF ROUGNESS COEFFICIENTS	:	6
STREAM SLOPE (ft/ft)	:	.01820
MINIMUM FLOW (cfs)	:	100.00
MAXIMUM FLOW (cfs)	:	1300.00
FLOW INCREMENT (cfs)	:	100.00
NUMBER OF CULVERTS	:	2
CULVERT CODE	:	21534
CULVERT SLOPE (ft/ft)	:	.02553
CULVERT LENGTH (ft)	:	225.00
DOWNSTREAM CULVERT INVERT (ft)	:	1337.98
CIRCULAR CULVERT DIAMETER	:	3.00
ENTRANCE LOSS COEFFICIENT Ke	:	.5
CULVERT ROUGHNESS COEFFICIENT	:	.012

--- CROSS SECTION DESCRIPTION ---

STATION NUMBER	STATION (ft)	GROUND ELEVATION (ft)	ROUGNESS FACTOR	ROAD ELEVATION (ft)
1	.00	1342.00	.0400	
2	490.50	1341.08	.0400	
3	493.00	1337.98	.0400	
4	507.00	1337.98	.0400	
5	509.50	1340.28	.0400	
6	1000.00	1342.00	.0400	

--- HOBCW OUTPUT DATA ---

****

STAGE ELEVATION = 1339.19

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
492.03	493.00	.0400	.6	1.55	.38	11.44	1.54	2.62
493.00	507.00	.0400	16.9	14.00	1.21	712.16	96.08	5.68
507.00	508.31	.0400	.8	1.78	.44	17.14	2.31	2.92
TOTALS			18.3			740.74	99.93	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .931 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 49.97
HEADWATER (ft) : 1347.72
VELOCITY (fps) : 15.78

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 49.97
HEADWATER (ft) : 1347.74
VELOCITY (fps) : 15.78

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 8.556
UPSTREAM STAGE (ft) : 1347.744

****

STAGE ELEVATION = 1339.79

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
491.54	493.00	.0400	1.3	2.32	.57	33.65	4.54	3.44
493.00	507.00	.0400	25.3	14.00	1.81	1397.75	188.57	7.44
507.00	508.97	.0400	1.8	2.67	.67	50.42	6.80	3.82
TOTALS			28.4			1481.81	199.91	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.004 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 99.95
HEADWATER (ft) : 1353.68
VELOCITY (fps) : 18.43

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 99.95
HEADWATER (ft) : 1351.38
VELOCITY (fps) : 18.43

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.894
UPSTREAM STAGE (ft) : 1353.684

****

STAGE ELEVATION = 1340.27

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
491.15	493.00	.0400	2.1	2.94	.72	62.92	8.49	4.02
493.00	507.00	.0400	32.0	14.00	2.29	2066.92	278.84	8.70
507.00	509.49	.0400	2.8	3.38	.84	94.29	12.72	4.47
TOTALS			37.0			2224.12	300.05	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.050 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1347.968000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1347.968000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 150.03
HEADWATER (ft) : 1364.16
VELOCITY (fps) : 21.22

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 150.03
HEADWATER (ft) : 1361.09
VELOCITY (fps) : 21.25

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 23.896
UPSTREAM STAGE (ft) : 1364.164

****

STAGE ELEVATION = 1340.59

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
490.89	493.00	.0400	2.8	3.36	.82	89.73	12.11	4.39
493.00	507.00	.0400	36.6	14.00	2.61	2580.28	348.10	9.51
507.00	509.50	.0400	3.7	3.40	1.08	142.93	19.28	5.27
509.50	599.11	.0400	14.1	89.61	.16	152.27	20.54	1.46
TOTALS			57.1			2965.22	400.03	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 2.180 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1353.413000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1353.413000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 200.01
HEADWATER (ft) : 1392.24
VELOCITY (fps) : 28.30

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 200.01
HEADWATER (ft) : 1376.86
VELOCITY (fps) : 28.30

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 51.651
UPSTREAM STAGE (ft) : 1392.245

****

STAGE ELEVATION = 1340.78

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
490.74	493.00	.0400	3.2	3.60	.88	107.81	14.54	4.60
493.00	507.00	.0400	39.2	14.00	2.80	2893.94	390.41	9.96
507.00	509.50	.0400	4.1	3.40	1.21	174.51	23.54	5.71
509.50	652.23	.0400	35.7	142.73	.25	526.92	71.08	1.99
TOTALS			82.2			3703.17	499.59	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 2.212 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1360.371000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1360.371000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 249.79
HEADWATER (ft) : 1491.78
VELOCITY (fps) : 35.34

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 249.79
HEADWATER (ft) : 1396.93
VELOCITY (fps) : 35.34

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 151.000
UPSTREAM STAGE (ft) : 1491.781

****

STAGE ELEVATION = 1340.92

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
490.63	493.00	.0400	3.5	3.77	.92	122.23	16.49	4.75
493.00	507.00	.0400	41.1	14.00	2.94	3130.17	422.28	10.28
507.00	509.50	.0400	4.5	3.40	1.31	198.94	26.84	6.01
509.50	690.73	.0400	57.6	181.23	.32	996.16	134.39	2.33
TOTALS			106.6			4447.51	600.00	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 2.129 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1368.950000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1368.950000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 300.00
HEADWATER (ft) : 1791.62
VELOCITY (fps) : 42.44

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 300.00
HEADWATER (ft) : 1421.69
VELOCITY (fps) : 42.44

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 450.703
UPSTREAM STAGE (ft) : 1791.619

****

STAGE ELEVATION = 1341.02

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
490.55	493.00	.0400	3.7	3.91	.96	134.53	18.15	4.86
493.00	507.00	.0400	42.6	14.00	3.04	3323.40	448.35	10.52
507.00	509.50	.0400	4.7	3.40	1.39	219.29	29.58	6.25
509.50	721.37	.0400	78.7	211.87	.37	1510.79	203.82	2.59
TOTALS			129.8			5188.01	699.90	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 2.038 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1379.039000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1379.082000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 349.95
HEADWATER (ft) : 2517.95
VELOCITY (fps) : 49.51

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 349.95
HEADWATER (ft) : 1450.85
VELOCITY (fps) : 49.51

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 1176.923
UPSTREAM STAGE (ft) : 2517.946

****

STAGE ELEVATION = 1341.11

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
472.67	490.50	.0400	.3	17.83	.02	.72	.10	.33
490.50	493.00	.0400	4.0	3.98	.99	146.47	19.76	4.99
493.00	507.00	.0400	43.9	14.00	3.13	3489.68	470.78	10.73
507.00	509.50	.0400	5.0	3.40	1.46	237.03	31.98	6.45
509.50	747.16	.0400	99.0	237.66	.42	2052.41	276.89	2.80
TOTALS			152.1			5926.32	799.50	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 2.020 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1390.643000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1390.776000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 399.75
HEADWATER (ft) : 4027.13
VELOCITY (fps) : 56.55

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 399.75
HEADWATER (ft) : 1484.42
VELOCITY (fps) : 56.55

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 2686.021
UPSTREAM STAGE (ft) : 4027.135

****

STAGE ELEVATION = 1341.19

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
431.08	490.50	.0400	3.3	59.42	.06	17.95	2.42	.73
490.50	493.00	.0400	4.2	3.98	1.04	158.70	21.41	5.15
493.00	507.00	.0400	45.0	14.00	3.21	3635.66	490.48	10.91
507.00	509.50	.0400	5.2	3.40	1.52	252.77	34.10	6.62
509.50	769.41	.0400	118.4	259.91	.46	2605.47	351.50	2.97
TOTALS			176.0			6670.54	899.91	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 2.053 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1403.899000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1404.111000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 449.95
HEADWATER (ft) : 6870.08
VELOCITY (fps) : 63.66

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 449.95
HEADWATER (ft) : 1522.75
VELOCITY (fps) : 63.66

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 5528.894
UPSTREAM STAGE (ft) : 6870.085

****

STAGE ELEVATION = 1341.26

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
395.09	490.50	.0400	8.5	95.41	.09	63.44	8.56	1.00
490.50	493.00	.0400	4.3	3.98	1.09	169.59	22.88	5.29
493.00	507.00	.0400	45.9	14.00	3.28	3763.92	507.78	11.06
507.00	509.50	.0400	5.3	3.40	1.57	266.72	35.98	6.76
509.50	788.66	.0400	136.6	279.16	.49	3152.38	425.28	3.11
TOTALS			200.7			7416.05	1000.48	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 2.043 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1418.749000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1419.028000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 500.24
HEADWATER (ft) : 11778.68
VELOCITY (fps) : 70.77

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 500.24
HEADWATER (ft) : 1565.66
VELOCITY (fps) : 70.77

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 10437.420
UPSTREAM STAGE (ft) : 11778.680

****

STAGE ELEVATION = 1341.32

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
364.05	490.50	.0400	15.0	126.45	.12	134.47	18.14	1.21
490.50	493.00	.0400	4.5	3.98	1.12	179.21	24.18	5.41
493.00	507.00	.0400	46.7	14.00	3.34	3875.98	522.90	11.19
507.00	509.50	.0400	5.5	3.40	1.61	278.98	37.64	6.88
509.50	805.26	.0400	153.4	295.76	.52	3677.54	496.13	3.23
TOTALS			225.0			8146.19	1098.98	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 2.014 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1434.816000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1435.154000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 549.49
HEADWATER (ft) : 19511.02
VELOCITY (fps) : 77.74

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 549.49
HEADWATER (ft) : 1612.09
VELOCITY (fps) : 77.74

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 18169.700
UPSTREAM STAGE (ft) : 19511.020

****

STAGE ELEVATION = 1341.37

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
335.55	490.50	.0400	22.5	154.95	.15	231.24	31.20	1.39
490.50	493.00	.0400	4.6	3.98	1.16	188.24	25.39	5.52
493.00	507.00	.0400	47.5	14.00	3.39	3980.03	536.94	11.31
507.00	509.50	.0400	5.6	3.40	1.65	290.44	39.18	7.00
509.50	820.51	.0400	169.6	311.01	.55	4205.08	567.30	3.35
TOTALS			249.8			8895.03	1200.01	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.977 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1452.861000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1453.251000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 600.00
HEADWATER (ft) : 31660.14
VELOCITY (fps) : 84.88

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 600.00
HEADWATER (ft) : 1664.21
VELOCITY (fps) : 84.88

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 30318.770
UPSTREAM STAGE (ft) : 31660.140

****

STAGE ELEVATION = 1341.42

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
310.04	490.50	.0400	30.5	180.46	.17	347.19	46.84	1.53
490.50	493.00	.0400	4.7	3.98	1.19	196.46	26.50	5.61
493.00	507.00	.0400	48.1	14.00	3.44	4074.09	549.62	11.42
507.00	509.50	.0400	5.7	3.40	1.68	300.85	40.59	7.09
509.50	834.16	.0400	184.8	324.66	.57	4715.27	636.12	3.44
TOTALS			273.9			9633.86	1299.68	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.938 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1472.219000
TAILWATER DEPTH > CULVERT NORMAL DEPTH
STARTING DOWNSTREAM EGL = 1472.657000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 649.84
HEADWATER (ft) : 49318.21
VELOCITY (fps) : 91.93

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 649.84
HEADWATER (ft) : 1720.11
VELOCITY (fps) : 91.93

--- INLET CONTROL GOVERNS ---

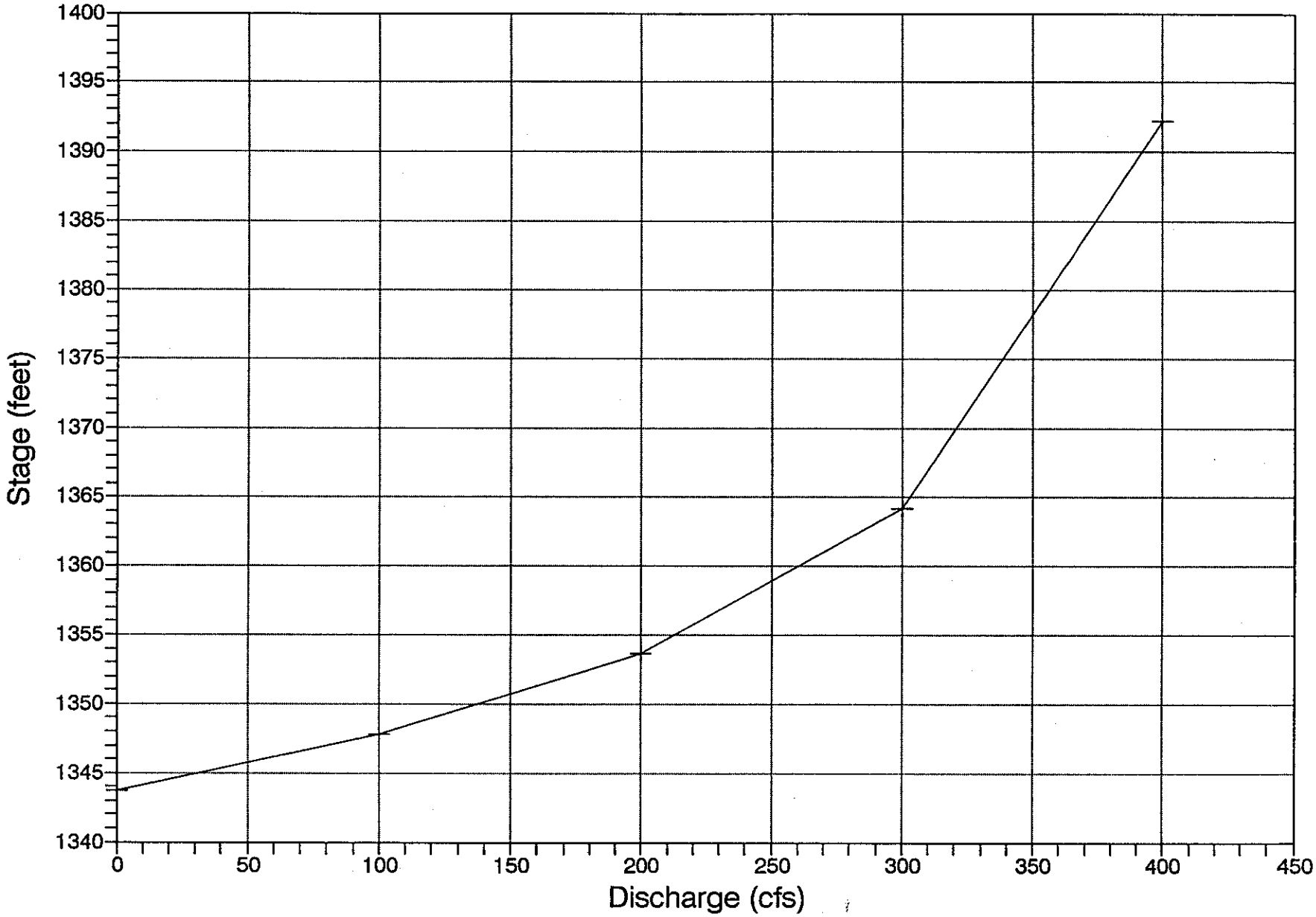
BACKWATER (ft) : 47976.790
UPSTREAM STAGE (ft) : 49318.210

--- SUMMARY OF RESULTS ---

FLOW (cfs)	TAILWATER ELEVATION (ft)	HEADWATER ELEVATION (ft)	BACKWATER (ft)
99.93	1339.19	1347.74	8.56
199.91	1339.79	1353.68	13.89
300.05	1340.27	1364.16	23.90
400.03	1340.59	1392.24	51.65
499.59	1340.78	1491.78	151.00
600.00	1340.92	1791.62	450.70
699.90	1341.02	2517.95	1176.92
799.50	1341.11	4027.13	2686.02
899.91	1341.19	6870.08	5528.89
1000.48	1341.26	11778.68	10437.42
1098.98	1341.32	19511.02	18169.70
1200.01	1341.37	31660.14	30318.77
1299.68	1341.42	49318.21	47976.79

CAP CANAL STAGE-DISCHARGE CURVE

CAP-9, Sta. 544+25



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GALILEO SOFTWARE
16 RANCH ROAD
CHELMSFORD, MA 01824

VERSION 3.02
SERIAL NUMBER 1003

CAP Structure CAP-10 Hydraulic Calculations

--- HOBCW PROJECT DATA ---

NUMBER OF GROUND STATIONS	:	6
NUMBER OF ROAD STATIONS	:	0
NUMBER OF ROUGNESS COEFFICIENTS	:	6
STREAM SLOPE (ft/ft)	:	.01430
MINIMUM FLOW (cfs)	:	20.00
MAXIMUM FLOW (cfs)	:	160.00
FLOW INCREMENT (cfs)	:	20.00
NUMBER OF CULVERTS	:	1
CULVERT CODE	:	21534
CULVERT SLOPE (ft/ft)	:	.01893
CULVERT LENGTH (ft)	:	231.00
DOWNSTREAM CULVERT INVERT (ft)	:	1335.71
CIRCULAR CULVERT DIAMETER	:	2.50
ENTRANCE LOSS COEFFICIENT Ke	:	.5
CULVERT ROUGHNESS COEFFICIENT	:	.012

--- CROSS SECTION DESCRIPTION ---

STATION NUMBER	STATION (ft)	GROUND ELEVATION (ft)	ROUGNESS FACTOR	ROAD ELEVATION (ft)
1	.00	1339.00	.0400	
2	489.00	1337.71	.0400	
3	492.50	1335.71	.0400	
4	507.50	1335.71	.0400	
5	511.00	1336.91	.0400	
6	1000.00	1339.00	.0400	

--- HOBCW OUTPUT DATA ---

****

STAGE ELEVATION = 1336.18

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
491.67	492.50	.0400	.2	.95	.21	2.54	.30	1.55
492.50	507.50	.0400	7.1	15.00	.47	160.23	19.16	2.70
507.50	508.88	.0400	.3	1.46	.22	4.48	.54	1.64
TOTALS			7.6			167.24	20.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .705 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 20.00
HEADWATER (ft) : 1342.41
VELOCITY (fps) : 11.17

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 20.00
HEADWATER (ft) : 1342.56
VELOCITY (fps) : 11.17

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 6.375
UPSTREAM STAGE (ft) : 1342.558

****

STAGE ELEVATION = 1336.42

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
491.26	492.50	.0400	.4	1.43	.31	7.44	.89	2.02
492.50	507.50	.0400	10.6	15.00	.71	313.95	37.54	3.53
507.50	509.57	.0400	.7	2.19	.34	13.13	1.57	2.14
TOTALS			11.8			334.52	40.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .760 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 40.00
HEADWATER (ft) : 1344.38
VELOCITY (fps) : 13.31

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 40.00
HEADWATER (ft) : 1344.09
VELOCITY (fps) : 13.31

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 7.957
UPSTREAM STAGE (ft) : 1344.376

****

STAGE ELEVATION = 1336.61

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
490.93	492.50	.0400	.7	1.80	.39	13.88	1.66	2.37
492.50	507.50	.0400	13.4	15.00	.90	463.52	55.43	4.13
507.50	510.11	.0400	1.2	2.76	.42	24.49	2.93	2.51
TOTALS			15.3			501.89	60.02	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .794 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 60.02
HEADWATER (ft) : 1347.70
VELOCITY (fps) : 14.23

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 60.02
HEADWATER (ft) : 1346.06
VELOCITY (fps) : 14.23

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 11.094
UPSTREAM STAGE (ft) : 1347.700

****

STAGE ELEVATION = 1336.77

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
490.65	492.50	.0400	1.0	2.13	.46	21.51	2.57	2.64
492.50	507.50	.0400	15.8	15.00	1.06	609.55	72.89	4.60
507.50	510.58	.0400	1.6	3.25	.50	37.96	4.54	2.80
TOTALS			18.4			669.02	80.00	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .819 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1342.323000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1342.323000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 80.00
HEADWATER (ft) : 1352.31
VELOCITY (fps) : 16.30

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 80.00
HEADWATER (ft) : 1351.80
VELOCITY (fps) : 16.34

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 15.546
UPSTREAM STAGE (ft) : 1352.311

****

STAGE ELEVATION = 1336.91

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
490.41	492.50	.0400	1.3	2.41	.52	30.10	3.60	2.87
492.50	507.50	.0400	18.0	15.00	1.20	751.88	89.91	5.01
507.50	510.99	.0400	2.1	3.69	.57	53.11	6.35	3.04
TOTALS			21.3			835.08	99.86	

****

--- SUBCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = .839 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1344.631000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1344.631000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 99.86
HEADWATER (ft) : 1359.09
VELOCITY (fps) : 20.34

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 99.86
HEADWATER (ft) : 1359.43
VELOCITY (fps) : 20.36

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 22.524
UPSTREAM STAGE (ft) : 1359.431

****

STAGE ELEVATION = 1337.03

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
490.19	492.50	.0400	1.5	2.66	.57	38.89	4.65	3.06
492.50	507.50	.0400	19.8	15.00	1.32	882.48	105.53	5.34
507.50	511.00	.0400	2.5	3.70	.68	72.07	8.62	3.43
511.00	538.50	.0400	1.6	27.50	.06	9.08	1.09	.67
TOTALS			25.4			1002.51	119.88	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.246 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1347.472000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL = 1347.472000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 119.88
HEADWATER (ft) : 1372.61
VELOCITY (fps) : 24.42

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 119.88
HEADWATER (ft) : 1368.90
VELOCITY (fps) : 24.42

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 35.579
UPSTREAM STAGE (ft) : 1372.608

****

STAGE ELEVATION = 1337.12

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
490.03	492.50	.0400	1.7	2.85	.61	46.85	5.60	3.21
492.50	507.50	.0400	21.2	15.00	1.41	991.44	118.56	5.59
507.50	511.00	.0400	2.8	3.70	.77	88.72	10.61	3.73
511.00	560.81	.0400	5.3	49.81	.11	44.24	5.29	1.00
TOTALS			31.1			1171.26	140.06	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.407 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1350.852000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1350.852000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 140.06
HEADWATER (ft) : 1403.74
VELOCITY (fps) : 28.53

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 140.06
HEADWATER (ft) : 1380.11
VELOCITY (fps) : 28.53

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 66.622
UPSTREAM STAGE (ft) : 1403.745

****

STAGE ELEVATION = 1337.20

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
489.89	492.50	.0400	1.9	3.00	.65	53.85	6.44	3.32
492.50	507.50	.0400	22.3	15.00	1.49	1081.52	129.33	5.79
507.50	511.00	.0400	3.1	3.70	.84	102.91	12.31	3.96
511.00	578.52	.0400	9.7	67.52	.14	99.56	11.91	1.22
TOTALS			37.1			1337.84	159.98	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.463 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1354.704000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1354.704000
FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 159.98
HEADWATER (ft) : 1470.97
VELOCITY (fps) : 32.59

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 159.98
HEADWATER (ft) : 1392.87
VELOCITY (fps) : 32.59

--- INLET CONTROL GOVERNS ---

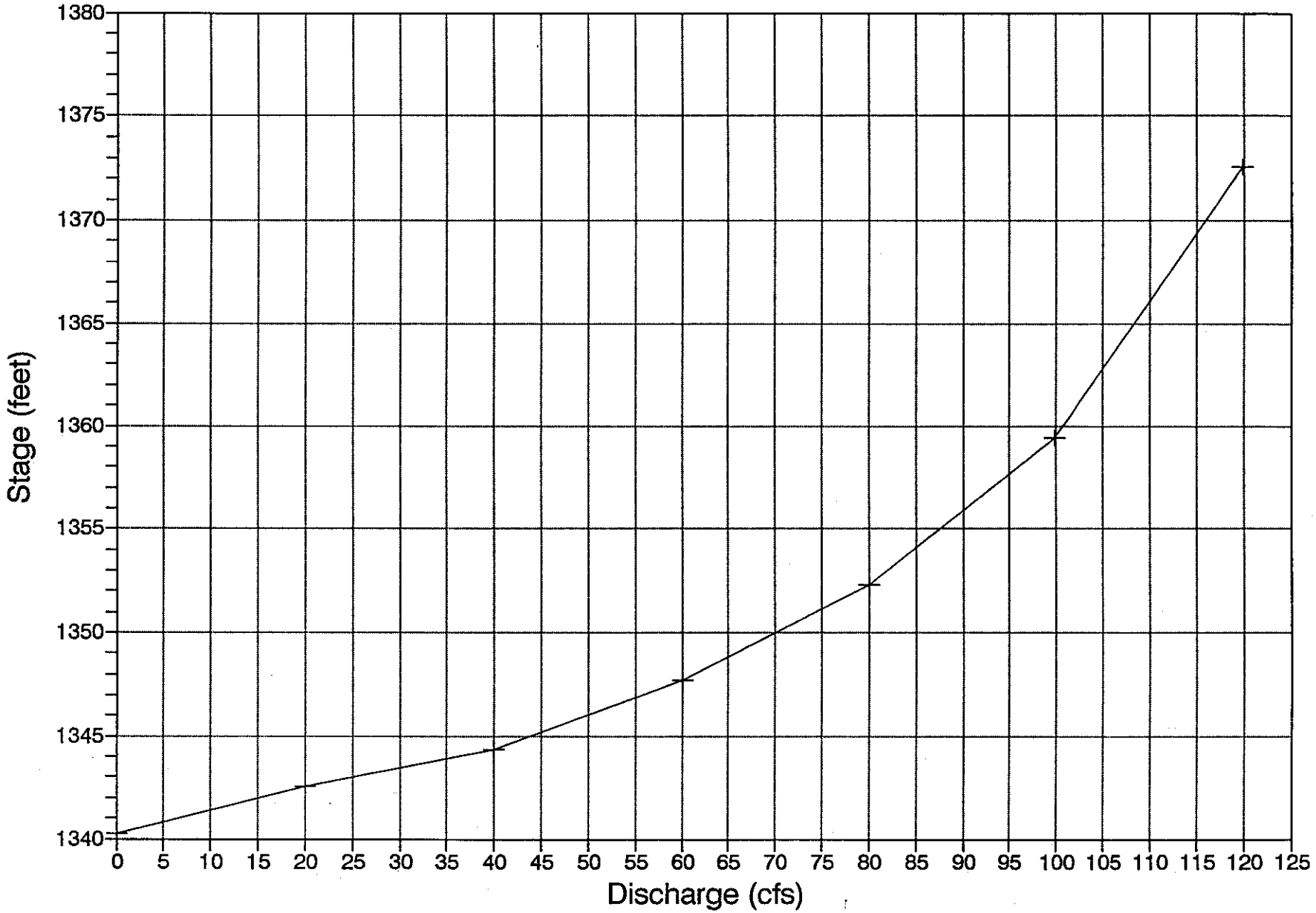
BACKWATER (ft) : 133.771
UPSTREAM STAGE (ft) : 1470.970

--- SUMMARY OF RESULTS ---

FLOW (cfs)	TAILWATER ELEVATION (ft)	HEADWATER ELEVATION (ft)	BACKWATER (ft)
20.00	1336.18	1342.56	6.38
40.00	1336.42	1344.38	7.96
60.02	1336.61	1347.70	11.09
80.00	1336.77	1352.31	15.55
99.86	1336.91	1359.43	22.52
119.88	1337.03	1372.61	35.58
140.06	1337.12	1403.74	66.62
9.98	1337.20	1470.97	133.77

CAP CANAL STAGE-DISCHARGE CURVE

CAP-10, Sta. 561+50



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* H    H   O    O   B    B   C         WW    WW  *
* H    H    OOOO    BBBBB     CCCCC    W      W  *
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HYDRAULICS OF BRIDGE AND CULVERT WATERWAYS

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GALILEO SOFTWARE
16 RANCH ROAD
CHELMSFORD, MA 01824

VERSION 3.02
SERIAL NUMBER 1003

CAP Structure CAP-11 Hydraulic Calculations

--- HOBCW PROJECT DATA ---

NUMBER OF GROUND STATIONS	:	4
NUMBER OF ROAD STATIONS	:	0
NUMBER OF ROUGNESS COEFFICIENTS	:	4
STREAM SLOPE (ft/ft)	:	.06670
MINIMUM FLOW (cfs)	:	5.00
MAXIMUM FLOW (cfs)	:	100.00
FLOW INCREMENT (cfs)	:	5.00
NUMBER OF CULVERTS	:	1
CULVERT CODE	:	21534
CULVERT SLOPE (ft/ft)	:	.03300
CULVERT LENGTH (ft)	:	205.21
DOWNSTREAM CULVERT INVERT (ft)	:	1342.73
CIRCULAR CULVERT DIAMETER	:	2.50
ENTRANCE LOSS COEFFICIENT Ke	:	.5
CULVERT ROUGHNESS COEFFICIENT	:	.012

--- CROSS SECTION DESCRIPTION ---

STATION NUMBER	STATION (ft)	GROUND ELEVATION (ft)	ROUGNESS FACTOR	ROAD ELEVATION (ft)
1	496.50	1344.23	.0400	
2	498.25	1342.73	.0400	
3	501.75	1342.73	.0400	
4	503.50	1344.23	.0400	

--- HOBCW OUTPUT DATA ---

****

STAGE ELEVATION = 1343.04

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
497.89	498.25	.0400	.1	.48	.12	.50	.13	2.30
498.25	501.75	.0400	1.1	3.50	.31	18.44	4.76	4.39
501.75	502.11	.0400	.1	.48	.12	.50	.13	2.30
TOTALS			1.2			19.44	5.02	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.427 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 5.02
HEADWATER (ft) : 1350.48
VELOCITY (fps) : 9.18

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 5.02
HEADWATER (ft) : 1350.64
VELOCITY (fps) : 9.18

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 7.600
UPSTREAM STAGE (ft) : 1350.640

****

STAGE ELEVATION = 1343.19

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
497.71	498.25	.0400	.1	.71	.18	1.45	.37	3.00
498.25	501.75	.0400	1.6	3.50	.46	35.84	9.26	5.73
501.75	502.29	.0400	.1	.71	.18	1.45	.37	3.00
TOTALS			1.9			38.73	10.00	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.539 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 10.00
HEADWATER (ft) : 1351.02
VELOCITY (fps) : 11.20

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 10.00
HEADWATER (ft) : 1351.16
VELOCITY (fps) : 11.20

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 7.966
UPSTREAM STAGE (ft) : 1351.157

****

STAGE ELEVATION = 1343.31

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
497.57	498.25	.0400	.2	.90	.22	2.69	.69	3.51
498.25	501.75	.0400	2.0	3.50	.58	52.83	13.64	6.69
501.75	502.43	.0400	.2	.90	.22	2.69	.69	3.51
TOTALS			2.4			58.21	15.03	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.609 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 15.03
HEADWATER (ft) : 1351.45
VELOCITY (fps) : 12.62

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 15.03
HEADWATER (ft) : 1351.59
VELOCITY (fps) : 12.62

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 8.278
UPSTREAM STAGE (ft) : 1351.589

****

STAGE ELEVATION = 1343.41

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
497.45	498.25	.0400	.3	1.05	.26	4.14	1.07	3.91
498.25	501.75	.0400	2.4	3.50	.68	69.20	17.87	7.46
501.75	502.55	.0400	.3	1.05	.26	4.14	1.07	3.91
TOTALS			2.9			77.48	20.01	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.660 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 20.01
HEADWATER (ft) : 1351.83
VELOCITY (fps) : 13.67

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 20.01
HEADWATER (ft) : 1351.98
VELOCITY (fps) : 13.67

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 8.564
UPSTREAM STAGE (ft) : 1351.978

****

STAGE ELEVATION = 1343.51

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
497.34	498.25	.0400	.4	1.19	.29	5.78	1.49	4.25
498.25	501.75	.0400	2.7	3.50	.78	85.25	22.02	8.10
501.75	502.66	.0400	.4	1.19	.29	5.78	1.49	4.25
TOTALS			3.4			96.81	25.00	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.701 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 25.00
HEADWATER (ft) : 1352.22
VELOCITY (fps) : 14.53

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 25.00
HEADWATER (ft) : 1352.35
VELOCITY (fps) : 14.53

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 8.846
UPSTREAM STAGE (ft) : 1352.352

****

STAGE ELEVATION = 1343.59

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
497.25	498.25	.0400	.4	1.32	.33	7.60	1.96	4.55
498.25	501.75	.0400	3.0	3.50	.86	101.12	26.12	8.68
501.75	502.75	.0400	.4	1.32	.33	7.60	1.96	4.55
TOTALS			3.9			116.32	30.04	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.735 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 30.04
HEADWATER (ft) : 1352.67
VELOCITY (fps) : 15.28

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 30.04
HEADWATER (ft) : 1352.73
VELOCITY (fps) : 15.28

--- OUTLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.139
UPSTREAM STAGE (ft) : 1352.728

****

STAGE ELEVATION = 1343.67

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
497.16	498.25	.0400	.5	1.44	.36	9.53	2.46	4.81
498.25	501.75	.0400	3.3	3.50	.94	116.49	30.08	9.18
501.75	502.84	.0400	.5	1.44	.36	9.53	2.46	4.81
TOTALS			4.3			135.54	35.01	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.763 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 35.01
HEADWATER (ft) : 1353.19
VELOCITY (fps) : 15.89

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 35.01
HEADWATER (ft) : 1353.11
VELOCITY (fps) : 15.89

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 9.523
UPSTREAM STAGE (ft) : 1353.189

****

STAGE ELEVATION = 1343.74

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
497.08	498.25	.0400	.6	1.55	.38	11.57	2.99	5.05
498.25	501.75	.0400	3.5	3.50	1.01	131.48	33.96	9.64
501.75	502.92	.0400	.6	1.55	.38	11.57	2.99	5.05
TOTALS			4.7			154.62	39.93	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.788 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 39.93
HEADWATER (ft) : 1353.79
VELOCITY (fps) : 16.44

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 39.93
HEADWATER (ft) : 1353.50
VELOCITY (fps) : 16.44

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 10.048
UPSTREAM STAGE (ft) : 1353.786

****

STAGE ELEVATION = 1343.80

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
497.00	498.25	.0400	.7	1.65	.41	13.78	3.56	5.28
498.25	501.75	.0400	3.8	3.50	1.08	146.70	37.89	10.07
501.75	503.00	.0400	.7	1.65	.41	13.78	3.56	5.28
TOTALS			5.1			174.26	45.00	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.810 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 45.00
HEADWATER (ft) : 1354.49
VELOCITY (fps) : 16.92

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 45.00
HEADWATER (ft) : 1353.94
VELOCITY (fps) : 16.92

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 10.689
UPSTREAM STAGE (ft) : 1354.494

****

STAGE ELEVATION = 1343.87

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.92	498.25	.0400	.8	1.75	.43	16.08	4.15	5.49
498.25	501.75	.0400	4.0	3.50	1.14	161.53	41.72	10.46
501.75	503.08	.0400	.8	1.75	.43	16.08	4.15	5.49
TOTALS			5.5			193.69	50.02	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.830 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 50.02
HEADWATER (ft) : 1355.29
VELOCITY (fps) : 17.36

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 50.02
HEADWATER (ft) : 1354.41
VELOCITY (fps) : 17.36

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 11.418
UPSTREAM STAGE (ft) : 1355.286

****

STAGE ELEVATION = 1343.93

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.85	498.25	.0400	.8	1.84	.46	18.47	4.77	5.68
498.25	501.75	.0400	4.2	3.50	1.20	176.15	45.49	10.83
501.75	503.15	.0400	.8	1.84	.46	18.47	4.77	5.68
TOTALS			5.9			213.09	55.03	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.848 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 55.03
HEADWATER (ft) : 1356.16
VELOCITY (fps) : 17.73

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 55.03
HEADWATER (ft) : 1354.93
VELOCITY (fps) : 17.73

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 12.235
UPSTREAM STAGE (ft) : 1356.165

****

STAGE ELEVATION = 1343.99

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.78	498.25	.0400	.9	1.93	.48	20.95	5.41	5.86
498.25	501.75	.0400	4.4	3.50	1.26	190.60	49.23	11.18
501.75	503.22	.0400	.9	1.93	.48	20.95	5.41	5.86
TOTALS			6.2			232.50	60.05	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.864 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 60.05
HEADWATER (ft) : 1357.12
VELOCITY (fps) : 18.05

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 60.05
HEADWATER (ft) : 1355.49
VELOCITY (fps) : 18.05

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 13.137
UPSTREAM STAGE (ft) : 1357.124

****

STAGE ELEVATION = 1344.04

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.72	498.25	.0400	1.0	2.02	.50	23.52	6.07	6.03
498.25	501.75	.0400	4.6	3.50	1.31	204.90	52.92	11.51
501.75	503.28	.0400	1.0	2.02	.50	23.52	6.07	6.03
TOTALS			6.6			251.94	65.07	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.879 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 65.07
HEADWATER (ft) : 1358.16
VELOCITY (fps) : 18.34

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 65.07
HEADWATER (ft) : 1356.09
VELOCITY (fps) : 18.34

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 14.119
UPSTREAM STAGE (ft) : 1358.161

****

STAGE ELEVATION = 1344.10

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.65	498.25	.0400	1.1	2.10	.52	26.16	6.76	6.20
498.25	501.75	.0400	4.8	3.50	1.37	218.98	56.55	11.82
501.75	503.35	.0400	1.1	2.10	.52	26.16	6.76	6.20
TOTALS			7.0			271.30	70.07	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.893 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 70.07
HEADWATER (ft) : 1359.27
VELOCITY (fps) : 18.56

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 70.07
HEADWATER (ft) : 1356.75
VELOCITY (fps) : 18.56

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 15.174
UPSTREAM STAGE (ft) : 1359.271

****

STAGE ELEVATION = 1344.15

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.59	498.25	.0400	1.2	2.18	.54	28.88	7.46	6.35
498.25	501.75	.0400	5.0	3.50	1.42	232.94	60.16	12.11
501.75	503.41	.0400	1.2	2.18	.54	28.88	7.46	6.35
TOTALS			7.3			290.70	75.08	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.906 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 75.08
HEADWATER (ft) : 1360.46
VELOCITY (fps) : 18.72

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 75.08
HEADWATER (ft) : 1357.45
VELOCITY (fps) : 18.72

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 16.315
UPSTREAM STAGE (ft) : 1360.463

****

STAGE ELEVATION = 1344.20

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.54	498.25	.0400	1.3	2.26	.56	31.67	8.18	6.50
498.25	501.75	.0400	5.1	3.50	1.47	246.76	63.73	12.40
501.75	503.46	.0400	1.3	2.26	.56	31.67	8.18	6.50
TOTALS			7.7			310.10	80.09	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.918 ---

PIPE SLOPE IS SUPERCRITICAL
PARTIALLY FULL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 80.09
HEADWATER (ft) : 1361.75
VELOCITY (fps) : 18.80

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 80.09
HEADWATER (ft) : 1358.20
VELOCITY (fps) : 18.80

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 17.555
UPSTREAM STAGE (ft) : 1361.753

```
*******************************************************************************

STAGE ELEVATION =   1344.24

LEFT END EXTENDED      .02 FT. AT NORMAL DEPTH.

RIGHT END EXTENDED      .02 FT. AT NORMAL DEPTH.
```

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
496.50	498.25	.0400	1.3	2.30	.58	34.62	8.94	6.68
498.25	501.75	.0400	5.3	3.50	1.52	259.85	67.11	12.66
501.75	503.50	.0400	1.3	2.30	.58	34.62	8.94	6.68
TOTALS			8.0			329.10	84.99	

```
*******************************************************************************

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER =  1.924 ---


PIPE SLOPE IS SUBCRITICAL
EGLCRIT =     1349.876000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL =     1349.876000
PARTIAL PIPE FLOW

 INLET CONTROL RESULTS
        DISCHARGE (cfs) :      84.99
        HEADWATER (ft)  :    1363.13
        VELOCITY (fps)  :      17.31

OUTLET CONTROL RESULTS
        DISCHARGE (cfs) :      84.99
        HEADWATER (ft)  :    1359.64
        VELOCITY (fps)  :      17.35

        --- INLET CONTROL GOVERNS ---

   BACKWATER (ft)      :    18.890
   UPSTREAM STAGE (ft) :  1363.135
```

```
*******************************************************************************

STAGE ELEVATION =   1344.29

LEFT END EXTENDED      .06 FT. AT NORMAL DEPTH.

RIGHT END EXTENDED      .06 FT. AT NORMAL DEPTH.
```

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.50	498.25	.0400	1.4	2.30	.61	37.99	9.81	6.93
498.25	501.75	.0400	5.5	3.50	1.56	272.50	70.38	12.90
501.75	503.50	.0400	1.4	2.30	.61	37.99	9.81	6.93
TOTALS			8.3			348.48	90.00	

```
*******************************************************************************

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER =  1.920 ---


PIPE SLOPE IS SUBCRITICAL
EGLCRIT =     1350.443000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL =     1350.443000
PARTIAL PIPE FLOW

 INLET CONTROL RESULTS
        DISCHARGE (cfs) :      90.00
        HEADWATER (ft)  :    1364.71
        VELOCITY (fps)  :      18.33

OUTLET CONTROL RESULTS
        DISCHARGE (cfs) :      90.00
        HEADWATER (ft)  :    1361.40
        VELOCITY (fps)  :      18.36

        --- INLET CONTROL GOVERNS ---

   BACKWATER (ft)       :    20.417
   UPSTREAM STAGE (ft) :  1364.706
```

****

STAGE ELEVATION = 1344.33

LEFT END EXTENDED .10 FT. AT NORMAL DEPTH.

RIGHT END EXTENDED .10 FT. AT NORMAL DEPTH.

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE (cfs)	DISCHARGE (cfs)	VELOCITY (fps)
496.50	498.25	.0400	1.5	2.30	.65	41.42	10.70	7.18
498.25	501.75	.0400	5.6	3.50	1.60	285.17	73.65	13.14
501.75	503.50	.0400	1.5	2.30	.65	41.42	10.70	7.18
TOTALS			8.6			368.02	95.05	

****

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER = 1.918 ---

PIPE SLOPE IS SUBCRITICAL
EGLCRIT = 1351.046000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
STARTING DOWNSTREAM EGL = 1351.046000
PARTIAL PIPE FLOW

INLET CONTROL RESULTS
DISCHARGE (cfs) : 95.05
HEADWATER (ft) : 1366.51
VELOCITY (fps) : 19.36

OUTLET CONTROL RESULTS
DISCHARGE (cfs) : 95.05
HEADWATER (ft) : 1363.27
VELOCITY (fps) : 19.38

--- INLET CONTROL GOVERNS ---

BACKWATER (ft) : 22.179
UPSTREAM STAGE (ft) : 1366.511

```
*******************************************************************************

STAGE ELEVATION =   1344.37

LEFT END EXTENDED      .14 FT. AT NORMAL DEPTH.

RIGHT END EXTENDED      .14 FT. AT NORMAL DEPTH.
```

STARTING STATION (ft)	ENDING STATION (ft)	ROUGHNESS FACTOR	CHANNEL AREA (sq ft)	WETTED PERIMETER (ft)	HYDRAULIC RADIUS (ft)	CONVEYANCE	DISCHARGE (cfs)	VELOCITY (fps)
496.50	498.25	.0400	1.6	2.30	.68	44.85	11.58	7.41
498.25	501.75	.0400	5.8	3.50	1.64	297.62	76.87	13.36
501.75	503.50	.0400	1.6	2.30	.68	44.85	11.58	7.41
TOTALS			8.9			387.33	100.03	

```
*******************************************************************************

--- SUPERCRITICAL FLOW IN CHANNEL, FROUDE NUMBER =  1.916 ---


PIPE SLOPE IS SUBCRITICAL
EGLCRIT =     1351.674000
TW DEPTH < CULVERT CRIT DEPTH. SETTING OUTLET ELEV TO CRITICAL
COMPUTED STARTING DS EGL < CRIT EGL. RESETTING STARTING EGL TO CRITICAL EGL.
STARTING DOWNSTREAM EGL =     1351.674000
PARTIAL PIPE FLOW

 INLET CONTROL RESULTS
        DISCHARGE (cfs) :     100.03
        HEADWATER (ft)  :    1368.59
        VELOCITY (fps)  :      20.38

OUTLET CONTROL RESULTS
        DISCHARGE (cfs) :     100.03
        HEADWATER (ft)  :    1365.23
        VELOCITY (fps)  :      20.39

        --- INLET CONTROL GOVERNS ---

   BACKWATER (ft)      :    24.217
   UPSTREAM STAGE (ft) :  1368.590
```

--- SUMMARY OF RESULTS ---

FLOW (cfs)	TAILWATER ELEVATION (ft)	HEADWATER ELEVATION (ft)	BACKWATER (ft)
5.02	1343.04	1350.64	7.60
10.00	1343.19	1351.16	7.97
15.03	1343.31	1351.59	8.28
20.01	1343.41	1351.98	8.56
25.00	1343.51	1352.35	8.85
30.04	1343.59	1352.73	9.14
35.01	1343.67	1353.19	9.52
39.93	1343.74	1353.79	10.05
45.00	1343.80	1354.49	10.69
50.02	1343.87	1355.29	11.42
55.03	1343.93	1356.16	12.24
60.05	1343.99	1357.12	13.14
65.07	1344.04	1358.16	14.12
70.07	1344.10	1359.27	15.17
75.08	1344.15	1360.46	16.31
80.09	1344.20	1361.75	17.55
84.99	1344.24	1363.13	18.89
90.00	1344.29	1364.71	20.42
95.05	1344.33	1366.51	22.18
100.03	1344.37	1368.59	24.22

CAP CANAL STAGE-DISCHARGE CURVE

CAP-11, Sta. 571+50

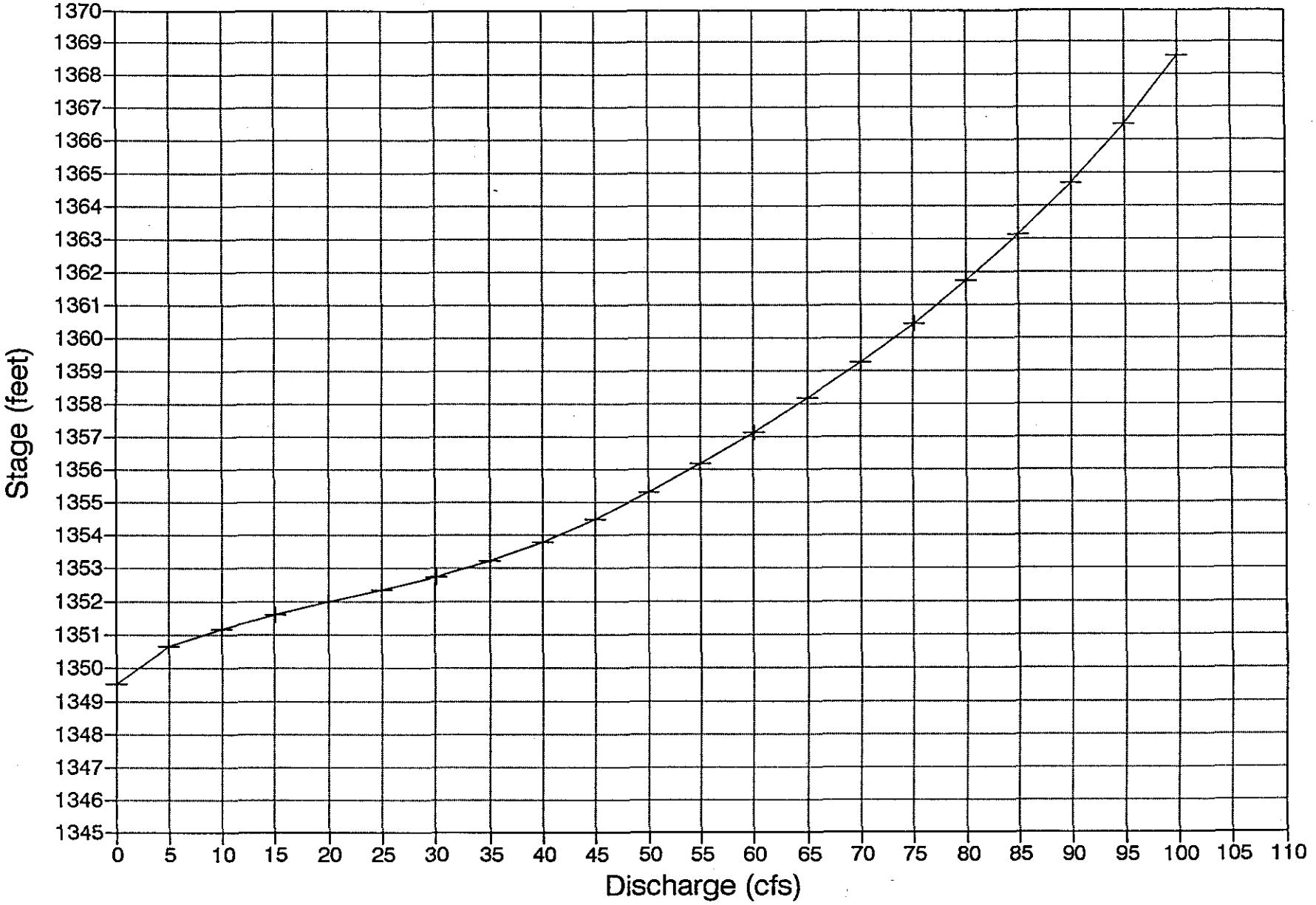


FIGURE 3: CAP-1
DISCHARGE AND STORAGE VOLUME vs STAGE

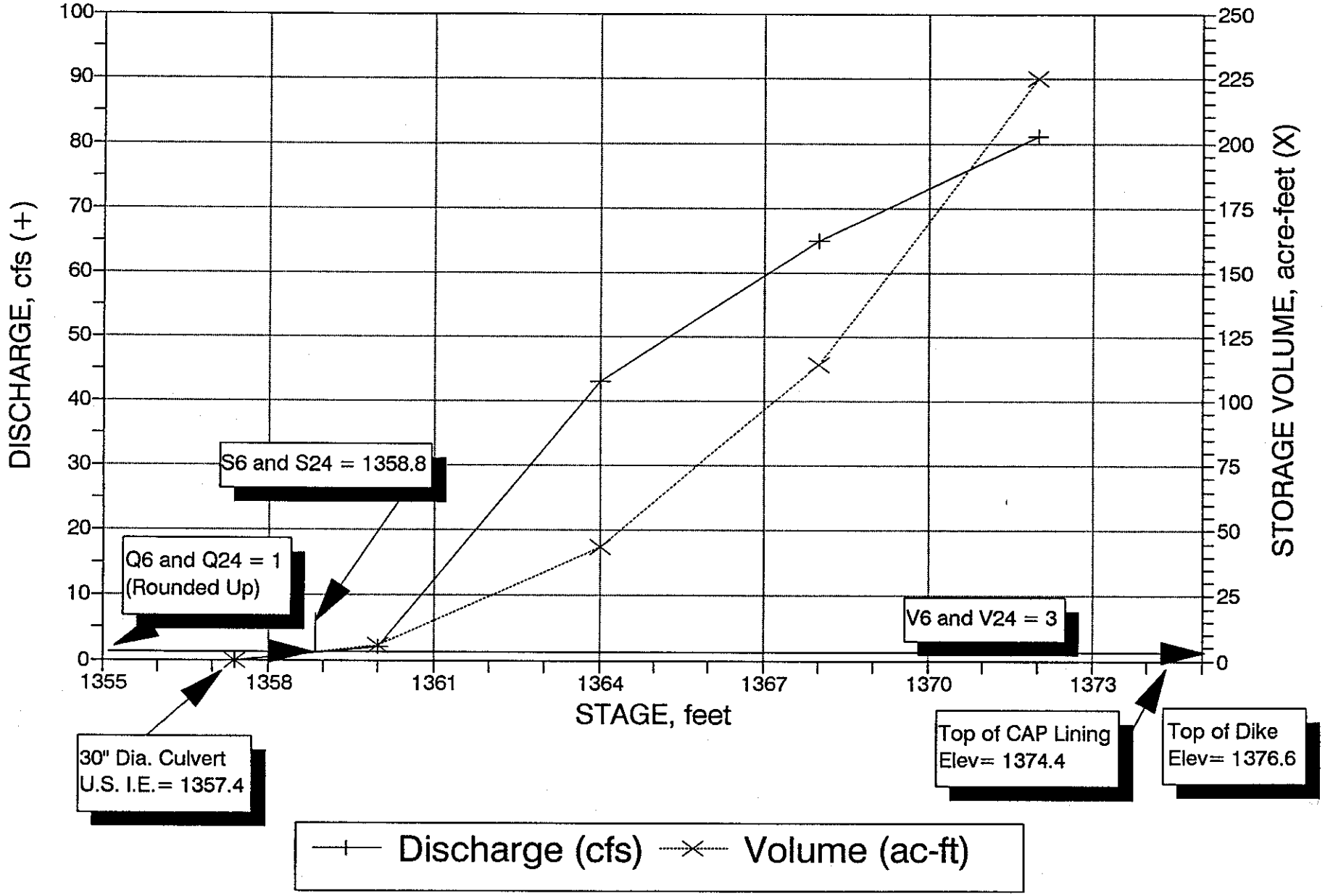


FIGURE 4: CAP-2
DISCHARGE AND STORAGE VOLUME vs STAGE

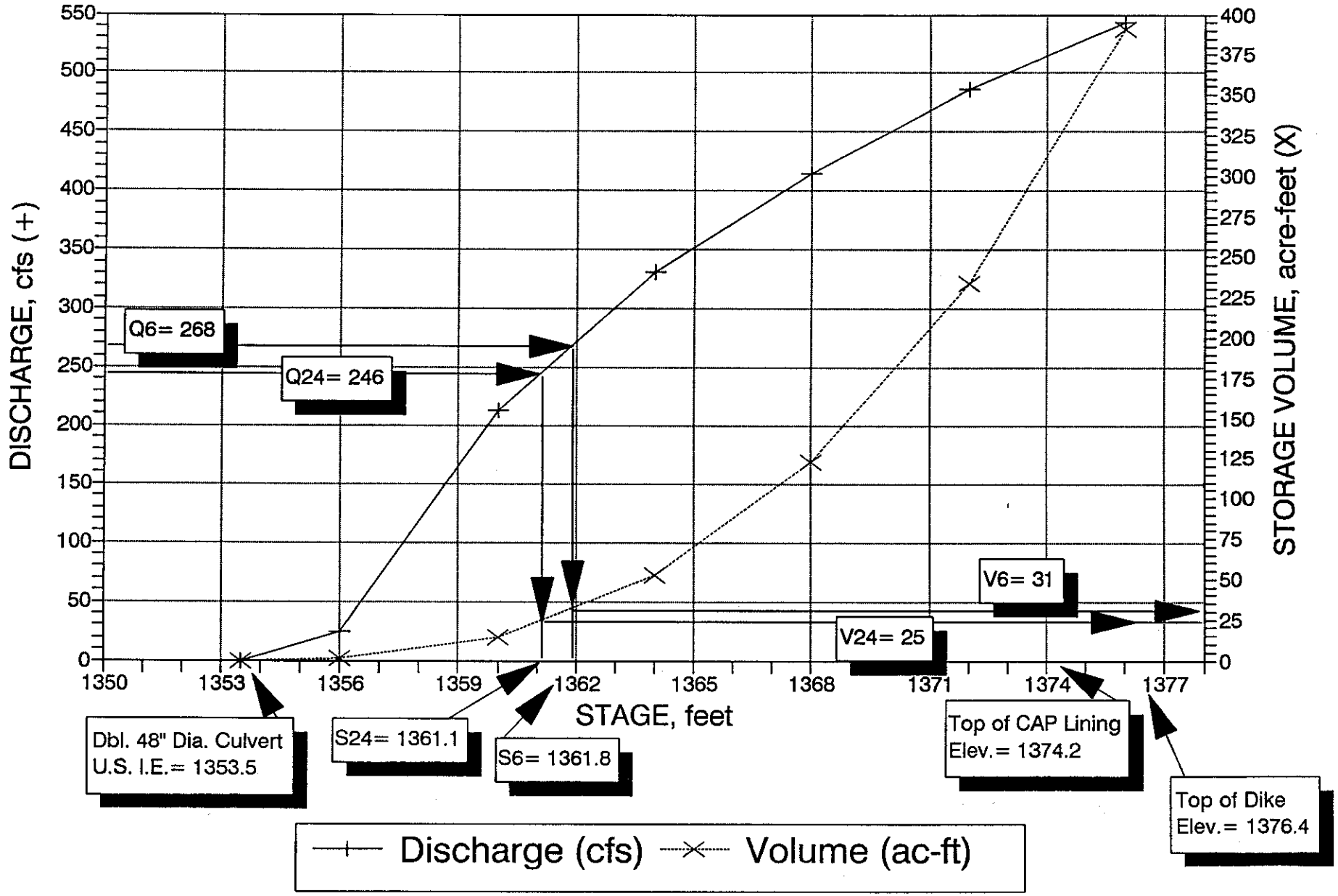


FIGURE 5: CAP-3
DISCHARGE AND STORAGE VOLUME vs STAGE

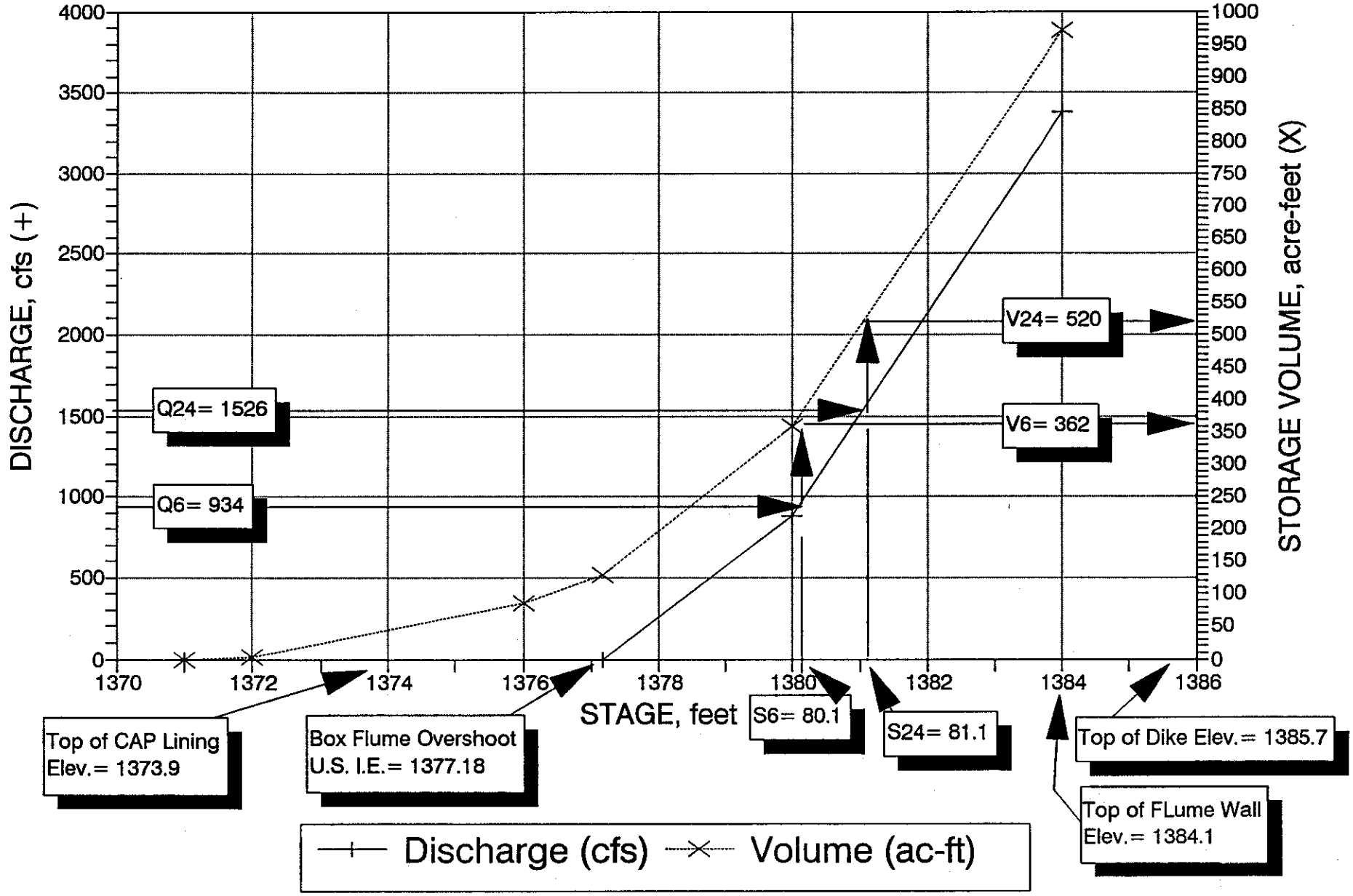


FIGURE 6: CAP-4
DISCHARGE AND STORAGE VOLUME vs STAGE

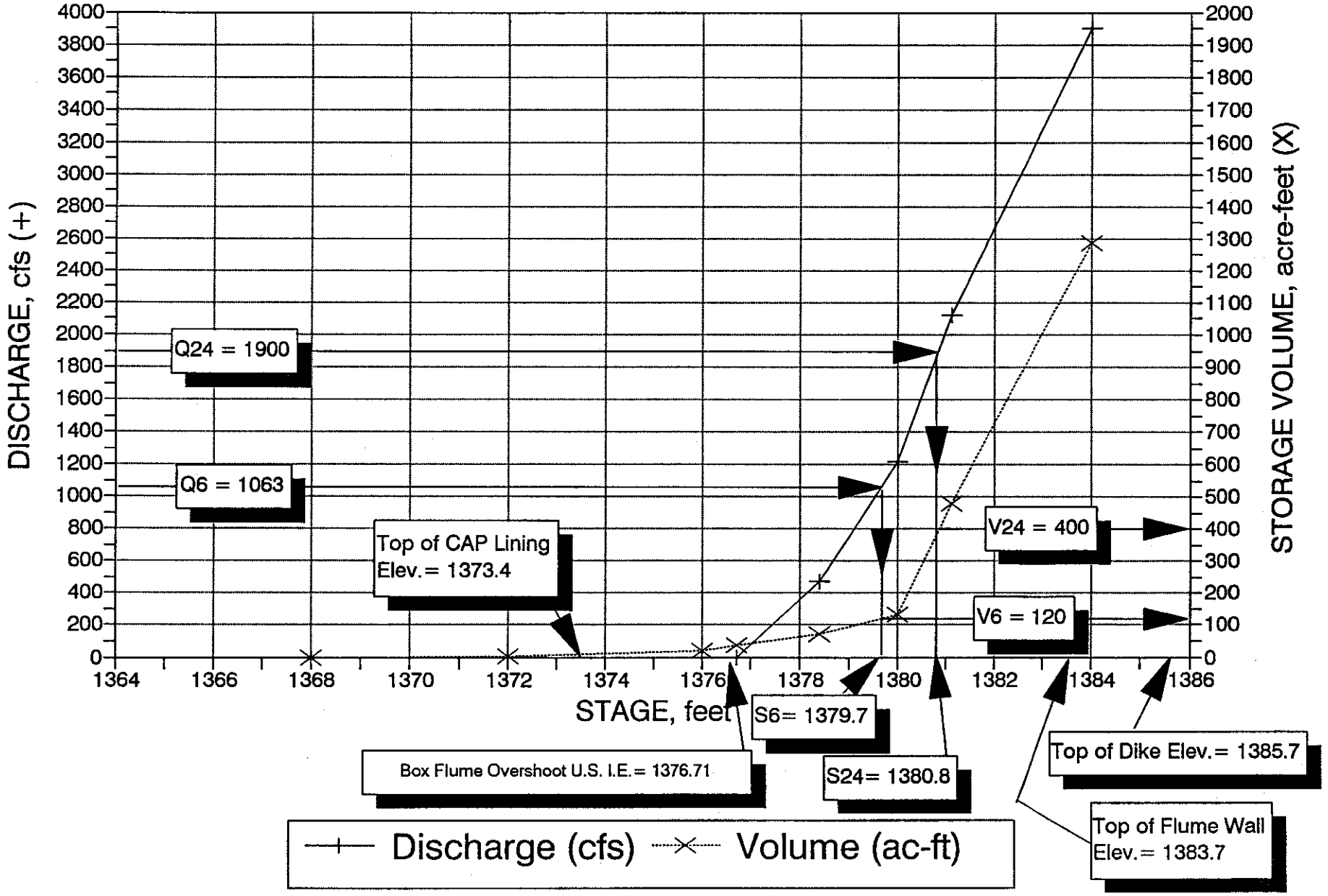


FIGURE 7: CAP-6 and CAP-7
DISCHARGE AND STORAGE VOLUME vs STAGE

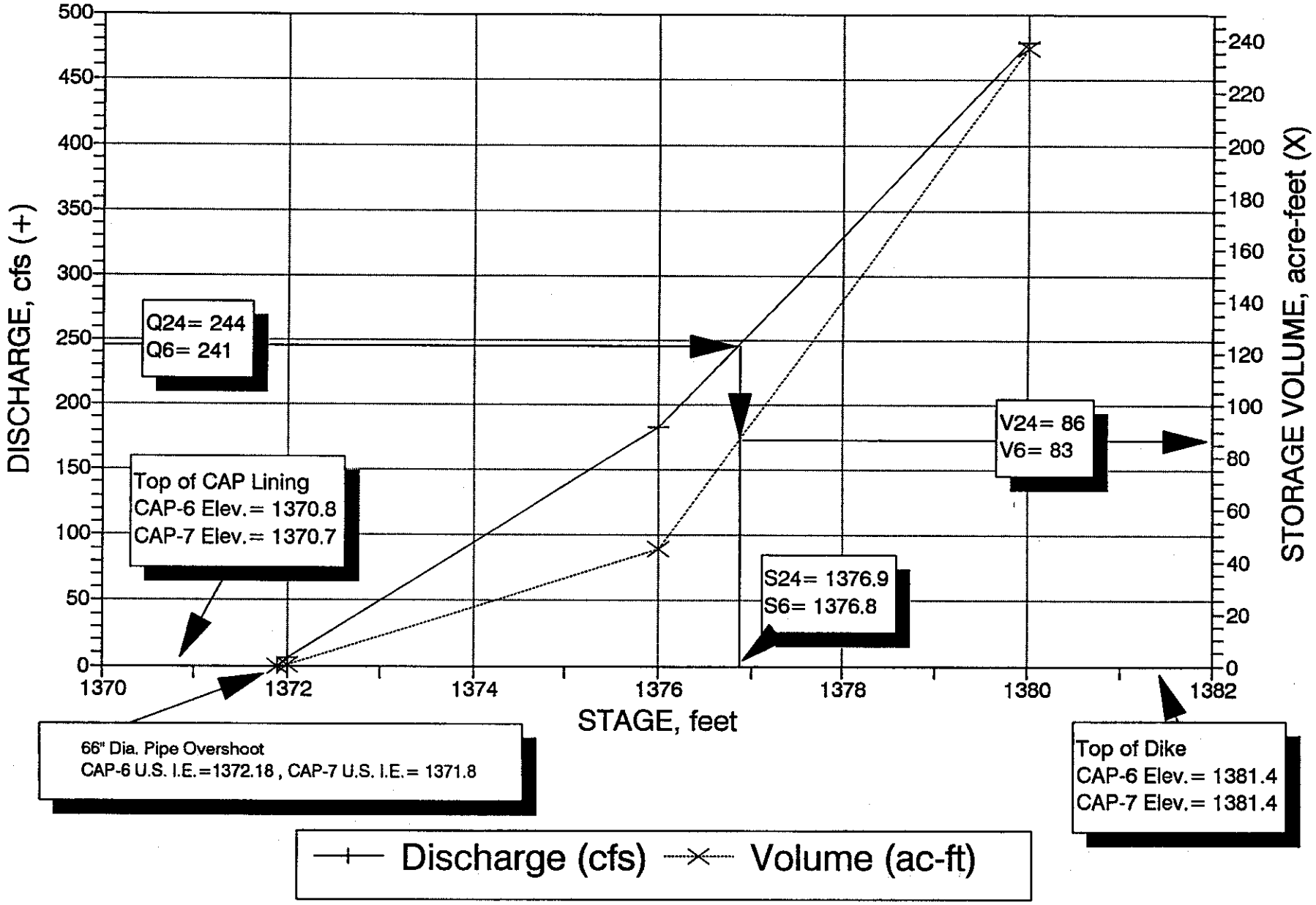


FIGURE 8: CAP-8
DISCHARGE AND STORAGE VOLUME vs STAGE

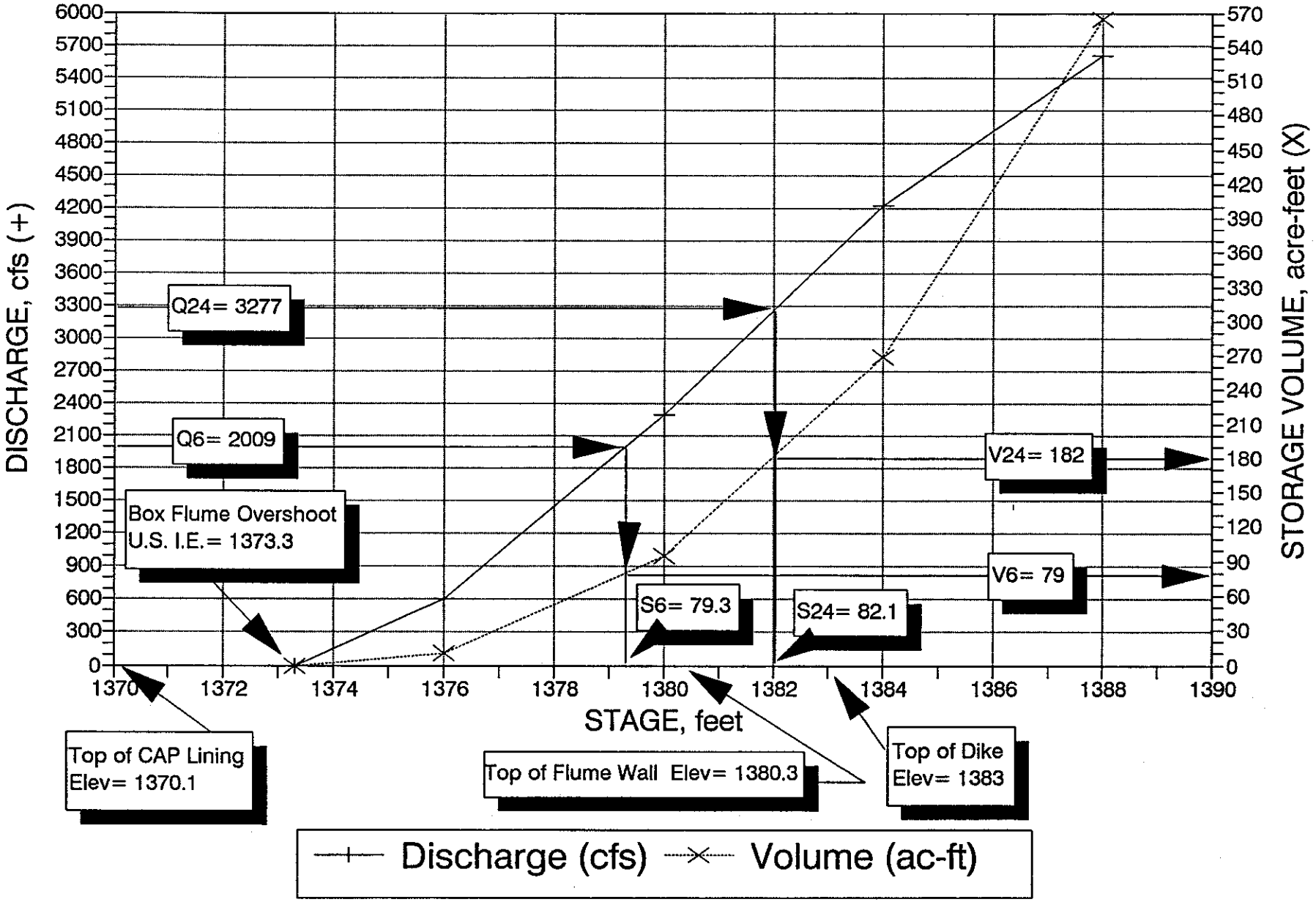


FIGURE 9: CAP-9
DISCHARGE AND STORAGE VOLUME vs STAGE

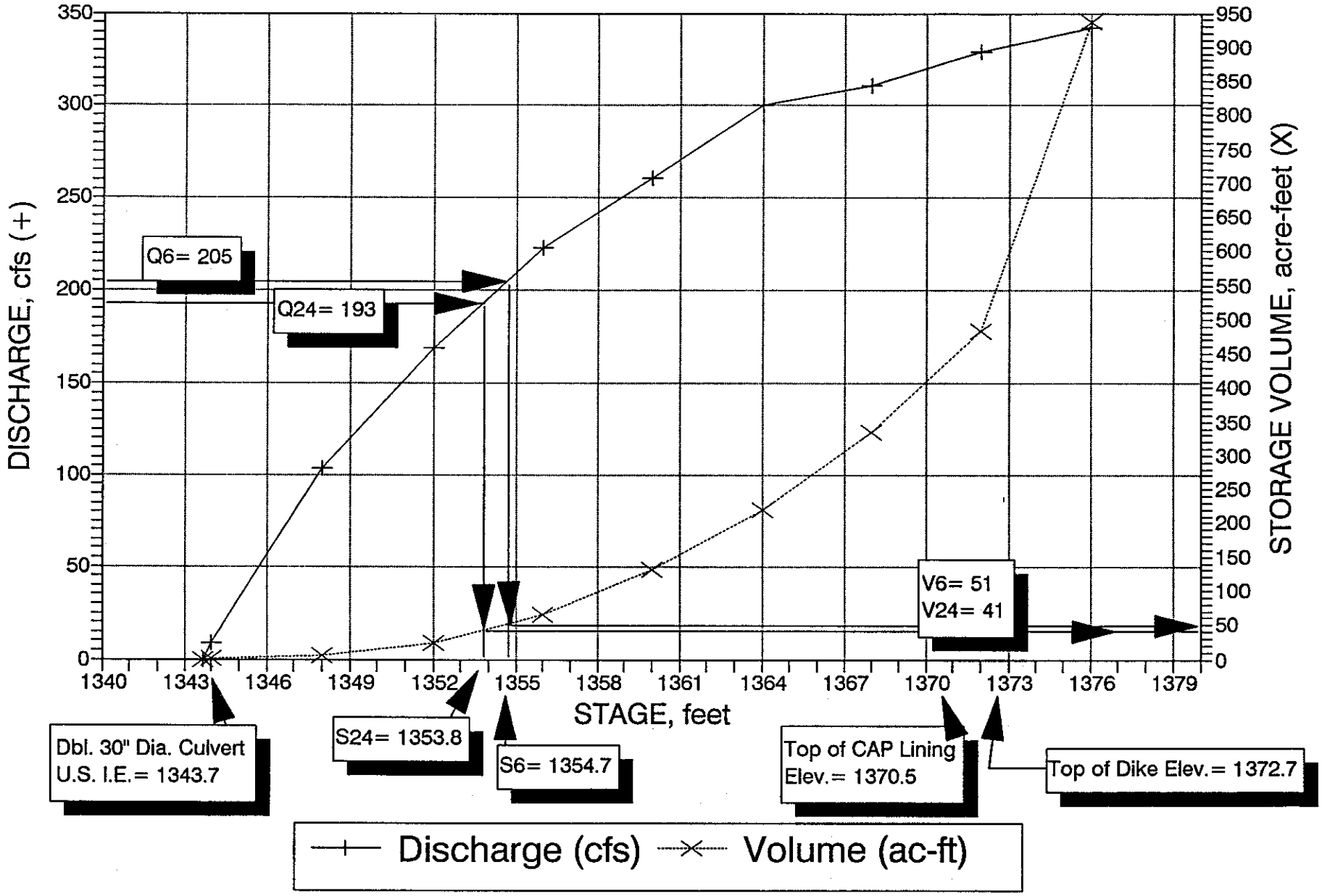


FIGURE 10: CAP-10
DISCHARGE AND STORAGE VOLUME vs STAGE

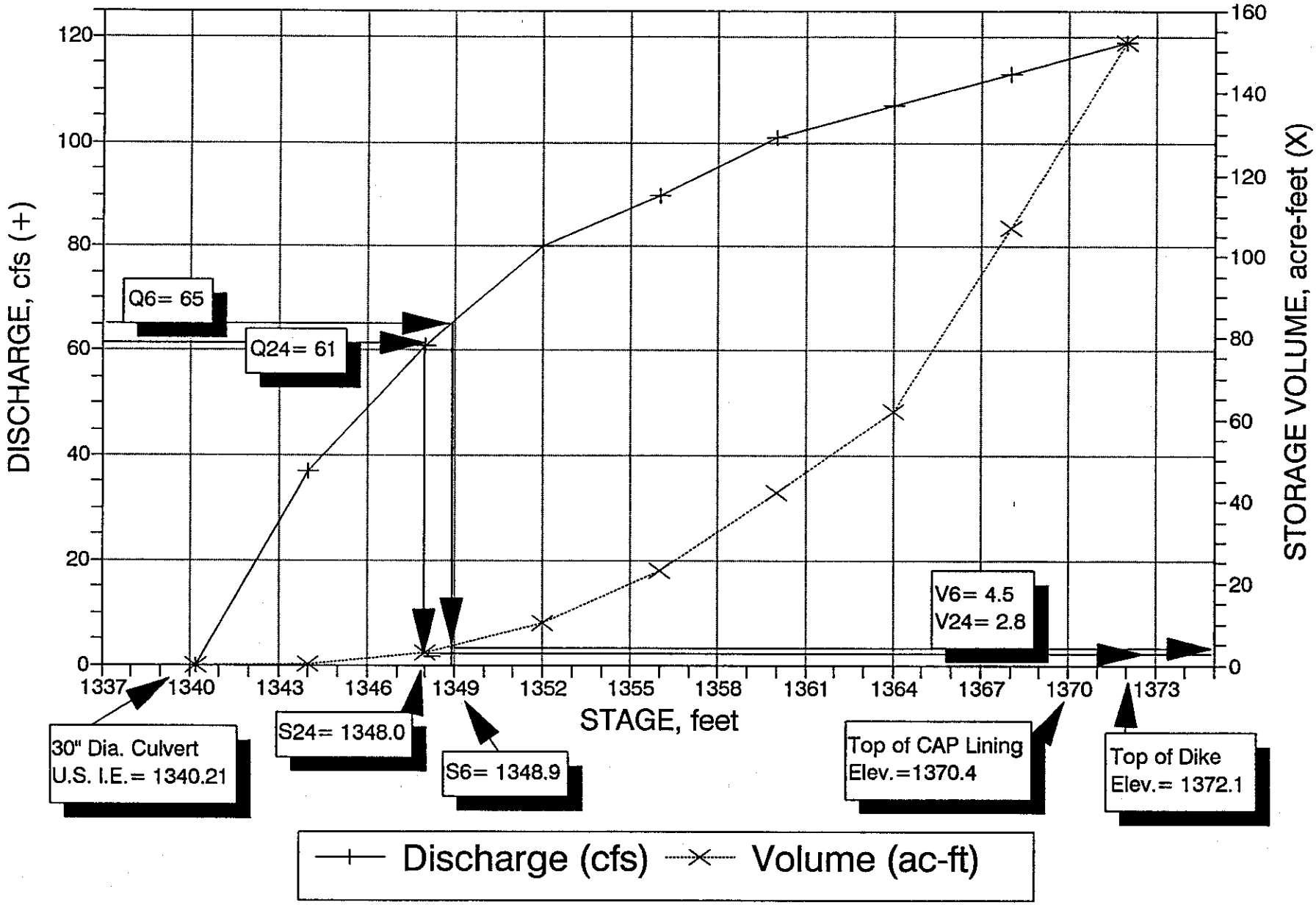
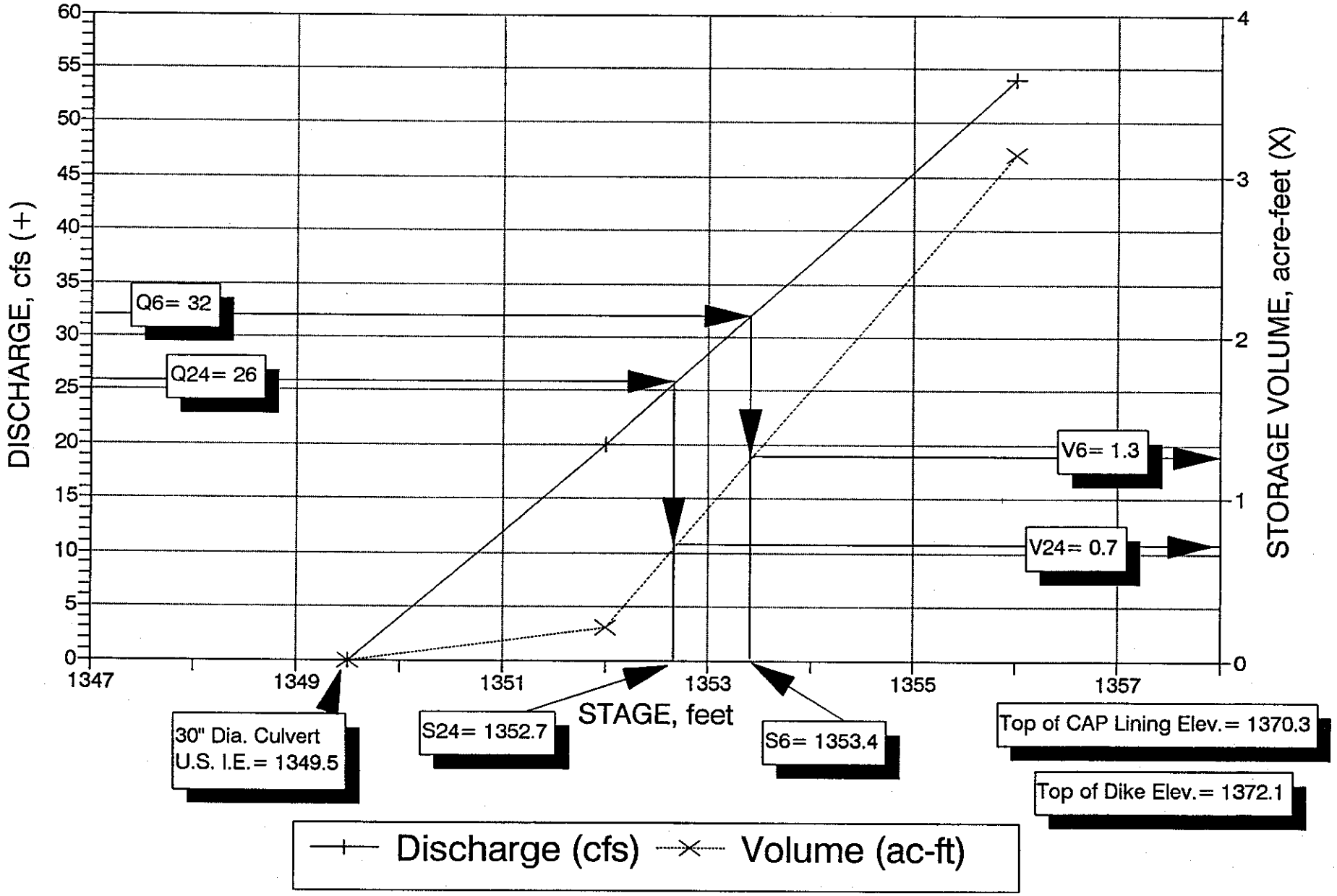


FIGURE 11: CAP-11
DISCHARGE AND STORAGE VOLUME vs STAGE



3.2.3 Statistical Parameters

The statistical parameters used for this study are contained in the Design Manual. These parameters are the result of extensive study and analysis of historical record data by the Flood Control District, the State of Arizona, and consulting engineers. The parameters are based on the assumption of randomness, non-climatic variability and non-cyclic behavior of precipitation and runoff. A paper entitled Cyclic Streamflow Test for Validity of Randomness (refer to Section 6.5: Bibliography Reference Number 6) raises questions concerning the validity of these assumptions for frequency analysis in Arizona. The possibility that climatic patterns in Arizona may be cyclic, and that frequency analysis data used in a region may not have occurred during a rising climatic cycle, is reason for concern in the future. As more data is collected, and the picture becomes clearer for Arizona, this possibility should be explored and analyzed.

3.2.4 Precipitation

3.2.4.1 Rainfall Distributions

The storm frequencies specified for analysis in this study are the 100-year 6-hour and the 100-year 24-hour duration storms. The rainfall distribution for the 6-hour duration storm was furnished by Maricopa County Flood Control District and is listed in the Design Manual. There are a total of 5 precipitation patterns for the 6-hour storm. Each precipitation pattern is valid up to certain watershed area. Each precipitation pattern and its appropriate watershed area is input to the HEC-1 model and the model instructions were set up to interpolate based on a sub-basin area. The 24-hour rainfall distribution used for this study is the SCS Type II.

3.2.4.2 Precipitation Data

Point precipitation values used in this study were derived from the isopluvial maps in the Design Manual. The point precipitation value used for the 100-

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

Table P-1

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

Table P-1

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

Table P-1

year 6-hour storm is 3.3" and the point precipitation value used for the 24-hour storm is 4.2".

3.2.4.3 Aerial Precipitation Reduction

The precipitation reduction for the 100-year 6-hour duration storm is based on the depth-area curve developed for the historic storm of 1954 over the Queen Creek area, as developed by the U.S. Army Corps of Engineers in 1974. The depth-area curve is listed in the Design Manual. The depth-area reduction factors were simulated in HEC-1 through use of the JD operation card.

The precipitation reduction factors used for the 100-year 24-hour storm were derived from information contained in NOAA Technical Memorandum NWS HYDRO-40. The precipitation values versus watershed drainage area used for the 24-hour model are contained in Table P-1.

Table P-1

Aerial Precipitation Reduction Data
100-Year 24-Hour Storm

2.54 Year Depth-Area Ratios
Zones A and C - Central Arizona

NOAA Technical Memorandum NWS Hydro-40

Watershed Area (Sq Mi)	Reduction Factor	Point Precipitation (inches)
0.01	1.00	4.20
5.0	0.98	4.12
10.0	0.95	3.99
50.0	0.88	3.70
100.0	0.85	3.57
500.0	0.78	3.28

3.2.5 Gage Data

3.2.5.1 General - The Flood Control District of Maricopa County has assembled gage data for representative washes in Maricopa County. The data was compiled by the US Geological Survey (USGS) in cooperation with Maricopa County. The majority of the data was summarized in a report entitled Compilation of Flood Data for Maricopa County, Arizona through September, 1965, and a subsequent administrative report of the same name dated 1970. Refer to Section 6.5: Bibliography Reference Numbers 30 and 31, respectively. The data contained in these reports was from streamflow gaging stations. Precipitation gages were referenced but precipitation data was not compiled in the reports. Supplemental data for subsequent years is available, but has not been placed in a report format.

3.2.5.2 Streamflow Gaging Stations - A crest-stage gage was established by the USGS on Jackrabbit Wash at a location 100 feet upstream of concentration point 34, which is the Jackrabbit Wash crossing of Wickenburg Road. The gage was operated from 1964 through 1979, a period of 15 years. The peaks recorded during this period are listed in Table G-1.

The Flood Control District performed a Log Pearson III statistical analysis for multiple recurrence intervals on the compiled gage data. The results are summarized in Table G-2 and depicted graphically in Figure 2.

3.2.5.3 Precipitation Stations - A non-recording precipitation station was established on the Jackrabbit Wash watershed in May, 1961. The gage, named Wickenburg 20 SW, was located in Section 31, Township 5 North, Range 6 West, approximately 20 miles southwest of Wickenburg, AZ. The gage was maintained from 1961 through 1966. There were no significant peaks of record during this period.

Table G-1
Jackrabbit Wash Crest-Stage Gage Record Peak Flows
Station Number 516800

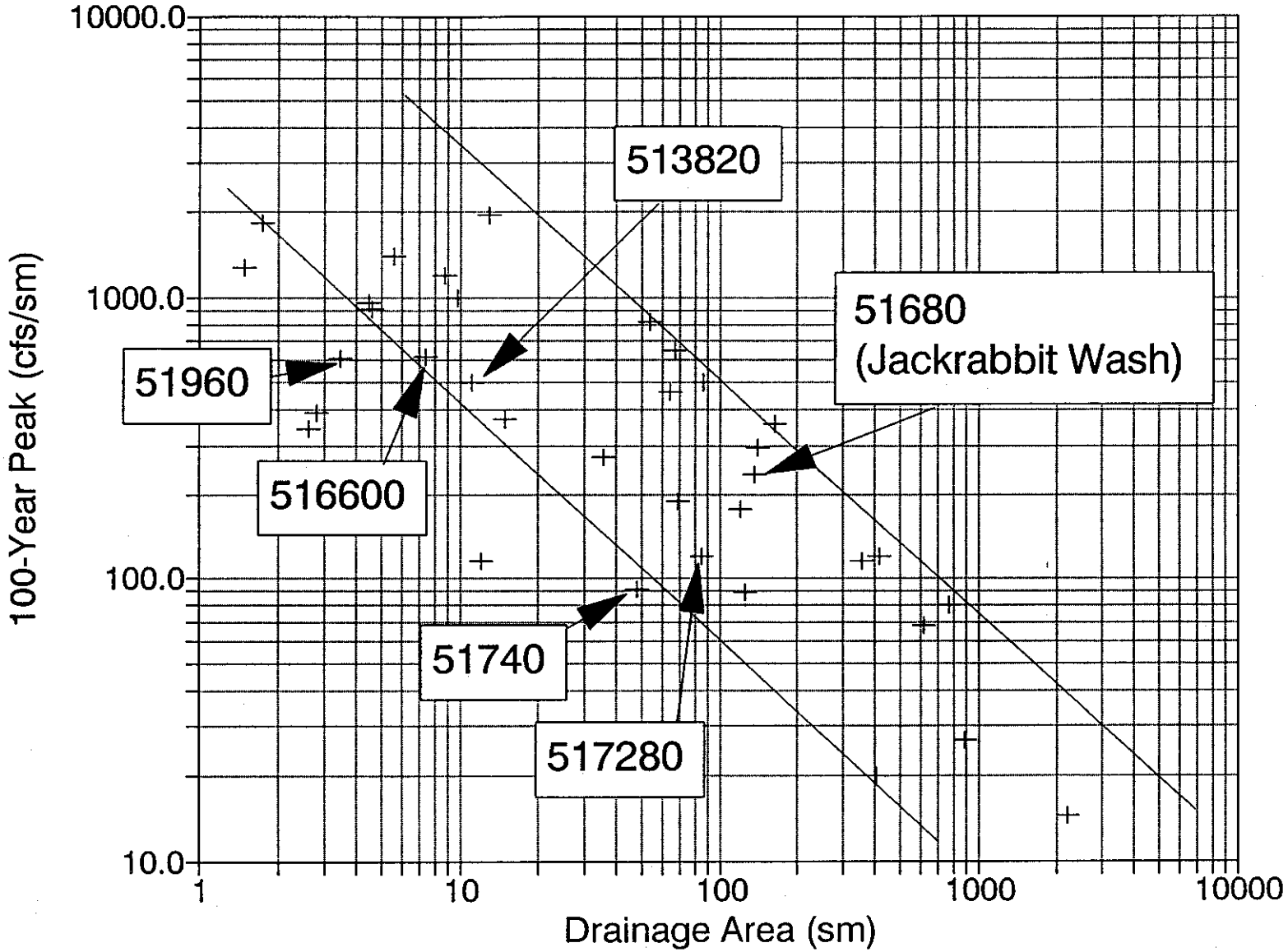
Rank	Date	Flow (cfs)	Storm Type
1	10/7/72	6840	Tropical Storm Joanne
2	9/3/67	6040	Unknown
3	9/5/70	5000	Tropical Storm Norma
4	8/7/71	2500	Monsoon
5	9/25/76	2200	Tropical Storm
6	1/18/79	2510	Unknown
7	10/6/77	650	Tropical Storm Heather
8	4/4/65	200	Unknown
9	9/13/66	200	Unknown
10	9/13/69	200	Unknown
11	12/19/67	105	Significant Winter General Storm
12	9/18/72	100	Unknown
13	8/16/77	80	Tropical Storm Doreen
14	7/7/74	75	Unknown
15	3/11/75	6	Unknown

TABLE G-2

LOG PEARSON III ANALYSIS SUMMARY FOR REPRESENTATIVE MARICOPA COUNTY WASHES

Station Number	Station Name	Drainage Area (sm)	Record Period 1		Record Period 2		Record Length (years)	Qmax (cfs)	Log Pearson III Discharge For 100-Year Storm	
			Start	End	Start	End			cfs	cfs/sm
447000	Eagle Creek Near Morenci	613.00	1945	1988			43	36,400	41,600	68
482500	Santa Cruz River Near Tucson	2,222.00	1915	1988			73	52,700	32,000	14
484000	Sabino Creek Near Tucson	35.50	1932	1988			56	7,730	9,700	273
485850	Rillito Creek Near Tucson	892.00	1915	1981			66	24,000	23,800	27
504500	Oak Creek Near Cornville	357.00	1941	1988			47	26,400	41,400	116
510070	West Fork Sycamore Creek Near Sunflower	4.58	1966	1974	1983	1986	11	1,700	4,200	917
510080	West Fork Sycamore Creek Near Sunflower	9.80	1961	1979			18	3,480	9,800	1,000
510100	East Fork Sycamore Creek Near Sunflower	4.49	1961	1986			25	1,940	4,300	958
510150	Sycamore Creek Near Sunflower	53.40	1962	1976			14	16,100	44,000	824
510170	Camp Creek Near Sunflower	2.60	1963	1979			16	402	900	346
510180	Rock Creek Near Sunflower	15.00	1963	1972			9	1,900	5,600	373
510200	Sycamore Creek Near Fort McDowell	165.00	1960	1987			27	24,200	58,800	356
512100	Indian bend Wash Near Scottsdale	142.00	1961	1984			23	21,000	41,600	293
512200	Salt River Tributary Near South Mountain Park	1.75	1961	1988			27	670	3,200	1,829
512300	Cave Creek Near Cave Creek	121.00	1958	1988			30	12,400	21,600	179
513780	New River Near Rock Springs	67.30	1962	1987			25	18,600	43,700	649
513800	New River At Rock Springs	85.70	1961	1982			21	19,500	42,900	501
513820	Deadman Wash Near New River	11.10	1960	1979			19	1,850	5,600	505
513860	Skunk Creek Phoenix	64.60	1960	1988			28	11,500	29,900	463
514200	Waterman Wash Near Buckeye	403.00	1964	1988			24	6,300	8,100	20
515500	Hassayampa River At B.D. Near Wickenburg	417.00	1946	1983			37	56,300	50,300	121
515800	Hartman Wash Near Wickenburg	5.57	1964	1979			15	2,600	7,800	1,400
516500	Hassayampa River Near Morristown	774.00	1939	1942	1964	1988	27	47,500	62,600	81
516600	Ox Wash Near Morristown	7.44	1963	1979			16	2,900	4,600	618
516800	Jackrabbit Wash Near Tonopah	137.00	1964	1979			15	6,840	32,500	237
517200	Centennial Wash Tributary Near Wendon	2.79	1963	1979			16	720	1,100	394
517280	Tiger Wash Near Aguila	85.20	1963	1979			16	4,550	10,300	121
517400	Winters Wash Near Tonopah	47.80	1962	1979			17	3,640	4,400	92
519600	Rainbow Wash Tributary Near Buckeye	3.45	1963	1979			16	1,430	2,100	609
519750	Bender Wash Near Gila Bend	68.80	1963	1979			16	2,670	13,100	190
519760	Sauceda Wash Near Gila Bend	126.00	1963	1979			16	3,150	11,300	90
519780	Windmill Wash Near Gila Bend	12.90	1964	1979			15	34,430	25,300	1,961
520100	Military Wash Near Sentinel	8.70	1963	1979			16	1,530	10,400	1,195
520200	Black Gap Wash Near Ajo	12.10	1963	1979			16	9,402	1,400	116
520230	Crater Range Wash Near Ajo	1.49	1963	1979			16	440	1,900	1,275

FIGURE 2: 100-Yr. Peak Vs Drainage Area
For Representative Maricopa Co. Washes



FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

Section 3.3

SECTION 3: Hydrologic Analysis

3.3 Calibration

3.3 Calibration

No attempt has been made to calibrate the HEC-1 models. The available historical data was reviewed, but there is not any precipitation data available which is close enough to the watershed to correlate with the known peak discharges. Also, the precipitation gage which was operated on the watershed, was discontinued prior to the recording of any significant peaks by the USGS crest-stage gage.

Section 3.4

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

SECTION 3: Hydrologic Analysis

3.4 Special Problems & Solutions

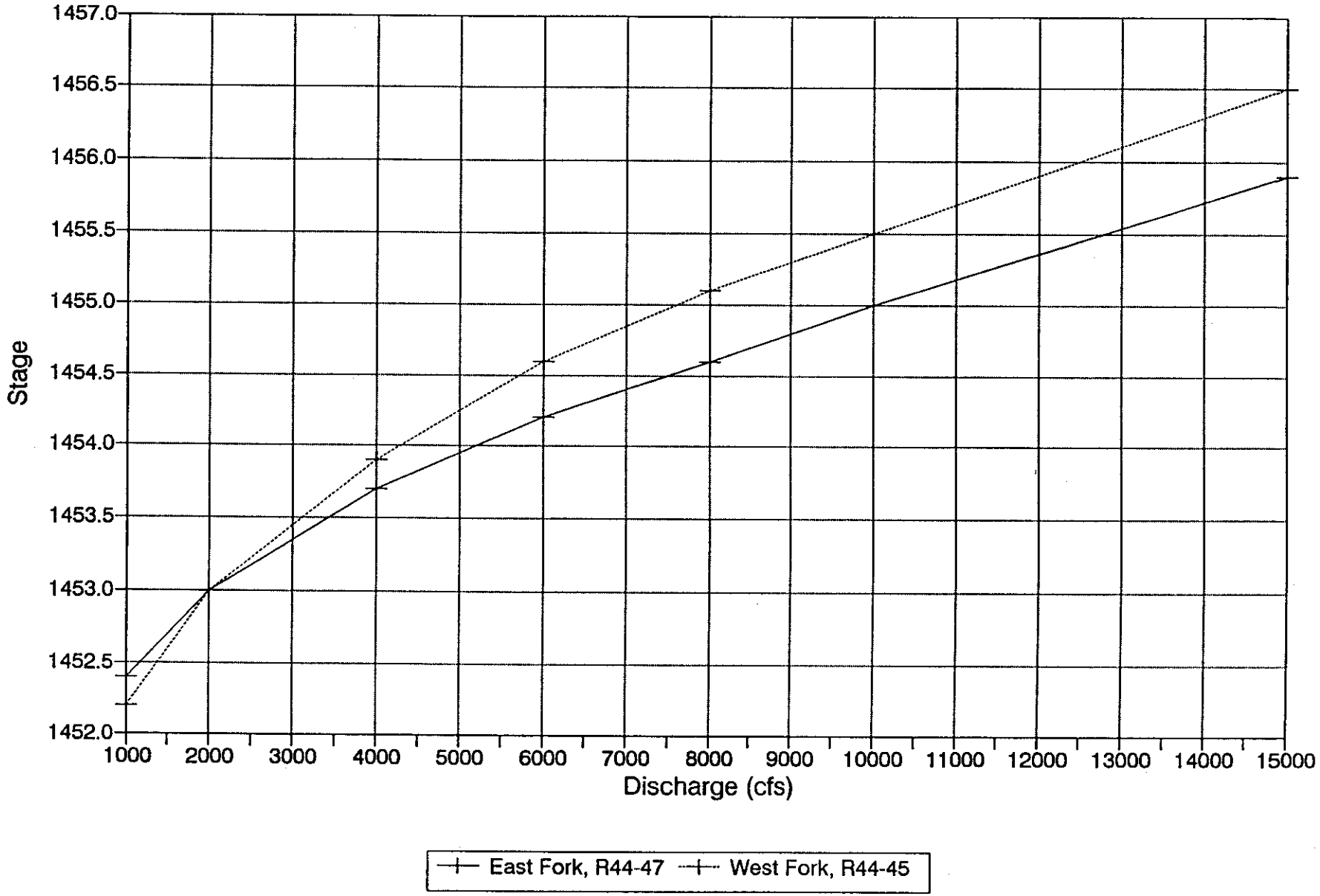
3.4 Special Problems and Solutions

3.4.1 Coyote Wash Split

3.4.1.1 Discussion of Problem

Coyote Wash has a channel split at concentration point 44 (CP44). Refer to Sheet 3 of Exhibit "C". This location is at the downstream end of sub-basins 9E and 9F. A normal low flow pattern in Coyote Wash proceeds in the west fork of Coyote Wash to concentration point 47 at the Central Arizona Canal CAP-3 structure. Flow splits into the east fork of Coyote Wash at CP44, when flow depth in the west fork exceeds approximately 3.5 feet. This flow split has been modeled for the both 100-year 6-hour and the 100-year 24-hour storms because the diversion affects peak flows in Coyote Wash and Jackrabbit Wash at the Central Arizona Project Canal. The flow split was modeled by creating a stage-discharge curve for both branches of Coyote Wash. The location of the cross section used is shown on Exhibit "G". The U.S. Army Corps of Engineers computer program HEC-2 was used to calculate the data necessary to produce the stage-discharge curve. The stage-discharge curve is included herein as Figure 1 under Section 3.4.1.2. The split was then modeled in HEC-1 using the diversion operation.

FIGURE 1 - Stage vs Discharge Table
Coyote Wash Flow Split at CP 44



```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  DEVELOPED BY THE COE                             *
*  VERSION OF SEPTEMBER 1988                        *
*  ERROR: 01,02,03                                  *
*  RUN DATE    12/10/90    TIME    14:29:37         *
*****************************************************
```

```
*************************************
*  DODSON & ASSOCIATES, INC.        *
*  HYDROLOGIST AND CIVIL ENGINEERS  *
*  5629 FM 1960 WEST SUITE 314      *
*  HOUSTON, TEXAS  77069            *
*  (713) 440-3787 Fax (713) 440-4742 *
*************************************
```

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

END OF BANNER

THIS RUN EXECUTED 12/10/90 14:29:37

```
**************************************************
  HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

  ERROR CORR -  01,02,03
  MODIFICATION -
**************************************************

T1 Jackrabbit Wash Floodplain Delineation Study, 10310 12/10/90
T2 FILENAME= 10310D2W.H2  Coyote Wash Split At CP 44, West Fork
T3      DIV2, West Chan., Q=1000

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     0.       2.       0.       0.     0.0059      0.       0.       0.     1454.0     0.

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    1.0       0.      -1.0      0.       0.       0.       -1.      0.       0.       15.

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.      43.       1.       8.      55.      26.      56.      46.      47.       5.
    38.      53.      54.               150

NC    0.060    0.035    0.060    0.1      0.3
NH      5.     0.060  1450.0     0.035  1495.0    0.050  1770.0    0.040  1814.0    0.050
NH   1900.0
QT      7.0  1000.0   2000.0   4000.0   6000.0   8000.0  10000.0  15000.0
X1      1.0     15.0  1370.0   1495.0      0.0      0.0      0.0
GR   1460.0  1300.0   1452.7   1300.0   1452.0   1370.0   1450.0   1420.0   1449.0   1450.0
GR   1450.0  1485.0   1452.0   1495.0   1454.0   1600.0   1454.0   1610.0   1452.0   1770.0
GR   1452.0  1800.0   1452.0   1814.0   1454.0   1835.0   1456.0   1900.0   1460.0   1900.0
```



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

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000

3265 DIVIDED FLOW

    1.000     3.19  1452.19  1451.35  1454.00  1452.44      .25      .00      .00  1452.00
    1000.       1.     990.       9.       2.     246.      11.       0.       0.   1452.00
      .00      .39     4.02      .82     .060     .044     .041     .000  1449.00  1351.10
 .005819       0.       0.       0.        0       14        4      .00   214.92  1815.98

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1452.19

STA=    1351.    1370.    1450.    1495.    1505.    1770.    1800.    1814.    1816.
  PER Q=      .1     38.4     60.6       .0       .1       .5       .2       .0
   AREA=     1.8    140.1    106.0       .9      1.4      5.7      2.6       .2
    VEL=      .4      2.7      5.7       .5       .5       .9       .9       .5
  DEPTH=      .1      1.8      2.4       .1       .0       .2       .2       .1
```



```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2W.H2  Coyote Wash Split At CP 44, West Fork
T3      DIV2, West Chan., Q=2000

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     0.       3.       0.       0.     0.0059      0.       0.       0.     1454.0     0.

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    2.0       0.      -1.0      0.       0.       0.       -1.      0.       0.       15.
```



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

*PROF 2

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000

3265 DIVIDED FLOW
```

```
    1.000     3.99  1452.99  1452.39  1454.00  1453.32      .34      .00      .00  1452.00
    2000.      62.    1716.     222.      45.     346.     113.       0.       0.   1452.00
      .00     1.40     4.96     1.96     .060     .045     .044     .000  1449.00  1300.00
  .005906       0.       0.       0.        0       14        6      .00   379.99  1824.35

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1452.99

STA=    1300.    1370.    1450.    1495.    1547.    1770.    1800.    1814.    1824.
  PER Q=      3.1     36.2     49.6      1.8      2.8      4.2      2.0       .4
   AREA=     44.5    203.9    141.9     25.5     38.9     29.6     13.8      5.1
    VEL=      1.4      3.5      7.0      1.4      1.4      2.8      2.8      1.4
  DEPTH=       .6      2.5      3.2       .5       .2      1.0      1.0       .5
```



```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2W.H2  Coyote Wash Split At CP 44, West Fork
T3      DIV2, West Chan., Q=4000

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       4.       0.       0.    0.0059      0.       0.       0.     1454.0     0.

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    3.0       0.      -1.0      0.       0.       0.       -1.      0.       0.       15.
```



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

*PROF 3

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000

3265 DIVIDED FLOW

    1.000     4.93  1453.93  1453.39  1454.00  1454.34      .41      .00      .00  1452.00
    4000.      281.    2754.     965.     110.     463.     350.       0.       0.   1452.00
      .00     2.55     5.94     2.76     .060     .046     .046     .000  1449.00  1300.00
  .005902       0.       0.       0.        0       16        5      .00   514.47  1834.23

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1453.93

STA=    1300.    1370.    1450.    1495.    1596.    1770.    1800.    1814.    1834.
  PER Q=      7.0     30.5     38.3      5.4      8.3      6.4      3.0      1.1
   AREA=    110.3    279.1    184.2     97.4    148.4     57.8     27.0     19.5
    VEL=      2.5      4.4      8.3      2.2      2.2      4.4      4.4      2.2
  DEPTH=      1.6      3.5      4.1      1.0       .9      1.9      1.9      1.0
```



```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2W.H2  Coyote Wash Split At CP 44, West Fork
T3      DIV2, West Chan., Q=6000

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       5.       0.       0.    0.0059      0.       0.       0.     1454.0     0.

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    4.0       0.      -1.0      0.       0.       0.       -1.      0.       0.       15.
```



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

*PROF 4

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000
    1.000     5.55  1454.55  1454.00  1454.00  1455.02      .47      .00      .00  1452.00
    6000.      487.    3547.    1966.     154.     541.     566.       0.       0.   1452.00
      .00     3.16     6.55     3.47     .060     .046     .047     .000  1449.00  1300.00
  .005897       0.       0.       0.        0        5        5      .00   552.89  1852.89

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1454.55

STA=    1300.    1370.    1450.    1495.    1600.    1610.    1770.    1800.    1814.    1835.    1853.
  PER Q=      8.1     26.8     32.3      8.3       .1     12.6      6.8      3.2      1.7       .1
   AREA=    154.0    329.0    212.3    162.8      5.5    248.1     76.5     35.7     32.6      4.9
    VEL=      3.2      4.9      9.1      3.1      1.5      3.1      5.3      5.3      3.0      1.0
  DEPTH=      2.2      4.1      4.7      1.6       .6      1.6      2.6      2.6      1.6       .3
```

```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2W.H2  Coyote Wash Split At CP 44, West Fork
T3      DIV2, West Chan., Q=8000

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     0.        6.        0.        0.      0.0059      0.        0.        0.      1454.0      0.

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    5.0       0.       -1.0       0.        0.        0.       -1.        0.        0.        15.
```



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

*PROF 5

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=      .100 CEHV=      .300
1490 NH CARD USED
*SECNO 1.000
    1.000      6.05  1455.05  1454.37  1454.00  1455.58      .53      .00      .00  1452.00
    8000.      687.    4273.    3040.     189.     604.     749.       0.       0.  1452.00
      .00      3.64     7.08     4.06     .060     .046     .047     .000  1449.00  1300.00
  .005991        0.       0.       0.        0        8        4      .00   569.13  1869.13

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1455.05

STA=    1300.    1370.    1450.    1495.    1600.    1610.    1770.    1800.    1814.    1835.    1869.
  PER Q=     8.6     24.5     28.9     10.0       .3     15.2      6.9      3.2      2.0       .3
   AREA=   189.0    369.0    234.8    215.3     10.5    328.0     91.5     42.7     43.1     17.9
    VEL=     3.6      5.3      9.9      3.7      2.4      3.7      6.0      6.0      3.7      1.5
  DEPTH=     2.7      4.6      5.2      2.1      1.1      2.1      3.1      3.1      2.1       .5
```



```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2W.H2  Coyote Wash Split At CP 44, West Fork
T3      DIV2, West Chan., Q=10000

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     0.        7.        0.        0.      0.0059      0.        0.        0.      1454.0      0.

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    6.0       0.       -1.0       0.        0.        0.       -1.        0.        0.        15.
```



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

*PROF 6

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=      .100 CEHV=      .300
1490 NH CARD USED
*SECNO 1.000
    1.000      6.51  1455.51  1454.69  1454.00  1456.09      .58      .00      .00  1452.00
   10000.      886.    4937.    4177.     221.     662.     926.       0.       0.  1452.00
      .00      4.00     7.46     4.51     .060     .047     .048     .000  1449.00  1300.00
  .005928        0.       0.       0.        0       11        4      .00   584.17  1884.17

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1455.51

STA=    1300.    1370.    1450.    1495.    1600.    1610.    1770.    1800.    1814.    1835.    1884.
  PER Q=     8.9     22.9     26.5     11.2       .5     17.0      7.0      3.3      2.2       .7
   AREA=   221.4    406.0    255.6    263.8     15.1    402.1    105.4     49.2     52.8     37.2
    VEL=     4.0      5.6     10.4      4.2      3.0      4.2      6.6      6.6      4.2      1.9
  DEPTH=     3.2      5.1      5.7      2.5      1.5      2.5      3.5      3.5      2.5       .8
```



```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2W.H2  Coyote Wash Split At CP 44, West Fork
T3      DIV2, West Chan., Q=15000

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     0.        8.        0.        0.      0.0059      0.        0.        0.      1454.0      0.

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
```

```
   6.0        0.      -1.0        0.        0.        0.       -1.        0.        0.       15.


   12/10/90      14:29:37                                                                                    PAGE   14

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

*PROF 7

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000
    1.000     7.48  1456.48  1455.43  1454.00  1457.19      .71      .00      .00  1452.00
   15000.     1368.    6497.    7135.     289.     782.    1312.       0.       0.   1452.00
      .00     4.74     8.31     5.44     .060     .047     .048     .000  1449.00  1300.00
  .005932       0.       0.       0.        0       11        4      .00   600.00  1900.00

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1456.48

STA=    1300.    1370.    1450.    1495.    1600.    1610.    1770.    1800.    1814.    1835.    1900.
  PER Q=      9.1     20.4     23.0     12.8       .7     19.5      7.0      3.2      2.5      1.9
   AREA=    288.8    483.0    298.9    364.9     24.8    556.1    134.3     62.7     73.0     95.9
    VEL=      4.7      6.3     11.5      5.3      4.2      5.3      7.8      7.8      5.2      3.0
  DEPTH=      4.1      6.0      6.6      3.5      2.5      3.5      4.5      4.5      3.5      1.5


   12/10/90      14:29:37                                                                                    PAGE   15


                                                                                THIS RUN EXECUTED 12/10/90    14:29:41
**************************************************
  HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

  ERROR CORR -  01,02,03
  MODIFICATION -
**************************************************

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

DIV2, West Chan., Q=1000

SUMMARY PRINTOUT

      SECNO       Q        CWSEL     DEPTH     VLOB      VCH       VROB      QWEIR     QPR       10*KS     SECNO     SSTA      ENDST

      1.000   1000.00   1452.19      3.19       .39      4.02       .82       .00       .00      58.19      1.00   1351.10   1815.98
      1.000   2000.00   1452.99      3.99      1.40      4.96      1.96       .00       .00      59.06      1.00   1300.00   1824.35
      1.000   4000.00   1453.93      4.93      2.55      5.94      2.76       .00       .00      59.02      1.00   1300.00   1834.23
      1.000   6000.00   1454.55      5.55      3.16      6.55      3.47       .00       .00      58.97      1.00   1300.00   1852.89
      1.000   8000.00   1455.05      6.05      3.64      7.08      4.06       .00       .00      59.91      1.00   1300.00   1869.13
      1.000  10000.00   1455.51      6.51      4.00      7.46      4.51       .00       .00      59.28      1.00   1300.00   1884.17
      1.000  15000.00   1456.48      7.48      4.74      8.31      5.44       .00       .00      59.32      1.00   1300.00   1900.00


   12/10/90      14:29:37                                                                                    PAGE   16

DIV2, West Chan., Q=1000

SUMMARY PRINTOUT TABLE  150

      SECNO     XLCH      ELTRD     ELLC      ELMIN       Q         CWSEL     CRIWS     EG        10*KS     VCH       AREA      .01K

      1.000      .00       .00       .00    1449.00   1000.00   1452.19   1451.35   1452.44    58.19     4.02    258.77    131.10
      1.000      .00       .00       .00    1449.00   2000.00   1452.99   1452.39   1453.32    59.06     4.96    503.15    260.25
      1.000      .00       .00       .00    1449.00   4000.00   1453.93   1453.39   1454.34    59.02     5.94    923.74    520.66
      1.000      .00       .00       .00    1449.00   6000.00   1454.55   1454.00   1455.02    58.97     6.55   1261.46    781.31
      1.000      .00       .00       .00    1449.00   8000.00   1455.05   1454.37   1455.58    59.91     7.08   1541.83   1033.60
      1.000      .00       .00       .00    1449.00  10000.00   1455.51   1454.69   1456.09    59.28     7.46   1808.55   1298.76
      1.000      .00       .00       .00    1449.00  15000.00   1456.48   1455.43   1457.19    59.32     8.31   2382.21   1947.64


   12/10/90      14:29:37                                                                                    PAGE   17

DIV2, West Chan., Q=1000

SUMMARY PRINTOUT TABLE  150

      SECNO       Q        CWSEL     DIFWSP    DIFWSX    DIFKWS    TOPWID    XLCH

      1.000   1000.00   1452.19       .00       .00     -1.81    214.92      .00
      1.000   2000.00   1452.99       .80       .00     -1.01    379.99      .00
      1.000   4000.00   1453.93       .94       .00      -.07    514.47      .00
      1.000   6000.00   1454.55       .62       .00       .55    552.89      .00
      1.000   8000.00   1455.05       .50       .00      1.05    569.13      .00
      1.000  10000.00   1455.51       .46       .00      1.51    584.17      .00
      1.000  15000.00   1456.48       .96       .00      2.48    600.00      .00
```

SUMMARY OF ERRORS AND SPECIAL NOTES

```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  DEVELOPED BY THE COE                             *
*  VERSION OF SEPTEMBER 1988                        *
*  ERROR: 01,02,03                                  *
*  RUN DATE    12/10/90   TIME   14:29: 7           *
*****************************************************
```

```
*************************************
*  DODSON & ASSOCIATES, INC.        *
*  HYDROLOGIST AND CIVIL ENGINEERS  *
*  5629 FM 1960 WEST SUITE 314      *
*  HOUSTON, TEXAS  77069            *
*  (713) 440-3787 Fax (713) 440-4742 *
*************************************
```

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

END OF BANNER

THIS RUN EXECUTED 12/10/90 14:29: 7

```
**************************************************
  HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

  ERROR CORR -  01,02,03
  MODIFICATION -
**************************************************

T1 Jackrabbit Wash Floodplain Delineation Study, 10310 12/10/90
T2 FILENAME= 10310D2E.H2  Coyote Wash Split At CP 44, East Fork
T3      DIV2, East Chan., Q=1000

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.       2.        0.        0.     0.0059       0.        0.        0.     1454.0      0.

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.0        0.      -1.0        0.        0.        0.       -1.        0.        0.       15.

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.       43.        1.        8.       55.       26.       56.       46.       47.        5.
    38.       53.       54.                 150

NC    0.060     0.035     0.060     0.1       0.3
NH      6.      0.040     670.0     0.050     780.0     0.040     1040.0    0.060     1155.0    0.035
NH   1215.0     0.060    1300.0
QT      7.0    1000.0    2000.0    4000.0    6000.0    8000.0    10000.0   15000.0
X1      1.0      28.0    1155.0    1215.0      0.0       0.0       0.0
GR   1460.0    500.0     1458.5    500.0     1458.0    535.0     1456.0    580.0     1456.5    620.0
GR   1456.0    650.0     1456.5    670.0     1456.0    695.0     1454.0    710.0     1452.0    758.0
GR   1450.0    765.0     1450.0    775.0     1452.0    780.0     1452.5    850.0     1452.0    920.0
GR   1452.0    930.0     1452.5    945.0     1452.0    960.0     1451.0    975.0     1452.0    990.0
GR   1452.5   1040.0     1452.0   1155.0     1450.0   1180.0     1449.0   1195.0     1450.0   1208.0
GR   1452.0   1215.0     1452.7   1299.0     1460.0   1300.0
```



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

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000

3265 DIVIDED FLOW

    1.000     3.44  1452.44  1452.27  1454.00  1452.78      .34      .00      .00  1452.00
    1000.     297.     695.       8.     142.     128.      12.       0.       0.   1452.00
      .00     2.10     5.41      .70     .046     .035     .060     .000  1449.00   747.43
  .005945       0.       0.       0.        0       17        6      .00   480.51  1267.86

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1452.44

STA=     747.     765.     775.     842.     975.     990.    1155.    1215.    1268.
  PER Q=     3.1     10.1      3.4      6.6      3.9      2.6     69.5       .8
   AREA=    12.4     24.4     20.8     37.9     14.1     32.0    128.4     11.6
    VEL=     2.5      4.2      1.6      1.7      2.7       .8      5.4       .7
  DEPTH=      .7      2.4       .3       .3       .9       .2      2.1       .2
```



```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2E.H2  Coyote Wash Split At CP 44, East Fork
T3      DIV2, East Chan., Q=2000

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.       3.        0.        0.     0.0059       0.        0.        0.     1454.0      0.

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    2.0        0.      -1.0        0.        0.        0.       -1.        0.        0.       15.
```



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

*PROF 2

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000
```

```
   1.000     3.97  1452.97  1452.86  1454.00  1453.33      .36      .00      .00  1452.00
   2000.     922.     1006.      72.     359.     160.      52.       0.       0.  1452.00
     .00     2.56     6.28     1.39     .045     .035     .060     .000  1449.00   734.73
 .005966       0.       0.       0.        0       13        6      .00   564.31  1299.04

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1452.97

STA=     735.     765.     775.     850.     920.     960.     975.     990.    1040.    1155.    1215.    1299.
  PER Q=     3.2      7.0      7.5      5.8      3.8      4.1      4.1      4.1      6.4     50.3      3.6
   AREA=    25.1     29.7     60.2     50.4     31.3     22.0     22.0     36.0     82.8    160.2     52.0
    VEL=     2.6      4.7      2.5      2.3      2.5      3.7      3.7      2.3      1.5      6.3      1.4
  DEPTH=      .8      3.0       .8       .7       .8      1.5      1.5       .7       .7      2.7       .6
```



```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2E.H2  Coyote Wash Split At CP 44, East Fork
T3      DIV2, East Chan., Q=4000

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     0.       4.       0.       0.     0.0059     0.       0.       0.     1454.0     0.

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    3.0      0.      -1.0      0.       0.       0.       -1.      0.       0.       15.
```



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

*PROF 3

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000
   1.000     4.66  1453.66  1453.40  1454.00  1454.07      .42      .00      .00  1452.00
   4000.    2277.     1472.     251.     654.     201.     110.       0.       0.  1452.00
     .00     3.48     7.31     2.28     .045     .035     .060     .000  1449.00   718.26
 .005957       0.       0.       0.        0        9        5      .00   580.88  1299.13

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1453.66

STA=     718.     765.     775.     850.     920.     945.     975.     990.    1040.    1155.    1215.    1299.
  PER Q=     3.7      5.0     10.2      8.9      3.6      5.8      3.9      6.3      9.7     36.8      6.3
   AREA=    51.5     36.6    111.7     98.4     37.7     53.4     32.3     70.3    161.7    201.4    109.7
    VEL=     2.8      5.4      3.7      3.6      3.8      4.3      4.8      3.6      2.4      7.3      2.3
  DEPTH=     1.1      3.7      1.5      1.4      1.5      1.8      2.2      1.4      1.4      3.4      1.3
```



```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2E.H2  Coyote Wash Split At CP 44, East Fork
T3      DIV2, East Chan., Q=6000

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     0.       5.       0.       0.     0.0059     0.       0.       0.     1454.0     0.

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    4.0      0.      -1.0      0.       0.       0.       -1.      0.       0.       15.
```



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

*PROF 4

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000
   1.000     5.18  1454.18  1453.82  1454.00  1454.67      .49      .00      .00  1452.00
   6000.    3681.     1878.     441.     886.     233.     154.       0.       0.  1452.00
     .00     4.15     8.06     2.86     .045     .035     .060     .000  1449.00   708.63
 .005969       0.       0.       0.        0       10        4      .00   590.57  1299.20

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1454.18

STA=     709.     765.     775.     850.     920.     945.     975.     990.    1040.    1155.    1215.    1299.    1299.
  PER Q=     4.2      4.2     11.3     10.0      3.9      5.9      3.7      7.2     11.0     31.3      7.3       .0
   AREA=    79.1     41.8    151.2    135.2     50.8     69.2     40.2     96.6    222.2    232.9    153.9       .2
    VEL=     3.2      6.0      4.5      4.5      4.6      5.1      5.5      4.5      3.0      8.1      2.9       .4
  DEPTH=     1.4      4.2      2.0      1.9      2.0      2.3      2.7      1.9      1.9      3.9      1.8       .7
```

```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2E.H2  Coyote Wash Split At CP 44, East Fork
T3      DIV2, East Chan., Q=8000

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     0.        6.        0.        0.     0.0059       0.        0.        0.     1454.0      0.

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    5.0        0.      -1.0        0.        0.        0.       -1.        0.        0.       15.
```



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

*PROF 5

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000
    1.000     5.63  1454.63  1454.09  1454.00  1455.19      .56      .00      .00  1452.00
    8000.    5108.    2257.     635.    1085.     260.     191.       0.       0.  1452.00
      .00     4.71     8.69     3.32     .045     .035     .060     .000  1449.00   705.30
  .006003       0.       0.       0.        0        8        4      .00   593.96  1299.26

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1454.63

STA=     705.     758.     775.     850.     920.     945.     975.     990.    1040.    1155.    1215.    1299.    1299.
  PER Q=     3.1      5.4     11.8     10.7      4.1      5.9      3.6      7.6     11.7     28.2      7.9       .0
   AREA=    79.5     71.6    184.5    166.4     61.9     82.5     46.9    118.8    273.3    259.6    191.2       .3
    VEL=     3.1      6.0      5.1      5.1      5.3      5.7      6.1      5.1      3.4      8.7      3.3       .5
  DEPTH=     1.5      4.2      2.5      2.4      2.5      2.8      3.1      2.4      2.4      4.3      2.3      1.0
```



```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2E.H2  Coyote Wash Split At CP 44, East Fork
T3      DIV2, East Chan., Q=10000

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     0.        7.        0.        0.     0.0059       0.        0.        0.     1454.0      0.

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    6.0        0.      -1.0        0.        0.        0.       -1.        0.        0.       15.
```



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

*PROF 6

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000
    1.000     6.03  1455.03  1454.40  1454.00  1455.67      .63      .00      .00  1452.00
   10000.    6553.    2614.     833.    1269.     284.     226.       0.       0.  1452.00
      .00     5.16     9.20     3.69     .045     .035     .060     .000  1449.00   702.25
  .005968       0.       0.       0.        0        8        4      .00   597.07  1299.32

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1455.03

STA=     702.     758.     775.     850.     920.     945.     975.     990.    1040.    1155.    1215.    1299.    1299.
  PER Q=     3.7      5.0     12.2     11.1      4.2      5.9      3.5      7.9     12.1     26.1      8.3       .0
   AREA=   101.6     78.6    215.0    194.8     72.1     94.8     53.0    139.2    320.1    284.0    225.4       .4
    VEL=     3.6      6.4      5.7      5.7      5.8      6.2      6.6      5.7      3.8      9.2      3.7       .6
  DEPTH=     1.8      4.6      2.9      2.8      2.9      3.2      3.5      2.8      2.8      4.7      2.7      1.2
```



```
T1 Jackrabbit Wash Floodplain Delineation Study, 10310 1 12/10/90
T2 FILENAME= 10310D2E.H2  Coyote Wash Split At CP 44, East Fork
T3      DIV2, East Chan., Q=15000

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     0.        8.        0.        0.     0.0059       0.        0.        0.     1454.0      0.

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    6.0        0.      -1.0        0.        0.        0.       -1.        0.        0.       15.
```

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

*PROF 7

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV=     .100 CEHV=     .300
1490 NH CARD USED
*SECNO 1.000
   1.000     6.91  1455.91  1455.05  1454.00  1456.71      .80      .00      .00  1452.00
  15000.    10197.    3469.    1334.    1667.     336.     299.       0.       0.  1452.00
     .00     6.12    10.31     4.45     .045     .035     .060     .000  1449.00   695.70
 .005981       0.       0.       0.        0       11        3      .00   603.74  1299.44

FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=   1455.91

STA=     696.     758.     775.     850.     920.     945.     975.     990.    1040.    1155.    1215.    1299.    1299.
  PER Q=    4.6      4.4     12.7     11.6      4.3      5.9      3.4      8.3     12.7     23.1      8.9       .0
   AREA=  153.1     93.4    280.5    255.9     93.9    120.9     66.1    182.8    420.5    336.4    298.7       .7
    VEL=    4.5      7.1      6.8      6.8      6.9      7.3      7.7      6.8      4.5     10.3      4.5       .7
  DEPTH=    2.5      5.5      3.7      3.7      3.8      4.0      4.4      3.7      3.7      5.6      3.6      1.6
```



```
                                                                    THIS RUN EXECUTED 12/10/90    14:29:12
**************************************************
  HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

  ERROR CORR -  01,02,03
  MODIFICATION -
**************************************************
```

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

DIV2, East Chan., Q=1000

SUMMARY PRINTOUT

SECNO	Q	CWSEL	DEPTH	VLOB	VCH	VROB	QWEIR	QPR	10*KS	SECNO	SSTA	ENDST
1.000	1000.00	1452.44	3.44	2.10	5.41	.70	.00	.00	59.45	1.00	747.43	1267.86
1.000	2000.00	1452.97	3.97	2.56	6.28	1.39	.00	.00	59.66	1.00	734.73	1299.04
1.000	4000.00	1453.66	4.66	3.48	7.31	2.28	.00	.00	59.57	1.00	718.26	1299.13
1.000	6000.00	1454.18	5.18	4.15	8.06	2.86	.00	.00	59.69	1.00	708.63	1299.20
1.000	8000.00	1454.63	5.63	4.71	8.69	3.32	.00	.00	60.03	1.00	705.30	1299.26
1.000	10000.00	1455.03	6.03	5.16	9.20	3.69	.00	.00	59.68	1.00	702.25	1299.32
1.000	15000.00	1455.91	6.91	6.12	10.31	4.45	.00	.00	59.81	1.00	695.70	1299.44

DIV2, East Chan., Q=1000

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
1.000	.00	.00	.00	1449.00	1000.00	1452.44	1452.27	1452.78	59.45	5.41	281.68	129.69
1.000	.00	.00	.00	1449.00	2000.00	1452.97	1452.86	1453.33	59.66	6.28	571.69	258.92
1.000	.00	.00	.00	1449.00	4000.00	1453.66	1453.40	1454.07	59.57	7.31	964.72	518.25
1.000	.00	.00	.00	1449.00	6000.00	1454.18	1453.82	1454.67	59.69	8.06	1273.40	776.59
1.000	.00	.00	.00	1449.00	8000.00	1454.63	1454.09	1455.19	60.03	8.69	1536.57	1032.51
1.000	.00	.00	.00	1449.00	10000.00	1455.03	1454.40	1455.67	59.68	9.20	1779.00	1294.50
1.000	.00	.00	.00	1449.00	15000.00	1455.91	1455.05	1456.71	59.81	10.31	2302.96	1939.55

DIV2, East Chan., Q=1000

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1.000	1000.00	1452.44	.00	.00	-1.56	480.51	.00
1.000	2000.00	1452.97	.53	.00	-1.03	564.31	.00
1.000	4000.00	1453.66	.69	.00	-.34	580.88	.00
1.000	6000.00	1454.18	.53	.00	.18	590.57	.00
1.000	8000.00	1454.63	.44	.00	.63	593.96	.00
1.000	10000.00	1455.03	.41	.00	1.03	597.07	.00
1.000	15000.00	1455.91	.87	.00	1.91	603.74	.00

SUMMARY OF ERRORS AND SPECIAL NOTES

3.4.2 Impoundments on Watershed

There are a number of stock tanks located on the watershed. The Jackrabbit Tank, located in Major Basin 1, has the largest impoundment area. All tanks that appeared to be significant were observed in the field. It was found that the dam structures on every tank that was observed would likely fail during a 100-year event. Therefore these tanks were not considered in the modeling effort and flow was assumed to pass straight through.

3.4.3 Bureau of Land Management Levees

There are a series of check dams which exist in sub-basins 10E, 10G, 10L and 10N. Refer to Sheets 3 and 5 of Exhibit "C". These check dams were constructed by the Bureau of Land Management (BLM). The BLM project number was 269, and the project was constructed in 1963. The original purpose of this project was range management. The check dams were inspected individually to determine if they were structurally adequate and to determine if they would have a significant impact on runoff from the watershed. The examination yielded that the dams at the upper end of the series had already been overtopped numerous times and were in danger of completely eroding away. Therefore, the effects of these dams were not modeled. However, flow paths were affected to some extent by the positioning of the dams and this was taken into account in routing direction and time of concentration flow paths.

3.4.4 Central Arizona Project Canal Structure CAP-4

3.4.4.1 Discussion of Problem

The structure at Central Arizona Project Canal CAP-4 is a concrete box flume overchute with a bottom width of 67.5 feet and a wall height of 7 feet. The canal at this location is constructed with the top of the canal lining at the original ground elevation. Flow is directed to the crossing structure by collective dikes which extend east and west along the north side of the canal.

Modeling of the reservoir storage effects of the CAP-4 structure was complicated by a large impoundment area east of the structure which has a bottom elevation 18 feet lower than the invert elevation of the flume. This area is separated from the release structure by a ridge which, at its lowest point, is 2 feet higher than the flume invert. This ridge is in its natural state, and appears stable and not easily eroded.

In addition, the USBR considered structures CAP-3 and CAP-4 to be hydraulically connected. Therefore, the available storage for the two structures was assumed to be shared for the design condition. The results of this study contend with this assumption and show that the storage areas for the two structures are not connected. CAP-3 will be mentioned in this section because it was initially assumed that CAP-3 was hydraulically linked to CAP-4.

For the purposes of this discussion, the ridge which separates the two storage areas is referred to as the "Control Section". The area east of the Control Section is referred to as the "East Ponding Area", and the area west of the Control Section is referred to as the "West Ponding Area". Refer to Figure 12 and Sheet 7 of Exhibit "H". The problem was worthy of a more detailed analysis than was applied to the other CAP structures because:

1. The storage volume of the East Ponding Area at the spillover elevation of the Control Section is in excess of 400 acre-feet.

2. The flood stage at the CAP-4 structure will reach a significantly higher elevation because of the Control Section constriction than if the East Ponding Area volume was considered available at the start of the routing operation.

3.4.4.2 Problem Solution

The procedures used in arriving at a reasonably accurate hydraulic model of the problem are discussed in the following sections in a step by step manner.

Step 1: Estimate the runoff volume from the watershed upstream of the Control Section which is trapped in the East Ponding Area. The watershed is the easterly 2.14 square miles of Sub-Basin 9I.

6-hour Rainfall Excess for 9I = 0.95"
6-hour Runoff Volume to East Ponding Area = 109 ac-ft
24-hour Rainfall Excess for 9I = 1.02"
24-hour Runoff Volume To East Ponding Area = 117 ac-ft

Step 2: Divert the volumes estimated in Step 1 from the 9I hydrograph before the hydrograph combination operation at C46. Note that this volume, 117 acre-feet for the 24-hour storm, does not exceed the trap volume of 400 acre-feet.

Step 3: Estimate the volumes of the East and West Ponding Areas. The surface area of each 4' contour was planimetered and the storage volumes by stage were calculated using the prismatic formula. Refer to Figure 12.

Stage	Incremental Depth (ft)	Surface Area (acres)	Volume (ac-ft)	Cumulative Volume (ac-ft)
East Ponding Area Storage Volumes				
1358.1	0	0	0	0
1360	1.9	0.34	0.2	0.2
1364	4	3.93	7.2	7.4
1368	4	10.63	28.0	35.4
1372	4	21.41	62.8	98.2
1376	4	51.53	125.9	224.1
1380	4	101.06	299.7	523.8
1384	4	156.51	511.1	1034.9
West Ponding Area Storage Volumes				
1367.5	0	0	0	0
1368	0.5	0.06	0	0
1372	4	1.23	2.1	2.1
1376	4	8.31	17.0	19.1
1380	4	39.52	87.9	107.0
1384	4	96.12	263.2	370.2

Step 4: Estimate the flow over the Control Section from west to east. The Control Section was assumed to function as an uneven broad-crested weir with a breadth of 100 feet.

The following are the results of the weir flow calculations:

```
*******************************************
   UNEVEN WEIR FLOW PROGRAM
   FORTRAN VERSION 1.0
*******************************************


   PROJECT:  FCDMC Jackrabbit Wash Floodplain Delineation Study
   ENGINEER:  trl
   DATE:   2/ 5/1991
   TIME:   8:39. 1


-------------------------------------------
   INPUT PARAMETERS
-------------------------------------------


   STARTING WSEL:        1378.50
   MAXIMUM WSEL:         1385.00
   STEP SIZE:               0.50
   BREADTH OF WEIR:       100.00


*******************************************
   INPUT ELEVATION/STATION TABLE.
   PROJECT:  FCDMC Jackrabbit Wash Floodplain Delineation Study
   DATE:   2/ 5/1991
   TIME:   8:39. 1
*******************************************
```

POINT	ELEVATION	STATION
1	1385.00	0.00
2	1380.00	10.00
3	1378.40	150.00
4	1380.00	350.00
5	1382.20	740.00
6	1384.00	995.00
7	1388.00	1280.00

****

WEIR COEFFICIENT TABLE
PROJECT: FCDMC Jackrabbit Wash Floodplain Delineation Study
DATE: 2/ 5/1991
TIME: 8:39. 1

****

REFERENCE: COE CHART - UPPER CURVE

POINT	HEAD	COEFFICIENT
1	0.00	2.5000
2	0.50	2.5167
3	1.00	2.5333
4	1.50	2.5500
5	2.00	2.5667
6	2.50	2.5833
7	3.00	2.6000
8	3.50	2.6167
9	4.00	2.6333
10	4.50	2.6500
11	5.00	2.6667
12	5.50	2.6833
13	6.00	2.7000
14	6.50	2.7167

****

UNEVEN WEIR FLOW PROGRAM
FORTRAN VERSION 1.0
PROJECT: FCDMC Jackrabbit Wash Floodplain Delineation Study
DATE: 2/ 5/1991
TIME: 8:39. 1

****

ELEVATION	DISCHARGE (CFS)
1378.50	0.67
1379.00	59.49
1379.50	271.64
1380.00	695.44
1380.50	1375.12
1381.00	2334.73
1381.50	3601.20
1382.00	5201.10
1382.50	7161.63
1383.00	9494.88
1383.50	12210.87
1384.00	15324.62
1384.50	18842.88
1385.00	22747.90

Step 5: Generate an outflow hydrograph for the CAP-4 structure assuming that the East Ponding Area volume is not effective. Use the 24-hour storm. The HEC-1 output from this step has not been included in the report but is available from Burgess & Niple, Inc.

The outflow hydrograph was plotted and is included as Figure 14. The time-to-peak for each stage above the lowest elevation on the Control Section was determined using the rising limb of the plotted hydrograph.

The average volumes passed by CAP-4 and the Control Section as the ponding elevation at the structure increases above the lowest point on the Control Section were estimated. The results are summarized as follows:

Stage	Discharge (cfs)	Time To Peak (hrs)	Average Discharge (cfs)	Average Volume (ac-ft)
CAP-4 Structure				
1378.4	475	12.6	---	---
1380.0	1220	13.5	848	63
1381.1	2120	15.5	1670	276
Control Section				
1378.4	0	12.6	---	---
1380.0	695	13.5	348	26
1381.1	2588	15.5	1642	271

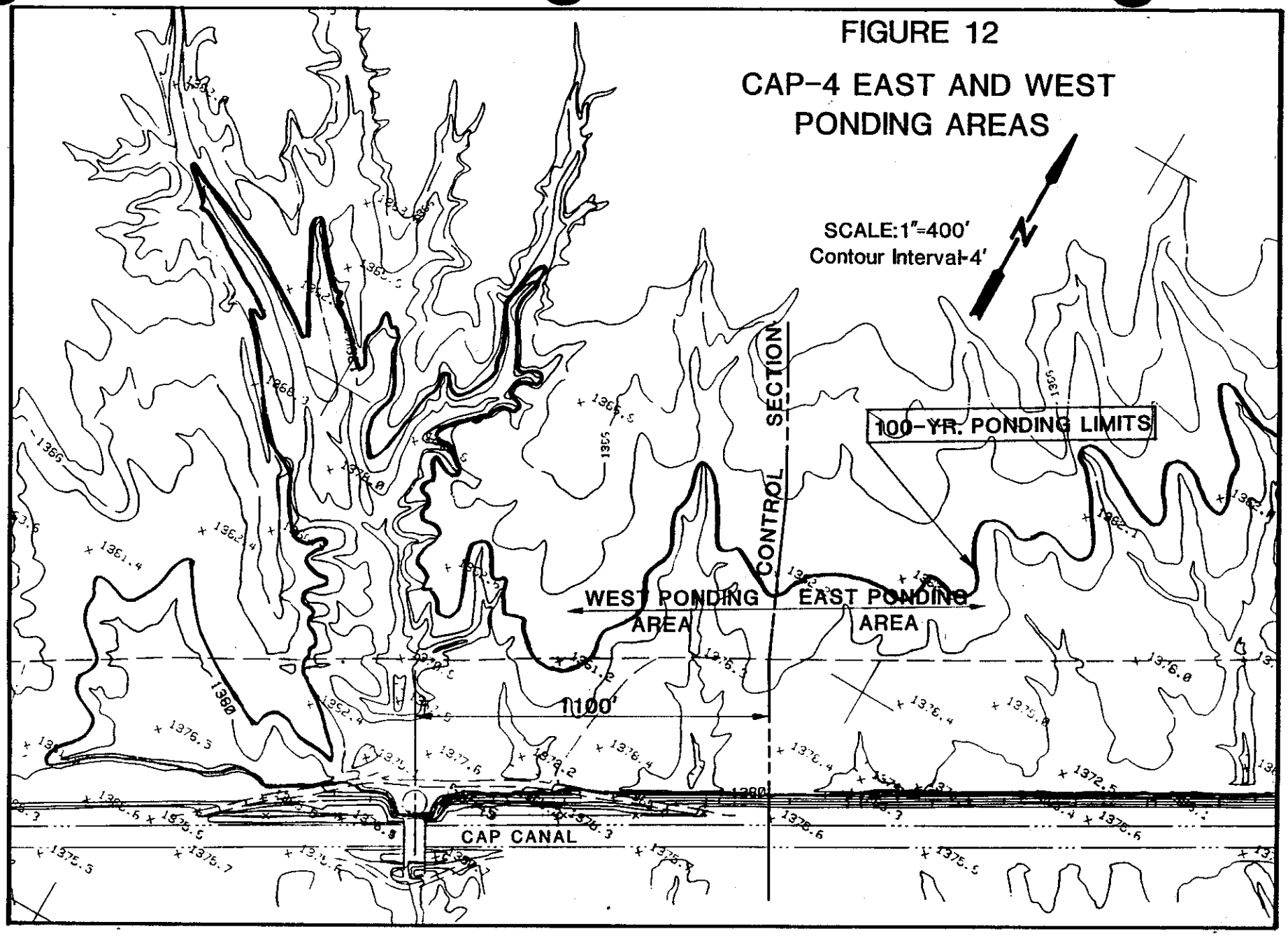


FIGURE 12

CAP-4 EAST AND WEST PONDING AREAS

FIGURE 13: CAP-4

CAP-4 East & West Stage vs Volume

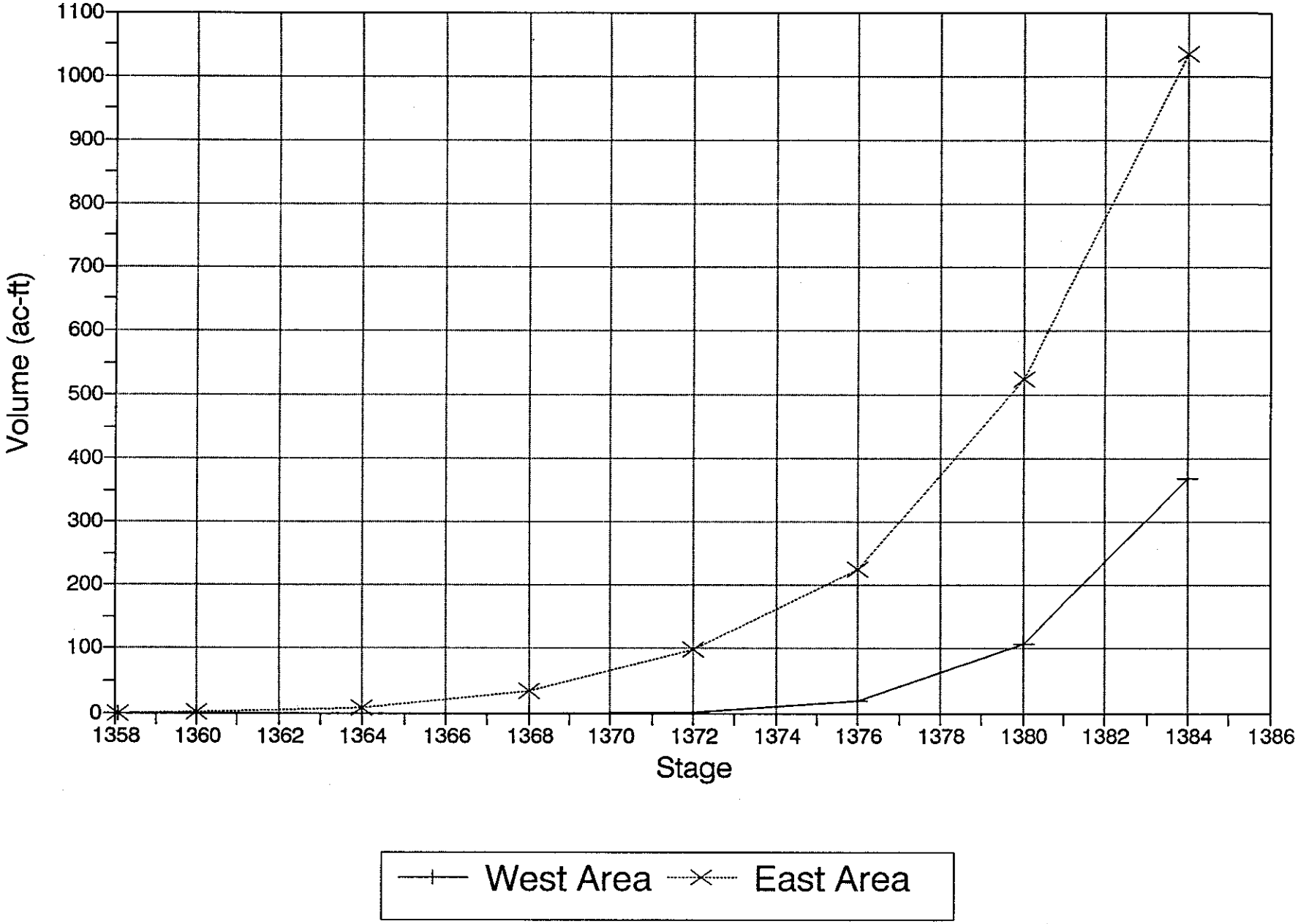
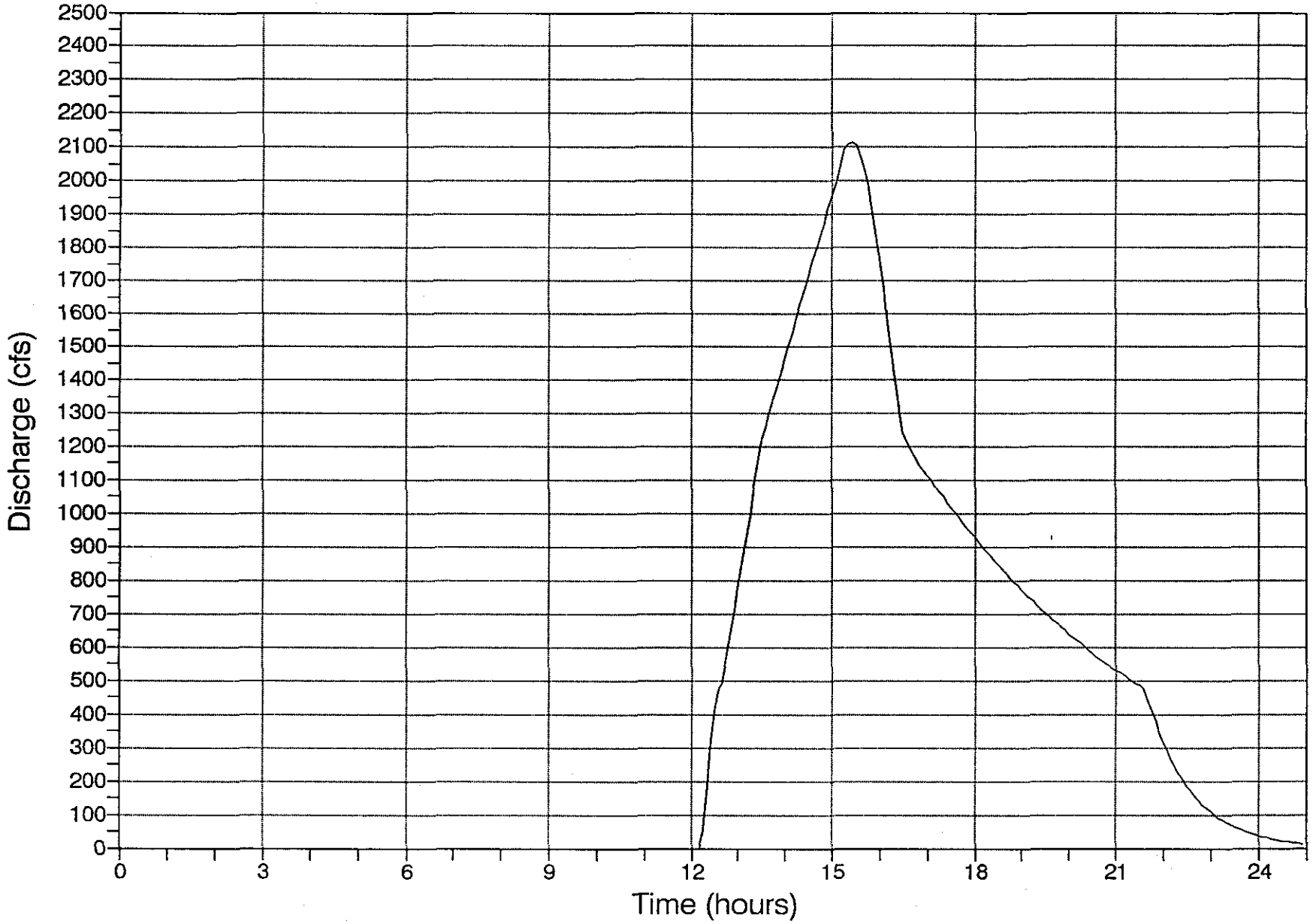


FIGURE 14: CAP-4 HYDROGRAPH

100-Year 24-Hour, 1st Est. of Storage



Step 6: Create new composite Stage versus Volume and Discharge tables for CAP 4 for the 6- and 24-hour storms. Note that above elevation 1381.1, the Control Section weir is submerged.

Stage	Discharge (cfs)	Volume At West Ponding Area (ac-ft)	Volume At East Ponding Area (ac-ft)	Total Volume (ac-ft)
6-Hour Storm				
1368.0	0	0	0	0
1372.0	0	2.1	0	2.1
1376.0	0	19.1	0	19.1
1376.71	0	35.0	0	35.0
1378.4	475	72.0	0	72.0
1380.0	1220	107.0	26.0	133.0
1381.1	2120	207.0	271.0	478.0
1383.0	3899	370.0	926.0	1296.0
24-Hour Storm				
1368.0	0	0	0	0
1372.0	0	2.1	0	2.1
1376.0	0	19.1	0	19.1
1376.71	0	35.0	0	35.0
1378.4	475	72.0	0	72.0
1380.0	1220	107.0	26.0	133.0
1381.1	2120	207.0	271.0	478.0
1384.0	3899	307.0	918.0	1288.0

The difference between the 6-hour and 24-hour total volumes at stage 1384 is caused by the difference in runoff volume from the easterly portion of sub-basin 9I, as described in Step 1. The data in the above table was used for the final HEC-1 models.

3.4.5 Central Arizona Project Canal Structure CAP-8

3.4.5.1 Discussion of Problem

The structure at CAP-8 is the only structure along the study reach of the CAP canal where there is less than 3 feet of freeboard from the top of the canal collective dike to the estimated 100-year peak flood stage. Refer to Tables F-4b and F-4c. It is also the only structure where the top of compacted embankment is exceeded. The problem is to analyze the computed data in more detail and then determine whether it is reasonable to accept the computed 100-year ponding elevation and routed outflow peak discharge for regulation purposes.

3.4.5.2 Problem Solution

The structure at Central Arizona Project Canal CAP-8 is a concrete box flume overchute with a bottom width of 47.5 feet, and a wall height of 7 feet. The canal at this location is constructed with the top of the canal lining at the original ground elevation. Flow is directed from Daggs Wash to the crossing structure by collective dikes which extend east and west along the northerly side of the canal. The inlet structure has lined transition dikes which funnel the flow into the box flume. The dikes form an arc on both sides of the structure with a 90° central angle and a 135 foot radius to transition from the collective dikes, which parallel the canal, to the flume concrete wing walls. These dikes are lined with 24" thick rock riprap on a 12" thick sand and gravel filter blanket. The transition dikes are lined and compacted to the 1383.0 top elevation of the collective dikes. The above information was taken from the plans of the CAP canal furnished by the USBR.

The outflow hydrograph for CAP-8 was examined to estimate the duration that ponding would exceed elevation 1380.0, the top of the compacted portion of the collective dikes. Refer to Figure 15. Assuming the uncompacted embankment does not fail, the duration is estimated to be less than 3 hours.

The following conclusions were made after examining the available data:

1. The peak stage of 1382.1 will be used for delineating the 100-year ponding limits against the CAP canal at this crossing. In the event the uncompacted portion of the collective dikes fail, this will still be the most conservative assumption.

2. The peak outflow of 3,300 cfs will be used for floodplain administration downstream of the CAP canal. The reasons for this conclusion are:

   a. In the event that the uncompacted portions of the collective dikes fail, the peak stage will not be reached, so the peak flow through the box flume will not exceed 3,300 cfs.

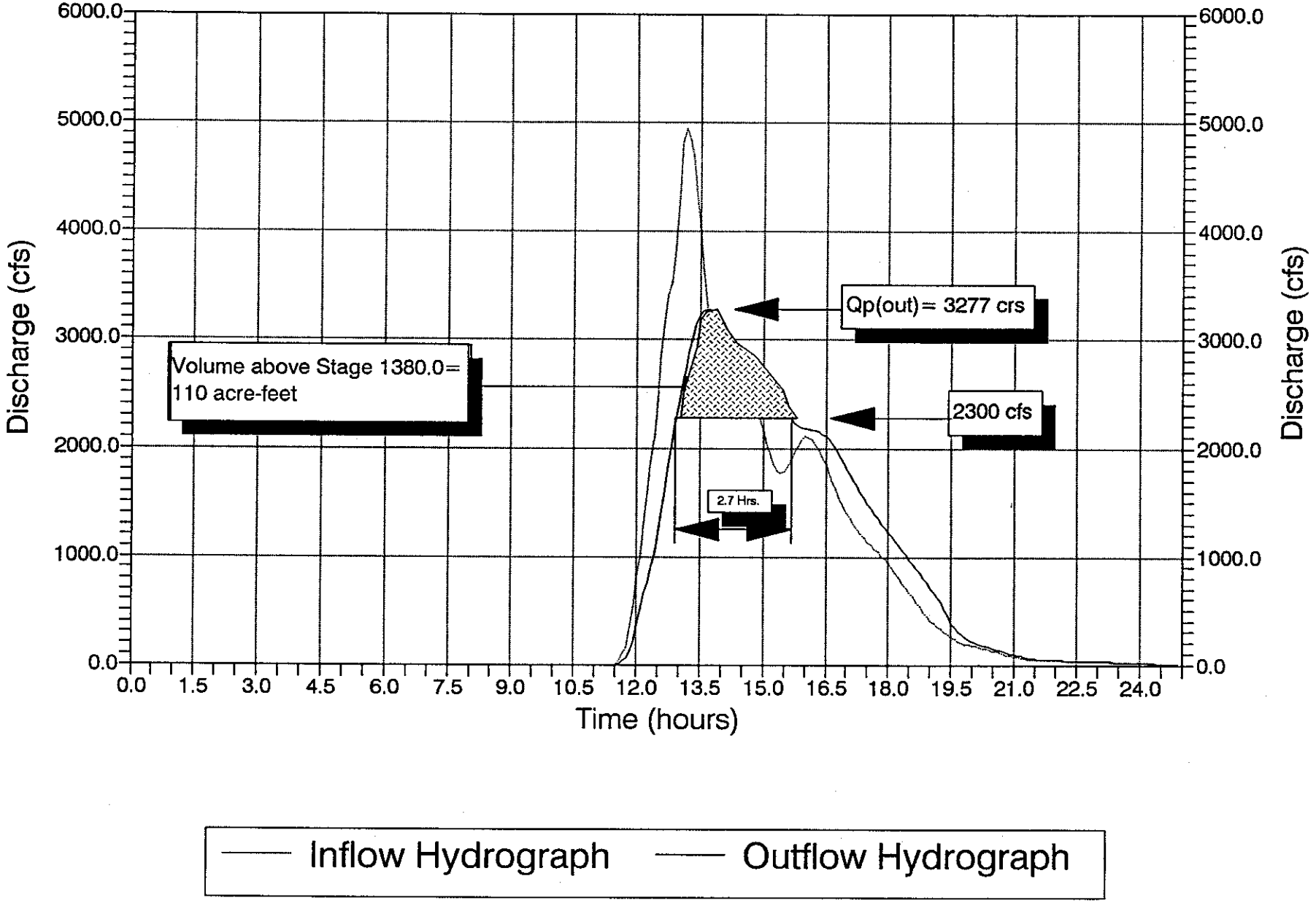
   b. Flow which may breach the uncompacted embankments will be trapped and conveyed by the CAP canal.

   c. Flow which may top the box flume walls will spill into the CAP canal and will not contribute to the peak downstream in Daggs Wash.

   d. The areas of high velocity are protected by the lined transition dikes. There will not be scourable flow velocities against the collective dikes. The danger of failure of the collective dikes is due to the potential for wave action and piping. Failure due to wave action is slight because the exposure of the uncompacted portion of the levee to wave action is less than 3 hours. The possibility of failure due to piping is also slight since the compacted portions of the collective dikes were constructed under USBR specifications and inspection. Cutoff trenches were also constructed under the collective dikes where areas of clean sand and gravels were encountered.

FIGURE 15: CAP-8

100-Yr 24-Hr Inflow and Outflow Hyds.



3.4.6 HEC-1 Warnings

The only warnings encountered in the HEC-1 output were concerning hydrograph routing. The warnings were caused by the following problems with the input data:

1. Some routing reaches were not long enough to have a travel time in excess of the computation time interval of five minutes.

2. Some routing reaches have a configuration such that the numeric calculations could be unstable.

3. The reservoir route for CAP-1 has insufficient outflow for stable calculations.

The following steps were taken to ensure that the final results are reasonable and stable:

1. The number of steps (NSTEPS) for the routing reach was reduced in order to either eliminate the warning or place the routed peak discharge value outside the limits of the warning range.

2. If the warning was still present, and the routed peak fell within the warning range, then the outflow peak was checked against the inflow peak to be sure that the value did not increase. Outflow hydrographs for critical routing reaches were plotted and examined for oscillations at critical times.

Section 3.5

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

SECTION 3: Hydrologic Analysis

3.5 Final Results

3.5 Final Results

3.5.1 General

The results of this study are summarized in Tables F-1 through F-4. Evaluation of the results indicate that peak flow rates for the major concentration points on Jackrabbit Wash and Star Wash result from the 100-year 24-hour duration storm. The 6-hour duration storm typically produced higher peaks on the smaller portions of the watershed. Therefore, care must be taken in selecting a peak discharge at any particular point of interest. The HEC-1 output files for both the 6-hour and 24-hour storms are included as a part of this report. Both of these printouts reflect use of channel transmission losses. A separate run was done for the 100-year 24-hour storm which did not include channel losses. The results of the analyses are included in Table F-3 for comparison.

3.5.2 Discussion of Results

The results for both storms are lower in magnitude than was anticipated. The peak discharges at critical points in the watershed have a yield, in cubic feet per second per square mile (cfs/sm), lower than has been seen for similar watersheds using different modeling methodology. An example would be to examine the results for concentration point 38. The 100-year 6-hour model yielded a peak discharge of 7,500 cfs at this location, which is the Jackrabbit Wash crossing of the CAP canal. The watershed area at this point is 319 square miles. Refer to Sheet 3 of Exhibit "C". The USBR developed a peak discharge of 25,500 cfs for a 100-year 6-hour storm at this same location. However, the 6-hour model often yielded higher peaks than the 24-hour model for smaller watersheds. The lower 6-hour peaks for the larger watersheds is due to the use of the Queen Creek precipition aerial reduction curve and the higher precipitation losses resultant from the use of the Green & Ampt loss equation.

The 100-year 24-hour peak discharge of 33,200 cfs at the above mentioned location is much more reasonable. This peak also falls within the Log Pearson III analysis statistical envelope for representative washes in Maricopa County, contained herein as Figure 2.

The final results are summarized in Tables F-1 through F-4. Table F-1 for instance, contains a summary of peak discharges at key locations in the watershed. These peaks are arranged alphabetically by wash name, in an upstream to downstream secondary order. The HEC-1 identifier is the name used on the exhibit maps and the HEC-1 input files to pin point the type of HEC-1 operation and the location on the watershed. The following is a descriptive list of the nomenclature used throughout all tables in the report, and in the HEC-1 computer models:

HEC-1 Computer Model Nomenclature

HEC-1 Identifier	Description
6A	Hydrograph identifier for sub-basin 6A. Refers to sub-basin A in major basin 6.
C44	Hydrograph identifier for concentration point 44. More than one hydrograph has been combined at this location. Point 44 is a physical location on the watershed which is labeled on Exhibit "C".
CP44E	The resultant hydrograph at concentration point 44 was split using the HEC-1 diversion operation. This defines the hydrograph diverted to the East Fork of Coyote Wash.
C38I	Hydrograph identifier for concentration point 38. The "I" symbolizes this is an inflow hydrograph to a reservoir route operation.
C84.1	Hydrograph identifier for concentration point 84. The "1" symbolizes this is an intermediate hydrograph for a wash immediately upstream of C84. This hydrograph will be combined with one or more intermediate hydrographs to produce hydrograph C84.
C850	Hydrograph identifier at concentration point 85. The "0" symbolizes this is an outflow hydrograph from a reservoir route.
R36-37	Hydrograph resultant from a normal depth channel route from concentration point 36 downstream to concentration point 37.
DT9IE	The hydrograph from sub-basin 9I was split using the HEC-1 diversion operation. This defines the hydrograph diverted to the East Ponding Area.
BC460	The outflow hydrograph from the reservoir route at concentration point 46 has been written to disk in the Tape 21 file using an HEC-1 BI operation. The hydrograph has been recalled from disk for continued use in the HEC-1 model.

Table F-1

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

TABLE F-1

Summary of Peak Discharges At Key Locations On The Watershed

HEC-1 Identifier	Description	Peak Discharge 6-Hour	Peak Discharge 24-Hour	Area (sm)
C44	Coyote Wash Upstream of Split	5,200	7,800	34.5
CP44W	Coyote Wash (West Fork) Downstream of Split	2,300	3,600	34.5
CP44E	Coyote Wash (East Fork) Downstream of Split	2,500	4,100	34.5
C119	Coyote Wash (West Fork) at 371st Avenue	900	1,500	36.4
C99	Daggs Wash at Hassayampa River	1,900	3,000	28.1
C12	Jackrabbit Wash at Deadhorse Wash	7,800	18,800	79.1
C33	Jackrabbit Wash at Vulture Mine Road	6,100	21,100	138.1
C34	Jackrabbit Wash at Wickenburg Road	5,600	20,000	140.3
R34-37	Jackrabbit Wash Upstream of Confluence with W.F.J.R.W.	5,500	19,700	140.3
C37	Jackrabbit Wash at W.F. Jackrabbit Wash	5,400	19,800	148.7
C38I.1	Jackrabbit Wash Upstream of Confluence with Star Wash	4,900	19,300	152.4
C38I	Jackrabbit Wash at CAP Canal CAP-5 (upstream)	7,500	33,200	319.2
C38I	Jackrabbit Wash at CAP Canal CAP-5 (downstream)	7,500	33,200	319.2
C94	Jackrabbit Wash at East Fork Coyote Wash	2,900	33,600	363.1
C98	Jackrabbit Wash at Hassayampa River	600	32,500	372.1
R36-37	Jackrabbit Wash (W.F.) Upstream of Confluence with J.R.W	2,300	2,900	8.4
6A	Jackrabbit Wash (West Fork) at Vulture Mine Road	2,800	3,000	3.7
C36	Jackrabbit Wash (West Fork) at Wickenburg Road	2,400	3,000	8.4
C84.1	Powerline Wash Upstream of Confluence with Star Wash	2,800	5,000	34.9
C84.2	Star Wash Upstream of Confluence with Powerline Wash	6,900	14,000	125.7
C84	Star Wash at Powerline Wash	7,100	17,600	160.6
C38I.2	Star Wash Upstream of Confluence with Jackrabbit Wash	5,400	17,300	166.8

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

Table F-2

TABLE F-2A

100-YEAR 6-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
1A	6498	4.42	6.7	971
R1-2	5778	4.83	6.7	864
1B	5802	4.33	5.7	1018
C2	8095	4.67	12.4	653
R2-4	7380	5.17	12.4	596
1C	1451	4.25	0.8	1791
R3-4	865	5.17	0.8	1068
1D	4013	4.33	3.3	1227
C4	7783	5.17	16.5	473
R4-7	7306	5.50	16.5	444
1E	1756	4.25	1.1	1582
R5-7	1510	4.50	1.1	1360
1F	2294	4.50	3.1	750
R6-7	2208	4.67	3.1	722
1G	2537	4.33	2.6	991
C7	7441	5.42	23.2	321
R7-8	7276	5.58	23.2	314
1H	4893	4.50	7.6	648
C8	7249	4.75	30.8	236
R8-10	6973	4.92	30.8	227
1I	2826	4.75	6.9	411
R9-10	2804	4.75	6.9	408
C10	8098	4.83	37.6	215
R10-11	7441	5.50	37.6	198
1J	1418	4.50	2.6	552
1K	2089	4.67	5.0	416
C11	7488	5.42	45.2	166
R11-12	7098	6.08	45.2	157
1L	3353	4.67	5.9	565
C12.1	7174	6.00	51.2	140
2A	4811	4.50	7.8	620
R13-14	4629	4.67	7.8	597
2B	2351	4.42	4.3	545
C14	5594	4.58	12.1	463
R14-15	5342	4.83	12.1	443
2C	1488	4.33	3.8	390
C15	5339	4.83	15.9	336
R15-17	4555	5.50	15.9	287
2D	1552	4.83	5.1	303
C17	4584	5.50	21.0	218

TABLE F-2B

100-YEAR 6-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
1A	6498	4.42	6.7	971
1B	5802	4.33	5.7	1018
1C	1451	4.25	0.8	1791
1D	4013	4.33	3.3	1227
1E	1756	4.25	1.1	1582
1F	2294	4.50	3.1	750
1G	2537	4.33	2.6	991
1H	4893	4.50	7.6	648
1I	2826	4.75	6.9	411
1J	1418	4.50	2.6	552
1K	2089	4.67	5.0	416
1L	3353	4.67	5.9	565
2A	4811	4.50	7.8	620
2B	2351	4.42	4.3	545
2C	1488	4.33	3.8	390
2D	1552	4.83	5.1	303
2E	1637	4.33	2.1	783
2F	1556	4.92	4.9	318
3A	3141	4.58	6.0	526
3B	2261	4.75	6.3	362
3C	2009	4.92	5.7	352
3D	2365	4.75	5.0	472
3E	1864	4.50	2.9	643
4A	2284	5.17	7.4	307
4B	1862	4.83	4.1	457
4C	2446	4.58	2.7	923
5A	3847	4.83	8.0	479
5B	2410	4.75	7.4	327
5C	1822	4.58	3.6	512
6A	2834	4.67	3.7	774
6B	1744	4.83	4.8	366
6C	618	4.67	2.2	277
6D	1310	4.67	3.7	357
7A	3339	4.83	5.2	643
7B	2786	4.83	6.1	456
7C	2754	4.92	6.8	404
7D	2909	4.58	5.8	498
7E	3016	5.17	8.3	363
7F	1385	4.75	2.6	527
8A	2044	5.08	6.3	326

TABLE F-2A

100-YEAR 6-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
R17-18	4442	5.67	21.0	211
2E	1637	4.33	2.1	783
R16-18	1387	4.75	2.1	664
C18	4536	5.67	23.1	196
R18-12	4116	6.00	23.1	178
2F	1556	4.92	4.9	318
C12.2	3983	6.08	28.0	142
BC12.1	7174	6.00	51.2	140
C12	7831	6.17	79.1	99
R12-21	7747	6.33	79.1	98
3A	3141	4.58	6.0	526
R19-21	2855	5.08	6.0	478
3D	2365	4.75	5.0	472
R20-21	2163	5.17	5.0	432
3B	2261	4.75	6.3	362
3C	2009	4.92	5.7	352
C21	7697	6.25	102.1	75
R21-22	7374	6.50	102.1	72
3E	1864	4.50	2.9	643
C22	7293	6.50	105.0	69
R22-25	7190	6.58	105.0	68
4A	2284	5.17	7.4	307
4B	1862	4.83	4.1	457
C23	3411	5.00	11.5	297
R23-24	3350	5.08	11.5	291
4C	2446	4.58	2.7	923
C24	4299	4.92	14.2	304
R24-25	4249	5.00	14.2	300
C25	7132	6.58	119.1	60
R25-32	6917	6.92	119.1	58
5A	3847	4.83	8.0	479
5B	2410	4.75	7.4	327
C32	6798	6.92	134.5	51
R32-33	6169	7.17	134.5	46
5C	1822	4.58	3.6	512
C33	6110	7.17	138.1	44
R33-34	5637	8.00	138.1	41
6C	618	4.67	2.2	277
C34	5637	8.00	140.3	40
R34-37	5455	8.33	140.3	39

TABLE F-2B

100-YEAR 6-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
9A	2413	4.67	4.6	520
9B	3593	4.67	8.5	423
9C	4008	4.67	7.3	548
9D	3442	4.67	6.2	552
9E	2328	4.50	6.1	383
9F	1359	4.25	1.8	777
9G	963	4.42	1.0	963
9H	1071	4.25	1.5	729
9I	3271	4.42	4.8	680
DT9IE	1635	4.42	4.8	340
9IW	1635	4.42	4.8	340
10A	1432	4.50	2.0	712
10AA	1226	4.42	1.6	752
10AB	2042	4.67	4.3	474
10B	1896	4.75	5.4	354
10C	1685	4.67	5.7	298
10C1	1135	4.42	1.4	794
10C2	1872	4.67	4.2	443
10D	2778	4.75	4.5	612
10E	1664	4.58	2.7	612
10F	3849	4.58	5.7	678
10G	1883	4.67	4.3	440
10H	1513	5.00	6.7	224
10I	3103	4.83	6.9	448
10J	2138	4.92	7.1	302
10K	2328	4.92	5.4	428
10K1	927	4.25	0.9	1053
10K2	2435	4.75	4.6	534
10L	1935	4.83	6.3	305
10M	3580	4.75	6.2	580
10M1	2421	4.25	1.9	1309
10M2	1490	4.42	1.5	1007
10M3	1975	4.58	2.8	695
10N	1702	4.83	3.5	490
10O	3192	4.42	3.1	1036
10P	3137	4.75	6.2	510
10Q	2112	4.42	2.6	809
10R	2358	4.75	4.9	478
10S	3046	4.67	3.9	777
10T	2296	4.67	3.8	603

TABLE F-2A

100-YEAR 6-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
6A	2834	4.67	3.7	774
R35-36	2293	5.67	3.7	627
6B	1744	4.83	4.8	366
C36	2428	5.58	8.4	288
R36-37	2335	6.00	8.4	277
C37	5442	8.25	148.7	37
R37-38	4933	8.33	148.7	33
6D	1310	4.67	3.7	357
C38I.1	4933	8.33	152.4	152
7A	3339	4.83	5.2	643
R26-27	2849	5.92	5.2	549
7B	2786	4.83	6.1	456
C27	2847	5.83	11.3	252
R27-29	2660	6.42	11.3	235
7C	2754	4.92	6.8	404
R28-29	2403	5.67	6.8	353
C29	3693	5.67	18.1	204
R29-30	3661	5.83	18.1	202
7D	2909	4.58	5.8	498
C30	3610	5.75	24.0	151
R30-31	3109	7.33	24.0	130
7F	1385	4.75	2.6	527
C31	3013	7.33	26.6	113
R31-84	2892	7.92	26.6	109
7E	3016	5.17	8.3	363
C84.1	2758	7.92	34.9	79
10A	1432	4.50	2.0	712
R50-51	854	6.50	2.0	425
10B	1896	4.75	5.4	354
C51	1703	4.75	7.4	231
R51-57	1506	5.17	7.4	204
10D	2778	4.75	4.5	612
R52-55	2432	5.50	4.5	536
10E	1664	4.58	2.7	612
C55	2423	5.50	7.3	334
R55-57	2117	6.25	7.3	292
C57	2203	5.25	14.6	151
R57-58	2134	5.50	14.6	146
10C	1685	4.67	5.7	298
C58	2059	5.50	20.3	101

TABLE F-2B

100-YEAR 6-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
10U	2247	4.67	4.3	527
10V	1803	4.67	3.1	578
10W	3685	4.67	5.3	695
10X	1880	4.58	2.7	686
10Y	1418	4.67	3.7	383
10Z	1311	4.58	3.7	355
11A	1447	4.67	2.2	664
12A	3565	4.67	4.9	731
12B	1449	5.00	4.8	303
12C	1554	4.92	3.6	427
12D	2683	4.83	5.3	507
12E	3002	4.92	7.5	398
13A	1596	4.17	0.9	1773
14A	276	4.00	0.1	3067
14B	89	4.00	0.0	2967
15A	1209	4.42	3.6	337
15B	1510	4.58	2.1	726
15C	933	4.25	1.8	510
15D	967	4.58	2.9	337
16A	1047	4.50	1.9	540
17A	1539	4.58	2.2	709
18A	395	4.08	0.3	1580
18B	1760	4.42	1.8	972
18C	1615	4.58	1.9	850
18D	2227	4.67	3.6	619
18E	2563	4.58	3.8	669
18F	1134	4.33	0.8	1418
18G	1797	4.58	2.0	885
18H	2222	4.42	2.6	845
18I	2092	4.50	2.6	814
18J	1901	4.42	2.4	809
18K	1239	4.25	0.8	1549
18L	2002	4.42	2.4	834
18M	1278	4.67	1.5	852
18N	1679	4.75	2.4	700
18O	1112	4.42	0.9	1236
18P	1387	4.50	1.4	1020
18Q	1517	4.33	1.1	1342
18R	1503	4.83	2.2	693
18S	1528	4.42	1.4	1132

TABLE F-2A

100-YEAR 6-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
R58-59	1932	5.67	20.3	95
10F	3849	4.58	5.7	678
R53-54	3073	6.00	5.7	541
10G	1883	4.67	4.3	440
C54	3144	6.00	10.0	316
R54-59	2762	7.17	10.0	277
10H	1513	5.00	6.7	224
C59	3429	7.17	37.0	93
R59-61	3323	7.42	37.0	90
10I	3103	4.83	6.9	448
R60-61	2034	7.42	6.9	294
10J	2138	4.92	7.1	302
C61	3984	7.58	51.0	78
R61-82	3594	8.33	51.0	70
10L	1935	4.83	6.3	305
C82.1	3577	8.33	57.3	62
10M	3580	4.75	6.2	580
R67-68	2586	6.83	6.2	419
10K	2328	4.92	5.4	428
R63-68	2093	5.42	5.4	385
10N	1702	4.83	3.5	490
C68	2504	5.17	15.1	166
R68-72	2234	7.17	15.1	148
10S	3046	4.67	3.9	777
R70-71	2584	5.50	3.9	659
10T	2296	4.67	3.8	603
R69-71	1963	5.42	3.8	515
10U	2247	4.67	4.3	527
C71	3826	5.50	12.0	319
R71-72	3656	5.83	12.0	305
C72	4352	5.75	27.1	161
R72-81	4229	6.00	27.1	156
10Q	2112	4.42	2.6	809
R75-76	1543	5.83	2.6	591
100	3192	4.42	3.1	1036
R73-74	2917	4.92	3.1	947
10P	3137	4.75	6.2	510
C74	5342	4.83	9.2	579
R74-76	4542	5.75	9.2	492
10R	2358	4.75	4.9	478

TABLE F-2B

100-YEAR 6-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
18T	592	4.17	0.4	1518
19A	181	4.00	0.1	3017
19B	1201	4.08	0.8	1560
C2	8095	4.67	12.4	653
C4	7783	5.17	16.5	473
C7	7441	5.42	23.2	321
C8	7249	4.75	30.8	236
C10	8098	4.83	37.6	215
C11	7488	5.42	45.2	166
C12.1	7174	6.00	51.2	140
C12.2	3983	6.08	28.0	142
C12	7831	6.17	79.1	99
C14	5594	4.58	12.1	463
C15	5339	4.83	15.9	336
C17	4584	5.50	21.0	218
C18	4536	5.67	23.1	196
C21	7697	6.25	102.1	75
C22	7293	6.50	105.0	69
C23	3411	5.00	11.5	297
C24	4299	4.92	14.2	304
C25	7132	6.58	119.1	60
C27	2847	5.83	11.3	252
C29	3693	5.67	18.1	204
C30	3610	5.75	24.0	151
C31	3013	7.33	26.6	113
C32	6798	6.92	134.5	51
C33	6110	7.17	138.1	44
C34	5637	8.00	140.3	40
C36	2428	5.58	8.4	288
C37	5442	8.25	148.7	37
C38I.1	4933	8.33	152.4	32
C38I.2	5431	8.33	166.8	33
C38I	7457	8.33	319.2	23
C40	4945	4.75	13.1	377
C41	4230	5.42	20.5	207
C43	5335	5.58	26.7	200
CP44E	2278	5.58	34.5	66
CP44W	2538	5.67	34.5	74
C44	5195	5.67	34.5	150
C45	2222	5.83	35.5	63

TABLE F-2A

100-YEAR 6-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
C76	5658	5.83	16.8	337
R76-77	5221	6.58	16.8	311
10V	1803	4.67	3.1	578
C77	5220	6.58	19.9	262
R77-80	4900	6.83	19.9	246
10W	3685	4.67	5.3	695
R78-79	3352	5.33	5.3	632
10X	1880	4.58	2.7	686
C79	3906	5.25	8.0	486
R79-80	3384	6.58	8.0	421
10Y	1418	4.67	3.7	383
C80	6868	6.83	31.6	217
R80-81	6684	7.17	31.6	211
BR7281	4229	6.00	27.1	156
C81	7134	7.33	58.7	122
R81-82	6886	7.75	58.7	117
10Z	1311	4.58	3.7	355
BC82.1	3402	8.33	57.3	59
C82	8274	8.25	119.7	69
R82-84	6900	8.33	119.7	58
10AA	1226	4.42	1.6	752
R83-84	583	7.25	1.6	358
10AB	2042	4.67	4.3	474
C84.2	6900	8.33	125.7	55
BC84.1	2576	8.00	34.9	74
C84	7054	8.33	160.6	44
R84-38	5431	8.33	160.6	34
8A	2044	5.08	6.3	326
C38I.2	5431	8.33	166.8	167
BC38I1	4834	8.33	152.4	152
C38I	7457	8.33	319.2	23
9A	2413	4.67	4.6	520
R39-40	2296	4.83	4.6	495
9B	3593	4.67	8.5	423
C40	4945	4.75	13.1	377
R40-41	4088	5.58	13.1	311
9C	4008	4.67	7.3	548
C41	4230	5.42	20.5	207
R41-43	4123	6.00	20.5	202
9D	3442	4.67	6.2	552

TABLE F-2B

100-YEAR 6-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
C46I	2128	6.42	40.3	53
C460	1063	7.42	40.3	26
C47I	2433	6.33	36.0	68
C470	934	8.17	36.0	26
C480	268	4.50	0.8	348
C490	0	4.25	0.1	0
C51	1703	4.75	7.4	231
C54	3144	6.00	10.0	316
C55	2423	5.50	7.3	334
C57	2203	5.25	14.6	151
C58	2059	5.50	20.3	101
C59	3429	7.17	37.0	93
C61	3984	7.58	51.0	78
C64	1347	4.50	3.5	383
C68	2504	5.17	15.1	166
C71	3826	5.50	12.0	319
C72	4352	5.75	27.1	161
C74	5342	4.83	9.2	579
C76	5658	5.83	16.8	337
C77	5220	6.58	19.9	262
C79	3906	5.25	8.0	486
C80	6868	6.83	31.6	217
C81	7134	7.33	58.7	122
C82.1	3577	8.33	57.3	62
C82	8274	8.25	119.7	69
C84.1	2758	7.92	34.9	79
C84.2	6900	8.33	125.7	55
C84	7054	8.33	160.6	44
C850	241	5.42	2.2	111
C88	2748	6.33	13.3	206
C89	2221	7.58	18.6	119
C90I	2604	5.33	26.1	100
C900	2009	5.83	26.1	77
C910	205	4.58	0.9	228
C920	65	4.17	0.1	722
C930	32	4.08	0.0	1067
C94	2927	8.33	363.1	8
C95	1237	4.58	4.3	290
C96	1611	8.33	367.4	4
C97	1090	8.33	369.2	3

TABLE F-2A

100-YEAR 6-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
R42-43	3140	5.25	6.2	503
C43	5335	5.58	26.7	200
R43-44	5294	5.67	26.7	198
9E	2328	4.50	6.1	383
9F	1359	4.25	1.8	777
C44	5195	5.67	34.5	150
CP44W	2538	5.67	34.5	74
CP44E	2278	5.58	34.5	66
R44-45	2259	5.83	34.5	65
9G	963	4.42	1.0	963
C45	2222	5.83	35.5	63
R45-46	2128	6.42	35.5	60
9I	3271	4.42	4.8	680
DT9IE	1635	4.42	4.8	340
9IW	1635	4.42	4.8	340
C46I	2128	6.42	40.3	53
C46O	1063	7.42	40.3	26
BCP44W	2538	5.67	34.5	74
R44-47	2434	6.33	34.5	71
9H	1071	4.25	1.5	729
C47I	2433	6.33	36.0	68
C47O	934	8.17	36.0	26
11A	1447	4.67	2.2	664
C85O	241	5.42	2.2	111
12A	3565	4.67	4.9	731
R86-88	2780	6.33	4.9	570
12B	1449	5.00	4.8	303
R87-88	1379	5.17	4.8	288
12C	1554	4.92	3.6	427
C88	2748	6.33	13.3	206
R88-89	2194	7.50	13.3	165
12D	2683	4.83	5.3	507
C89	2221	7.58	18.6	119
R89-90	1904	8.25	18.6	102
12E	3002	4.92	7.5	398
C90I	2604	5.33	26.1	100
C90O	2009	5.83	26.1	77
13A	1596	4.17	0.9	1773
C91O	205	4.58	0.9	228
14A	276	4.00	0.1	3067

TABLE F-2B

100-YEAR 6-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
C98	584	8.33	372.1	2
C99	1852	6.92	28.1	66
C101	278	4.17	1.1	257
C105	2226	4.58	7.4	300
C106	2093	5.08	8.2	254
C109	2985	4.67	5.2	574
C110	2277	5.83	7.6	302
C117	1471	4.42	2.5	591
C119	877	8.33	36.4	24
R1-2	5778	4.83	6.7	864
R2-4	7380	5.17	12.4	596
R3-4	865	5.17	0.8	1068
R4-7	7306	5.50	16.5	444
R5-7	1510	4.50	1.1	1360
R6-7	2208	4.67	3.1	722
R7-8	7276	5.58	23.2	314
R8-10	6973	4.92	30.8	227
R9-10	2804	4.75	6.9	408
R10-11	7441	5.50	37.6	198
R11-12	7098	6.08	45.2	157
R12-21	7747	6.33	79.1	98
R13-14	4629	4.67	7.8	597
R14-15	5342	4.83	12.1	443
R15-17	4555	5.50	15.9	287
R16-18	1387	4.75	2.1	664
R17-18	4442	5.67	21.0	211
R18-12	4116	6.00	23.1	178
R19-21	2855	5.08	6.0	478
R20-21	2163	5.17	5.0	432
R21-22	7374	6.50	102.1	72
R22-25	7190	6.58	105.0	68
R23-24	3350	5.08	11.5	291
R24-25	4249	5.00	14.2	300
R25-32	6917	6.92	119.1	58
R26-27	2849	5.92	5.2	549
R27-29	2660	6.42	11.3	235
R28-29	2403	5.67	6.8	353
R29-30	3661	5.83	18.1	202
R30-31	3109	7.33	24.0	130
R31-84	2892	7.92	26.6	109

TABLE F-2A

100-YEAR 6-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
C92O	65	4.17	0.1	722
14B	89	4.00	0.0	2967
C93O	32	4.08	0.0	1067
19A	181	4.00	0.1	3017
C49O	0	4.25	0.1	0
19B	1201	4.08	0.8	1560
C48O	268	4.50	0.8	348
BC9OO	2009	5.83	26.1	77
R90-99	1862	6.92	26.1	71
16A	1047	4.50	1.9	540
C99	1852	6.92	28.1	66
17A	1539	4.58	2.2	709
BC46O	1063	7.42	40.3	26
R46-94	921	8.33	40.3	23
BC38I	4816	8.33	319.2	15
R38-94	2852	8.33	319.2	9
15A	1209	4.42	3.6	337
C94	2927	8.33	363.1	8
R94-96	1611	8.33	363.1	4
BC85O	241	5.42	2.2	111
R85-95	220	7.50	2.2	101
15B	1510	4.58	2.1	726
C95	1237	4.58	4.3	290
R95-96	1133	4.83	4.3	266
C96	1611	8.33	367.4	4
R96-97	1090	8.33	367.4	3
15C	933	4.25	1.8	510
C97	1090	8.33	369.2	3
R97-98	584	8.33	369.2	2
15D	967	4.58	2.9	337
C98	584	8.33	372.1	2
BC48O	268	4.50	0.8	348
R48-101	251	5.00	0.8	326
BC49O	0	4.25	0.1	0
R49-101	0	5.25	0.1	0
18A	395	4.08	0.3	1580
C101	278	4.17	1.1	257
BC47O	934	8.17	36.0	26
R47-119	877	8.33	36.0	24
18T	592	4.17	0.4	1518

TABLE F-2B

100-YEAR 6-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
R32-33	6169	7.17	134.5	46
R33-34	5637	8.00	138.1	41
R34-37	5455	8.33	140.3	39
R35-36	2293	5.67	3.7	627
R36-37	2335	6.00	8.4	277
R37-38	4933	8.33	148.7	33
R38-94	2852	8.33	319.2	9
R39-40	2296	4.83	4.6	495
R40-41	4088	5.58	13.1	311
R41-43	4123	6.00	20.5	202
R42-43	3140	5.25	6.2	503
R43-44	5294	5.67	26.7	198
R44-45	2259	5.83	34.5	65
R44-47	2434	6.33	34.5	71
R45-46	2128	6.42	35.5	60
R46-94	921	8.33	40.3	23
R47-119	877	8.33	36.0	24
R48-101	251	5.00	0.8	326
R49-101	0	5.25	0.1	0
R50-51	854	6.50	2.0	425
R51-57	1506	5.17	7.4	204
R52-55	2432	5.50	4.5	536
R53-54	3073	6.00	5.7	541
R54-59	2762	7.17	10.0	277
R55-57	2117	6.25	7.3	292
R57-58	2134	5.50	14.6	146
R58-59	1932	5.67	20.3	95
R59-61	3323	7.42	37.0	90
R60-61	2034	7.42	6.9	294
R61-82	3594	8.33	51.0	70
R63-68	2093	5.42	5.4	385
R67-68	2586	6.83	6.2	419
R68-72	2234	7.17	15.1	148
R69-71	1963	5.42	3.8	515
R70-71	2584	5.50	3.9	659
R71-72	3656	5.83	12.0	305
R72-81	4229	6.00	27.1	156
R73-74	2917	4.92	3.1	947
R74-76	4542	5.75	9.2	492
R75-76	1543	5.83	2.6	591

TABLE F-2A

100-YEAR 6-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
C119	877	8.33	36.4	24
18B	1760	4.42	1.8	972
18C	1615	4.58	1.9	850
18M	1278	4.67	1.5	852
18N	1679	4.75	2.4	700
18O	1112	4.42	0.9	1236
18P	1387	4.50	1.4	1020
R116-117	1152	5.17	1.4	847
18Q	1517	4.33	1.1	1342
C117	1471	4.42	2.5	591
18R	1503	4.83	2.2	693
R118-64	1292	5.58	2.2	595
18S	1528	4.42	1.4	1132
C64	1347	4.50	3.5	383
18D	2227	4.67	3.6	619
R104-105	1697	6.00	3.6	471
18E	2563	4.58	3.8	669
C105	2226	4.58	7.4	300
R105-106	2093	5.08	7.4	282
18F	1134	4.33	0.8	1418
C106	2093	5.08	8.2	254
18G	1797	4.58	2.0	885
18K	1239	4.25	0.8	1549
18H	2222	4.42	2.6	845
R108-109	1884	4.83	2.6	716
18I	2092	4.50	2.6	814
C109	2985	4.67	5.2	574
R109-110	2283	5.83	5.2	439
18J	1901	4.42	2.35	809
C110	2277	5.83	7.55	302
18L	2002	4.42	2.4	834
10C1	1135	4.42	1.43	794
10C2	1872	4.67	4.23	443
10K1	927	4.25	0.88	1053
10K2	2435	4.75	4.56	534
10M1	2421	4.25	1.85	1309
10M2	1490	4.42	1.48	1007
10M3	1975	4.58	2.84	695

TABLE F-2B

100-YEAR 6-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)
R76-77	5221	6.58	16.8	311
R77-80	4900	6.83	19.9	246
R78-79	3352	5.33	5.3	632
R79-80	3384	6.58	8.0	421
R80-81	6684	7.17	31.6	211
R81-82	6886	7.75	58.7	117
R82-84	6900	8.33	119.7	58
R83-84	583	7.25	1.6	358
R84-38	5431	8.33	160.6	34
R85-95	220	7.50	2.2	101
R86-88	2780	6.33	4.9	570
R87-88	1379	5.17	4.8	288
R88-89	2194	7.50	13.3	165
R89-90	1904	8.25	18.6	102
R90-99	1862	6.92	26.1	71
R94-96	1611	8.33	363.1	4
R95-96	1133	4.83	4.3	266
R96-97	1090	8.33	367.4	3
R97-98	584	8.33	369.2	2
R104-105	1697	6.00	3.6	471
R105-106	2093	5.08	7.4	282
R108-109	1884	4.83	2.6	716
R109-110	2283	5.83	5.2	439
R116-117	1152	5.17	1.4	847
R118-64	1292	5.58	2.2	595

TABLE F-2A

100-YEAR 6-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)

TABLE F-2B

100-YEAR 6-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge (cfs)	Time To Peak (hrs)	Drainage Area (sm)	Discharge (cfs/sm)

Legend:

C106 - Hydrograph combination at Concentration Point 106.
18B - Sub-Basin 18B.
R116-117 - Channel Route from Concentration Point 116 to 117.
BC38I - Recall stored hydrograph for Concentration Point 38I
C47I - Inflow hydrograph to Reservoir Route operation at Concentration Point 47.
C47O - Outflow hydrograph from Reservoir Route operation at Concentration Point 47.

FLOOD CONTROL
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1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

Table F-3

TABLE F-3A

100-YEAR 24-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
1A	7432	7432	12.33	6.7	1111	1111
R1-2	6367	6365	12.75	6.7	952	951
1B	6707	6707	12.25	5.7	1177	1177
C2	8964	8963	12.50	12.4	723	723
R2-4	8291	8288	13.00	12.4	669	669
1C	1106	1106	12.08	0.8	1365	1365
R3-4	705	701	13.08	0.8	870	865
1D	4360	4360	12.17	3.3	1333	1333
C4	8925	8917	13.00	16.5	542	541
R4-7	8410	8323	13.33	16.5	511	505
1E	1446	1446	12.17	1.1	1303	1303
R5-7	1283	1279	12.42	1.1	1156	1152
1F	2329	2329	12.33	3.1	761	761
R6-7	2226	2222	12.58	3.1	727	726
1G	2793	2793	12.17	2.6	1091	1091
C7	9031	8939	13.25	23.2	389	385
R7-8	8855	8735	13.50	23.2	382	377
1H	6146	6146	12.42	7.6	814	814
C8	11483	11417	12.58	30.8	373	371
R8-10	10902	10804	12.75	30.8	355	351
1I	3424	3424	12.58	6.9	498	498
R9-10	3406	3399	12.67	6.9	495	494
C10	13645	13549	12.67	37.6	363	360
R10-11	12286	12049	13.25	37.6	326	320
1J	1510	1510	12.42	2.6	588	588
1K	2524	2524	12.58	5.0	503	503
C11	13470	13236	13.17	45.2	298	293
R11-12	12313	11945	13.83	45.2	272	264
1L	3671	3671	12.50	5.9	619	619
C12.1	12818	12452	13.83	51.2	251	243
2A	5739	5739	12.33	7.8	740	740

TABLE F-3A

100-YEAR 24-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
R13-14	5505	5490	12.50	7.8	709	707
2B	2880	2880	12.25	4.3	668	668
C14	7577	7563	12.50	12.1	628	627
R14-15	7034	6942	12.67	12.1	583	575
2C	2173	2173	12.25	3.8	569	569
C15	7680	7588	12.67	15.9	483	478
R15-17	6856	6661	13.25	15.9	431	419
2D	2053	2053	12.67	5.1	401	401
C17	7665	7470	13.25	21.0	365	356
R17-18	7515	7252	13.42	21.0	358	345
2E	1644	1644	12.25	2.1	787	787
R16-18	1408	1406	12.67	2.1	674	673
C18	7948	7680	13.33	23.1	344	332
R18-12	7682	7331	13.67	23.1	333	317
2F	1944	1944	12.75	4.9	398	398
C12.2	8276	7916	13.58	28.0	296	283
BC12.1	12818	12452	13.83	51.2	251	243
C12	19436	18752	13.75	79.1	246	237
R12-21	19255	18528	13.83	79.1	243	234
3A	3621	3621	12.50	6.0	607	607
R19-21	3313	3255	12.92	6.0	555	545
3D	2660	2660	12.58	5.0	531	531
R20-21	2463	2429	13.00	5.0	492	485
3B	2824	2824	12.67	6.3	452	452
3C	2450	2450	12.75	5.7	430	430
C21	21884	21106	13.75	102.1	214	207
R21-22	21633	20770	13.92	102.1	212	203
3E	2134	2134	12.42	2.9	736	736
C22	21633	20769	13.92	105.0	206	198
R22-25	21388	20486	14.00	105.0	204	195
4A	2725	2725	13.00	7.4	367	367

TABLE F-3A

100-YEAR 24-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
4B	1988	1988	12.75	4.1	488	488
C23	4274	4274	12.92	11.5	372	372
R23-24	4193	4173	13.00	11.5	365	363
4C	2430	2430	12.50	2.7	917	917
C24	5280	5261	12.67	14.2	373	372
R24-25	5219	5177	12.75	14.2	369	366
C25	22825	21891	14.00	119.1	192	184
R25-32	22429	21314	14.33	119.1	188	179
5A	4743	4743	12.75	8.0	591	591
5B	3269	3269	12.58	7.4	444	444
C32	22540	21430	14.33	134.5	168	159
R32-33	22414	21112	14.50	134.5	167	157
5C	2282	2282	12.50	3.6	641	641
C33	22401	21101	14.50	138.1	162	153
R33-34	21931	20042	15.25	138.1	159	145
6C	773	773	12.67	2.2	347	347
C34	21923	20035	15.25	140.3	156	143
R34-37	21761	19714	15.50	140.3	155	141
6A	3015	3015	12.50	3.7	824	824
R35-36	2366	2346	13.50	3.7	646	641
6B	2341	2341	12.83	4.8	492	492
C36	3040	3018	13.42	8.4	361	358
R36-37	2898	2868	13.83	8.4	344	341
C37	21863	19789	15.50	148.7	147	133
R37-38	21698	19294	15.75	148.7	146	130
6D	1832	1832	12.58	3.7	499	499
C38I.1	21690	19290	15.75	152.4	142	127
7A	3603	3603	12.75	5.2	694	694
R26-27	3031	3016	13.75	5.2	584	581
7B	3521	3521	12.75	6.1	576	576
C27	3424	3423	12.75	11.3	303	303

TABLE F-3A

100-YEAR 24-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
R27-29	3164	3146	14.25	11.3	280	278
7C	3578	3578	12.83	6.8	525	525
R28-29	3126	3111	13.58	6.8	459	457
C29	5722	5702	13.50	18.1	316	315
R29-30	5660	5637	13.58	18.1	313	311
7D	3854	3854	12.50	5.8	660	660
C30	5688	5666	13.58	24.0	237	237
R30-31	5216	5155	14.92	24.0	218	215
7F	1514	1514	12.67	2.6	576	576
C31	5216	5155	14.92	26.6	196	194
R31-84	5050	4977	15.42	26.6	190	187
7E	3787	3787	13.08	8.3	456	456
C84.1	5049	4976	15.42	34.9	145	143
10A	1350	1350	12.42	2.0	672	672
R50-51	851	797	14.42	2.0	423	397
10B	2722	2722	12.67	5.4	508	508
C51	2631	2631	12.67	7.4	357	357
R51-57	2394	2378	13.00	7.4	325	323
10D	2859	2859	12.58	4.5	630	630
R52-55	2452	2427	13.42	4.5	540	535
10E	1876	1876	12.50	2.7	690	690
C55	2487	2464	13.42	7.3	343	339
R55-57	2249	2207	14.17	7.3	310	304
C57	3739	3706	13.08	14.6	256	253
R57-58	3618	3578	13.33	14.6	247	245
10C	2784	2784	12.75	5.7	492	492
C58	4632	4594	13.17	20.3	228	226
R58-59	4526	4460	13.33	20.3	223	220
10F	4088	4088	12.50	5.7	720	720
R53-54	3142	3109	13.92	5.7	553	547
10G	2180	2180	12.58	4.3	509	509

TABLE F-3A

100-YEAR 24-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
C54	3451	3417	13.83	10.0	346	343
R54-59	3039	2970	15.00	10.0	305	298
10H	2554	2554	12.92	6.7	379	379
C59	6413	6319	13.42	37.0	173	171
R59-61	6239	6061	13.67	37.0	169	164
10I	3500	3500	12.67	6.9	505	505
R60-61	2295	2209	15.17	6.9	331	319
10J	3177	3177	12.83	7.1	449	449
C61	6723	6553	13.50	51.0	132	128
R61-82	6608	6288	14.17	51.0	130	123
10L	2938	2938	12.75	6.3	463	463
C82.1	6608	6288	14.08	57.3	115	110
10M	3824	3824	12.58	6.2	620	620
R67-68	2716	2640	14.67	6.2	440	428
10K	2951	2951	12.83	5.4	542	542
R63-68	2639	2632	13.33	5.4	485	484
10N	1989	1989	12.75	3.5	573	573
C68	3329	3324	12.92	15.1	221	220
R68-72	3306	3293	13.25	15.1	219	218
10S	3207	3207	12.58	3.9	818	818
R70-71	2685	2668	13.42	3.9	685	681
10T	2625	2625	12.58	3.8	689	689
R69-71	2247	2228	13.33	3.8	590	585
10U	2786	2786	12.50	4.3	654	654
C71	4930	4894	13.33	12.0	411	408
R71-72	4719	4670	13.58	12.0	394	389
C72	7241	7180	13.50	27.1	267	265
R72-81	7081	7007	13.75	27.1	262	259
10Q	2149	2149	12.25	2.6	823	823
R75-76	1476	1473	13.75	2.6	566	564
10O	3181	3181	12.25	3.1	1033	1033

TABLE F-3A

100-YEAR 24-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
R73-74	2837	2827	12.83	3.1	921	918
10P	3464	3464	12.58	6.2	563	563
C74	5913	5903	12.75	9.2	641	640
R74-76	4827	4807	13.67	9.2	523	521
10R	2662	2662	12.58	4.9	540	540
C76	6671	6649	13.67	16.8	398	396
R76-77	6096	6028	14.42	16.8	364	359
10V	2060	2060	12.58	3.1	660	660
C77	6096	6028	14.42	19.9	306	303
R77-80	5865	5786	14.67	19.9	295	291
10W	3751	3751	12.58	5.3	708	708
R78-79	3337	3328	13.25	5.3	630	628
10X	1872	1872	12.42	2.7	683	683
C79	3996	3987	13.17	8.0	497	496
R79-80	3426	3365	14.50	8.0	426	419
10Y	1701	1701	12.58	3.7	460	460
C80	8804	8673	14.58	31.6	278	274
R80-81	8584	8431	15.00	31.6	271	267
BR7281	7081	7007	13.75	27.1	262	259
C81	10911	10661	15.00	58.7	186	182
R81-82	10699	10333	15.42	58.7	182	176
10Z	1721	1721	12.42	3.7	466	466
BC82.1	6592	6279	14.08	57.3	115	110
C82	14690	13936	15.67	119.7	123	116
R82-84	14602	13739	15.92	119.7	122	115
10AA	1136	1136	12.33	1.6	697	697
R83-84	554	544	15.25	1.6	340	334
10AB	2316	2316	12.58	4.3	537	537
C84.2	14894	14027	15.92	125.7	119	112
BC84.1	5003	4931	15.42	34.9	143	141
C84	18450	17561	15.75	160.6	115	109

TABLE F-3A

100-YEAR 24-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
R84-38	18374	17291	16.08	160.6	114	108
8A	2776	2776	13.00	6.3	443	443
C38I.2	18356	17283	16.08	166.8	110	104
BC38I1	21635	19235	15.75	152.4	142	126
C38I	36455	33207	15.92	319.2	114	104
9A	2721	2721	12.50	4.6	586	586
R39-40	2622	2594	12.75	4.6	565	559
9B	4497	4497	12.50	8.5	530	530
C40	6561	6534	12.67	13.1	500	498
R40-41	5547	5297	13.42	13.1	422	403
9C	4997	4997	12.58	7.3	683	683
C41	6171	5927	13.33	20.5	302	290
R41-43	6001	5740	13.83	20.5	293	281
9D	3777	3777	12.58	6.2	605	605
R42-43	3447	3428	13.08	6.2	552	549
C43	8068	7870	13.42	26.7	302	295
R43-44	8009	7780	13.50	26.7	300	291
9E	3640	3640	12.42	6.1	599	599
9F	1312	1312	12.17	1.8	750	750
C44	8008	7780	13.42	34.5	232	225
CP44W	3685	3596	13.42	34.5	107	104
CP44E	4277	4144	13.42	34.5	124	120
R44-45	4231	4084	13.58	34.5	123	118
9G	764	764	12.33	1.0	764	764
C45	4231	4084	13.58	35.5	119	115
R45-46	4073	3897	14.17	35.5	115	110
9I	4079	4079	12.33	4.8	848	848
DT9IE	2040	2040	12.33	4.8	424	424
9IW	2040	2040	12.33	4.8	424	424
C46I	4073	3896	14.17	40.3	101	97
C46O	1968	1902	15.50	40.3	49	47

TABLE F-3A

100-YEAR 24-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
BCP44W	3685	3596	13.42	34.5	107	104
R44-47	3530	3417	14.17	34.5	102	99
9H	948	948	12.17	1.5	645	645
C47I	3530	3416	14.17	36.0	98	95
C47O	1610	1526	15.92	36.0	45	42
11A	1477	1477	12.50	2.2	678	678
C85O	252	244	13.25	2.2	116	112
12A	3641	3641	12.50	4.9	746	746
R86-88	2678	2655	14.25	4.9	549	544
12B	2028	2028	12.92	4.8	423	423
R87-88	1960	1957	13.08	4.8	409	409
12C	1875	1875	12.83	3.6	515	515
C88	3300	3297	12.92	13.3	248	248
R88-89	2820	2737	13.92	13.3	212	206
12D	3263	3263	12.75	5.3	617	617
C89	2949	2943	12.75	18.6	159	158
R89-90	2795	2753	13.33	18.6	150	148
12E	3916	3916	12.83	7.5	519	519
C90I	4997	4957	13.17	26.1	191	190
C90O	3310	3277	13.67	26.1	127	125
13A	1199	1199	12.08	0.9	1332	1332
C91O	194	193	12.50	0.9	216	214
14A	134	134	12.00	0.1	1489	1489
C92O	61	61	12.17	0.1	678	678
14B	42	42	12.00	0.0	1400	1400
C93O	26	26	12.00	0.0	867	867
19A	78	78	12.00	0.1	1300	1300
C49O	1	0	12.25	0.1	17	0
19B	829	829	12.08	0.8	1077	1077
C48O	247	246	12.42	0.8	321	319
BC90O	3310	3277	13.67	26.1	127	125

TABLE F-3A

100-YEAR 24-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
R90-99	3175	3041	14.83	26.1	121	116
16A	1080	1080	12.42	1.9	557	557
C99	3175	3041	14.83	28.1	113	108
17A	1570	1570	12.50	2.2	724	724
BC460	1968	1902	15.50	40.3	49	47
R46-94	1951	1843	16.58	40.3	48	46
BC38I	36455	33207	15.92	319.2	114	104
R38-94	36228	32593	16.33	319.2	113	102
15A	1903	1903	12.33	3.6	530	530
C94	37256	33554	16.33	363.1	103	92
R94-96	37172	33310	16.50	363.1	102	92
BC850	252	244	13.25	2.2	116	112
R85-95	244	223	15.42	2.2	112	102
15B	1517	1517	12.42	2.1	729	729
C95	1510	1510	12.42	4.3	354	354
R95-96	1410	1405	12.75	4.3	331	330
C96	37286	33409	16.50	367.4	101	91
R96-97	37186	33142	16.67	367.4	101	90
15C	817	817	12.17	1.8	446	446
C97	37180	33138	16.67	369.2	101	90
R97-98	36916	32485	17.08	369.2	100	88
15D	1364	1364	12.50	2.9	475	475
C98	36907	32480	17.08	372.1	99	87
BC480	247	246	12.42	0.8	321	319
R48-101	240	232	12.92	0.8	312	301
BC490	1	0	12.25	0.1	17	0
R49-101	1	0	0.08	0.1	17	0
18A	117	117	12.08	0.3	468	468
C101	241	232	12.92	1.1	223	215
BC470	1610	1526	15.92	36.0	45	42
R47-119	1602	1500	16.33	36.0	45	42

TABLE F-3A

100-YEAR 24-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
18T	269	269	12.08	0.4	690	690
C119	1601	1500	16.33	36.4	44	41
18B	1662	1662	12.33	1.8	918	918
18C	1526	1526	12.50	1.9	803	803
18M	1131	1131	12.58	1.5	754	754
18N	1655	1655	12.67	2.4	690	690
18O	877	877	12.25	0.9	974	974
18P	1206	1206	12.42	1.4	887	887
R116-117	1039	1035	13.00	1.4	764	761
18Q	1248	1248	12.25	1.1	1104	1104
C117	1506	1504	12.33	2.5	605	604
18R	1447	1447	12.75	2.2	667	667
R118-64	1262	1256	13.42	2.2	582	579
18S	1327	1327	12.25	1.4	983	983
C64	1506	1503	12.42	3.5	428	427
18D	2518	2518	12.58	3.6	699	699
R104-105	1903	1888	13.92	3.6	529	524
18E	2930	2930	12.50	3.8	765	765
C105	2841	2840	12.50	7.4	382	382
R105-106	2672	2662	13.00	7.4	360	358
18F	859	859	12.17	0.8	1074	1074
C106	2671	2661	13.00	8.2	325	323
18G	1713	1713	12.50	2.0	844	844
18K	898	898	12.08	0.8	1123	1123
18H	2413	2413	12.25	2.6	917	917
R108-109	2077	2072	12.67	2.6	790	788
18I	2198	2198	12.42	2.6	855	855
C109	3799	3794	12.58	5.2	731	730
R109-110	2799	2770	13.75	5.2	538	533
18J	1992	1992	12.33	2.4	848	848
C110	2799	2770	13.75	7.6	371	367

TABLE F-3A

100-YEAR 24-HOUR RESULTS IN HEC-1 RUN ORDER

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
18L	2119	2119	12.25	2.4	883	883
10C1	1014	1014	12.33	1.4	709	709
10C2	2450	2450	12.58	4.2	579	579
10K1	710	710	12.25	0.9	807	807
10K2	2953	2953	12.58	4.6	648	648
10M1	2245	2245	12.17	1.9	1214	1214
10M2	1282	1282	12.33	1.5	866	866
10M3	1992	1992	12.42	2.8	701	701

Legend:

C106 - Hydrograph combination at Concentration Point 106.
18B - Sub-Basin 18B.
R116-117 - Channel Route from Concentration Point 116 to 117.
BC38I - Recall stored hydrograph for Concentration Point 38I
C47I - Inflow hydrograph to Reservoir Route operation at Concentration Point 47.
C47O - Outflow hydrograph from Reservoir Route operation at Concentration Point 47.

TABLE F-3B

100-YEAR 24-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
1A	7432	7432	12.33	6.7	1111	1111
1B	6707	6707	12.25	5.7	1177	1177
1C	1106	1106	12.08	0.8	1365	1365
1D	4360	4360	12.17	3.3	1333	1333
1E	1446	1446	12.17	1.1	1303	1303
1F	2329	2329	12.33	3.1	761	761
1G	2793	2793	12.17	2.6	1091	1091
1H	6146	6146	12.42	7.6	814	814
1I	3424	3424	12.58	6.9	498	498
1J	1510	1510	12.42	2.6	588	588
1K	2524	2524	12.58	5.0	503	503
1L	3671	3671	12.50	5.9	619	619
2A	5739	5739	12.33	7.8	740	740
2B	2880	2880	12.25	4.3	668	668
2C	2173	2173	12.25	3.8	569	569
2D	2053	2053	12.67	5.1	401	401
2E	1644	1644	12.25	2.1	787	787
2F	1944	1944	12.75	4.9	398	398
3A	3621	3621	12.50	6.0	607	607
3B	2824	2824	12.67	6.3	452	452
3C	2450	2450	12.75	5.7	430	430
3D	2660	2660	12.58	5.0	531	531
3E	2134	2134	12.42	2.9	736	736
4A	2725	2725	13.00	7.4	367	367
4B	1988	1988	12.75	4.1	488	488
4C	2430	2430	12.50	2.7	917	917
5A	4743	4743	12.75	8.0	591	591
5B	3269	3269	12.58	7.4	444	444
5C	2282	2282	12.50	3.6	641	641
6A	3015	3015	12.50	3.7	824	824
6B	2341	2341	12.83	4.8	492	492

TABLE F-3B

100-YEAR 24-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
6C	773	773	12.67	2.2	347	347
6D	1832	1832	12.58	3.7	499	499
7A	3603	3603	12.75	5.2	694	694
7B	3521	3521	12.75	6.1	576	576
7C	3578	3578	12.83	6.8	525	525
7D	3854	3854	12.50	5.8	660	660
7E	3787	3787	13.08	8.3	456	456
7F	1514	1514	12.67	2.6	576	576
8A	2776	2776	13.00	6.3	443	443
9A	2721	2721	12.50	4.6	586	586
9B	4497	4497	12.50	8.5	530	530
9C	4997	4997	12.58	7.3	683	683
9D	3777	3777	12.58	6.2	605	605
9E	3640	3640	12.42	6.1	599	599
9F	1312	1312	12.17	1.8	750	750
9G	764	764	12.33	1.0	764	764
9H	948	948	12.17	1.5	645	645
9I	4079	4079	12.33	4.8	848	848
DT9IE	2040	2040	12.33	4.8	424	424
9IW	2040	2040	12.33	4.8	424	424
10A	1350	1350	12.42	2.0	672	672
10AA	1136	1136	12.33	1.6	697	697
10AB	2316	2316	12.58	4.3	537	537
10B	2722	2722	12.67	5.4	508	508
10C	2784	2784	12.75	5.7	492	492
10C1	1014	1014	12.33	1.4	709	709
10C2	2450	2450	12.58	4.2	579	579
10D	2859	2859	12.58	4.5	630	630
10E	1876	1876	12.50	2.7	690	690
10F	4088	4088	12.50	5.7	720	720
10G	2180	2180	12.58	4.3	509	509

TABLE F-3B

100-YEAR 24-HOUR RESULTS
IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
10H	2554	2554	12.92	6.7	379	379
10I	3500	3500	12.67	6.9	505	505
10J	3177	3177	12.83	7.1	449	449
10K	2951	2951	12.83	5.4	542	542
10K1	710	710	12.25	0.9	807	807
10K2	2953	2953	12.58	4.6	648	648
10L	2938	2938	12.75	6.3	463	463
10M	3824	3824	12.58	6.2	620	620
10M1	2245	2245	12.17	1.9	1214	1214
10M2	1282	1282	12.33	1.5	866	866
10M3	1992	1992	12.42	2.8	701	701
10N	1989	1989	12.75	3.5	573	573
10O	3181	3181	12.25	3.1	1033	1033
10P	3464	3464	12.58	6.2	563	563
10Q	2149	2149	12.25	2.6	823	823
10R	2662	2662	12.58	4.9	540	540
10S	3207	3207	12.58	3.9	818	818
10T	2625	2625	12.58	3.8	689	689
10U	2786	2786	12.50	4.3	654	654
10V	2060	2060	12.58	3.1	660	660
10W	3751	3751	12.58	5.3	708	708
10X	1872	1872	12.42	2.7	683	683
10Y	1701	1701	12.58	3.7	460	460
10Z	1721	1721	12.42	3.7	466	466
11A	1477	1477	12.50	2.2	678	678
12A	3641	3641	12.50	4.9	746	746
12B	2028	2028	12.92	4.8	423	423
12C	1875	1875	12.83	3.6	515	515
12D	3263	3263	12.75	5.3	617	617
12E	3916	3916	12.83	7.5	519	519
13A	1199	1199	12.08	0.9	1332	1332

TABLE F-3B

100-YEAR 24-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
14A	134	134	12.00	0.1	1489	1489
14B	42	42	12.00	0.0	1400	1400
15A	1903	1903	12.33	3.6	530	530
15B	1517	1517	12.42	2.1	729	729
15C	817	817	12.17	1.8	446	446
15D	1364	1364	12.50	2.9	475	475
16A	1080	1080	12.42	1.9	557	557
17A	1570	1570	12.50	2.2	724	724
18A	117	117	12.08	0.3	468	468
18B	1662	1662	12.33	1.8	918	918
18C	1526	1526	12.50	1.9	803	803
18D	2518	2518	12.58	3.6	699	699
18E	2930	2930	12.50	3.8	765	765
18F	859	859	12.17	0.8	1074	1074
18G	1713	1713	12.50	2.0	844	844
18H	2413	2413	12.25	2.6	917	917
18I	2198	2198	12.42	2.6	855	855
18J	1992	1992	12.33	2.4	848	848
18K	898	898	12.08	0.8	1123	1123
18L	2119	2119	12.25	2.4	883	883
18M	1131	1131	12.58	1.5	754	754
18N	1655	1655	12.67	2.4	690	690
18O	877	877	12.25	0.9	974	974
18P	1206	1206	12.42	1.4	887	887
18Q	1248	1248	12.25	1.1	1104	1104
18R	1447	1447	12.75	2.2	667	667
18S	1327	1327	12.25	1.4	983	983
18T	269	269	12.08	0.4	690	690
19A	78	78	12.00	0.1	1300	1300
19B	829	829	12.08	0.8	1077	1077
C2	8964	8963	12.50	12.4	723	723

TABLE F-3B

100-YEAR 24-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
C4	8925	8917	13.00	16.5	542	541
C7	9031	8939	13.25	23.2	389	385
C8	11483	11417	12.58	30.8	373	371
C10	13645	13549	12.67	37.6	363	360
C11	13470	13236	13.17	45.2	298	293
C12.1	12818	12452	13.83	51.2	251	243
C12.2	8276	7916	13.58	28.0	296	283
C12	19436	18752	13.75	79.1	246	237
C14	7577	7563	12.50	12.1	628	627
C15	7680	7588	12.67	15.9	483	478
C17	7665	7470	13.25	21.0	365	356
C18	7948	7680	13.33	23.1	344	332
C21	21884	21106	13.75	102.1	214	207
C22	21633	20769	13.92	105.0	206	198
C23	4274	4274	12.92	11.5	372	372
C24	5280	5261	12.67	14.2	373	372
C25	22825	21891	14.00	119.1	192	184
C27	3424	3423	12.75	11.3	303	303
C29	5722	5702	13.50	18.1	316	315
C30	5688	5666	13.58	24.0	237	237
C31	5216	5155	14.92	26.6	196	194
C32	22540	21430	14.33	134.5	168	159
C33	22401	21101	14.50	138.1	162	153
C34	21923	20035	15.25	140.3	156	143
C36	3040	3018	13.42	8.4	361	358
C37	21863	19789	15.50	148.7	147	133
C38I.1	21690	19290	15.75	152.4	142	127
C38I.2	18356	17283	16.08	166.8	110	104
C38I	36455	33207	15.92	319.2	114	104
C40	6561	6534	12.67	13.1	500	498
C41	6171	5927	13.33	20.5	302	290

TABLE F-3B

100-YEAR 24-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
C43	8068	7870	13.42	26.7	302	295
CP44E	4277	4144	13.42	34.5	124	120
CP44W	3685	3596	13.42	34.5	107	104
C44	8008	7780	13.42	34.5	232	225
C45	4231	4084	13.58	35.5	119	115
C46I	4073	3896	14.17	40.3	101	97
C46O	1968	1902	15.50	40.3	49	47
C47I	3530	3416	14.17	36.0	98	95
C47O	1610	1526	15.92	36.0	45	42
C48O	247	246	12.42	0.8	321	319
C49O	1	0	12.25	0.1	17	0
C51	2631	2631	12.67	7.4	357	357
C54	3451	3417	13.83	10.0	346	343
C55	2487	2464	13.42	7.3	343	339
C57	3739	3706	13.08	14.6	256	253
C58	4632	4594	13.17	20.3	228	226
C59	6413	6319	13.42	37.0	173	171
C61	6723	6553	13.50	51.0	132	128
C64	1506	1503	12.42	3.5	428	427
C68	3329	3324	12.92	15.1	221	220
C71	4930	4894	13.33	12.0	411	408
C72	7241	7180	13.50	27.1	267	265
C74	5913	5903	12.75	9.2	641	640
C76	6671	6649	13.67	16.8	398	396
C77	6096	6028	14.42	19.9	306	303
C79	3996	3987	13.17	8.0	497	496
C80	8804	8673	14.58	31.6	278	274
C81	10911	10661	15.00	58.7	186	182
C82.1	6608	6288	14.08	57.3	115	110
C82	14690	13936	15.67	119.7	123	116
C84.1	5049	4976	15.42	34.9	145	143

TABLE F-3B

100-YEAR 24-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
C84.2	14894	14027	15.92	125.7	119	112
C84	18450	17561	15.75	160.6	115	109
C850	252	244	13.25	2.2	116	112
C88	3300	3297	12.92	13.3	248	248
C89	2949	2943	12.75	18.6	159	158
C90I	4997	4957	13.17	26.1	191	190
C900	3310	3277	13.67	26.1	127	125
C910	194	193	12.50	0.9	216	214
C920	61	61	12.17	0.1	678	678
C930	26	26	12.00	0.0	867	867
C94	37256	33554	16.33	363.1	103	92
C95	1510	1510	12.42	4.3	354	354
C96	37286	33409	16.50	367.4	101	91
C97	37180	33138	16.67	369.2	101	90
C98	36907	32480	17.08	372.1	99	87
C99	3175	3041	14.83	28.1	113	108
C101	241	232	12.92	1.1	223	215
C105	2841	2840	12.50	7.4	382	382
C106	2671	2661	13.00	8.2	325	323
C109	3799	3794	12.58	5.2	731	730
C110	2799	2770	13.75	7.6	371	367
C117	1506	1504	12.33	2.5	605	604
C119	1601	1500	16.33	36.4	44	41
R1-2	6367	6365	12.75	6.7	952	951
R2-4	8291	8288	13.00	12.4	669	669
R3-4	705	701	13.08	0.8	870	865
R4-7	8410	8323	13.33	16.5	511	505
R5-7	1283	1279	12.42	1.1	1156	1152
R6-7	2226	2222	12.58	3.1	727	726
R7-8	8855	8735	13.50	23.2	382	377
R8-10	10902	10804	12.75	30.8	355	351

TABLE F-3B

100-YEAR 24-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
R9-10	3406	3399	12.67	6.9	495	494
R10-11	12286	12049	13.25	37.6	326	320
R11-12	12313	11945	13.83	45.2	272	264
R12-21	19255	18528	13.83	79.1	243	234
R13-14	5505	5490	12.50	7.8	709	707
R14-15	7034	6942	12.67	12.1	583	575
R15-17	6856	6661	13.25	15.9	431	419
R16-18	1408	1406	12.67	2.1	674	673
R17-18	7515	7252	13.42	21.0	358	345
R18-12	7682	7331	13.67	23.1	333	317
R19-21	3313	3255	12.92	6.0	555	545
R20-21	2463	2429	13.00	5.0	492	485
R21-22	21633	20770	13.92	102.1	212	203
R22-25	21388	20486	14.00	105.0	204	195
R23-24	4193	4173	13.00	11.5	365	363
R24-25	5219	5177	12.75	14.2	369	366
R25-32	22429	21314	14.33	119.1	188	179
R26-27	3031	3016	13.75	5.2	584	581
R27-29	3164	3146	14.25	11.3	280	278
R28-29	3126	3111	13.58	6.8	459	457
R29-30	5660	5637	13.58	18.1	313	311
R30-31	5216	5155	14.92	24.0	218	215
R31-84	5050	4977	15.42	26.6	190	187
R32-33	22414	21112	14.50	134.5	167	157
R33-34	21931	20042	15.25	138.1	159	145
R34-37	21761	19714	15.50	140.3	155	141
R35-36	2366	2346	13.50	3.7	646	641
R36-37	2898	2868	13.83	8.4	344	341
R37-38	21698	19294	15.75	148.7	146	130
R38-94	36228	32593	16.33	319.2	113	102
R39-40	2622	2594	12.75	4.6	565	559

TABLE F-3B

100-YEAR 24-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
R40-41	5547	5297	13.42	13.1	422	403
R41-43	6001	5740	13.83	20.5	293	281
R42-43	3447	3428	13.08	6.2	552	549
R43-44	8009	7780	13.50	26.7	300	291
R44-45	4231	4084	13.58	34.5	123	118
R44-47	3530	3417	14.17	34.5	102	99
R45-46	4073	3897	14.17	35.5	115	110
R46-94	1951	1843	16.58	40.3	48	46
R47-119	1602	1500	16.33	36.0	45	42
R48-101	240	232	12.92	0.8	312	301
R49-101	1	0	0.08	0.1	17	0
R50-51	851	797	14.42	2.0	423	397
R51-57	2394	2378	13.00	7.4	325	323
R52-55	2452	2427	13.42	4.5	540	535
R53-54	3142	3109	13.92	5.7	553	547
R54-59	3039	2970	15.00	10.0	305	298
R55-57	2249	2207	14.17	7.3	310	304
R57-58	3618	3578	13.33	14.6	247	245
R58-59	4526	4460	13.33	20.3	223	220
R59-61	6239	6061	13.67	37.0	169	164
R60-61	2295	2209	15.17	6.9	331	319
R61-82	6608	6288	14.17	51.0	130	123
R63-68	2639	2632	13.33	5.4	485	484
R67-68	2716	2640	14.67	6.2	440	428
R68-72	3306	3293	13.25	15.1	219	218
R69-71	2247	2228	13.33	3.8	590	585
R70-71	2685	2668	13.42	3.9	685	681
R71-72	4719	4670	13.58	12.0	394	389
R72-81	7081	7007	13.75	27.1	262	259
R73-74	2837	2827	12.83	3.1	921	918
R74-76	4827	4807	13.67	9.2	523	521

TABLE F-3B

100-YEAR 24-HOUR RESULTS IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)
R75-76	1476	1473	13.75	2.6	566	564
R76-77	6096	6028	14.42	16.8	364	359
R77-80	5865	5786	14.67	19.9	295	291
R78-79	3337	3328	13.25	5.3	630	628
R79-80	3426	3365	14.50	8.0	426	419
R80-81	8584	8431	15.00	31.6	271	267
R81-82	10699	10333	15.42	58.7	182	176
R82-84	14602	13739	15.92	119.7	122	115
R83-84	554	544	15.25	1.6	340	334
R84-38	18374	17291	16.08	160.6	114	108
R85-95	244	223	15.42	2.2	112	102
R86-88	2678	2655	14.25	4.9	549	544
R87-88	1960	1957	13.08	4.8	409	409
R88-89	2820	2737	13.92	13.3	212	206
R89-90	2795	2753	13.33	18.6	150	148
R90-99	3175	3041	14.83	26.1	121	116
R94-96	37172	33310	16.50	363.1	102	92
R95-96	1410	1405	12.75	4.3	331	330
R96-97	37186	33142	16.67	367.4	101	90
R97-98	36916	32485	17.08	369.2	100	88
R104-105	1903	1888	13.92	3.6	529	524
R105-106	2672	2662	13.00	7.4	360	358
R108-109	2077	2072	12.67	2.6	790	788
R109-110	2799	2770	13.75	5.2	538	533
R116-117	1039	1035	13.00	1.4	764	761
R118-64	1262	1256	13.42	2.2	582	579

TABLE F-3B

100-YEAR 24-HOUR RESULTS
IN NUMERIC ORDER BY TYPE

HEC-1 Identifier	Peak Discharge W/O Losses (cfs)	Peak Discharge W/ Losses (cfs)	Time To Peak (cfs)	Drainage Area (sq mi)	Discharge W/O Losses (cfs/sm)	Discharge W/ Losses (cfs/sm)

Legend:

C106 - Hydrograph combination at Concentration Point 106.
18B - Sub-Basin 18B.
R116-117 - Channel Route from Concentration Point 116 to 117.
BC38I - Recall stored hydrograph for Concentration Point 38I
C47I - Inflow hydrograph to Reservoir Route operation at Concentration Point 47.
C47O - Outflow hydrograph from Reservoir Route operation at Concentration Point 47.

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

Table F-4

Section 3.5.3: Final Results

Table F-4a

Central Arizona Canal Structures Summary Table
Peak Discharges

HEC-1 Identifier	CAP Station	Description	Peak Discharge		Drainage Area (sm)
			6-Hour (cfs)	24-Hour (cfs)	
19A	CAP-1, 121+60	Inflow, 1-30" RCP Culvert	180	80	0.1
C490	CAP-1, 121+60	Outflow	1	1	0.1
19B	CAP-2, 146+50	Inflow, 2-48" RCP Culverts	1,200	830	0.8
C480	CAP-2, 146+50	Outflow	270	250	0.8
C47I	CAP-3, 180+50	Inflow, 67.5' Wide Box Flume Overchute	2,400	3,400	36.0
C470	CAP-3, 180+50	Outflow	930	1,500	36.0
C46I	CAP-4, 293+50	Inflow, 67.5' Wide Box Flume Overchute	2,100	3,900	40.3
C460	CAP-4, 293+50	Outflow	1,100	1,900	40.3
C38I	CAP-5, 366+50	Inflow, Siphon (no routing structure)	7,600	33,200	319.2
11A	CAP-6&7, 397+75	Inflow, 1-66" RCP Overchute	1,500	1,500	2.2
C850	CAP-6&7, 397+75	Outflow	240	240	2.2
C90I	CAP-8, 485+00	Inflow, 47.5' Wide Box Flume Overchute	2,600	5,000	26.1
C900	CAP-8, 485+00	Outflow	2,000	3,300	26.1
13A	CAP-9, 544+25	Inflow, 2-36" RCP Culverts	1,600	1,200	0.9
C910	CAP-9, 544+25	Outflow	200	190	0.9
14A	CAP-10, 561+50	Inflow, 1-30" RCP Culvert	300	130	0.1
C920	CAP-10, 561+50	Outflow	70	60	0.1
14B	CAP-11, 571+50	Inflow, 1-30" RCP Culvert	90	40	0.03
C930	CAP-11, 571+50	Outflow	30	30	0.03

Table F-4b

Central Arizona Project Canal Structures Summary Table
Critical Elevations

Structure	100-Year Peak		Physical Elevations			
	Discharge (cfs)	Stage	Top of Canal Linings[2]	Top of Compacted Dikes[2]	Top of Uncompacted Dikes	Top of Flume Wall
CAP-1	1	1358.5	1374.4	1373.6	1376.6	---
CAP-2[1]	268	1361.8	1374.2	1373.4	1376.4	---
CAP-3	1519	1381.1	1373.9	1382.7	1385.7	1384.1
CAP-4	1944	1380.8	1373.4	1382.7	1385.7	1383.7
CAP-6&7	244	1376.9	1370.8	1378.4	1381.4	---
CAP-8	3277	1382.1	1370.1	1380.0	1383.0	1380.3
CAP-9[1]	205	1354.7	1370.5	1370.5	1372.7	---
CAP-10[1]	65	1348.9	1370.4	1369.9	1372.1	---
CAP-11[1]	32	1353.4	1370.3	1369.9	1372.1	---

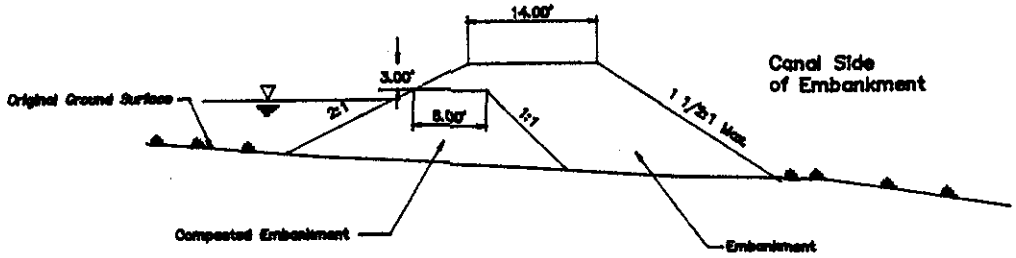
[1] - Peak discharge and stage are for the 100-year 6-hour storm

[2] - Represents the collective dikes, not the lined inlet transition dikes

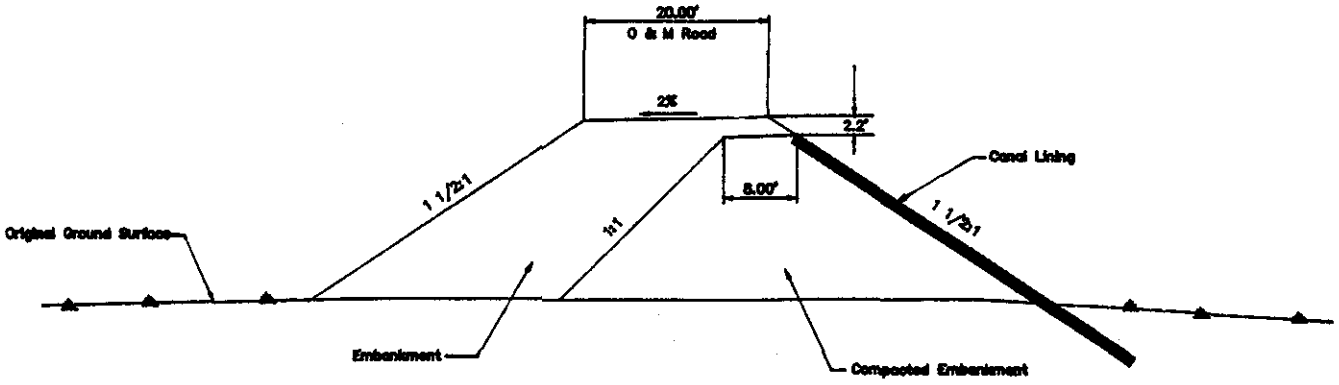
Table F-4c

Central Arizona Canal Structures Summary Table
Freeboard at Structures

Structure	Freeboard at Top of Compacted Embankment (ft)	Freeboard at Top of Embankment (ft)
CAP-1	14.8	17.8
CAP-2	11.6	14.6
CAP-3	1.7	4.7
CAP-4	1.5	4.5
CAP-6	1.5	4.5
CAP-7	1.5	4.5
CAP-8	(2.1)	0.9
CAP-9	15.8	18.0
CAP-10	21.0	23.2
CAP-11	16.5	18.7



TYPICAL SECTION OF COLLECTIVE DIKE
STRUCTURES CAP--1 through CAP--8



TYPICAL SECTION OF CAP CANAL NORTHERLY EMBANKMENT
STRUCTURES CAP--9 through CAP--11

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1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            SEPTEMBER 1990            *
*              VERSION 4.0             *
*                                      *
*  RUN DATE  02/17/1991  TIME  13:00:38 *
*                                      *
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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
```

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   FCDMC JACKRABBIT WASH, PROJECT NO. 10310
  2           ID   100-YEAR 6-HOUR DURATION STORM
  3           ID   FILENAME= 10310-6.H1,   15FEB91
              *
  4           IT       5
  5           IO       5       0
  6           IN      15
              *
  7           JD    3.30    0.01
  8           PC    .000    .008    .016    .025    .033    .041    .050    .058    .066    .074
  9           PC    .087    .099    .118    .138    .216    .377    .834    .911    .931    .950
 10           PC    .962    .972    .983    .991   1.000
              *
 11           JD    3.28    0.50
              *
 12           JD    3.23    2.80
 13           PC    .000    .009    .016    .025    .034    .042    .051    .059    .067    .076
 14           PC    .087    .100    .120    .163    .252    .451    .694    .837    .900    .938
 15           PC    .950    .963    .975    .988   1.000
              *
 16           JD    3.04    16.0
 17           PC    .000    .015    .020    .030    .048    .063    .076    .090    .105    .119
 18           PC    .135    .152    .175    .222    .304    .472    .670    .796    .868    .912
 19           PC    .946    .960    .973    .987   1.000
              *
 20           JD    2.67    90.0
 21           PC    .000    .021    .035    .051    .071    .087    .105    .125    .143    .160
 22           PC    .179    .201    .232    .281    .364    .500    .658    .773    .841    .888
 23           PC    .927    .945    .964    .982   1.000
              *
 24           JD    1.88   500.0
 25           PC    .000    .024    .043    .059    .078    .098    .119    .141    .162    .186
 26           PC    .212    .239    .271    .321    .408    .515    .627    .735    .814    .864
              *
              *

 27           KK      1A
 28           KM   SUB-BASIN 1A
 29           KM      HEADWATERS OF JACKRABBIT WASH
 30           KM   NODE 1
 31           BA    6.69
 32           LG     .34     .31    6.90     .16     .00
 33           UI    662.   1323.   2847.   3688.   4580.   6146.   8158.   6346.   5091.   4008.
 34           UI   3115.   1927.   1146.    935.    662.    297.    203.    203.    203.    203.
 35           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 36           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

 37           KK    R1-2
 38           KM   REP. X-SECT. 1D1
 39           RS       6    FLOW      -1
 40           RL                   0.03    92.2
 41           RC  0.035   0.038   0.035    4224   0.001
 42           RX  510.0  1510.0  1585.0  1596.0  1600.0  1612.0  1662.0  2262.0
```



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

 43           RY    99.7    94.1    93.6    92.2    92.2    93.6    94.9    99.7
              *
              *

 44           KK      1B
 45           KM   SUB-BASIN 1B
 46           BA    5.70
 47           LG     .34     .31    6.80     .17     .00
 48           UI    619.   1479.   2868.   3690.   4744.   7138.   6619.   5048.   3917.   2972.
 49           UI   1776.   1062.    793.    560.    190.    190.    190.    190.      0.      0.
 50           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

 51           KK      C2
 52           KM      COMBINE SURFACE RUNOFF AT NODE 2
 53           KM      1A + 1B
 54           HC       2
              *
              *

 55           KK    R2-4
 56           KM   X-SECT. 1D1
 57           RS       7    FLOW      -1
 58           RL                   0.03    92.2
 59           RC  0.035   0.038   0.035    6917   0.002
 60           RX  510.0  1510.0  1585.0  1596.0  1600.0  1612.0  1662.0  2262.0
 61           RY    99.7    94.1    93.6    92.2    92.2    93.6    94.9    99.7
              *
              *

 62           KK      1C
 63           KM   SUB-BASIN 1C
 64           KM   NODE 3  AT AGUILA ROAD
 65           BA     .81
 66           LG     .35     .36    5.40     .23     .00
 67           UI    124.    497.    747.   1130.   1398.    950.    661.    343.    193.    110.
 68           UI     38.     38.     38.      0.      0.      0.      0.      0.      0.      0.
 69           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

 70           KK    R3-4
 71           KM   REP. X-SECT. 1D1
 72           RS      12    FLOW      -1
 73           RL                   0.17    92.2
 74           RC  0.035   0.038   0.035   11299   0.005
 75           RX  510.0  1510.0  1585.0  1596.0  1600.0  1612.0  1662.0  2262.0
 76           RY    99.7    94.1    93.6    92.2    92.2    93.6    94.9    99.7
              *
```

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

  77              KK      1D
  78              KM   SUB-BASIN 1D
  79              BA    3.27
  80              LG     .35      .29     7.30      .14      .00
  81              UI    408.    1217.    2110.    2761.    4054.    4667.    3353.    2500.    1789.     890.
  82              UI    630.     408.     146.     125.     125.     125.       0.       0.       0.       0.
  83              UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                  *
                  *

  84              KK      C4
  85              KM      COMBINE SURFACE RUNOFF AT NODE 4
  86              KM      R3-4 + 1C + 1D
  87              HC       3
                  *
                  *

  88              KK    R4-7
  89              KM   INTERPOLATE BETWEEN X-SECT. 1D1 AND 1H1
  90              RS       4     FLOW       -1
  91              RL                     2.45     91.8
  92              RC   0.035     0.03    0.035     6019    0.004
  93              RX   515.0   1515.0   1578.0   1592.0   1601.0   1612.0   1662.0   2287.0
  94              RY   102.0     97.0     96.5     91.8     91.8     96.0     97.0    102.0
                  *
                  *

  95              KK      1E
  96              KM   SUB-BASIN 1E
  97              KM   NODE 5  AT AGUILA ROAD
  98              BA    1.11
  99              LG     .27      .36     4.90      .26      .00
 100              UI    156.     556.     874.    1211.    1849.    1399.    1016.     698.     332.     219.
 101              UI    127.      48.      48.      48.       0.       0.       0.       0.       0.       0.
 102              UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                  *
                  *

 103              KK    R5-7
 104              KM   REP. X-SECT. 2C1
 105              RS       4     FLOW       -1
 106              RL                     0.27     85.5
 107              RC   0.039     0.04    0.038     7181    0.007
 108              RX  1000.0   1520.0   1616.0   1632.0   1672.0   1744.0   1786.0   2061.0
 109              RY    99.5     94.3     91.7     85.5     85.5     87.9     90.2     99.5
                  *
                  *

 110              KK      1F
 111              KM   SUB-BASIN 1F
 112              KM   NODE 6  AT AGUILA ROAD
 113              BA    3.06
 114              LG     .15      .34     4.50      .29      .00
 115              UI    234.     234.     724.    1113.    1489.    1759.    2130.    2723.    1758.    1450.
```



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

 116              UI   1303.    1162.    1033.     916.     771.     642.     566.     523.     454.     375.
 117              UI    299.     277.     256.     204.     180.     177.     115.     115.     115.     115.
 118              UI     52.      45.      45.      45.      45.      45.      45.      45.      45.      45.
 119              UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
 120              UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                  *
                  *

 121              KK    R6-7
 122              KM   REP. X-SECT. 2C1
 123              RS       3     FLOW       -1
 124              RL                     0.27     85.5
 125              RC    0.03    0.037     0.03     5491    0.005
 126              RX  1000.0   1520.0   1616.0   1632.0   1672.0   1744.0   1786.0   2061.0
 127              RY    99.5     94.3     91.7     85.5     85.5     87.9     90.2     99.5
                  *
                  *

 128              KK      1G
 129              KM   SUB-BASIN 1G
 130              BA    2.56
 131              LG     .30      .31     6.00      .37      .00
 132              UI    332.    1053.    1756.    2331.    3613.    3493.    2545.    1862.    1227.     584.
 133              UI    423.     246.     102.     102.     102.       0.       0.       0.       0.       0.
 134              UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                  *
                  *

 135              KK      C7
 136              KM      COMBINE SURFACE RUNOFF AT NODE 7
 137              KM      R4-7 + R5-7 + R6-7 + 1G
 138              HC       4
                  *
                  *

 139              KK    R7-8
 140              KM   X-SECT. 1H1
 141              RS       3     FLOW       -1
 142              RL                     2.45     90.8
 143              RC    0.04   0.041     0.04     4013    0.004
 144              RX   520.0   1520.0   1570.0   1588.0   1603.0   1612.0   1662.0   1915.0
 145              RY   109.0     99.0     98.7     90.8     91.1     98.6     98.9    109.0
                  *
                  *

 146              KK      1H
 147              KM   SUB-BASIN 1H
 148              BA    7.55
 149              LG     .27      .34     4.50      .40      .00
```

```
150          UI    636.    868.   2355.   3157.   3775.   4571.   5880.   7990.   6548.   5340.
151          UI   4418.   3598.   2879.   1899.   1119.   1044.    655.    586.    195.    195.
152          UI    195.    195.    195.      0.      0.      0.      0.      0.      0.      0.
153          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *
```



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

154          KK      C8
155          KM      COMBINE SURFACE RUNOFF AT NODE 8
156          KM      R7-8 + 1H
157          HC       2
             *
             *

158          KK   R8-10
159          KM   REP. X-SECT. 1H1
160          RS       2    FLOW      -1
161          RL                    2.45    90.8
162          RC    0.04   0.041    0.04    3379   0.004
163          RX   520.0  1520.0  1570.0  1588.0  1603.0  1612.0  1662.0  1915.0
164          RY   109.0    99.0    98.7    90.8    91.1    98.6    98.9   109.0
             *
             *

165          KK      1I
166          KM   SUB-BASIN 1I
167          KM   NODE 9  AT AGUILA ROAD
168          BA    6.88
169          LG     .16     .35    4.80     .40     .00
170          UI    362.    362.    400.   1052.   1461.   1937.   2289.   2587.   2837.   3311.
171          UI   4173.   3718.   2640.   2307.   2128.   1977.   1825.   1699.   1545.   1428.
172          UI   1290.   1147.    979.    903.    856.    812.    757.    617.    585.    462.
173          UI    462.    412.    396.    387.    277.    277.    277.    253.    177.    177.
174          UI    177.    177.    177.    153.     69.     69.     69.     69.     69.     69.
175          UI     69.     69.     69.     69.     69.     69.     69.     69.     69.      0.
176          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
177          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

178          KK   R9-10
179          KM   REP. X-SECT. 9B1
180          RS       1    FLOW      -1
181          RL                    2.45    91.2
182          RC    0.04   0.037    0.04     792   0.006
183          RX  1000.0  1521.0  1533.0  1541.0  1646.0  1664.0  1764.0  1772.0
184          RY    98.2    93.0    92.6    91.2    92.2    94.7    96.6    99.5
             *
             *

185          KK     C10
186          KM      COMBINE SURFACE RUNOFF AT NODE 10
187          KM      R8-10 + R9-10
188          HC       2
             *
             *
```



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

189          KK  R10-11
190          KM   INTERPOLATE BETWEEN X-SECT. 1H1 AND 1L1
191          RS       7    FLOW      -1
192          RL                    2.45    90.8
193          RC   0.035   0.045   0.037   14203   0.005
194          RX  1170.0  1522.0  1558.0  1570.0  1622.0  1628.0  1675.0  2065.0
195          RY   105.0    97.0    95.5    90.8    90.8    96.3    97.2   105.0
             *
             *

196          KK      1J
197          KM   SUB-BASIN 1J
198          BA    2.57
199          LG     .19     .36    5.30     .45     .00
200          UI    184.    184.    489.    790.   1116.   1314.   1507.   1980.   1849.   1266.
201          UI   1095.    994.    892.    797.    714.    606.    508.    452.    419.    379.
202          UI    302.    252.    233.    202.    196.    141.    141.    127.     90.     90.
203          UI     90.     90.     43.     35.     35.     35.     35.     35.     35.     35.
204          UI     35.     35.     35.      0.      0.      0.      0.      0.      0.      0.
205          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

206          KK      1K
207          KM   SUB-BASIN 1K
208          BA    5.02
209          LG     .22     .34    5.50     .42     .00
210          UI    282.    282.    408.    885.   1201.   1650.   1884.   2112.   2375.   2970.
211          UI   3241.   2147.   1828.   1664.   1544.   1416.   1318.   1178.   1099.    961.
212          UI    843.    733.    686.    648.    596.    518.    463.    372.    360.    323.
213          UI    309.    290.    216.    216.    216.    169.    138.    138.    138.    138.
214          UI    138.     57.     54.     54.     54.     54.     54.     54.     54.     54.
215          UI     54.     54.     54.     54.     54.      0.      0.      0.      0.      0.
216          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

217          KK     C11
218          KM      COMBINE SURFACE RUNOFF AT NODE 11
219          KM      R10-11 + 1J + 1K
220          HC       3
             *
             *

221          KK  R11-12
222          KM   X-SECT. 1L1
223          RS       7    FLOW      -1
224          RL                    1.90    90.7
```

```
225          RC    0.04   0.032    0.04   16790   0.005
226          RX  1249.7  1524.0  1545.0  1552.0  1642.0  1650.0  1680.0  2430.0
227          RY   103.0    95.0    92.6    90.8    90.7    94.1    95.5   103.0
             *
             *
```



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

228          KK      1L
229          KM   SUB-BASIN 1L
230          BA    5.93
231          LG     .15     .33    7.40     .21     .00
232          UI    344.    344.    559.   1123.   1557.   2074.   2367.   2642.   3080.   3958.
233          UI   3390.   2453.   2123.   1973.   1803.   1662.   1517.   1375.   1240.   1092.
234          UI    919.    847.    800.    743.    657.    566.    467.    440.    396.    377.
235          UI    348.    264.    264.    264.    189.    168.    168.    168.    168.    135.
236          UI     66.     66.     66.     66.     66.     66.     66.     66.     66.     66.
237          UI     66.     66.     66.      0.      0.      0.      0.      0.      0.      0.
238          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

239          KK   C12.1
240          KM      TOTAL SURFACE RUNOFF FROM MAJOR BASIN NO. 1 ONLY:  This is the flow
241          KM      in Jackrabbit Wash prior to the confluence of Deadhorse Wash.
242          KM      R11-12 + 1L
243          KO                                  21
244          HC       2
             *
             *

245          KK      2A
246          KM   SUB-BASIN 2A
247          KM      HEADWATERS OF DEADHORSE WASH
248          KM   NODE 13
249          BA    7.76
250          LG     .16     .36    5.40     .28     .00
251          UI    622.    701.   2025.   3173.   4117.   4827.   6253.   6501.   4277.   3660.
252          UI   3259.   2909.   2539.   2200.   1796.   1553.   1420.   1247.   1018.    795.
253          UI    738.    681.    530.    477.    439.    304.    304.    304.    254.    119.
254          UI    119.    119.    119.    119.    119.    119.    119.    119.      0.      0.
255          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

256          KK  R13-14
257          KM   REP. X-SECT. 9B1
258          RS       4    FLOW      -1
259          RL                   0.52    91.2
260          RC    0.03   0.025    0.03    7022   0.007
261          RX  1000.0  1521.0  1533.0  1541.0  1646.0  1664.0  1764.0  1772.0
262          RY    98.2    93.0    92.6    91.2    92.2    94.7    96.6    99.5
             *
             *

263          KK      2B
264          KM   SUB-BASIN 2B
265          BA    4.31
266          LG     .17     .35    4.30     .54     .00
267          UI    382.    562.   1389.   2197.   2744.   3362.   4313.   2752.   2278.   2003.
268          UI   1757.   1526.   1269.   1020.    907.    821.    647.    512.    456.    418.
269          UI    310.    293.    231.    187.    187.    186.     73.     73.     73.     73.
```



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

270          UI     73.     73.     73.     73.     73.      0.      0.      0.      0.      0.
271          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

272          KK     C14
273          KM      COMBINE SURFACE RUNOFF AT NODE 14
274          KM      2A + 2B
275          HC       2
             *
             *

276          KK  R14-15
277          KM   X-SECT. 2C1
278          RS       4    FLOW      -1
279          RL                   2.45    85.5
280          RC    0.03   0.037    0.03   11246    0.01
281          RX  1000.0  1520.0  1616.0  1632.0  1672.0  1744.0  1786.0  2061.0
282          RY    99.5    94.3    91.7    85.5    85.5    87.9    90.2    99.5
             *
             *

283          KK      2C
284          KM   SUB-BASIN 2C
285          BA    3.82
286          LG     .16     .35    5.10     .75     .00
287          UI    415.    892.   2023.   2866.   3706.   4293.   2691.   2270.   1931.   1616.
288          UI   1271.   1027.    908.    708.    532.    464.    377.    318.    236.    203.
289          UI    203.    105.     80.     80.     80.     80.     80.     80.      0.      0.
290          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

291          KK     C15
292          KM      COMBINE SURFACE RUNOFF AT NODE 15
293          KM      R14-15 + 2C
294          KM
295          HC       2
             *
             *

296          KK  R15-17
297          KM   X-SECT. 2D1
298          RS       8    FLOW      -1
299          RL                   1.71    87.0
```

```
300          RC   0.035   0.041   0.035   14890   0.008
301          RX  1000.0  1520.0  1540.0  1546.0  1606.0  1681.0  1714.0  2096.2
302          RY    94.9    90.0    90.0    87.0    87.0    93.0    93.0    94.9
             *
             *
```



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

303          KK      2D
304          KM   SUB-BASIN 2D
305          BA    5.12
306          LG     .15      .36     5.40      .54      .00
307          UI    254.     254.     254.     668.     919.    1244.    1534.    1719.    1898.    2093.
308          UI   2525.    3068.    2283.    1799.    1587.    1483.    1380.    1282.    1195.    1103.
309          UI   1012.     931.     830.     731.     655.     619.     583.     548.     511.     416.
310          UI    392.     324.     324.     286.     278.     278.     198.     194.     194.     194.
311          UI    132.     124.     124.     124.     124.     124.      87.      49.      49.      49.
312          UI     49.      49.      49.      49.      49.      49.      49.      49.      49.      49.
313          UI     49.      49.       0.       0.       0.       0.       0.       0.       0.       0.
314          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
             *
             *

315          KK     C17
316          KM      COMBINE SURFACE RUNOFF AT NODE 17
317          KM      R15-17 + 2D
318          KM
319          HC       2
             *
             *

320          KK  R17-18
321          KM   X-SECT. 2F1
322          RS       3    FLOW      -1
323          RL                    2.45    93.0
324          RC   0.035   0.029   0.035    5914   0.009
325          RX  1000.0  1550.0  1586.0  1613.0  1688.0  1695.0  1705.0  1725.0
326          RY   100.5    95.0    94.5    93.0    93.0    96.5   100.5   100.8
             *
             *

327          KK      2E
328          KM   SUB-BASIN 2E
329          KM   NODE 16
330          BA    2.09
331          LG     .16      .35     4.80      .47      .00
332          UI    220.     441.    1032.    1481.    1868.    2397.    1503.    1247.    1071.     903.
333          UI    740.     572.     507.     417.     318.     266.     238.     169.     161.     108.
334          UI    108.     100.      42.      42.      42.      42.      42.      42.      42.       0.
335          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
336          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
             *
             *

337          KK  R16-18
338          KM   REP. X-SECT. 2C1
339          RS       6    FLOW      -1
340          RL                    0.11    85.5
341          RC   0.03   0.037    0.03   11088   0.007
342          RX  1000.0  1520.0  1616.0  1632.0  1672.0  1744.0  1786.0  2061.0
343          RY    99.5    94.3    91.7    85.5    85.5    87.9    90.2    99.5
             *
             *
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

344          KK     C18
345          KM      COMBINE SURFACE RUNOFF AT NODE 18
346          KM      R16-18 + R17-18
347          HC       2
             *
             *

348          KK  R18-12
349          KM   INTERPOLATE BETWEEN X-SECT. 3B1 AND 2F1
350          RS       6    FLOW      -1
351          RL                    1.90    84.0
352          RC   0.037   0.033   0.037   14520   0.006
353          RX  1000.0  1538.0  1567.0  1580.0  1720.0  1723.0  1752.0  2051.6
354          RY   100.1    93.0    87.0    84.0    84.0    88.0    91.0   100.1
             *
             *

355          KK      2F
356          KM   SUB-BASIN 2F
357          BA    4.89
358          LG     .15      .36     5.30      .49      .00
359          UI    220.     220.     220.     446.     705.     917.    1193.    1368.    1529.    1663.
360          UI   1813.    2150.    2645.    2205.    1641.    1445.    1319.    1257.    1171.    1093.
361          UI   1031.     954.     885.     826.     741.     676.     580.     548.     526.     505.
362          UI    466.     439.     361.     353.     281.     281.     264.     240.     240.     222.
363          UI    168.     168.     168.     168.     123.     107.     107.     107.     107.     107.
364          UI    107.      62.      42.      42.      42.      42.      42.      42.      42.      42.
365          UI     42.      42.      42.      42.      42.      42.      42.      42.      42.       0.
366          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
367          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
             *
             *

368          KK   C12.2
369          KM      TOTAL SURFACE RUNOFF FROM MAJOR BASIN NO. 2 ONLY: This is the flow in
370          KM      Deadhorse Wash prior to it's confluence with Jackrabbit Wash.
371          KM      R18-12 + 2F
372          HC       2
             *
             *

373          KK  BC12.1
374          KM   RECALL HYDROGRAPH C12.1
```

```
375          BI   C12.1      21
             *
             *

376          KK     C12
377          KM      COMBINE SURFACE RUNOFF AT NODE 12:  This is the flow in Jackrabbit
378          KM      Wash after the confluence of Deadhorse Wash.
379          KM      (MAJOR BASIN NO. 1) + (MAJOR BASIN NO. 2)
380          HC       2
             *
             *
```



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

381          KK  R12-21
382          KM   X-SECT. 3B1
383          RS       2    FLOW      -1
384          RL                    1.90    75.0
385          RC    0.04   0.036    0.04    4488   0.007
386          RX  1000.0  1520.0  1545.0  1550.0  1750.0  1755.0  1815.0  2550.0
387          RY    95.2    90.0    77.5    75.0    75.0    77.5    80.5    95.2
             *
             *

388          KK      3A
389          KM   SUB-BASIN 3A
390          KM   NODE 19
391          BA    5.97
392          LG     .22     .32    7.10     .27     .00
393          UI    372.    372.    732.   1304.   1915.   2363.   2716.   3054.   3879.   4160.
394          UI   2752.   2344.   2143.   1950.   1786.   1614.   1465.   1285.   1100.    956.
395          UI    890.    833.    761.    612.    531.    476.    432.    408.    361.    285.
396          UI    285.    271.    182.    182.    182.    182.    175.     71.     71.     71.
397          UI     71.     71.     71.     71.     71.     71.     71.     71.     71.      0.
398          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
399          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

400          KK  R19-21
401          KM   X-SECT. 3B2
402          RS       7    FLOW      -1
403          RL                    1.90    90.3
404          RC   0.045   0.037   0.045   15998   0.01
405          RX  1000.0  1520.0  1540.0  1544.0  1589.0  1619.0  1646.0  2122.2
406          RY   104.0    98.8    92.0    90.3    90.3    93.3    94.0   104.0
             *
             *

407          KK      3D
408          KM   SUB-BASIN 3D
409          KM   NODE 20
410          BA    5.01
411          LG     .24     .32    6.50     .29     .00
412          UI    260.    260.    264.    746.   1025.   1356.   1622.   1835.   2007.   2305.
413          UI   2864.   2888.   1965.   1693.   1543.   1450.   1330.   1240.   1143.   1047.
414          UI    958.    850.    744.    666.    629.    597.    550.    491.    426.    368.
415          UI    332.    318.    284.    284.    237.    199.    199.    199.    152.    127.
416          UI    127.    127.    127.    127.     85.     50.     50.     50.     50.     50.
417          UI     50.     50.     50.     50.     50.     50.     50.     50.     50.     50.
418          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
419          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *
```



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

420          KK  R20-21
421          KM   X-SECT. 3C1
422          RS       5    FLOW      -1
423          RL                    1.90    92.1
424          RC    0.04   0.029   0.045    8976   0.012
425          RX  1000.0  1551.0  1562.0  1566.0  1602.0  1606.0  1627.0  1989.2
426          RY    98.9    94.6    93.7    92.1    92.5    94.2    95.3    98.9
             *
             *

427          KK      3B
428          KM   SUB-BASIN 3B
429          BA    6.25
430          LG     .16     .33    6.10     .41     .00
431          UI    309.    309.    309.    815.   1122.   1518.   1873.   2099.   2317.   2554.
432          UI   3082.   3745.   2786.   2196.   1938.   1810.   1685.   1565.   1459.   1347.
433          UI   1235.   1136.   1013.    892.    800.    756.    712.    669.    624.    508.
434          UI    479.    395.    395.    349.    339.    339.    241.    237.    237.    237.
435          UI    162.    151.    151.    151.    151.    151.    106.     59.     59.     59.
436          UI     59.     59.     59.     59.     59.     59.     59.     59.     59.     59.
437          UI     59.     59.      0.      0.      0.      0.      0.      0.      0.      0.
438          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

439          KK      3C
440          KM   SUB-BASIN 3C
441          BA    5.70
442          LG     .25     .32    6.20     .38     .00
443          UI    256.    256.    256.    520.    822.   1069.   1391.   1594.   1782.   1938.
444          UI   2114.   2506.   3084.   2571.   1913.   1684.   1538.   1465.   1365.   1274.
445          UI   1202.   1112.   1032.    962.    864.    788.    676.    638.    613.    589.
446          UI    543.    512.    420.    411.    327.    327.    308.    280.    280.    259.
447          UI    196.    196.    196.    196.    143.    125.    125.    125.    125.    125.
448          UI    125.     72.     49.     49.     49.     49.     49.     49.     49.     49.
449          UI     49.     49.     49.     49.     49.     49.     49.     49.     49.      0.
450          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
451          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

452          KK     C21
```

```
453          KM      COMBINE SURFACE RUNOFF AT NODE 21
454          KM      R12-21 + R19-21 + R20-21 + 3B + 3C
455          HC       5
             *
             *

456          KK  R21-22
457          KM   X-SECT. 3E1
458          RS       3    FLOW      -1
459          RL                    1.90    89.5
460          RC    0.04   0.035    0.04    6283   0.007
461          RX  1185.0  1605.0  1688.0  1700.0  1880.0  1904.0  2004.0  2284.0
```



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

462          RY   101.0    93.0    92.0    89.5    89.5    93.0    94.0   101.0
             *
             *

463          KK      3E
464          KM   SUB-BASIN 3E
465          BA    2.90
466          LG     .31     .35    4.00     .57     .00
467          UI    250.    368.    950.   1267.   1515.   1848.   2494.   3106.   2451.   2019.
468          UI   1642.   1331.   1030.    593.    429.    354.    250.    153.     77.     77.
469          UI     77.     77.     77.      0.      0.      0.      0.      0.      0.      0.
470          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

471          KK     C22
472          KM      COMBINE SURFACE RUNOFF AT NODE 22
473          KM      R21-22 + 3E
474          KM      (MAJOR BASIN 1) + (MAJOR BASIN 2) + (MAJOR BASIN 3)
475          KM      AGUILA ROAD CROSSING
476          HC       2
             *
             *

477          KK  R22-25
478          KM   X-SECT. 5B1
479          RS       2    FLOW      -1
480          RL                    1.90    87.2
481          RC   0.045   0.029   0.045    3010   0.004
482          RX  1150.0  1550.0  1590.0  1605.0  1773.0  1777.0  1827.0  2707.0
483          RY    99.7    91.7    90.7    87.2    87.4    90.4    90.9    99.7
             *
             *

484          KK      4A
485          KM   SUB-BASIN 4A
486          BA    7.43
487          LG     .15     .35    5.10     .37     .00
488          UI    261.    261.    261.    261.    546.    761.    999.   1178.   1492.   1616.
489          UI   1748.   1902.   2012.   2158.   2470.   2870.   3223.   2430.   1947.   1770.
490          UI   1625.   1548.   1484.   1401.   1329.   1266.   1211.   1128.   1066.   1017.
491          UI    946.    876.    810.    713.    682.    638.    625.    599.    577.    545.
492          UI    510.    428.    428.    370.    333.    333.    326.    285.    285.    285.
493          UI    275.    200.    200.    200.    200.    200.    174.    128.    128.    128.
494          UI    128.    128.    128.    128.    128.    101.     50.     50.     50.     50.
495          UI     50.     50.     50.     50.     50.     50.     50.     50.     50.     50.
496          UI     50.     50.     50.     50.     50.     50.     50.     50.      0.      0.
497          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *
```



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

498          KK      4B
499          KM   SUB-BASIN 4B
500          BA    4.07
501          LG     .17     .35    4.70     .34     .00
502          UI    188.    188.    188.    414.    625.    806.   1067.   1197.   1336.   1447.
503          UI   1618.   1956.   2278.   1631.   1329.   1182.   1105.   1042.    964.    908.
504          UI    844.    778.    731.    658.    593.    517.    478.    456.    432.    406.
505          UI    388.    308.    308.    240.    240.    227.    206.    206.    186.    144.
506          UI    144.    144.    144.     96.     92.     92.     92.     92.     92.     88.
507          UI     36.     36.     36.     36.     36.     36.     36.     36.     36.     36.
508          UI     36.     36.     36.     36.     36.     36.     36.      0.      0.      0.
509          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

510          KK     C23
511          KM      COMBINE SURFACE RUNOFF AT NODE 23
512          KM      4A + 4B
513          HC       2
             *
             *

514          KK  R23-24
515          KM   REP. X-SECT. 2C1
516          RS       2    FLOW      -1
517          RL                    1.90    85.5
518          RC    0.03   0.037    0.03    4277   0.008
519          RX  1000.0  1520.0  1616.0  1632.0  1672.0  1744.0  1786.0  2061.0
520          RY    99.5    94.3    91.7    85.5    85.5    87.9    90.2    99.5
             *
             *

521          KK      4C
522          KM   SUB-BASIN 4C
523          BA    2.65
524          LG     .33     .36    6.00     .19     .00
525          UI    203.    203.    695.    930.   1128.   1316.   1582.   2114.   2553.   2020.
526          UI   1689.   1421.   1181.    982.    701.    421.    344.    288.    203.    157.
527          UI     62.     62.     62.     62.     62.     62.      0.      0.      0.      0.
528          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *
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```
529          KK     C24
530          KM      COMBINE SURFACE RUNOFF AT NODE 24
531          KM      R23-24 + 4C
532          KM      This is the total runoff from Major Basin No. 4
533          HC       2
             *
             *
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

534          KK  R24-25
535          KM   REP. X-SECT. 5B1
536          RS       1    FLOW      -1
537          RL                    1.90    87.2
538          RC   0.045   0.029   0.045    3010   0.007
539          RX  1150.0  1550.0  1590.0  1605.0  1773.0  1777.0  1827.0  2707.0
540          RY    99.7    91.7    90.7    87.2    87.4    90.4    90.9    99.7
             *
             *

541          KK     C25
542          KM      COMBINE SURFACE RUNOFF AT NODE 25
543          KM      R22-25 + R24-25
544          HC       2
             *
             *

545          KK  R25-32
546          KM   INTERPOLATE BETWEEN X-SECT. 6C2 AND 5B1
547          RS       7    FLOW      -1
548          RL                    1.90    89.0
549          RC    0.04   0.034    0.04   15418   0.006
550          RX  1223.9  1535.0  1565.0  1575.0  1707.0  1842.0  1909.0  3109.0
551          RY   104.0    96.0    96.0    89.0    89.0    92.0    94.0   104.0
             *
             *

552          KK      5A
553          KM   SUB-BASIN 5A
554          KM   WOODCHOPPER WASH
555          BA    8.03
556          LG     .26     .35    4.80     .37     .00
557          UI    436.    436.    584.   1500.   1851.   2189.   2460.   2738.   3137.   3546.
558          UI   4553.   5503.   5065.   4260.   3747.   3364.   2927.   2590.   2229.   1958.
559          UI   1477.   1025.    772.    724.    681.    436.    436.    353.    134.    134.
560          UI    134.    134.    134.    134.    134.    134.    134.      0.      0.      0.
561          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

562          KK      5B
563          KM   SUB-BASIN 5B
564          BA    7.36
565          LG     .19     .35    6.10     .45     .00
566          UI    400.    400.    511.   1209.   1658.   2238.   2587.   2935.   3224.   3916.
567          UI   4809.   3461.   2745.   2439.   2281.   2094.   1941.   1780.   1630.   1483.
568          UI   1310.   1138.   1019.    959.    913.    836.    708.    657.    514.    511.
569          UI    456.    438.    419.    306.    306.    306.    260.    196.    196.    196.
570          UI    196.    196.    125.     77.     77.     77.     77.     77.     77.     77.
571          UI     77.     77.     77.     77.     77.     77.     77.      0.      0.      0.
572          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

573          KK     C32
574          KM      COMBINE SURFACE RUNOFF AT NODE 32:  This is the flow in Jackrabbit
575          KM      Wash after the confluence of Woodchopper Wash.
576          KM      R25-32 + 5A + 5B
577          HC       3
             *
             *

578          KK  R32-33
579          KM   REP. X-SECT. 6C2
580          RS       5    FLOW      -1
581          RL                    2.45    90.8
582          RC   0.035   0.038   0.035   11405   0.007
583          RX  1000.0  1520.0  1540.0  1545.0  1642.0  1906.0  1992.0  2632.0
584          RY   106.2   101.0   101.0    90.8    91.1    93.7    96.6   106.2
             *
             *

585          KK      5C
586          KM   SUB-BASIN 5C
587          BA    3.56
588          LG     .35     .35    6.20     .48     .00
589          UI    279.    293.    980.   1309.   1571.   1859.   2244.   3085.   3406.   2655.
590          UI   2239.   1850.   1536.   1248.    844.    493.    460.    324.    279.    130.
591          UI     85.     85.     85.     85.     85.      0.      0.      0.      0.      0.
592          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

593          KK     C33
594          KM      COMBINE SURFACE RUNOFF AT NODE 33
595          KM      R32-33 + 5C
596          KM      (MAJOR BASIN 1) + (MAJOR BASIN 2) + (MAJOR BASIN 3) + (MAJOR BASIN 4)
597          KM                      + (MAJOR BASIN 5)
598          KM      Crossing at Vulture Mine Road
599          HC       2
             *
             *

600          KK  R33-34
601          KM   X-SECT. 6C-AM1
602          KM   Jackrabbit Wash HEC-2 Section 14.232
```

```
603          RS      13    FLOW      -1
604          RL                    2.45  1580.6
605          RC   0.035   0.038   0.035   28195   0.007
606          RX  8890.0  9690.0  9927.0 10035.0 10061.0 10095.0 10215.0 12285.0
607          RY  1603.9  1595.9  1585.4  1580.6  1581.4  1583.2  1583.2  1603.9
             *
             *
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

608          KK      6C
609          KM   SUB-BASIN 6C
610          BA    2.23
611          LG     .35     .35    4.40     .96     .00
612          UI    147.    147.    367.    597.    735.    846.    973.   1141.   1461.   1862.
613          UI   1625.   1348.   1178.    999.    856.    725.    581.    376.    260.    242.
614          UI    191.    147.    128.     45.     45.     45.     45.     45.     45.     45.
615          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
616          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

617          KK     C34
618          KM      COMBINE SURFACE RUNOFF AT NODE 34
619          KM      R33-34 + 6C
620          HC       2
             *
             *

621          KK  R34-37
622          KM   X-SECT. 6D-AM3
623          KM   Jackrabbit Wash HEC-2 Section 11.608
624          RS       7    FLOW      -1
625          RL                    2.45  1485.3
626          RC   0.035   0.038   0.035   11405   0.006
627          RX  8983.0  9783.0  9905.0  9981.0 10000.0 10034.0 10302.0 10473.0
628          RY  1499.8  1491.8  1491.6  1485.3  1485.5  1488.8  1489.7  1501.6
             *
             *

629          KK      6A
630          KM   SUB-BASIN 6A
631          KM   NODE 35
632          BA    3.66
633          LG     .34     .36    6.80     .21     .00
634          UI    262.    262.    790.   1140.   1388.   1604.   1898.   2320.   3189.   3040.
635          UI   2440.   2102.   1761.   1487.   1255.    897.    556.    449.    407.    262.
636          UI    262.     84.     80.     80.     80.     80.     80.     80.      0.      0.
637          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

638          KK  R35-36
639          KM   X-SECT. 6B-AM1
640          KM   Jackrabbit Wash West Fork HEC-2 Section 2.550
641          RS      14    FLOW      -1
642          RL                    0.40  1535.2
643          RC   0.035   0.036   0.035   28195   0.007
644          RX  9121.0  9921.0  9955.0  9985.0 10019.0 10049.0 10104.0 10451.5
645          RY  1555.2  1547.2  1540.0  1535.2  1535.5  1540.3  1538.1  1555.2
             *
             *
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

646          KK      6B
647          KM   SUB-BASIN 6B
648          BA    4.76
649          LG     .35     .35    4.40     .58     .00
650          UI    258.    258.    346.    889.   1097.   1298.   1458.   1623.   1859.   2102.
651          UI   2699.   3262.   3002.   2525.   2221.   1994.   1735.   1536.   1321.   1160.
652          UI    876.    608.    457.    429.    404.    258.    258.    209.     79.     79.
653          UI     79.     79.     79.     79.     79.     79.     79.      0.      0.      0.
654          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

655          KK     C36
656          KM      COMBINE SURFACE RUNOFF AT NODE 36
657          KM      R35-36 + 6B
658          HC       2
             *
             *

659          KK  R36-37
660          KM   X-SECT. 6D-AM2
661          KM   Jackrabbit Wash West Fork HEC-2 Section 1.064
662          RS       7    FLOW      -1
663          RL                    0.41  1483.5
664          RC   0.035   0.036   0.035    8976   0.007
665          RX  9010.0  9810.0  9955.0 10000.0 10030.0 10063.0 10180.0 10388.0
666          RY  1495.5  1487.5  1487.6  1483.6  1483.5  1487.7  1488.0  1499.8
             *
             *

667          KK     C37
668          KM      COMBINE SURFACE RUNOFF AT NODE 37
669          KM      R34-37 + R36-37
670          HC       2
             *
             *

671          KK  R37-38
672          KM   X-SECT. 6D-AM3
673          KM   Jackrabbit Wash HEC-2 Section 8.870
674          KM   CHANNEL ROUTE TO NODE 38I
675          RS       7    FLOW      -1
676          RL                    2.45  1395.3
677          RC   0.035   0.029   0.035   13200   0.007
```

```
678          RX  9196.4  9670.0  9793.0  9910.0  9999.0 10218.0 10314.0 12194.0
679          RY  1415.5  1407.5  1400.7  1395.8  1395.3  1397.3  1396.7  1415.5
             *
             *
```



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

680          KK      6D
681          KM   SUB-BASIN 6D
682          BA    3.67
683          LG     .35     .35    3.30     .85     .00
684          UI    257.    257.    740.   1099.   1345.   1546.   1825.   2181.   2970.   3143.
685          UI   2493.   2132.   1818.   1540.   1281.   1025.    645.    453.    423.    300.
686          UI    257.    162.     79.     79.     79.     79.     79.     79.      0.      0.
687          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

688          KK  C38I.1
689          KM      R37-38 + 6D
690          KM      This is the flow in Jackrabbit Wash prior to the confluence of Star Wash.
691          KM      MAJOR BASIN'S  1 + 2 + 3 + 4 + 5 + 6
692          KO                                     21
693          HC       2
             *
             *

694          KK      7A
695          KM   SUB-BASIN 7A
696          KM   HEADWATERS OF POWERLINE WASH
697          KM   NODE 26
698          BA    5.19
699          LG     .26     .32    6.80     .21     .00
700          UI    282.    282.    377.    969.   1196.   1415.   1590.   1770.   2027.   2292.
701          UI   2943.   3557.   3273.   2754.   2422.   2174.   1892.   1674.   1441.   1265.
702          UI    955.    663.    499.    468.    440.    282.    282.    228.     86.     86.
703          UI     86.     86.     86.     86.     86.     86.     86.      0.      0.      0.
704          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

705          KK  R26-27
706          KM   X-SECT. 7B1
707          RS      14    FLOW      -1
708          RL                    0.26    91.0
709          RC   0.035   0.044   0.035   21384   0.009
710          RX  1000.0  1542.0  1610.0  1616.0  1621.0  1630.0  1669.0  2119.8
711          RY    99.5    94.1    94.4    91.0    91.3    94.2    95.1    99.5
             *
             *

712          KK      7B
713          KM   SUB-BASIN 7B
714          BA    6.11
715          LG     .34     .34    5.20     .41     .00
716          UI    343.    343.    531.   1202.   1501.   1758.   1978.   2228.   2549.   2969.
717          UI   3823.   4434.   3676.   3147.   2798.   2468.   2145.   1873.   1633.   1312.
718          UI    922.    607.    580.    563.    359.    343.    303.    105.    105.    105.
719          UI    105.    105.    105.    105.    105.      0.      0.      0.      0.      0.
720          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *
```



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

721          KK     C27
722          KM      COMBINE SURFACE RUNOFF AT NODE 27
723          KM      R26-27 + 7B
724          HC       2
             *
             *

725          KK  R27-29
726          KM   INTERPOLATE BETWEEN X-SECT. 7B1 AND 7E1
727          RS      10    FLOW      -1
728          RL                    0.10    92.0
729          RC   0.033   0.042   0.033   12989   0.006
730          RX  1000.0  1555.0  1613.0  1622.0  1637.0  1647.0  1676.0  2051.0
731          RY    99.8    94.2    94.4    92.0    92.0    93.4    96.0    99.8
             *
             *

732          KK      7C
733          KM   SUB-BASIN 7C
734          KM   NODE 28
735          BA    6.81
736          LG     .27     .33    5.90     .42     .00
737          UI    353.    353.    361.   1178.   1439.   1702.   1933.   2129.   2404.   2706.
738          UI   3198.   4048.   4566.   3803.   3290.   2937.   2649.   2299.   2055.   1784.
739          UI   1565.   1193.    846.    624.    591.    580.    370.    353.    353.    125.
740          UI    108.    108.    108.    108.    108.    108.    108.    108.      0.      0.
741          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

742          KK  R28-29
743          KM   INTERPOLATE BETWEEN X-SECT. 7B1 AND 7E1
744          RS      12    FLOW      -1
745          RL                    0.28    92.0
746          RC   0.033   0.042   0.033   18586   0.009
747          RX  1000.0  1555.0  1613.0  1622.0  1637.0  1647.0  1676.0  2051.0
748          RY    99.8    94.2    94.4    92.0    92.0    93.4    96.0    99.8
             *
             *

749          KK     C29
750          KM      COMBINE SURFACE RUNOFF AT NODE 29
751          KM      R27-29 + R28-29
752          HC       2
```

```
                 *
                 *
753              KK  R29-30
754              KM   REP. XSECT. 7E1
755              RS       1    FLOW      -1
756              RL                   0.23    92.7
757              RC    0.03    0.04    0.03    3221   0.011
758              RX  1396.5  1569.0  1617.0  1626.0  1665.0  1672.7  1683.0  2223.0
759              RY   102.3    94.3    94.5    93.0    92.7    94.5    96.9   102.3
                 *
                 *
1                                          HEC-1 INPUT                                                          PAGE 21
LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

760              KK      7D
761              KM   SUB-BASIN 7D
762              BA    5.84
763              LG     .35     .35    4.80     .48     .00
764              UI    427.    427.   1347.   1893.   2294.   2661.   3172.   3959.   5389.   4696.
765              UI   3829.   3296.   2742.   2293.   1890.   1312.    756.    711.    553.    427.
766              UI    300.    131.    131.    131.    131.    131.    131.     0.      0.      0.
767              UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                 *
                 *

768              KK     C30
769              KM      COMBINE SURFACE RUNOFF AT NODE 30
770              KM      R29-30 + 7D
771              KM      Crossing at Vulture Mine Road
772              HC       2
                 *
                 *

773              KK  R30-31
774              KM   X-SECT. 7E1
775              RS      19    FLOW      -1
776              RL                   0.33    92.7
777              RC    0.03    0.04    0.03   36590   0.006
778              RX  1396.5  1569.0  1617.0  1626.0  1665.0  1672.7  1683.0  2223.0
779              RY   102.3    94.3    94.5    93.0    92.7    94.5    96.9   102.3
                 *
                 *

780              KK      7F
781              KM   SUB-BASIN 7F
782              BA    2.63
783              LG     .35     .35    4.20     .51     .00
784              UI    155.    155.    290.    560.    717.    828.    928.   1067.   1220.   1528.
785              UI   1962.   1801.   1498.   1308.   1158.    994.    866.    748.    601.    411.
786              UI    275.    261.    242.    155.    155.    100.     48.     48.     48.     48.
787              UI     48.     48.     48.     48.      0.      0.      0.      0.      0.      0.
788              UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                 *
                 *

789              KK     C31
790              KM      COMBINE SURFACE RUNOFF AT NODE 31
791              KM      R30-31 + 7F
792              HC       2
                 *
                 *

793              KK  R31-84
794              KM   REP. X-SECT. 7E1
795              RS       8    FLOW      -1
796              RL                   0.33    92.7
797              RC    0.03    0.04    0.03   13992   0.005
798              RX  1396.5  1569.0  1617.0  1626.0  1665.0  1672.7  1683.0  2223.0
1                                          HEC-1 INPUT                                                          PAGE 22
LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

799              RY   102.3    94.3    94.5    93.0    92.7    94.5    96.9   102.3
                 *
                 *

800              KK      7E
801              KM   SUB-BASIN 7E
802              BA    8.30
803              LG     .35     .35    4.50     .38     .00
804              UI    333.    333.    333.    436.   1093.   1268.   1529.   1677.   1832.   1981.
805              UI   2149.   2392.   2589.   2978.   3677.   4164.   4139.   3562.   3177.   2893.
806              UI   2672.   2452.   2192.   2006.   1816.   1646.   1483.   1218.    956.    649.
807              UI    589.    561.    547.    483.    333.    333.    333.    232.    102.    102.
808              UI    102.    102.    102.    102.    102.    102.    102.    102.    102.    102.
809              UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
810              UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                 *
                 *

811              KK   C84.1
812              KM      R31-84 + 7E
813              KM      TOTAL SURFACE RUNOFF FROM MAJOR BASIN NO. 7
814              KM      This is the flow in Powerline Wash prior to it's confluence
815              KM      with Star Wash.
816              KO                                      21
817              HC       2
                 *
                 *

818              KK     10A
819              KM   SUB-BASIN 10A
820              KM   NODE 50
821              BA    2.01
822              LG     .15     .33    6.10     .32     .00
823              UI    144.    144.    382.    618.    873.   1028.   1178.   1549.   1446.    990.
824              UI    857.    778.    698.    623.    558.    474.    398.    353.    328.    296.
825              UI    237.    197.    182.    158.    153.    110.    110.    100.     70.     70.
826              UI     70.     70.     34.     28.     28.     28.     28.     28.     28.     28.
827              UI     28.     28.     28.      0.      0.      0.      0.      0.      0.      0.
```

```
828          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

829          KK  R50-51
830          KM   X-SECT. 10B1
831          RS      24    FLOW      -1
832          RL                    0.54    93.5
833          RC    0.03   0.038    0.03   37594   0.013
834          RX  1000.0  1587.0  1608.0  1612.0  1620.0  1624.0  1684.0  2324.6
835          RY   101.1    94.4    94.7    93.5    93.8    95.0    94.1   101.1
             *
             *
```



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

836          KK     10B
837          KM   SUB-BASIN 10B
838          BA    5.36
839          LG     .35     .35    4.50     .62     .00
840          UI    328.    328.    681.   1214.   1557.   1798.   2025.   2343.   2716.   3538.
841          UI   4226.   3490.   2961.   2618.   2245.   1959.   1660.   1398.   1011.    615.
842          UI    561.    539.    342.    328.    236.    101.    101.    101.    101.    101.
843          UI    101.    101.      0.      0.      0.      0.      0.      0.      0.      0.
844          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

845          KK     C51
846          KM      COMBINE SURFACE RUNOFF AT NODE 51
847          KM      R50-51 + 10B
848          HC       2
             *
             *

849          KK  R51-57
850          KM   INTERPOLATE BETWEEN X-SECT. 10H1 AND 10B1
851          RS       6    FLOW      -1
852          RL                    0.54    93.0
853          RC  0.033   0.038   0.033    8026   0.007
854          RX  1014.0  1554.0  1587.0  1601.0  1641.0  1651.0  1691.0  2566.2
855          RY   103.4    95.4    95.8    93.0    93.0    94.5    94.5   103.4
             *
             *

856          KK     10D
857          KM   SUB-BASIN 10D
858          KM   HEADWATERS OF TANK WASH
859          KM   NODE 52
860          BA    4.54
861          LG     .15     .32    7.30     .17     .00
862          UI    243.    243.    289.    719.    993.   1329.   1553.   1756.   1924.   2291.
863          UI   2900.   2270.   1726.   1509.   1408.   1298.   1196.   1114.   1008.    942.
864          UI    822.    730.    636.    594.    560.    524.    476.    399.    352.    310.
865          UI    299.    266.    266.    217.    186.    186.    186.    130.    119.    119.
866          UI    119.    119.    119.     53.     47.     47.     47.     47.     47.     47.
867          UI     47.     47.     47.     47.     47.     47.     47.     47.      0.      0.
868          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

869          KK  R52-55
870          KM   X-SECT. 10E2
871          RS      11    FLOW      -1
872          RL                    0.54    86.5
873          RC  0.035   0.036   0.035   18216   0.013
874          RX  1000.0  1520.0  1620.0  1623.0  1631.0  1637.0  1737.0  2257.0
875          RY    95.2    90.0    89.5    86.5    86.5    89.5    90.0    95.2
             *
             *
```



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

876          KK     10E
877          KM   SUB-BASIN 10E
878          BA    2.72
879          LG     .32     .36    4.80     .51     .00
880          UI    218.    252.    774.   1051.   1249.   1488.   1824.   2570.   2524.   1989.
881          UI   1679.   1375.   1135.    885.    526.    377.    337.    218.    185.     67.
882          UI     67.     67.     67.     67.     67.      0.      0.      0.      0.      0.
883          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

884          KK     C55
885          KM      COMBINE SURFACE RUNOFF AT NODE 55
886          KM      Crossing at Vulture Mine Road
887          KM      R52-55 + 10E
888          HC       2
             *
             *

889          KK  R55-57
890          KM   INTERPOLATE BETWEEN X-SECT. 10E1 AND 10H1
891          RS       9    FLOW      -1
892          RL                    0.54    93.0
893          RC  0.033   0.038   0.033   15523    0.01
894          RX  1000.0  1520.0  1599.0  1611.0  1652.0  1662.0  1686.0  2326.5
895          RY   101.1    95.9    95.7    93.0    93.0    94.3    95.0   101.1
             *
             *

896          KK     C57
897          KM      COMBINE SURFACE RUNOFF AT NODE 57
898          KM      R51-57 + R55-57
899          HC       2
             *
             *
```

```
900          KK  R57-58
901          KM   REP. X-SECT. 10H1
902          RS       3    FLOW      -1
903          RL                    0.43    92.6
904          RC   0.035   0.037   0.035    5597   0.007
905          RX  1000.0  1520.0  1568.0  1588.0  1664.0  1677.0  1697.0  2407.0
906          RY   102.1    96.9    97.0    92.6    92.6    94.0    95.0   102.1
             *
             *

907          KK     10C
908          KM   SUB-BASIN 10C
909          BA    5.66
910          LG     .35     .35    4.10     .63     .00
911          UI    291.    291.    796.   1219.   1497.   1718.   2013.   2377.   3168.   3675.
912          UI   2934.   2486.   2150.   1811.   1529.   1270.    899.    518.    488.    414.
913          UI    291.    273.     89.     89.     89.     89.     89.     89.     89.      0.
914          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1                                          HEC-1 INPUT                                          PAGE 25

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

915          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

916          KK     C58
917          KM      COMBINE SURFACE RUNOFF AT NODE 58
918          KM      R57-58 + 10C
919          HC       2
             *
             *

920          KK  R58-59
921          KM   X-SECT. 10H1
922          RS       2    FLOW      -1
923          RL                    1.90    92.6
924          RC   0.035   0.037   0.035    4013   0.005
925          RX  1000.0  1520.0  1568.0  1588.0  1664.0  1677.0  1697.0  2407.0
926          RY   102.1    96.9    97.0    92.6    92.6    94.0    95.0   102.1
             *
             *

927          KK     10F
928          KM   SUB-BASIN 10F
929          KM   NODE 53
930          BA    5.68
931          LG     .21     .30    7.80     .15     .00
932          UI    361.    361.    741.   1306.   1901.   2318.   2672.   3050.   3916.   3767.
933          UI   2572.   2211.   2042.   1846.   1694.   1506.   1373.   1185.   1009.    901.
934          UI    843.    778.    669.    587.    461.    452.    395.    395.    287.    277.
935          UI    277.    204.    177.    177.    177.    177.     96.     69.     69.     69.
936          UI     69.     69.     69.     69.     69.     69.     69.     69.      0.      0.
937          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

938          KK  R53-54
939          KM   X-SECT. 10G1
940          RS      18    FLOW      -1
941          RL                    0.38    92.3
942          RC   0.045   0.048   0.045   33792   0.015
943          RX  1000.0  1520.0  1601.0  1606.0  1616.0  1621.0  1630.0  1773.6
944          RY   100.8    95.6    93.6    92.5    92.3    93.6    94.0   100.8
             *
             *

945          KK     10G
946          KM   SUB-BASIN 10G
947          BA    4.28
948          LG     .20     .35    5.20     .42     .00
949          UI    240.    240.    348.    755.   1024.   1407.   1607.   1801.   2025.   2532.
950          UI   2763.   1831.   1558.   1419.   1316.   1207.   1123.   1005.    937.    819.
951          UI    718.    625.    585.    552.    508.    442.    395.    317.    307.    275.
952          UI    263.    247.    184.    184.    184.    144.    118.    118.    118.    118.
953          UI    118.     49.     46.     46.     46.     46.     46.     46.     46.     46.
954          UI     46.     46.     46.     46.     46.      0.      0.      0.      0.      0.
1                                          HEC-1 INPUT                                          PAGE 26

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

955          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

956          KK     C54
957          KM      COMBINE SURFACE RUNOFF AT NODE 54
958          KM      R53-54 + 10G
959          KM      Crossing at Vulture Mine Road
960          HC       2
             *
             *

961          KK  R54-59
962          KM   INTERPOLATE BETWEEN X-SECT. 10H1 AND 10G1
963          RS      15    FLOW      -1
964          RL                    0.54    92.5
965          RC   0.04   0.043    0.04   27614   0.009
966          RX  1120.0  1520.0  1585.0  1597.0  1639.0  1650.0  1665.0  1933.8
967          RY   104.1    96.1    95.3    92.5    92.5    93.8    94.5   104.1
             *
             *

968          KK     10H
969          KM   SUB-BASIN 10H
970          BA    6.74
971          LG     .35     .35    3.90     .76     .00
972          UI    334.    334.    334.    999.   1291.   1577.   1770.   1946.   2164.   2450.
973          UI   2745.   3447.   4182.   4037.   3401.   2993.   2708.   2421.   2131.   1907.
974          UI   1676.   1462.   1126.    815.    590.    564.    548.    394.    334.    334.
975          UI    197.    102.    102.    102.    102.    102.    102.    102.    102.    102.
976          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
977          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

```
                 *
                 *
 978             KK     C59
 979             KM      COMBINE SURFACE RUNOFF AT NODE 59
 980             KM      R58-59 + R54-59 + 10H
 981             HC       3
                 *
                 *
 982             KK  R59-61
 983             KM   REP. X-SECT. 10H1
 984             RS       4    FLOW      -1
 985             RL                    2.61    92.6
 986             RC   0.035   0.037   0.035    7181   0.007
 987             RX  1000.0  1520.0  1568.0  1588.0  1664.0  1677.0  1697.0  2407.0
 988             RY   102.1    96.9    97.0    92.6    92.6    94.0    95.0   102.1
                 *
                 *
1                                        HEC-1 INPUT                                                    PAGE 27

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

 989             KK     10I
 990             KM   SUB-BASIN 10I
 991             KM   HEADWATERS OF MILL WASH
 992             KM   NODE 60
 993             BA    6.93
 994             LG     .23     .32    6.70     .25     .00
 995             UI    329.    329.    329.    781.   1133.   1461.   1936.   2143.   2393.   2592.
 996             UI   2985.   3648.   3766.   2537.   2212.   1997.   1891.   1755.   1630.   1538.
 997             UI   1405.   1306.   1200.   1075.    953.    855.    804.    762.    724.    687.
 998             UI    555.    540.    431.    420.    399.    360.    360.    320.    252.    252.
 999             UI    252.    242.    161.    161.    161.    161.    161.    161.    118.     63.
1000             UI     63.     63.     63.     63.     63.     63.     63.     63.     63.     63.
1001             UI     63.     63.     63.     63.     63.      0.      0.      0.      0.      0.
1002             UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                 *
                 *
1003             KK  R60-61
1004             KM   INTERPOLATE BETWEEN X-SECT. 10J1 AND 10J2
1005             RS      27    FLOW      -1
1006             RL                    0.64    93.3
1007             RC   0.038   0.035   0.038   44299   0.01
1008             RX  1000.0  1520.0  1622.0  1627.0  1632.0  1638.0  1667.0  2427.0
1009             RY   100.9    95.7    95.5    93.3    93.3    94.7    94.9   100.9
                 *
                 *
1010             KK     10J
1011             KM   SUB-BASIN 10J
1012             BA    7.08
1013             LG     .35     .34    4.40     .61     .00
1014             UI    367.    367.    375.   1225.   1496.   1769.   2009.   2213.   2499.   2813.
1015             UI   3324.   4209.   4747.   3953.   3421.   3053.   2754.   2391.   2136.   1854.
1016             UI   1627.   1240.    879.    649.    614.    602.    385.    367.    367.    130.
1017             UI    112.    112.    112.    112.    112.    112.    112.    112.      0.      0.
1018             UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                 *
                 *
1019             KK     C61
1020             KM      COMBINE SURFACE RUNOFF AT NODE 61
1021             KM      R59-61 + R60-61 + 10J
1022             HC       3
                 *
                 *
1023             KK  R61-82
1024             KM   X-SECT. 10L1
1025             RS      13    FLOW      -1
1026             RL                    1.90    90.7
1027             RC    0.04   0.034    0.03   17213   0.005
1028             RX  1248.0  1563.0  1695.0  1704.0  1749.0  1761.0  1979.0  2639.0
1029             RY   101.8    93.8    94.3    90.7    90.7    93.5    95.2   101.8
                 *
                 *
1                                        HEC-1 INPUT                                                    PAGE 28

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

1030             KK     10L
1031             KM   SUB-BASIN 10L
1032             BA    6.34
1033             LG     .35     .35    3.90     .69     .00
1034             UI    362.    362.    598.   1280.   1613.   1880.   2112.   2386.   2739.   3253.
1035             UI   4221.   4575.   3738.   3229.   2878.   2496.   2187.   1886.   1644.   1228.
1036             UI    834.    640.    595.    518.    362.    362.    207.    111.    111.    111.
1037             UI    111.    111.    111.    111.    111.      0.      0.      0.      0.      0.
1038             UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                 *
                 *
1039             KK   C82.1
1040             KM      COMBINE SURFACE RUNOFF AT NODE 82.1
1041             KM      R61-82 + 10L
1042             KM      This is the flow from the area to the west of Star Wash prior to
1043             KM      it's confluence with Star Wash.
1044             KO                                      21
1045             HC       2
                 *
                 *
1046             KK     10M
1047             KM   SUB-BASIN 10M
1048             KM   NODE 67
1049             BA    6.17
1050             LG     .21     .32    7.00     .17     .00
1051             UI    330.    330.    393.    978.   1349.   1806.   2110.   2386.   2615.   3114.
1052             UI   3941.   3085.   2345.   2051.   1914.   1764.   1626.   1515.   1370.   1281.
```

```
1053          UI   1117.    992.    864.    807.    762.    712.    647.    542.    479.    421.
1054          UI    406.    361.    361.    295.    253.    253.    253.    177.    161.    161.
1055          UI    161.    161.    161.     72.     63.     63.     63.     63.     63.     63.
1056          UI     63.     63.     63.     63.     63.     63.     63.     63.      0.      0.
1057          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1058          KK  R67-68
1059          KM   INTERPOLATE BETWEEN X-SECT. 10N1 AND 10N2
1060          RS      27    FLOW      -1
1061          RL                   0.65    90.8
1062          RC   0.035   0.045   0.035   43402    0.01
1063          RX  1000.0  1520.0  1619.0  1630.0  1637.0  1647.0  1753.0  2076.3
1064          RY    99.7    94.5    93.9    90.8    90.8    94.3    94.4    99.7
              *
              *

1065          KK     10K
1066          KM   SUB-BASIN 10K
1067          KM   NODE 63
1068          BA    5.44
1069          LG     .32     .35    5.10     .44     .00
1070          UI    291.    291.    359.    990.   1218.   1441.   1624.   1802.   2060.   2314.
1071          UI   2836.   3639.   3525.   2936.   2565.   2308.   2022.   1779.   1559.   1378.
```



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

1072          UI   1101.    795.    514.    496.    478.    342.    291.    291.    124.     89.
1073          UI     89.     89.     89.     89.     89.     89.     89.      0.      0.      0.
1074          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1075          KK  R63-68
1076          KM   REP. X-SECT. 10R1
1077          RS       7    FLOW      -1
1078          RL                   0.42    92.0
1079          RC   0.035   0.033   0.035   11986   0.008
1080          RX  1000.0  1520.0  1553.0  1562.0  1572.0  1580.0  1694.0  2244.0
1081          RY   102.9    97.7    94.9    92.0    92.1    95.6    97.4   102.9
              *
              *

1082          KK     10N
1083          KM   SUB-BASIN 10N
1084          BA    3.47
1085          LG     .35     .36    4.60     .47     .00
1086          UI    201.    201.    354.    719.    914.   1060.   1189.   1352.   1549.   1890.
1087          UI   2464.   2448.   2009.   1745.   1554.   1341.   1171.   1008.    851.    620.
1088          UI    387.    347.    331.    236.    201.    193.     62.     62.     62.     62.
1089          UI     62.     62.     62.     62.      0.      0.      0.      0.      0.      0.
1090          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1091          KK     C68
1092          KM      COMBINE SURFACE RUNOFF AT NODE 68
1093          KM      R67-68 + R63-68 + 10N
1094          HC       3
              *
              *

1095          KK  R68-72
1096          KM   REP. X-SECT. 10N2
1097          RS       4    FLOW      -1
1098          RL                   0.54    89.5
1099          RC    0.03   0.043   0.035    4805   0.005
1100          RX  1000.0  1520.0  1592.0  1607.0  1613.0  1625.0  1739.0  1989.0
1101          RY    99.6    94.4    93.4    89.6    89.5    94.4    93.1    99.6
              *
              *

1102          KK     10S
1103          KM   SUB-BASIN 10S
1104          KM   HEADWATERS OF STAR WASH
1105          KM   NODE 70
1106          BA    3.92
1107          LG     .30     .36    5.50     .23     .00
1108          UI    269.    269.    737.   1130.   1388.   1592.   1866.   2203.   2936.   3406.
1109          UI   2719.   2304.   1992.   1679.   1417.   1177.    833.    480.    452.    383.
1110          UI    269.    253.     83.     83.     83.     83.     83.     83.     83.      0.
1111          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```



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

1112          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1113          KK  R70-71
1114          KM   X-SECT. 10U1
1115          RS      12    FLOW      -1
1116          RL                   0.54    90.9
1117          RC    0.03   0.044    0.03   23179   0.009
1118          RX  1000.0  1551.0  1571.0  1584.0  1593.0  1607.0  1620.0  1730.5
1119          RY   101.1    95.6    92.6    90.9    91.0    94.1    98.9   101.1
              *
              *

1120          KK     10T
1121          KM   SUB-BASIN 10T
1122          KM   NODE 69
1123          BA    3.81
1124          LG     .34     .35    5.40     .36     .00
1125          UI    252.    252.    628.   1019.   1256.   1446.   1663.   1950.   2496.   3181.
1126          UI   2776.   2303.   2013.   1707.   1462.   1238.    992.    642.    445.    414.
1127          UI    326.    252.    218.     77.     77.     77.     77.     77.     77.     77.
1128          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1129          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
```

```
                *
1130            KK  R69-71
1131            KM   X-SECT. 10U2
1132            RS      12    FLOW       -1
1133            RL                     0.48    91.6
1134            RC    0.03    0.04     0.03   18586   0.009
1135            RX  1000.0  1575.0  1641.0  1651.0  1652.0  1663.0  1699.0  2027.3
1136            RY   101.7    94.0    94.8    91.6    91.6    94.6    95.1   101.7
                *
                *
1137            KK     10U
1138            KM   SUB-BASIN 10U
1139            BA    4.26
1140            LG     .35     .36    4.90     .47     .00
1141            UI    305.    305.    920.   1327.   1615.   1867.   2209.   2700.   3711.   3538.
1142            UI   2840.   2447.   2050.   1731.   1461.   1044.    647.    522.    473.    305.
1143            UI    305.     97.     94.     94.     94.     94.     94.     94.      0.      0.
1144            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *
1145            KK     C71
1146            KM      COMBINE SURFACE RUNOFF AT NODE 71
1147            KM      R70-71 + R69-71 + 10U
1148            HC       3
                *
                *
1                                          HEC-1 INPUT                                          PAGE 31

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

1149            KK  R71-72
1150            KM   REP. X-SECT. 10U2
1151            RS       5    FLOW       -1
1152            RL                     0.54    91.6
1153            RC    0.03    0.04     0.03    7181   0.005
1154            RX  1000.0  1575.0  1641.0  1651.0  1652.0  1663.0  1699.0  2027.3
1155            RY   101.7    94.0    94.8    91.6    91.6    94.6    95.1   101.7
                *
                *
1156            KK     C72
1157            KM      COMBINE SURFACE RUNOFF AT NODE 72
1158            KM      R68-72 + R71-72
1159            HC       2
                *
                *
1160            KK  R72-81
1161            KM   REP. X-SECT. 10U2
1162            KO                                     22
1163            RS       4    FLOW       -1
1164            RL                     0.54    91.6
1165            RC    0.03    0.04     0.03    6178   0.005
1166            RX  1000.0  1575.0  1641.0  1651.0  1652.0  1663.0  1699.0  2027.3
1167            RY   101.7    94.0    94.8    91.6    91.6    94.6    95.1   101.7
                *
                *
1168            KK     10Q
1169            KM   SUB-BASIN 10Q
1170            KM   NODE 75
1171            BA    2.61
1172            LG     .22     .32    7.10     .24     .00
1173            UI    231.    341.    841.   1331.   1661.   2036.   2612.   1667.   1380.   1213.
1174            UI   1064.    924.    769.    617.    549.    497.    392.    310.    276.    253.
1175            UI    188.    177.    140.    113.    113.    113.     44.     44.     44.     44.
1176            UI     44.     44.     44.     44.     44.      0.      0.      0.      0.      0.
1177            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *
1178            KK  R75-76
1179            KM   X-SECT. 10R3
1180            RS      19    FLOW       -1
1181            RL                     0.08    86.0
1182            RC   0.035   0.057    0.035   25397   0.011
1183            RX  1000.0  1520.0  1570.0  1577.0  1582.0  1589.0  1639.0  2159.0
1184            RY    95.2    90.0    89.5    86.0    86.0    89.5    90.0    95.2
                *
                *
1                                          HEC-1 INPUT                                          PAGE 32

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

1185            KK     10O
1186            KM   SUB-BASIN 10O
1187            KM   HEADWATERS OF BOX WASH
1188            KM   NODE 73
1189            BA    3.08
1190            LG     .17     .30    8.20     .09     .00
1191            UI    288.    474.   1114.   1765.   2158.   2820.   2892.   1883.   1621.   1412.
1192            UI   1220.   1031.    822.    699.    631.    507.    397.    345.    315.    228.
1193            UI    221.    160.    141.    141.    109.     55.     55.     55.     55.     55.
1194            UI     55.     55.     55.      0.      0.      0.      0.      0.      0.      0.
1195            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *
1196            KK  R73-74
1197            KM   X-SECT. 10P2
1198            RS       9    FLOW       -1
1199            RL                     0.21    91.1
1200            RC    0.03   0.031     0.03   24922   0.019
1201            RX  1000.0  1522.0  1534.0  1539.0  1611.0  1620.0  1644.0  1878.2
1202            RY    98.7    93.5    93.2    91.5    91.1    93.1    94.5    98.7
                *
                *
```

```
1203          KK     10P
1204          KM   SUB-BASIN 10P
1205          BA    6.15
1206          LG     .20      .32     7.00      .23      .00
1207          UI    324.     324.     358.     940.    1306.    1731.    2046.    2312.    2536.    2960.
1208          UI   3731.    3324.    2360.    2063.    1902.    1767.    1631.    1519.    1381.    1277.
1209          UI   1153.    1025.     875.     807.     765.     726.     676.     551.     523.     413.
1210          UI    413.     368.     354.     346.     248.     248.     248.     227.     158.     158.
1211          UI    158.     158.     158.     137.      62.      62.      62.      62.      62.      62.
1212          UI     62.      62.      62.      62.      62.      62.      62.      62.      62.       0.
1213          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
1214          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

1215          KK     C74
1216          KM      COMBINE SURFACE RUNOFF AT NODE 74
1217          KM      R73-74 + 10P
1218          HC       2
              *
              *

1219          KK  R74-76
1220          KM   X-SECT. 10R1
1221          RS      11     FLOW      -1
1222          RL                     0.17     92.0
1223          RC   0.035    0.033    0.035    26189    0.013
1224          RX  1000.0   1520.0   1553.0   1562.0   1572.0   1580.0   1694.0   2244.0
1225          RY   102.9     97.7     94.9     92.0     92.1     95.6     97.4    102.9
              *
              *
```



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

1226          KK     10R
1227          KM   SUB-BASIN 10R
1228          BA    4.93
1229          LG     .16      .36     5.80      .31      .00
1230          UI    263.     263.     314.     781.    1078.    1443.    1686.    1906.    2090.    2488.
1231          UI   3149.    2465.    1874.    1639.    1529.    1409.    1299.    1210.    1095.    1023.
1232          UI    893.     793.     690.     645.     609.     569.     517.     433.     382.     337.
1233          UI    324.     289.     289.     236.     202.     202.     202.     141.     129.     129.
1234          UI    129.     129.     129.      58.      50.      51.      50.      51.      50.      51.
1235          UI     50.      51.      51.      50.      51.      50.      51.      50.       0.       0.
1236          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

1237          KK     C76
1238          KM      COMBINE SURFACE RUNOFF AT NODE 76
1239          KM      R75-76 + R74-76 + 10R
1240          HC       3
              *
              *

1241          KK  R76-77
1242          KM   INTERPOLATE BETWEEN X-SECT. 10V1 AND 10V2
1243          RS      10     FLOW      -1
1244          RL                     0.54     89.9
1245          RC   0.035     0.04    0.035    17002    0.008
1246          RX  1000.0   1520.0   1632.0   1637.0   1663.0   1670.0   1751.0   1949.0
1247          RY    95.8     93.2     92.3     89.9     89.9     92.3     92.5     95.8
              *
              *

1248          KK     10V
1249          KM   SUB-BASIN 10V
1250          BA    3.12
1251          LG     .35      .35     4.90      .46      .00
1252          UI    219.     219.     629.     934.    1143.    1315.    1551.    1854.    2525.    2672.
1253          UI   2120.    1812.    1546.    1310.    1089.     871.     548.     385.     360.     255.
1254          UI    219.     138.      67.      67.      67.      67.      67.      67.       0.       0.
1255          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

1256          KK     C77
1257          KM      COMBINE SURFACE RUNOFF AT NODE 77
1258          KM      R76-77 + 10V
1259          HC       2
              *
              *
```



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

1260          KK  R77-80
1261          KM   REP. X-SECT. 10V2
1262          RS       4     FLOW      -1
1263          RL                     0.54     92.8
1264          RC   0.035    0.035    0.035     6178    0.007
1265          RX  1000.0   1520.0   1643.0   1650.0   1685.0   1692.0   1755.0   2040.0
1266          RY   101.7     96.5     95.6     92.8     92.8     95.9     96.0    101.7
              *
              *

1267          KK     10W
1268          KM   SUB-BASIN 10W
1269          KM   NODE 78
1270          BA    5.30
1271          LG     .20      .30     8.00      .11      .00
1272          UI    302.     302.     465.     969.    1322.    1804.    2050.    2296.    2622.    3311.
1273          UI   3267.    2221.    1917.    1766.    1619.    1486.    1370.    1245.    1130.     992.
1274          UI    856.     766.     720.     678.     632.     499.     460.     386.     375.     331.
1275          UI    331.     259.     232.     232.     216.     148.     148.     148.     148.     148.
1276          UI     90.      58.      58.      58.      58.      58.      58.      58.      58.      58.
1277          UI     58.      58.      58.      58.       0.       0.       0.       0.       0.       0.
1278          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *
```

```
1279        KK  R78-79
1280        KM   X-SECT. 10X1
1281        RS       9    FLOW      -1
1282        RL                    0.21    93.0
1283        RC   0.035   0.049   0.035   18691   0.012
1284        RX  1200.0  1520.0  1576.0  1579.0  1588.0  1596.0  1650.0  2005.0
1285        RY   104.0    96.0    96.2    93.0    93.1    95.1    96.9   104.0
            *
            *

1286        KK     10X
1287        KM   SUB-BASIN 10X
1288        BA    2.74
1289        LG     .30     .34    6.60     .20     .00
1290        UI    177.    177.    380.    663.    957.   1159.   1332.   1543.   2034.   1671.
1291        UI   1219.   1066.    979.    886.    808.    724.    646.    562.    465.    431.
1292        UI    404.    371.    295.    259.    227.    206.    194.    169.    136.    136.
1293        UI    120.     87.     87.     87.     87.     64.     34.     34.     34.     34.
1294        UI     34.     34.     34.     34.     34.     34.     34.     34.      0.      0.
1295        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
            *
            *

1296        KK     C79
1297        KM      COMBINE SURFACE RUNOFF AT NODE 79
1298        KM      R78-79 + 10X
1299        HC       2
            *
            *
```



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

1300        KK  R79-80
1301        KM   X-SECT. 10Y1
1302        RS      20    FLOW      -1
1303        RL                    0.54    93.7
1304        RC   0.035   0.051    0.03   27614   0.008
1305        RX  1000.0  1520.0  1676.0  1683.0  1699.0  1705.0  1825.0  2375.0
1306        RY   102.8    97.6    96.9    93.7    93.7    95.8    97.3   102.8
            *
            *

1307        KK     10Y
1308        KM   SUB-BASIN 10Y
1309        BA    3.70
1310        LG     .35     .36    4.70     .49     .00
1311        UI    204.    204.    279.    630.    859.   1169.   1343.   1515.   1681.   2078.
1312        UI   2428.   1643.   1369.   1224.   1145.   1046.    970.    887.    809.    732.
1313        UI    647.    549.    506.    479.    449.    415.    336.    304.    261.    252.
1314        UI    224.    224.    179.    157.    157.    156.    100.    100.    100.    100.
1315        UI    100.     83.     39.     39.     39.     39.     39.     39.     39.     39.
1316        UI     39.     39.     39.     39.     39.     39.      0.      0.      0.      0.
1317        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
            *
            *

1318        KK     C80
1319        KM      COMBINE SURFACE RUNOFF AT NODE 80
1320        KM      R77-80 + R79-80 + 10Y
1321        HC       3
            *
            *

1322        KK  R80-81
1323        KM   REP. X-SECT. 10Y1
1324        KM      This is the flow from the area to the east of Star Wash prior to
1325        KM      it's confluence with Star Wash.
1326        RS       6    FLOW      -1
1327        RL                    0.33    93.7
1328        RC   0.035   0.051    0.03    7920   0.005
1329        RX  1000.0  1520.0  1676.0  1683.0  1699.0  1705.0  1825.0  2375.0
1330        RY   102.8    97.6    96.9    93.7    93.7    95.8    97.3   102.8
            *
            *

1331        KK  BR7281
1332        KM      RECALL HYDROGRAPH R72-81
1333        BI  R72-81      22
            *
            *
```



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

1334        KK     C81
1335        KM      COMBINE SURFACE RUNOFF AT NODE 81:  This is the total runoff at
1336        KM      Node 81.
1337        KM      R72-81 + R80-81
1338        HC       2
            *
            *

1339        KK  R81-82
1340        KM   REP. X-SECT. 10AB2
1341        RS       6    FLOW      -1
1342        RL                    1.90    94.1
1343        RC   0.035   0.029   0.035    9398   0.006
1344        RX   600.0  1500.0  1571.0  1578.0  1682.0  1693.0  1733.0  2733.0
1345        RY   102.0    97.5    97.3    94.1    94.1    96.8    97.0   102.0
            *
            *

1346        KK     10Z
1347        KM   SUB-BASIN 10Z
1348        BA    3.69
1349        LG     .35     .35    4.40     .65     .00
1350        UI    254.    254.    608.   1035.   1472.   1747.   1984.   2485.   2905.   1887.
1351        UI   1583.   1441.   1294.   1176.   1045.    928.    800.    660.    610.    567.
1352        UI    505.    417.    338.    320.    278.    275.    194.    194.    188.    124.
```

```
1353          UI    124.    124.    124.     88.     49.     49.     49.     49.     49.     49.
1354          UI     49.     49.     49.     49.     49.      0.      0.      0.      0.      0.
1355          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1356          KK  BC82.1
1357          KM     RECALL HYDROGRAPH C82.1
1358          BI   C82.1      21
              *
              *

1359          KK     C82
1360          KM      COMBINE SURFACE RUNOFF AT NODE 82:  This is the total runoff at
1361          KM      Node 82
1362          KM      C82.1 + R81-82 + 10Z
1363          HC       3
              *
              *

1364          KK  R82-84
1365          KM   X-SECT. 10AB2
1366          RS       4    FLOW      -1
1367          RL                    1.90    94.1
1368          RC   0.035   0.029   0.035    7022   0.005
1369          RX   800.0  1500.0  1571.0  1578.0  1782.0  1793.0  1833.0  2333.0
1370          RY   101.0    97.5    97.3    94.1    94.1    96.8    97.0   101.0
              *
              *
```



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

1371          KK    10AA
1372          KM   SUB-BASIN 10AA
1373          KM   NODE 83
1374          BA    1.63
1375          LG     .35     .36    6.30     .29     .00
1376          UI    128.    133.    408.    628.    829.    973.   1218.   1420.    915.    769.
1377          UI    691.    615.    542.    475.    399.    328.    302.    274.    223.    183.
1378          UI    163.    140.    131.     98.     98.     76.     62.     62.     62.     40.
1379          UI     24.     24.     24.     24.     24.     24.     24.     24.     24.      0.
1380          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1381          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1382          KK  R83-84
1383          KM   X-SECT. 10AB1
1384          RS      27    FLOW      -1
1385          RL                    0.21    83.5
1386          RC    0.04   0.071    0.04   30202   0.006
1387          RX  1000.0  1500.0  1540.0  1640.0  1650.0  1750.0  1790.0  2290.0
1388          RY    92.7    90.2    90.0    83.5    83.5    90.0    90.2    92.7
              *
              *

1389          KK    10AB
1390          KM   SUB-BASIN 10AB
1391          BA    4.31
1392          LG     .35     .35    5.20     .33     .00
1393          UI    238.    238.    324.    734.   1001.   1362.   1564.   1765.   1958.   2420.
1394          UI   2828.   1914.   1595.   1426.   1334.   1218.   1130.   1034.    943.    852.
1395          UI    754.    639.    589.    558.    523.    483.    391.    354.    304.    294.
1396          UI    261.    261.    208.    182.    182.    182.    116.    116.    116.    116.
1397          UI    116.     97.     46.     46.     46.     46.     46.     46.     46.     46.
1398          UI     46.     46.     46.     46.     46.     46.      0.      0.      0.      0.
1399          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1400          KK   C84.2
1401          KM      TOTAL SURFACE RUNOFF FROM MAJOR BASIN NO. 10 ONLY:  This is the flow
1402          KM      in Star Wash prior to the confluence of Powerline Wash.
1403          KM      R82-84 + R83-84 + 10AB
1404          HC       3
              *
              *

1405          KK  BC84.1
1406          KM      RECALL HYDROGRAPH C84.1
1407          BI   C84.1      21
              *
              *
```



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

1408          KK     C84
1409          KM      COMBINE SURFACE RUNOFF AT NODE 84:  This is the flow in Star Wash
1410          KM      after the confluence of Powerline Wash.
1411          KM      C84.2 + C84.1
1412          KM      (MAJOR BASIN 7) + (MAJOR BASIN 10)
1413          HC       2
              *
              *

1414          KK  R84-38
1415          KM   X-SECT. 8A-AM1
1416          KM   Star Wash HEC-2 Section 1.100
1417          KM   CHANNEL ROUTE TO NODE 38I
1418          RS       8    FLOW      -1
1419          RL                    1.51  1390.3
1420          RC   0.035   0.029   0.035   10982   0.006
1421          RX  9616.3  9815.0  9942.0  9957.0 10031.0 10083.0 10956.0 11726.0
1422          RY  1401.8  1393.8  1392.3  1390.5  1390.3  1392.9  1394.1  1401.8
              *
              *

1423          KK      8A
1424          KM   SUB-BASIN 8A
```

```
1425          BA    6.27
1426          LG     .35      .35     3.90      .57      .00
1427          UI    285.     285.     285.     674.    1025.    1241.    1421.    1571.    1720.    1901.
1428          UI   2127.    2374.    2915.    3537.    3573.    3021.    2660.    2411.    2202.    1955.
1429          UI   1758.    1571.    1404.    1229.     959.     723.     505.     491.     469.     412.
1430          UI    285.     285.     285.     106.      87.      87.      87.      87.      87.      87.
1431          UI     87.      87.      87.      87.       0.       0.       0.       0.       0.       0.
1432          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

1433          KK  C38I.2
1434          KM      R84-38 + 8A
1435          KM      This is the flow in Star Wash prior to it's confluence with
1436          KM      Jackrabbit Wash.
1437          KM      (MAJOR BASIN 7) + (MAJOR BASIN 8) + (MAJOR BASIN 10)
1438          HC       2
              *
              *

1439          KK  BC38I1
1440          KM   RECALL HYDROGRAPH C38I.1
1441          BI  C38I.1      21
              *
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1442          KK    C38I
1443          KO                                      21
1444          KM      COMBINE SURFACE RUNOFF AT NODE 38I
1445          KM      This is the total flow to Node 38I at the CAP Canal.
1446          KM      (MAJOR BASINS 1 + 2 + 3 + 4 + 5 + 6) + (MAJOR BASINS 7 + 8 + 10)
1447          HC       2
              *
              *

1448          KK    CLR1
1449          KM      CLEAR HEC-1 STACK
1450          HC       5
              *
              *

1451          KK      9A
1452          KM   SUB-BASIN 9A
1453          KM   HEADWATERS OF COYOTE WASH
1454          KM   NODE 39
1455          BA    4.64
1456          LG     .21      .35     4.20      .38      .00
1457          UI    279.     279.     501.     943.    1347.    1717.    1981.    2200.    2681.    3322.
1458          UI   2315.    1865.    1657.    1534.    1398.    1288.    1155.    1052.     916.     785.
1459          UI    701.     658.     613.     551.     458.     388.     356.     322.     306.     276.
1460          UI    214.     214.     214.     140.     137.     137.     137.     137.      79.      53.
1461          UI     53.      53.      53.      53.      53.      53.      53.      53.      53.      53.
1462          UI     53.       0.       0.       0.       0.       0.       0.       0.       0.       0.
1463          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

1464          KK  R39-40
1465          KM   X-SECT. 981
1466          RS       4    FLOW      -1
1467          RL                     1.31     91.2
1468          RC    0.03    0.025    0.03     9398    0.013
1469          RX  1000.0   1521.0   1533.0   1541.0   1646.0   1664.0   1764.0   1772.0
1470          RY    98.2     93.0     92.6     91.2     92.2     94.7     96.6     99.5
              *
              *

1471          KK      9B
1472          KM   SUB-BASIN 9B
1473          BA    8.49
1474          LG     .25      .35     5.20      .36      .00
1475          UI    493.     493.     800.    1608.    2229.    2970.    3388.    3783.    4410.    5666.
1476          UI   4854.    3512.    3040.    2825.    2582.    2379.    2173.    1968.    1775.    1564.
1477          UI   1316.    1212.    1145.    1063.     940.     810.     669.     630.     567.     540.
1478          UI    498.     378.     378.     378.     271.     241.     241.     241.     241.     193.
1479          UI     94.      94.      94.      94.      94.      94.      94.      94.      94.      94.
1480          UI     94.      94.      94.       0.       0.       0.       0.       0.       0.       0.
1481          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1482          KK     C40
1483          KM      COMBINE SURFACE RUNOFF AT NODE 40
1484          KM      R39-40 + 9B
1485          HC       2
              *
              *

1486          KK  R40-41
1487          KM   X-SECT. 9C1
1488          KM      This is the flow in Coyote Wash prior to the confluence of Blue Wash.
1489          RS      11    FLOW      -1
1490          RL                     2.45     87.3
1491          RC   0.035    0.032    0.035    21226    0.008
1492          RX  1000.0   1520.0   1570.0   1582.0   1657.0   1669.0   1699.0   2208.6
1493          RY    95.0     90.0     89.8     87.3     87.3     89.3     89.9     95.0
              *
              *

1494          KK      9C
1495          KM   SUB-BASIN 9C
1496          KM      BLUE WASH;  This is the flow in Blue Wash prior to it's confluence
1497          KM      with Coyote Wash.
1498          BA    7.32
1499          LG     .29      .34     6.40      .32      .00
```

```
1500          UI    483.    483.   1206.   1958.   2414.   2778.   3195.   3746.   4796.   6112.
1501          UI   5334.   4424.   3867.   3280.   2809.   2379.   1906.   1233.    855.    796.
1502          UI    627.    483.    419.    148.    148.    148.    148.    148.    148.    148.
1503          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1504          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1505          KK     C41
1506          KM      COMBINE SURFACE RUNOFF AT NODE  41
1507          KM      R40-41 + 9C
1508          KM      This is the flow in Coyote Wash after the confluence of Blue Wash.
1509          HC       2
              *
              *

1510          KK  R41-43
1511          KM   X-SECT. 9E1
1512          KM      This is ONLY a channel route to Node 43:  This is NOT the TOTAL flow
1513          KM      in Coyote Wash just prior to the confluence of Beer Bottle Wash.
1514          RS      11    FLOW      -1
1515          RL                   0.77    89.9
1516          RC    0.04   0.036    0.03   15998   0.008
1517          RX  1000.0  1590.0  1620.0  1639.0  1675.0  1684.0  1846.0  1906.0
1518          RY    99.0    94.8    95.0    91.0    89.9    94.6    95.5    99.1
              *
              *
```



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

1519          KK      9D
1520          KM   SUB-BASIN 9D
1521          KM      HEADWATERS OF BEER BOTTLE WASH
1522          KM      NODE 42
1523          BA    6.24
1524          LG     .25     .30    7.10     .21     .00
1525          UI    350.    350.    508.   1101.   1493.   2051.   2342.   2625.   2952.   3692.
1526          UI   4028.   2669.   2272.   2069.   1919.   1760.   1638.   1465.   1366.   1194.
1527          UI   1047.    911.    853.    805.    741.    644.    575.    463.    447.    401.
1528          UI    384.    361.    268.    268.    268.    210.    171.    171.    171.    171.
1529          UI    171.     71.     67.     67.     67.     67.     67.     67.     67.     67.
1530          UI     67.     67.     67.     67.     67.      0.      0.      0.      0.      0.
1531          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1532          KK  R42-43
1533          KM   REP. X-SECT. 9E1
1534          KM      This is ONLY a channel route to Node 43:  This is NOT the TOTAL flow
1535          KM      in Beer Bottle Wash just prior to it's confluence with Coyote Wash.
1536          RS       8    FLOW      -1
1537          RL                   0.77    89.9
1538          RC    0.04   0.036    0.03   11616   0.008
1539          RX  1000.0  1590.0  1620.0  1639.0  1675.0  1684.0  1846.0  1906.0
1540          RY    99.0    94.8    95.0    91.0    89.9    94.6    95.5    99.1
              *
              *

1541          KK     C43
1542          KM      ADD CHANNEL ROUTES AT NODE 43:  This is  NOT  the flow in
1543          KM      Coyote Wash after the confluence of Beer Bottle Wash.
1544          KM      R41-43 + R42-43
1545          HC       2
              *
              *

1546          KK  R43-44
1547          KM   INTERPOLATE BETWEEN X-SECT. 3B1 AND 2F1
1548          RS       2    FLOW      -1
1549          RL                   2.17    84.0
1550          RC   0.037   0.033   0.037    4277   0.007
1551          RX  1000.0  1538.0  1567.0  1580.0  1720.0  1723.0  1752.0  2051.6
1552          RY   100.1    93.0    87.0    84.0    84.0    88.0    91.0   100.1
              *
              *

1553          KK      9E
1554          KM   SUB-BASIN 9E
1555          BA    6.08
1556          LG     .29     .36    5.10     .64     .00
1557          UI    525.    772.   1992.   2656.   3177.   3875.   5229.   6511.   5138.   4233.
1558          UI   3442.   2792.   2160.   1243.    899.    743.    525.    321.    161.    161.
1559          UI    161.    161.    161.      0.      0.      0.      0.      0.      0.      0.
1560          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1561          KK      9F
1562          KM   SUB-BASIN 9F
1563          BA    1.75
1564          LG     .23     .35    4.90     .58     .00
1565          UI    210.    545.   1156.   1577.   2264.   1577.   1203.   1013.    832.    641.
1566          UI    513.    439.    319.    256.    219.    161.    133.    103.    103.     50.
1567          UI     40.     40.     40.     40.     40.      0.      0.      0.      0.      0.
1568          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1569          KK     C44
1570          KM      COMBINE SURFACE RUNOFF AT NODE 44
1571          KM      This is the flow in Coyote Wash approximately 4480 feet downstream
1572          KM      of the confluence of Beer Bottle Wash with Coyote Wash.
1573          KM      This is also the flow in Coyote Wash prior to the the flow split.
1574          KM      R43-44 + 9E + 9F
1575          HC       3
              *
              *
```

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1576          KK   CP44E
1577          KM      Flow split diversion operation at Node 44 in Coyote Wash
1578          KM      CP44W = FLOW CONTINUING IN WEST FORK: R44-47
1579          KM      CP44E = FLOW DIVERTED TO EASH FORK: R44-45
1580          DT   CP44W
1581          DI      0.   1000.   1800.   4000.   6500.   9500.  13200.  17600.  22800.  28000.
1582          DQ      0.   1000.   1800.   2000.   3100.   4300.   5700.   7600.  10000.  12500.
              *
              *

1583          KK  R44-45
1584          KM   X-SECT. DIV1E
1585          KM      THIS IS THE RUNOFF TRAVELING THROUGH THE EAST FINGER OF COYOTE WASH AFTER
1586          KM      THE FLOW SPLIT.
1587          RS       3    FLOW      -1
1588          RL                    0.71    49.0
1589          RC   0.035   0.049   0.035    3379   0.006
1590          RX  1000.0  1695.0  1758.0  2155.0  2195.0  2215.0  2299.0  2985.4
1591          RY    59.6    56.0    52.0    49.0    49.0    52.0    52.7    59.6
              *
              *

1592          KK      9G
1593          KM   SUB-BASIN 9G
1594          BA    1.00
1595          LG     .35     .35    4.00     .60     .00
1596          UI     96.    182.    403.    524.    645.    833.   1189.    976.    779.    620.
1597          UI    491.    344.    186.    159.     99.     73.     30.     30.     30.     30.
1598          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1599          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1600          KK     C45
1601          KM      COMBINE SURFACE RUNOFF AT NODE 45
1602          KM      R44-45 + 9G
1603          KM      Crossing at Wickenburg Road
1604          HC       2
              *
              *

1605          KK  R45-46
1606          KM   X-SECT. 9I1
1607          KM      CHANNEL ROUTE TO NODE 46I
1608          RS       9    FLOW      -1
1609          RL                    0.56    88.2
1610          RC   0.035   0.049   0.035   10402   0.006
1611          RX  1000.0  1520.0  1540.0  1550.0  1572.0  1577.0  1597.0  1957.0
1612          RY    95.2    90.0    89.8    88.2    88.2    91.2    91.6    95.2
              *
              *

1613          KK      9I
1614          KM   SUB-BASIN 9I
1615          BA    4.81
1616          LG     .35     .35    3.70     .51     .00
1617          UI    463.    875.   1936.   2522.   3102.   4008.   5718.   4695.   3749.   2983.
1618          UI   2361.   1654.    896.    764.    475.    351.    142.    142.    142.    142.
1619          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1620          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1621          KK     9IW
1622          KO                                    21
1623          KM      DIVERT FLOW TO EAST SIDE OF SUB-BASIN 9I TO SIMULATE
1624          KM      RETENTION PONDING IN THE EAST SIDE DEPRESSION.
1625          KM      9IW = Flow continuing to Node 46 at CAP-4
1626          KM      DT9IE = Flow diverted to depression at East side of
1627          KM              Sub-basin 9I along C.A.P. Canal.
1628          DT   DT9IE     109
1629          DI       0     200    1000    2000    3000    4000    5000
1630          DQ       0     100     500    1000    1500    2000    2500
              *
              *

1631          KK    C46I
1632          KO                                    21
1633          KM      COMBINE SURFACE RUNOFF AT NODE 46I
1634          KM      R45-46 + 9IW
1635          KM      This is the flow to Node 46I at the CAP Canal,from the East finger
1636          KM      of the Coyote Wash flow split. (CAP-4)
1637          HC       2
              *
              *
```



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

1638          KK    C46O
1639          KM      ROUTE NODE 46 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1640          KM      BOX FLUME OVERSHOOT  STATION 293+50,   U.S. IE.= 1376.71
1641          KM      TOP OF DIKE ELEVATION = 1385.7
1642          KO                                    21
1643          RS       1    ELEV    1368
1644          RL                   0.272    1368
1645          SV       0     2.1    19.1    35.0    72.0   133.0   478.0  1296.0
1646          SE    1368    1372    1376 1376.71  1378.4    1380  1381.5    1384
1647          SQ       0       0       0       0     475    1200    2100    3899
              *
              *

1648          KK  BCP44W
1649          KO                                    21
1650          KM      RETRIEVE WEST FINGER OF FLOW SPLIT DIVERSION AT NODE 44 IN COYOTE WASH.
1651          DR   CP44W
              *
```

```
                *
1652            KK  R44-47
1653            KM   X-SECT. DIV1W
1654            KM      THIS IS THE RUNOFF TRAVELING THROUGH THE WEST FINGER OF COYOTE WASH
1655            KM      AFTER THE FLOW SPLIT.
1656            RS       9    FLOW     -1
1657            RL                   0.44    49.0
1658            RC   0.036   0.049   0.035   12514   0.007
1659            RX  1000.0  1300.0  1370.0  1450.0  1495.0  1600.0  1770.0  1933.0
1660            RY    55.7    52.7    52.0    49.0    49.0    54.0    52.0    57.0
                *
                *

1661            KK      9H
1662            KM   SUB-BASIN 9H
1663            BA    1.47
1664            LG     .23     .35    4.00     .81     .00
1665            UI    183.    501.   1053.   1421.   1979.   1255.   1008.    837.    677.    506.
1666            UI    424.    338.    248.    207.    159.    137.     90.     90.     61.     35.
1667            UI     35.     35.     35.     35.      0.      0.      0.      0.      0.      0.
                *
                *

1668            KK    C47I
1669            KO                                   21
1670            KM      COMBINE SURFACE RUNOFF AT NODE 47I
1671            KM      R44-47 + 9H
1672            KM      This is the flow to Node 47I at the CAP Canal,from the West finger
1673            KM      of the Coyote Wash flow split. (CAP-3)
1674            HC       2   35.99
                *
                *
1                                          HEC-1 INPUT                                          PAGE 45

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

1675            KK    C47O
1676            KM      ROUTE NODE 47 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1677            KM      BOX FLUME OVERSHOOT  STATION 180+50,   U.S. IE.= 1377.18
1678            KM      TOP OF DIKE ELEVATION = 1385.7
1679            KO                                   21
1680            RS       1    ELEV    1371
1681            RL                   0.434    1371
1682            SV       0     4.0    84.8   130.0   359.2   970.6
1683            SE   1371.    1372    1376 1377.18    1380    1384
1684            SQ       0       0       0       0     880    3380
                *
                *

1685            KK     11A
1686            KO                                   21
1687            KM   SUB-BASIN 11A
1688            KM   This is the flow to Node 85I at the CAP Canal. (CAP-6  AND  CAP-7)
1689            BA    2.18
1690            LG     .35     .35    4.10     .50     .00
1691            UI    156.    156.    471.    679.    827.    956.   1130.   1382.   1899.   1811.
1692            UI   1454.   1252.   1049.    886.    748.    534.    331.    267.    242.    156.
1693            UI    156.     50.     48.     48.     48.     48.     48.     48.      0.      0.
1694            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *

1695            KK    C85O
1696            KM      ROUTE NODE 85 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1697            KM      CAP-6; 66" CULVERT, STATION 393+00.,  U.S. IE= 1372.18
1698            KM              TOP OF DIKE ELEVATION = 1381.4
1699            KM      CAP-7; 66" CULVERT, STATION 402+50.,  U.S. IE= 1371.80
1700            KM              TOP OF DIKE ELEVATION = 1381.4
1701            KM      [ASSUMED U.S. IE.=1371.9]
1702            KO                                   21
1703            RS       1    ELEV  1371.9
1704            RL                   0.434  1371.9
1705            SA       0    2.71   22.88   78.79
1706            SE  1371.9    1372    1376    1380
1707            SQ       0       6     183     478
                *
                *

1708            KK     12A
1709            KM   SUB-BASIN 12A
1710            KM      NODE 86
1711            BA    4.88
1712            LG     .19     .31    8.00     .11     .00
1713            UI    299.    299.    562.   1028.   1489.   1869.   2148.   2402.   2987.   3514.
1714            UI   2299.   1927.   1754.   1605.   1463.   1334.   1206.   1082.    948.    791.
1715            UI    731.    688.    632.    534.    476.    382.    373.    327.    327.    244.
1716            UI    229.    229.    183.    146.    146.    146.    146.    112.     57.     57.
1717            UI     57.     57.     57.     57.     57.     57.     57.     57.     57.     57.
1718            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1719            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *
1                                          HEC-1 INPUT                                          PAGE 46

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

1720            KK  R86-88
1721            KM   X-SECT. 12C2
1722            RS      23    FLOW     -1
1723            RL                   0.21    91.2
1724            RC    0.03   0.047   0.035   41501   0.011
1725            RX  1000.0  1633.0  1596.0  1604.0  1617.0  1627.0  1648.0  1833.2
1726            RY    98.6    93.3    94.5    91.2    91.5    94.5    94.0    98.6
                *
                *

1727            KK     12B
1728            KM   SUB-BASIN 12B
1729            KM      HEADWATERS OF DAGGS WASH
1730            KM      NODE 87
```

```
1731          BA    4.79
1732          LG     .27      .34     5.60      .58      .00
1733          UI    230.     230.     230.     641.     858.    1070.    1191.    1321.    1453.    1637.
1734          UI   1819.    2172.    2709.    2985.    2497.    2178.    1956.    1778.    1568.    1403.
1735          UI   1248.    1103.     944.     703.     485.     408.     382.     379.     243.     230.
1736          UI    230.     119.      71.      71.      71.      71.      71.      71.      71.      71.
1737          UI     71.      0.       0.       0.       0.       0.       0.       0.       0.       0.
1738          UI      0.      0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

1739          KK  R87-88
1740          KM   REP. X-SECT. 12C1
1741          RS       2    FLOW       -1
1742          RL                     0.42     92.7
1743          RC   0.035   0.033    0.035     2006    0.002
1744          RX  1233.2  1572.0   1644.0   1654.0   1665.0   1675.0   1750.0   2340.0
1745          RY   101.8    93.8     94.6     92.9     92.7     94.8     95.9    101.8
              *
              *

1746          KK     12C
1747          KM   SUB-BASIN 12C
1748          BA    3.64
1749          LG     .30      .34     5.60      .48      .00
1750          UI    195.     195.     240.     663.     815.     964.    1086.    1206.    1371.    1548.
1751          UI   1897.    2435.    2359.    1965.    1716.    1544.    1353.    1190.    1043.     922.
1752          UI    737.     532.     344.     332.     320.     229.     195.     195.      83.      60.
1753          UI     60.      60.      60.      60.      60.      60.      60.       0.       0.       0.
1754          UI      0.      0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

1755          KK     C88
1756          KM      COMBINE SURFACE RUNOFF AT NODE 88
1757          KM      R86-88 + R87-88 + 12C
1758          HC       3
              *
              *
```



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

1759          KK  R88-89
1760          KM   INTERPOLATE BETWEEN X-SECT. 12D1 AND 12D2
1761          RS      15    FLOW       -1
1762          RL                     1.10     92.0
1763          RC   0.035   0.032    0.035    16315    0.003
1764          RX  1351.3  1560.0   1744.0   1762.0   1806.0   1819.0   1903.0   2368.0
1765          RY   102.2    94.2     95.0     92.0     92.0     94.7     94.7    102.2
              *
              *

1766          KK     12D
1767          KM   SUB-BASIN 12D
1768          BA    5.29
1769          LG     .35      .34     5.90      .35      .00
1770          UI    307.     307.     540.    1096.    1393.    1616.    1813.    2062.    2361.    2881.
1771          UI   3757.    3733.    3063.    2661.    2369.    2044.    1785.    1537.    1298.     945.
1772          UI    590.     530.     504.     360.     307.     294.      94.      94.      94.      94.
1773          UI     94.      94.      94.      94.       0.       0.       0.       0.       0.       0.
1774          UI      0.      0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

1775          KK     C89
1776          KM      COMBINE SURFACE RUNOFF AT NODE 89
1777          KM      R88-89 + 12D
1778          HC       2
              *
              *

1779          KK  R89-90
1780          KM   X-SECT. 12E1
1781          KM      CHANNEL ROUTE TO NODE 90I
1782          RS      12    FLOW       -1
1783          RL                     0.77     91.3
1784          RC    0.04   0.034     0.04    32525    0.009
1785          RX  1000.0  1520.0   1540.0   1550.0   1593.0   1605.0   1645.0   2145.0
1786          RY   102.6    97.4     97.0     91.3     91.6     96.1     97.6    102.6
              *
              *

1787          KK     12E
1788          KM   SUB-BASIN 12E
1789          BA    7.54
1790          LG     .35      .35     5.60      .38      .00
1791          UI    379.     379.     379.    1174.    1499.    1799.    2035.    2235.    2494.    2819.
1792          UI   3207.    4096.    4828.    4408.    3742.    3316.    3005.    2657.    2346.    2079.
1793          UI   1834.    1565.    1158.     780.     670.     623.     593.     379.     379.     369.
1794          UI    116.     116.     116.     116.     116.     116.     116.     116.     116.     116.
1795          UI      0.      0.       0.       0.       0.       0.       0.       0.       0.       0.
1796          UI      0.      0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *
```



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

1797          KK    C90I
1798          KO                                   21
1799          KM      COMBINE SURFACE RUNOFF AT NODE 90I
1800          KM      This is the flow to Node 90I at CAP Canal Structure CAP-8.
1801          KM      R89-90 + 12E
1802          HC       2
              *
              *

1803          KK    C90O
1804          KM      ROUTE NODE 90 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1805          KM      BOX FLUME OVERSHOOT  STATION 485+00,   U.S. IE.= 1373.3
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```
1806          KM      TOP OF DIKE ELEVATION = 1383.0
1807          KO                                  21
1808          RS       1    ELEV  1373.3
1809          RL                   0.333  1373.3
1810          SA       0   12.27   31.17   56.96   92.15
1811          SE  1373.3    1376    1380    1384    1388
1812          SQ       0     600    2300    4220    5600
              *
              *

1813          KK     13A
1814          KM   SUB-BASIN 13A
1815          KM      This is the total flow from Major Basin 13:  Node 91I at CAP Canal
1816          KM      Structure CAP-9.
1817          KO                                  21
1818          BA     .90
1819          LG     .35     .35    3.90     .38     .00
1820          UI    205.    720.   1100.   1811.   1356.    892.    440.    225.    104.     49.
1821          UI     49.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1822          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1823          KK    C910
1824          KM      ROUTE NODE 91 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1825          KM      DOUBLE 36" CULVERTS, STATION 344+25.,  U.S. IE.= 1343.70
1826          KM      TOP OF DIKE ELEVATION = 1372.7
1827          KO                                  21
1828          RS       1    ELEV  1343.7
1829          RL                   0.333  1343.7
1830          SA       0     .21    2.49    7.32   13.63   19.61   24.99   32.52   41.59  206.44
1831          SE  1343.7    1344    1348    1352    1356    1360    1364    1368    1372    1376
1832          SQ       0       9     104     169     223     261     300     311     329     342
              *
              *

1833          KK     14A
1834          KM   SUB-BASIN 14A
1835          KM      This is the flow to Node 92I at CAP Canal Structure CAP-10.
1836          KO                                  21
1837          BA     .09
1838          LG     .35     .35    3.90     .38     .00
```



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

1839          UI    129.    362.    166.     32.      0.      0.      0.      0.      0.      0.
1840          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1841          KK    C920
1842          KM      ROUTE NODE 92 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1843          KM      36" CULVERT, STATION 561+50.,  U.S. IE.= 1340.21
1844          KM      TOP OF DIKE ELEVATION = 1372.1
1845          KO                                  21
1846          RS       1    ELEV  1340.2
1847          RL                   0.333  1340.2
1848          SA       0     .19    1.27    2.51    3.96    5.57    7.86   10.16   12.42
1849          SE  1340.2    1344    1348    1352    1356    1360    1364    1368    1372
1850          SQ       0      37      61      80      90     101     107     113     119
              *
              *

1851          KK     14B
1852          KM   SUB-BASIN 14B
1853          KM      This is the flow to Node 93I at the CAP Canal Structure  CAP-11.
1854          KO                                  21
1855          BA     .03
1856          LG     .35     .35    3.90     .38     .00
1857          UI    210.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1858          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1859          KK    C930
1860          KM      ROUTE NODE 93 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1861          KM      30" CULVERT, STATION 571+50.,  U.S. IE.= 1349.50
1862          KM      TOP OF DIKE ELEVATION = 1372.1
1863          KO                                  21
1864          RS       1    ELEV  1349.5
1865          RL                   0.333  1349.5
1866          SA       0     .24    1.39
1867          SE  1349.5    1352    1356
1868          SQ       0      20      54
              *
              *

1869          KK    CLR2
1870          KM      CLEAR HEC-1 STACK
1871          HC       5
              *
              *

1872          KK    CLR3
1873          KM      CLEAR HEC-1 STACK
1874          HC       5
              *
              *
```



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

1875          KK     19A
1876          KO                                  21
1877          KM   SUB-BASIN 19A
1878          KM      This is the flow to Node 49I at CAP Canal Structure CAP-1.
1879          BA     .06
1880          LG     .25     .35    4.10     .57     .00
1881          UI    293.    138.     28.      0.      0.      0.      0.      0.      0.      0.
1882          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
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                *
1883            KK    C49O
1884            KM      ROUTE NODE 49 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1885            KM      30" CULVERT, STATION 121+60.,  U.S. IE.= 1357.4
1886            KM      TOP OF DIKE ELEVATION = 1373.7 (ASSUMED;  Use storage volume data
1887            KM                                     from CAP-2)
1888            KO                                     21
1889            RS       1    ELEV  1357.4
1890            RL                   0.494  1357.4
1891            SA       0    6.38   13.11   22.51   33.08
1892            SE  1357.4    1360    1364    1368    1372
1893            SQ       0       2      43      65      81
                *
                *

1894            KK     19B
1895            KO                                     21
1896            KM   SUB-BASIN 19B
1897            KM      This is the flow to Node 48I at  CAP Canal Structure CAP-2.
1898            BA     .77
1899            LG     .21     .35    4.50     .52     .00
1900            UI    215.    815.   1441.   1076.    746.    527.    362.    247.    175.    117.
1901            UI     76.     58.     29.     29.     29.      0.      0.      0.      0.      0.
1902            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *

1903            KK    C48O
1904            KM      ROUTE NODE 48 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1905            KM      DOUBLE 48" CULVERTS, STATION 146+50.,  U.S. IE.= 1353.5
1906            KM      TOP OF DIKE ELEVATION = 1373.7
1907            KO                                     21
1908            RS       1    ELEV  1353.5
1909            RL                   0.101  1353.5
1910            SA       0    1.08    6.38   13.11   22.51   33.08   45.86
1911            SE  1353.5    1356    1360    1364    1368    1372    1376
1912            SQ       0      25     213     331     415     486     543
                *
                *
```



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

1913            KK   BC9OO
1914            KM      RECALL RESERVOIR OUTFLOW FROM NODE 90
1915            KM      HYDROGRAPH C9OO
1916            BI    C9OO      21
                *
                *

1917            KK  R90-99
1918            KM   REP. X-SECT. 15A1
1919            RS      15    FLOW      -1
1920            RL                   2.45    91.2
1921            RC    0.04   0.049    0.04   17582   0.007
1922            RX  1000.0  1520.0  1559.0  1571.0  1621.0  1637.0  1685.0  1887.8
1923            RY    98.8    96.2    95.9    92.6    91.2    96.1    96.2    98.8
                *
                *

1924            KK     16A
1925            KM   SUB-BASIN 16A
1926            BA    1.94
1927            LG     .35     .35    3.30     .92     .00
1928            UI    177.    297.    701.    926.   1120.   1393.   1996.   2040.   1569.   1286.
1929            UI   1030.    815.    521.    308.    272.    177.    121.     54.     54.     54.
1930            UI     54.     54.      0.      0.      0.      0.      0.      0.      0.      0.
1931            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *

1932            KK     C99
1933            KM      COMBINE SURFACE RUNOFF AT NODE 99
1934            KM       R90-99 + 16A
1935            KM      This is the flow in Daggs Wash prior to it's confluence with
1936            KM      the Hassayampa River.
1937            KM      (MAJOR BASIN 12) + (MAJOR BASIN 16)
1938            HC       2
                *
                *

1939            KK     17A
1940            KM   SUB-BASIN 17A
1941            KM      NODE 100
1942            KM      This is the total runoff from Major Basin 17
1943            BA    2.17
1944            LG     .35     .35    5.30     .43     .00
1945            UI    170.    178.    597.    798.    958.   1133.   1368.   1880.   2076.   1619.
1946            UI   1365.   1128.    936.    761.    515.    301.    280.    197.    170.     79.
1947            UI     52.     52.     52.     52.     52.      0.      0.      0.      0.      0.
1948            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *
```



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

1949            KK   BC46O
1950            KM      RECALL RESERVOIR OUTFLOW FROM NODE 46.
1951            KM      HYDROGRAPH C46O
1952            BI    C46O      21
                *
                *

1953            KK  R46-94
1954            KM   X-SECT. FROM 1' CI BELMONT MAPPING
1955            RS      17    FLOW      -1
1956            RL                   0.49    82.0
1957            RC    0.04   0.049    0.04   16315   0.007
1958            RX  1000.0  1550.0  1770.0  1785.0  1810.0  1830.0  2010.0  2516.3
```

```
1959          RY    90.0    84.5    83.5    82.0    82.0    83.5    82.5    90.0
              *
              *

1960          KK   BC38I
1961          KM       RECALL HYDROGRAPH C38I
1962          BI    C38I      21
              *
              *

1963          KK  R38-94
1964          KM   REP. X-Sect. 15D1
1965          RS       8    FLOW      -1
1966          RL                   2.45    91.8
1967          RC   0.035   0.031   0.035   14784   0.006
1968          RX  1157.8  1780.0  1810.0  1820.0  2020.0  2053.0  2083.0  3163.0
1969          RY   102.4    94.4    93.3    91.8    91.8    95.1    97.0   102.4
              *
              *

1970          KK     15A
1971          KM   SUB-BASIN 15A
1972          BA    3.59
1973          LG     .35     .35    3.50     .99     .00
1974          UI    366.    774.   1611.   2089.   2610.   3620.   4438.   3320.   2651.   2066.
1975          UI   1551.    833.    616.    423.    305.    112.    112.    112.    112.      0.
1976          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1977          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1978          KK     C94
1979          KM      COMBINE SURFACE RUNOFF AT NODE 94
1980          KM      R46-94 + R38-94 + 15A
1981          HC       3
              *
              *
```



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

1982          KK  R94-96
1983          KM   REP. X-SECT. 15D1
1984          RS       4    FLOW      -1
1985          RL                   2.45    91.8
1986          RC   0.035   0.033   0.035    5386   0.005
1987          RX  1250.0  1780.0  1810.0  1820.0  2070.0  2103.0  2133.0  3493.0
1988          RY   103.0    92.4    93.3    91.8    91.8    95.1    97.0   103.0
              *
              *

1989          KK   BC85O
1990          KM       RECALL RESERVOIR OUTFLOW FROM NODE 85
1991          KM       HYDROGRAPH C85O
1992          BI    C85O      21
              *
              *

1993          KK  R85-95
1994          KM   X-SECT. FROM 1' CI BELMONT MAPPING
1995          RS      24    FLOW      -1
1996          RL                   0.43    76.0
1997          RC    0.07   0.041    0.07   19114   0.005
1998          RX  1000.0  1500.0  1530.0  1715.0  1730.0  1845.0  1855.0  2355.0
1999          RY    92.5    90.0    80.0    76.0    76.0    80.0    90.0    92.5
              *
              *

2000          KK     15B
2001          KM   SUB-BASIN 15B
2002          BA    2.08
2003          LG     .35     .35    4.20     .50     .00
2004          UI    167.    193.    592.    803.    955.   1138.   1395.   1965.   1930.   1521.
2005          UI   1284.   1052.    868.    677.    402.    288.    258.    167.    142.     51.
2006          UI     51.     51.     51.     51.     51.      0.      0.      0.      0.      0.
2007          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2008          KK     C95
2009          KM      COMBINE SURFACE RUNOFF AT NODE 95
2010          KM      R85-95 + 15B
2011          HC       2
              *
              *

2012          KK  R95-96
2013          KM   X-SECT. FROM 1' CI BELMONT MAPPING
2014          RS       4    FLOW      -1
2015          RL                   0.43    76.0
2016          RC   0.035   0.033   0.035    5016   0.006
2017          RX  1000.0  1530.0  1710.0  1715.0  1730.0  1735.0  1845.0  1855.0
2018          RY    85.3    80.0    77.5    76.0    76.0    77.5    80.0    90.0
              *
              *
```



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

2019          KK     C96
2020          KM      COMBINE SURFACE RUNOFF AT NODE 96
2021          KM      R94-96 + R95-96
2022          HC       2
              *
              *

2023          KK  R96-97
2024          KM   REP. X-SECT. 15D1
2025          RS       4    FLOW      -1
2026          RL                   2.45
2027          RC   0.035   0.033   0.035    6178   0.006
```

```
2028          RX  1157.8  1780.0  1810.0  1820.0  2080.0  2113.0  2143.0  3223.0
2029          RY   102.4    94.4    93.3    91.8    91.8    95.1    97.0   102.4
              *
              *

2030          KK     15C
2031          KM   SUB-BASIN 15C
2032          BA    1.83
2033          LG     .35     .35    4.20    1.16     .00
2034          UI    280.   1122.   1688.   2552.   3158.   2147.   1493.    775.    436.    249.
2035          UI     86.     86.     86.      0.      0.      0.      0.      0.      0.      0.
2036          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2037          KK     C97
2038          KM      COMBINE SURFACE RUNOFF AT NODE  97
2039          KM      R96-97 + 15C
2040          HC       2
              *
              *

2041          KK  R97-98
2042          KM   X-SECT. 15D1
2043          RS      11    FLOW      -1
2044          RL                    2.45    91.8
2045          RC   0.035   0.033   0.035   14784   0.006
2046          RX  1157.8  1780.0  1810.0  1820.0  2080.0  2113.0  2143.0  3223.0
2047          RY   102.4    94.4    93.3    91.8    91.8    95.1    97.0   102.4
              *
              *

2048          KK     15D
2049          KM   SUB-BASIN 15D
2050          BA    2.87
2051          LG     .35     .35    3.80     .91     .00
2052          UI    230.    266.    816.   1109.   1318.   1570.   1925.   2711.   2663.   2099.
2053          UI   1772.   1451.   1197.    934.    555.    398.    356.    230.    195.     71.
2054          UI     71.     71.     71.     71.     71.      0.      0.      0.      0.      0.
2055          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *
```



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

2056          KK     C98
2057          KM      COMBINE SURFACE RUNOFF AT NODE 98
2058          KM      R97-98 + 15D
2059          KM      This is the flow in Jackrabbit Wash prior to it's confluence
2060          KM      with the Hassayampa River.
2061          KM      (MAJOR BASINS 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + [a portion of 9] + 10 + 11)
2062          KM              + (MAJOR BASIN 15)
2063          HC       2
              *
              *

2064          KK    CLR4
2065          KM      CLEAR HEC-1 STACK
2066          HC       5
              *
              *

2067          KK   BC48O
2068          KM      RECALL RESERVOIR OUTFLOW FROM NODE 48
2069          KM      HYDROGRAPH C48O
2070          BI    C48O      21
              *
              *

2071          KK  48-101
2072          KM      R48-101
2073          KM   X-SECT. 18A1
2074          RS       3    FLOW      -1
2075          RL                    1.90    88.4
2076          RC    0.03   0.033    0.03    4488   0.007
2077          RX  1000.0  1520.0  1545.0  1549.0  1551.0  1556.0  1581.0  2101.0
2078          RY    95.2    90.0    89.9    88.4    88.4    89.9    90.0    95.2
              *
              *

2079          KK   BC49O
2080          KM      RECALL RESERVOIR OUTFLOW FROM NODE 49.
2081          KM      HYDROGRAPH C49O
2082          BI    C49O      21
              *
              *

2083          KK  49-101
2084          KM      R49-101
2085          KM   X-SECT. 18A2
2086          RS       5    FLOW      -1
2087          RL                    0.51    87.9
2088          RC   0.045   0.039   0.045    3379    0.01
2089          RX  1000.0  1520.0  1545.0  1549.0  1551.0  1555.0  1580.0  2100.0
2090          RY    95.2    90.0    89.9    87.9    87.9    89.9    90.0    95.2
              *
              *
```



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

2091          KK     18A
2092          KM   SUB-BASIN 18A
2093          BA     .25
2094          LG     .35     .35    2.80    1.50     .00
2095          UI    114.    348.    636.    464.    234.     86.     29.     18.      0.      0.
2096          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *
```

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2097          KK    C101
2098          KM      COMBINE SURFACE RUNOFF AT NODE 101
2099          KM      R480-101 + R490-101 + 18A
2100          KM      371st AVENUE CROSSING
2101          KM      (MAJOR BASIN 19) + (a portion of MAJOR BASIN 18)
2102          HC       3
              *
              *

2103          KK   BC470
2104          KM      RECALL RESERVOIR OUTFLOW FROM NODE 47.
2105          KM      HYDROGRAPH C470
2106          BI    C470      21
              *
              *

2107          KK  47-119
2108          KM      R47-119
2109          KM   X-SECT. 18T1
2110          RS       5    FLOW     -1
2111          RL                   1.19    90.4
2112          RC    0.03   0.034    0.03    8184   0.007
2113          RX  1000.0  1536.0  1628.0  1633.0  1650.0  1657.0  1757.0  2233.0
2114          RY    99.2    93.8    95.0    91.1    90.4    94.9    94.4    99.2
              *
              *

2115          KK     18T
2116          KM   SUB-BASIN 18T
2117          BA     .39
2118          LG     .35     .35    3.50    1.04     .00
2119          UI     89.    312.    477.    785.    588.    387.    191.     98.     45.     21.
2120          UI     21.      0.      0.      0.      0.      0.      0.      0.      0.      0.
2121          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2122          KK    C119
2123          KM      COMBINE SURFACE RUNOFF AT NODE 119
2124          KM      R470-119 + 18T
2125          KM      371st AVENUE CROSSING
2126          KM      (a portion of Major Basin 9) + (a portion of Major Basin 18)
2127          HC       2
              *
              *
```



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

2128          KK     18B
2129          KM   SUB-BASIN 18B
2130          KM      NODE 102 AT 371st AVENUE
2131          BA    1.81
2132          LG     .33     .35    3.90     .46     .00
2133          UI    185.    390.    812.   1053.   1316.   1825.   2238.   1674.   1336.   1041.
2134          UI    782.    420.    311.    213.    154.     57.     57.     57.     57.      0.
2135          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
2136          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2137          KK     18C
2138          KM   SUB-BASIN 18C
2139          KM      NODE 103 AT 371st AVENUE
2140          BA    1.90
2141          LG     .33     .35    3.70     .42     .00
2142          UI    149.    156.    523.    699.    838.    992.   1197.   1646.   1818.   1417.
2143          UI   1195.    987.    820.    666.    451.    263.    245.    173.    149.     69.
2144          UI     46.     46.     46.     46.     46.      0.      0.      0.      0.      0.
2145          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2146          KK     18M
2147          KM   SUB-BASIN 18M
2148          KM      NODE 113 AT 371st AVENUE
2149          BA    1.50
2150          LG     .35     .33    4.90     .31     .00
2151          UI     99.     99.    247.    401.    495.    569.    655.    768.    983.   1252.
2152          UI   1093.    907.    792.    672.    576.    487.    390.    253.    175.    163.
2153          UI    128.     99.     86.     30.     30.     30.     30.     30.     30.     30.
2154          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
2155          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2156          KK     18N
2157          KM   SUB-BASIN 18N
2158          KM      NODE 114 AT 371st AVENUE AND INDIAN SCHOOL ROAD
2159          BA    2.40
2160          LG     .35     .33    4.90     .31     .00
2161          UI    142.    142.    264.    511.    654.    756.    847.    974.   1113.   1395.
2162          UI   1791.   1644.   1367.   1193.   1057.    907.    790.    682.    548.    375.
2163          UI    251.    238.    221.    142.    142.     92.     43.     43.     43.     43.
2164          UI     43.     43.     43.     43.      0.      0.      0.      0.      0.      0.
2165          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *
```



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

2166          KK    CLR5
2167          KM      CLEAR HEC-1 STACK
2168          HC       5
              *
              *

2169          KK     18O
2170          KM   SUB-BASIN 18O
2171          KM      NODE 115 AT 371st AVENUE
```

```
2172          BA     .90
2173          LG     .35      .35     4.10     .43     .00
2174          UI     98.     233.     453.    583.    749.   1127.   1045.    797.    618.    469.
2175          UI    280.     168.     125.     88.     30.     30.     30.     30.      0.      0.
2176          UI      0.       0.       0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2177          KK     18P
2178          KM   SUB-BASIN 18P
2179          KM      NODE 116 AT INDIAN SCHOOL ROAD
2180          BA    1.36
2181          LG     .35      .31     6.00     .28     .00
2182          UI    112.     141.     404.    548.    650.    783.    978.   1376.   1218.    977.
2183          UI    820.     669.     547.    391.    227.    188.    144.    112.     60.     34.
2184          UI     34.      34.      34.     34.      0.      0.      0.      0.      0.      0.
2185          UI      0.       0.       0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2186          KK  116117
2187          KM      R116-117
2188          KM   REP. X-SECT. 18E1
2189          RS       9     FLOW      -1
2190          RL                     0.39    88.0
2191          RC    0.07    0.041     0.07    7392   0.006
2192          RX  1000.0   1520.0   1574.0  1579.0  1603.0  1609.0  1625.0  2045.0
2193          RY    96.2     91.0     90.0    88.0    88.0    91.0    92.0    96.2
              *
              *

2194          KK     18Q
2195          KM   SUB-BASIN 18Q
2196          BA    1.13
2197          LG     .35      .35     3.90     .37     .00
2198          UI    136.     381.     686.    888.   1259.   1615.   1190.    905.    673.    384.
2199          UI    231.     156.      91.     42.     42.     42.      0.      0.      0.      0.
2200          UI      0.       0.       0.      0.      0.      0.      0.      0.      0.      0.
              *
              *
```



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

2201          KK    C117
2202          KM      COMBINE SURFACE RUNOFF AT NODE 117
2203          KM      116117 + 18Q
2204          KM      This is the flow at Interstate-10 crossing I10-6
2205          HC       2
              *
              *

2206          KK    CLR6
2207          KM      CLEAR HEC-1 STACK
2208          HC       5
              *
              *

2209          KK     18R
2210          KM   SUB-BASIN 18R
2211          KM      NODE 118 AT INDIAN SCHOOL ROAD
2212          BA    2.17
2213          LG     .35      .34     4.30     .34     .00
2214          UI    124.     124.     205.    438.    552.    643.    723.    817.    937.   1114.
2215          UI   1445.    1566.    1279.   1105.    985.    854.    749.    645.    563.    420.
2216          UI    285.     219.     204.    177.    124.    124.     71.     38.     38.     38.
2217          UI     38.      38.      38.     38.     38.      0.      0.      0.      0.      0.
2218          UI      0.       0.       0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2219          KK  118-64
2220          KM      R118-64
2221          KM   REP. X-SECT. 18E1
2222          RS      10     FLOW      -1
2223          RL                     0.40    88.0
2224          RC    0.07    0.041     0.07    8818   0.006
2225          RX  1000.0   1520.0   1574.0  1579.0  1603.0  1609.0  1625.0  2045.0
2226          RY    96.2     91.0     90.0    88.0    88.0    91.0    92.0    96.2
              *
              *

2227          KK     18S
2228          KM   SUB-BASIN 18S
2229          BA    1.35
2230          LG     .35      .34     4.50     .38     .00
2231          UI    142.     320.     641.    827.   1046.   1520.   1636.   1222.    962.    744.
2232          UI    513.     268.     219.    142.     74.     44.     44.     44.     44.      0.
2233          UI      0.       0.       0.      0.      0.      0.      0.      0.      0.      0.
2234          UI      0.       0.       0.      0.      0.      0.      0.      0.      0.      0.
              *
              *
```



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

2235          KK     C64
2236          KM      COMBINE SURFACE RUNOFF AT NODE 64
2237          KM      118-64 + 18S
2238          KM      This is the flow at Interstate-10 crossing I10-12
2239          HC       2
              *
              *

2240          KK     18D
2241          KM   SUB-BASIN 18D
2242          KM      HEADWATERS OF PHILLIPS WASH
2243          KM      NODE 104
2244          BA    3.60
2245          LG     .35      .35     3.90     .45     .00
2246          UI    247.     247.     677.   1038.   1274.   1462.   1714.   2023.   2697.   3128.
```

```
2247          UI   2497.   2116.   1830.   1542.   1301.   1081.    765.    441.    415.    352.
2248          UI    247.    232.     76.     76.     76.     76.     76.     76.     76.      0.
2249          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
2250          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2251          KK  104105
2252          KM      R104-105
2253          KM   INTERPOLATE BETWEEN X-SECT. 18E1 AND 18F1
2254          RS      17    FLOW      -1
2255          RL                   0.43    85.2
2256          RC    0.07   0.039    0.06   18322   0.006
2257          RX  1000.0  1515.0  1567.0  1574.5  1596.5  1602.0  1622.5  2337.5
2258          RY    95.7    90.5    88.7    85.2    85.2    87.7    88.5    95.7
              *
              *

2259          KK     18E
2260          KM   SUB-BASIN 18E
2261          BA    3.83
2262          LG     .35     .35    4.20     .42     .00
2263          UI    293.    293.   1005.   1344.   1631.   1902.   2286.   3056.   3690.   2920.
2264          UI   2441.   2054.   1707.   1419.   1014.    608.    497.    416.    293.    227.
2265          UI     90.     90.     90.     90.     90.     90.      0.      0.      0.      0.
2266          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2267          KK    C105
2268          KM      COMBINE SURFACE RUNOFF AT NODE 105
2269          KM      104105 + 18E
2270          KM      Crossing at Indian School Road
2271          HC       2
              *
              *
```



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

2272          KK  105106
2273          KM      R105-106
2274          KM   X-SECT. 18F1
2275          RS       8    FLOW      -1
2276          RL                   0.33    82.5
2277          RC    0.05   0.037    0.05    9610   0.004
2278          RX  1000.0  1510.0  1560.0  1570.0  1590.0  1595.0  1620.0  1822.0
2279          RY    95.1    90.0    87.5    82.5    82.5    84.5    85.0    95.1
              *
              *

2280          KK     18F
2281          KM   SUB-BASIN 18F
2282          BA     .80
2283          LG     .35     .35    4.00     .45     .00
2284          UI    104.    329.    549.    729.   1129.   1092.    795.    582.    383.    183.
2285          UI    132.     77.     32.     32.     32.      0.      0.      0.      0.      0.
2286          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2287          KK    C106
2288          KM      COMBINE SURFACE RUNOFF AT NODE 106
2289          KM      105106 + 18F
2290          KM      This is the flow at Interstate-10 crossing I10-15
2291          HC       2
              *
              *

2292          KK     18G
2293          KM   SUB-BASIN 18G
2294          KM      NODE 107 AT INTERSTATE-10 CROSSING I10-18
2295          BA    2.03
2296          LG     .35     .35    5.30     .29     .00
2297          UI    159.    167.    559.    747.    896.   1060.   1279.   1759.   1942.   1514.
2298          UI   1277.   1055.    876.    712.    481.    281.    262.    185.    159.     74.
2299          UI     49.     49.     49.     49.     49.      0.      0.      0.      0.      0.
2300          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2301          KK     18K
2302          KM   SUB-BASIN 18K
2303          KM      NODE 111 AT INTERSTATE-10 CROSSING I10-19
2304          BA     .80
2305          LG     .35     .35    4.00     .49     .00
2306          UI    122.    491.    738.   1116.   1381.    939.    653.    339.    191.    109.
2307          UI     38.     38.     38.      0.      0.      0.      0.      0.      0.      0.
2308          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

2309          KK    CLR7
2310          KM      CLEAR HEC-1 STACK
2311          HC       5
              *
              *

2312          KK     18H
2313          KM   SUB-BASIN 18H
2314          KM      NODE 108
2315          BA    2.63
2316          LG     .35     .35    5.20     .40     .00
2317          UI    277.    623.   1248.   1611.   2038.   2961.   3187.   2380.   1875.   1450.
2318          UI   1000.    521.    426.    277.    144.     85.     85.     85.     85.      0.
2319          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
2320          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
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                *
2321            KK  108109
2322            KM     R108-109
2323            KM   REP. X-SECT. 18F1
2324            RS       6    FLOW       -1
2325            RL                     0.27    82.5
2326            RC    0.05   0.037    0.05   16210   0.017
2327            RX  1000.0  1510.0  1560.0  1570.0  1590.0  1595.0  1620.0  1822.0
2328            RY    95.1    90.0    87.5    82.5    82.5    84.5    85.0    95.1
                *
                *

2329            KK     18I
2330            KM   SUB-BASIN 18I
2331            BA    2.57
2332            LG     .35     .35    6.20     .31     .00
2333            UI    222.    326.    842.   1123.   1343.   1638.   2210.   2752.   2172.   1789.
2334            UI   1455.   1180.    913.    525.    380.    314.    222.    136.     68.     68.
2335            UI     68.     68.     68.      0.      0.      0.      0.      0.      0.      0.
2336            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *

2337            KK    C109
2338            KM      COMBINE SURFACE RUNOFF AT NODE 109
2339            KM      108109 + 18I
2340            KM      Crossing at Indian School Road
2341            HC       2
                *
                *

2342            KK  109110
2343            KM     R109-110
2344            KM   REP. X-SECT. 18E1
2345            RS      14    FLOW       -1
2346            RL                     0.52    88.0
2347            RC    0.07   0.041    0.07   14203   0.006
1                                     HEC-1 INPUT                                                          PAGE 63

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

2348            RX  1000.0  1520.0  1574.0  1579.0  1603.0  1609.0  1625.0  2045.0
2349            RY    96.2    91.0    90.0    88.0    88.0    91.0    92.0    96.2
                *
                *

2350            KK     18J
2351            KM   SUB-BASIN 18J
2352            BA    2.35
2353            LG     .35     .35    4.20     .48     .00
2354            UI    226.    428.    946.   1232.   1516.   1958.   2794.   2294.   1832.   1457.
2355            UI   1154.    808.    438.    373.    232.    172.     69.     69.     69.     69.
2356            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
2357            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *

2358            KK    C110
2359            KM      COMBINE SURFACE RUNOFF AT NODE 110
2360            KM      109110 + 18J
2361            KM      This is the flow at Interstate-10 crossing I10-25
2362            HC       2
                *
                *

2363            KK     18L
2364            KM   SUB-BASIN 18L
2365            KM      This is the flow prior to it's confluence with the Hassayampa River
2366            KM      NODE 112
2367            BA    2.40
2368            LG     .35     .35    4.40     .48     .00
2369            UI    253.    568.   1139.   1470.   1860.   2702.   2908.   2172.   1711.   1323.
2370            UI    912.    476.    389.    253.    132.     77.     77.     77.     77.      0.
2371            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
2372            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *

2373            KK    CLR8
2374            KM   ,CLEAR HEC-1 STACK
2375            KO       5       0
2376            HC       3
                *
                *

2377            KK    10C1
2378            KM   SUB-BASIN 10C1
2379            KM   This is flow at a Vulture Mine Road crossing for information only.
2380            BA    1.43
2381            LG     .35     .35    4.20     .65     .00
2382            UI    138.    260.    576.    750.    922.   1192.   1700.   1396.   1115.    887.
2383            UI    702.    492.    267.    227.    141.    104.     42.     42.     42.     42.
2384            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
2385            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *
1                                     HEC-1 INPUT                                                          PAGE 64

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

2386            KK    10C2
2387            KM   SUB-BASIN 10C2
2388            KM   This is an intermediate flow for information only.
2389            BA    4.23
2390            LG     .35     .35    4.10     .62     .00
2391            UI    291.    291.    796.   1219.   1497.   1718.   2013.   2377.   3168.   3675.
2392            UI   2934.   2486.   2150.   1811.   1529.   1270.    899.    518.    488.    414.
2393            UI    291.    273.     89.     89.     89.     89.     89.     89.     89.      0.
2394            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
2395            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
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                    *
2396                KK    10K1
2397                KM   SUB-BASIN 10K1
2398                KM   This is flow at a Vulture Mine Road crossing for information only.
2399                BA     .88
2400                LG     .16      .35     5.50      .43      .00
2401                UI     96.     206.     466.     660.     854.     989.     620.     523.     445.     372.
2402                UI    293.     237.     209.     163.     123.     107.      87.      73.      54.      47.
2403                UI     47.      24.      18.      18.      18.      18.      18.      18.       0.       0.
2404                UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                    *
                    *

2405                KK    10K2
2406                KM   SUB-BASIN 10K2
2407                KM   This is an intermediate flow for information only.
2408                BA    4.55
2409                LG     .35      .35     4.90      .42      .00
2410                UI    295.     295.     706.    1170.    1455.    1673.    1919.    2233.    2753.    3683.
2411                UI   3422.    2801.    2431.    2102.    1794.    1523.    1274.     912.     540.     500.
2412                UI    459.     295.     295.     143.      91.      91.      91.      91.      91.      91.
2413                UI     91.       0.       0.       0.       0.       0.       0.       0.       0.       0.
2414                UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                    *
                    *

2415                KK    10M1
2416                KM   SUB-BASIN 10M1
2417                KM   This is flow at a Vulture Mine Road crossing for information only.
2418                BA    1.85
2419                LG     .22      .30     8.20      .10      .00
2420                UI    231.     631.    1326.    1788.    2491.    1579.    1268.    1054.     852.     637.
2421                UI    534.     425.     312.     260.     200.     172.     113.     113.      76.      44.
2422                UI     44.      44.      44.      44.       0.       0.       0.       0.       0.       0.
2423                UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                    *
                    *
1                                                   HEC-1 INPUT                                                    PAGE 65

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

2424                KK    10M2
2425                KM   SUB-BASIN 10M2
2426                KM   This is flow at a Vulture Mine Road crossing for information only.
2427                BA    1.48
2428                LG     .17      .32     7.40      .16      .00
2429                UI    122.     148.     403.     642.     821.     966.    1290.    1165.     799.     699.
2430                UI    617.     548.     481.     401.     329.     291.     266.     221.     179.     155.
2431                UI    133.     122.      93.      93.      66.      59.      59.      59.      25.      23.
2432                UI     23.      23.      23.      23.      23.      23.      23.       0.       0.       0.
2433                UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                    *
                    *

2434                KK    10M3
2435                KM   SUB-BASIN 10M3
2436                KM   This is an intermediate flow for information only.
2437                BA    2.84
2438                LG     .23      .35     5.70      .24      .00
2439                UI    195.     195.     468.     797.    1133.    1344.    1527.    1913.    2236.    1452.
2440                UI   1219.    1109.     996.     905.     805.     714.     615.     508.     469.     437.
2441                UI    388.     321.     260.     246.     214.     212.     150.     150.     145.      95.
2442                UI     95.      95.      95.      67.      37.      37.      37.      37.      37.      37.
2443                UI     37.      37.      37.      37.      37.       0.       0.       0.       0.       0.
2444                UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                    *
                    *
2445                ZZ
1*************************************                                                  *************************************
*                                   *                                                  *                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*                                                  *   U.S. ARMY CORPS OF ENGINEERS    *
*          SEPTEMBER 1990           *                                                  *   HYDROLOGIC ENGINEERING CENTER   *
*           VERSION 4.0             *                                                  *         609 SECOND STREET         *
*                                   *                                                  *      DAVIS, CALIFORNIA 95616      *
*  RUN DATE  02/17/1991  TIME  13:00:38 *                                              *          (916) 756-1104           *
*                                   *                                                  *                                   *
*************************************                                                  *************************************


                        FCDMC JACKRABBIT WASH, PROJECT NO. 10310
                        100-YEAR 6-HOUR DURATION STORM
                        FILENAME= 10310-6.H1,   15FEB91

  5 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT           HYDROGRAPH TIME DATA
                       NMIN          5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1   0  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ        101  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      1   0  ENDING DATE
                     NDTIME       0820  ENDING TIME
                      ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE    8.33 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
```

```
 7 JD          INDEX STORM NO. 1
                     STRM        3.30  PRECIPITATION DEPTH
                     TRDA         .01  TRANSPOSITION DRAINAGE AREA

 8 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

11 JD          INDEX STORM NO. 2
                     STRM        3.28  PRECIPITATION DEPTH
                     TRDA         .50  TRANSPOSITION DRAINAGE AREA

 0 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

12 JD          INDEX STORM NO. 3
                     STRM        3.23  PRECIPITATION DEPTH
                     TRDA        2.80  TRANSPOSITION DRAINAGE AREA

13 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       .07       .07       .07       .08       .08       .08       .05       .05
                  .05       .02       .02       .02       .01       .01       .01       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00

16 JD          INDEX STORM NO. 4
                     STRM        3.04  PRECIPITATION DEPTH
                     TRDA       16.00  TRANSPOSITION DRAINAGE AREA

17 PI           PRECIPITATION PATTERN
                  .01       .01       .00       .00       .00       .00       .00       .00       .00       .01
                  .01       .01       .00       .01       .00       .00       .00       .00       .00       .00
                  .00       .00       .01       .00       .00       .00       .00       .01       .01       .01
                  .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

20 JD          INDEX STORM NO. 5
                     STRM        2.67  PRECIPITATION DEPTH
                     TRDA       90.00  TRANSPOSITION DRAINAGE AREA

21 PI           PRECIPITATION PATTERN
                  .01       .01       .01       .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       .01       .01       .01       .02       .02       .02       .03
                  .03       .03       .05       .05       .05       .05       .05       .05       .04       .04
                  .04       .02       .02       .02       .02       .02       .02       .01       .01       .01
                  .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                  .01       .01

24 JD          INDEX STORM NO. 6
                     STRM        1.88  PRECIPITATION DEPTH
                     TRDA      500.00  TRANSPOSITION DRAINAGE AREA

25 PI           PRECIPITATION PATTERN
                  .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       .01       .01       .01
                  .01       .01       .01       .01       .01       .01       .02       .02       .02       .03
                  .03       .03       .04       .04       .04       .04       .04       .04       .04       .04
                  .04       .03       .03       .03       .02       .02       .02       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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            *            *
239 KK      *    C12.1   *
            *            *
            **************

243 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS

375 BI          READ STATION    C12.1 HYDROGRAPH FROM UNIT 21

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
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              **************
              *            *
  688 KK      *    C38I.1  *
              *            *
              **************

  692 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE
                        IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                         IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
  811 KK      *     C84.1  *
              *            *
              **************

  816 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE
                        IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                         IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       .083  TIME INTERVAL IN HOURS


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              *            *
 1039 KK      *     C82.1  *
              *            *
              **************

 1044 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE
                        IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                         IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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              *            *
 1160 KK      *    R72-81  *
              *            *
              **************

 1162 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          5  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        101  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       .083  TIME INTERVAL IN HOURS

 1333 BI          READ STATION   R72-81 HYDROGRAPH FROM UNIT 22

 1358 BI          READ STATION    C82.1 HYDROGRAPH FROM UNIT 21

 1407 BI          READ STATION    C84.1 HYDROGRAPH FROM UNIT 21

 1441 BI          READ STATION   C38I.1 HYDROGRAPH FROM UNIT 21


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              **************
              *            *
 1442 KK      *      C38I  *
              *            *
              **************

 1443 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE
                        IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                         IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       .083  TIME INTERVAL IN HOURS
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
1621 KK     *     9IW    *
            *            *
            **************

1622 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
1631 KK     *    C46I    *
            *            *
            **************

1632 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
1638 KK     *    C460    *
            *            *
            **************

1642 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
1648 KK     *   BCP44W   *
            *            *
            **************

1649 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


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            **************
            *            *
1668 KK     *    C47I    *
            *            *
            **************

1669 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


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                **************
                *            *
1675 KK         *     C47O   *
                *            *
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1679 KO              OUTPUT CONTROL VARIABLES
                           IPRNT          5  PRINT CONTROL
                           IPLOT          0  PLOT CONTROL
                           QSCAL         0.  HYDROGRAPH PLOT SCALE
                           IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                            IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                           ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                           ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                          TIMINT       .083  TIME INTERVAL IN HOURS


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                *            *
1685 KK         *      11A   *
                *            *
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1686 KO              OUTPUT CONTROL VARIABLES
                           IPRNT          5  PRINT CONTROL
                           IPLOT          0  PLOT CONTROL
                           QSCAL         0.  HYDROGRAPH PLOT SCALE
                           IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                            IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                           ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                           ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                          TIMINT       .083  TIME INTERVAL IN HOURS


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                *            *
1695 KK         *     C85O   *
                *            *
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1702 KO              OUTPUT CONTROL VARIABLES
                           IPRNT          5  PRINT CONTROL
                           IPLOT          0  PLOT CONTROL
                           QSCAL         0.  HYDROGRAPH PLOT SCALE
                           IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                            IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                           ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                           ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                          TIMINT       .083  TIME INTERVAL IN HOURS


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                *            *
1797 KK         *     C9OI   *
                *            *
                **************

1798 KO              OUTPUT CONTROL VARIABLES
                           IPRNT          5  PRINT CONTROL
                           IPLOT          0  PLOT CONTROL
                           QSCAL         0.  HYDROGRAPH PLOT SCALE
                           IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                            IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                           ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                           ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                          TIMINT       .083  TIME INTERVAL IN HOURS


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                *            *
1803 KK         *     C9OO   *
                *            *
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1807 KO              OUTPUT CONTROL VARIABLES
                           IPRNT          5  PRINT CONTROL
                           IPLOT          0  PLOT CONTROL
                           QSCAL         0.  HYDROGRAPH PLOT SCALE
                           IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                            IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                           ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                           ISAV2        101  LAST ORDINATE PUNCHED OR SAVED
                          TIMINT       .083  TIME INTERVAL IN HOURS


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                *            *
1813 KK         *      13A   *
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1817 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         101  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *             *
1823 KK     *      C91O   *
            *             *
            ***************

1827 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         101  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *             *
1833 KK     *       14A   *
            *             *
            ***************

1836 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         101  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *             *
1841 KK     *      C92O   *
            *             *
            ***************

1845 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         101  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *             *
1851 KK     *       14B   *
            *             *
            ***************

1854 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         101  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *             *
1859 KK     *      C93O   *
            *             *
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1863 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         101  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *            *
1875 KK     *      19A   *
            *            *
            **************

1876 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         101  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *            *
1883 KK     *     C490   *
            *            *
            **************

1888 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         101  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *            *
1894 KK     *      19B   *
            *            *
            **************

1895 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         101  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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            *            *
1903 KK     *     C480   *
            *            *
            **************

1907 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         101  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS

1916 BI          READ STATION     C900 HYDROGRAPH FROM UNIT 21

1952 BI          READ STATION     C460 HYDROGRAPH FROM UNIT 21

1962 BI          READ STATION     C38I HYDROGRAPH FROM UNIT 21

1992 BI          READ STATION     C850 HYDROGRAPH FROM UNIT 21

2070 BI          READ STATION     C480 HYDROGRAPH FROM UNIT 21

2082 BI          READ STATION     C490 HYDROGRAPH FROM UNIT 21

2106 BI          READ STATION     C470 HYDROGRAPH FROM UNIT 21
         WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO
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2375 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE
1
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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	1A	6498.	4.42	967.	696.	696.	6.69		
+	ROUTED TO	R1-2	5778.	4.83	967.	696.	696.	6.69		
+	HYDROGRAPH AT	1B	5802.	4.33	822.	592.	592.	5.70		
+	2 COMBINED AT	C2	8095.	4.67	1624.	1169.	1169.	12.39		
+	ROUTED TO	R2-4	7380.	5.17	1618.	1165.	1165.	12.39		
+	HYDROGRAPH AT	1C	1451.	4.25	133.	96.	96.	.81		
+	ROUTED TO	R3-4	865.	5.17	132.	95.	95.	.81		
+	HYDROGRAPH AT	1D	4013.	4.33	546.	393.	393.	3.27		
+	3 COMBINED AT	C4	7783.	5.17	2078.	1496.	1496.	16.47		
+	ROUTED TO	R4-7	7306.	5.50	2047.	1474.	1474.	16.47		
+	HYDROGRAPH AT	1E	1756.	4.25	177.	128.	128.	1.11		
+	ROUTED TO	R5-7	1510.	4.50	176.	127.	127.	1.11		
+	HYDROGRAPH AT	1F	2294.	4.50	445.	321.	321.	3.06		
+	ROUTED TO	R6-7	2208.	4.67	443.	319.	319.	3.06		
+	HYDROGRAPH AT	1G	2537.	4.33	292.	210.	210.	2.56		
+	4 COMBINED AT	C7	7441.	5.42	2483.	1788.	1788.	23.20		
+	ROUTED TO	R7-8	7276.	5.58	2463.	1774.	1774.	23.20		
+	HYDROGRAPH AT	1H	4893.	4.50	731.	526.	526.	7.55		
+	2 COMBINED AT	C8	7249.	4.75	2804.	2019.	2019.	30.75		
+	ROUTED TO	R8-10	6973.	4.92	2765.	1991.	1991.	30.75		
+	HYDROGRAPH AT	1I	2826.	4.75	680.	489.	489.	6.88		
+	ROUTED TO	R9-10	2804.	4.75	675.	486.	486.	6.88		
+	2 COMBINED AT	C10	8098.	4.83	3014.	2170.	2170.	37.63		
+	ROUTED TO	R10-11	7441.	5.50	2888.	2079.	2079.	37.63		
+	HYDROGRAPH AT	1J	1418.	4.50	267.	192.	192.	2.57		
+	HYDROGRAPH AT	1K	2089.	4.67	474.	341.	341.	5.02		
+	3 COMBINED AT	C11	7488.	5.42	3040.	2189.	2189.	45.22		
+	ROUTED TO	R11-12	7098.	6.08	2827.	2036.	2036.	45.22		
+	HYDROGRAPH AT	1L	3353.	4.67	786.	566.	566.	5.93		
+	2 COMBINED AT	C12.1	7174.	6.00	3172.	2284.	2284.	51.15		
+	HYDROGRAPH AT	2A	4811.	4.50	910.	655.	655.	7.76		
+	ROUTED TO	R13-14	4629.	4.67	904.	651.	651.	7.76		
+	HYDROGRAPH AT	2B	2351.	4.42	390.	281.	281.	4.31		
	2 COMBINED AT									

+	C14	5594.	4.58	1127.	811.	811.	12.07
+ ROUTED TO	R14-15	5342.	4.83	1083.	780.	780.	12.07
+ HYDROGRAPH AT	2C	1488.	4.33	199.	143.	143.	3.82
+ 2 COMBINED AT	C15	5339.	4.83	1128.	812.	812.	15.89
+ ROUTED TO	R15-17	4555.	5.50	1037.	747.	747.	15.89
+ HYDROGRAPH AT	2D	1552.	4.83	377.	272.	272.	5.12
+ 2 COMBINED AT	C17	4584.	5.50	1164.	838.	838.	21.01
+ ROUTED TO	R17-18	4442.	5.67	1124.	809.	809.	21.01
+ HYDROGRAPH AT	2E	1637.	4.33	235.	169.	169.	2.09
+ ROUTED TO	R16-18	1387.	4.75	234.	168.	168.	2.09
+ 2 COMBINED AT	C18	4536.	5.67	1205.	867.	867.	23.10
+ ROUTED TO	R18-12	4116.	6.00	1078.	776.	776.	23.10
+ HYDROGRAPH AT	2F	1556.	4.92	409.	294.	294.	4.89
+ 2 COMBINED AT	C12.2	3983.	6.08	1207.	869.	869.	27.99
+ HYDROGRAPH AT	BC12.1	7174.	6.00	3172.	2284.	2284.	51.15
+ 2 COMBINED AT	C12	7831.	6.17	3202.	2305.	2305.	79.14
+ ROUTED TO	R12-21	7747.	6.33	3095.	2229.	2229.	79.14
+ HYDROGRAPH AT	3A	3141.	4.58	688.	496.	496.	5.97
+ ROUTED TO	R19-21	2855.	5.08	645.	464.	464.	5.97
+ HYDROGRAPH AT	3D	2365.	4.75	582.	419.	419.	5.01
+ ROUTED TO	R20-21	2163.	5.17	563.	405.	405.	5.01
+ HYDROGRAPH AT	3B	2261.	4.75	562.	404.	404.	6.25
+ HYDROGRAPH AT	3C	2009.	4.92	534.	384.	384.	5.70
+ 5 COMBINED AT	C21	7697.	6.25	3545.	2553.	2553.	102.07
+ ROUTED TO	R21-22	7374.	6.50	3311.	2384.	2384.	102.07
+ HYDROGRAPH AT	3E	1864.	4.50	264.	190.	190.	2.90
+ 2 COMBINED AT	C22	7293.	6.50	3318.	2389.	2389.	104.97
+ ROUTED TO	R22-25	7190.	6.58	3223.	2320.	2320.	104.97
+ HYDROGRAPH AT	4A	2284.	5.17	717.	516.	516.	7.43
+ HYDROGRAPH AT	4B	1862.	4.83	496.	357.	357.	4.07
+ 2 COMBINED AT	C23	3411.	5.00	1063.	765.	765.	11.50
+ ROUTED TO	R23-24	3350.	5.08	1037.	747.	747.	11.50
+ HYDROGRAPH AT	4C	2446.	4.58	402.	289.	289.	2.65
+ 2 COMBINED AT	C24	4299.	4.92	1304.	939.	939.	14.15
+ ROUTED TO	R24-25	4249.	5.00	1275.	918.	918.	14.15
+ 2 COMBINED AT	C25	7132.	6.58	3535.	2545.	2545.	119.12
+ ROUTED TO	R25-32	6917.	6.92	3040.	2188.	2188.	119.12
+ HYDROGRAPH AT	5A	3847.	4.83	788.	567.	567.	8.03

+	HYDROGRAPH AT	5B	2410.	4.75	554.	399.	399.	7.36
+	3 COMBINED AT	C32	6798.	6.92	3335.	2401.	2401.	134.51
+	ROUTED TO	R32-33	6169.	7.17	2691.	1938.	1938.	134.51
+	HYDROGRAPH AT	5C	1822.	4.58	269.	194.	194.	3.56
+	2 COMBINED AT	C33	6110.	7.17	2691.	1938.	1938.	138.07
+	ROUTED TO	R33-34	5637.	8.00	1459.	1051.	1051.	138.07
+	HYDROGRAPH AT	6C	618.	4.67	92.	66.	66.	2.23
+	2 COMBINED AT	C34	5637.	8.00	1459.	1051.	1051.	140.30
+	ROUTED TO	R34-37	5455.	8.33	970.	698.	698.	140.30
+	HYDROGRAPH AT	6A	2834.	4.67	486.	350.	350.	3.66
+	ROUTED TO	R35-36	2293.	5.67	468.	337.	337.	3.66
+	HYDROGRAPH AT	6B	1744.	4.83	343.	247.	247.	4.76
+	2 COMBINED AT	C36	2428.	5.58	693.	499.	499.	8.42
+	ROUTED TO	R36-37	2335.	6.00	676.	487.	487.	8.42
+	2 COMBINED AT	C37	5442.	8.25	1126.	811.	811.	148.72
+	ROUTED TO	R37-38	4933.	8.33	543.	391.	391.	148.72
+	HYDROGRAPH AT	6D	1310.	4.67	202.	145.	145.	3.67
+	2 COMBINED AT	C38I.1	4933.	8.33	546.	393.	393.	152.39
+	HYDROGRAPH AT	7A	3339.	4.83	703.	506.	506.	5.19
+	ROUTED TO	R26-27	2849.	5.92	692.	498.	498.	5.19
+	HYDROGRAPH AT	7B	2786.	4.83	543.	391.	391.	6.11
+	2 COMBINED AT	C27	2847.	5.83	1075.	774.	774.	11.30
+	ROUTED TO	R27-29	2660.	6.42	1017.	732.	732.	11.30
+	HYDROGRAPH AT	7C	2754.	4.92	569.	410.	410.	6.81
+	ROUTED TO	R28-29	2403.	5.67	558.	402.	402.	6.81
+	2 COMBINED AT	C29	3693.	5.67	1320.	951.	951.	18.11
+	ROUTED TO	R29-30	3661.	5.83	1301.	937.	937.	18.11
+	HYDROGRAPH AT	7D	2909.	4.58	464.	334.	334.	5.84
+	2 COMBINED AT	C30	3610.	5.75	1573.	1132.	1132.	23.95
+	ROUTED TO	R30-31	3109.	7.33	1031.	742.	742.	23.95
+	HYDROGRAPH AT	7F	1385.	4.75	258.	186.	186.	2.63
+	2 COMBINED AT	C31	3013.	7.33	1123.	809.	809.	26.58
+	ROUTED TO	R31-84	2892.	7.92	827.	595.	595.	26.58
+	HYDROGRAPH AT	7E	3016.	5.17	780.	562.	562.	8.30
+	2 COMBINED AT	C84.1	2758.	7.92	1296.	933.	933.	34.88
+	HYDROGRAPH AT	10A	1432.	4.50	270.	194.	194.	2.01
+	ROUTED TO	R50-51	854.	6.50	200.	144.	144.	2.01
+	HYDROGRAPH AT	10B	1896.	4.75	332.	239.	239.	5.36

+	2 COMBINED AT	C51	1703.	4.75	449.	324.	324.	7.37
+	ROUTED TO	R51-57	1506.	5.17	418.	301.	301.	7.37
+	HYDROGRAPH AT	10D	2778.	4.75	702.	505.	505.	4.54
+	ROUTED TO	R52-55	2432.	5.50	682.	491.	491.	4.54
+	HYDROGRAPH AT	10E	1664.	4.58	247.	178.	178.	2.72
+	2 COMBINED AT	C55	2423.	5.50	859.	619.	619.	7.26
+	ROUTED TO	R55-57	2117.	6.25	781.	562.	562.	7.26
+	2 COMBINED AT	C57	2203.	5.25	1003.	722.	722.	14.63
+	ROUTED TO	R57-58	2134.	5.50	957.	689.	689.	14.63
+	HYDROGRAPH AT	10C	1685.	4.67	273.	196.	196.	5.66
+	2 COMBINED AT	C58	2059.	5.50	1041.	749.	749.	20.29
+	ROUTED TO	R58-59	1932.	5.67	970.	698.	698.	20.29
+	HYDROGRAPH AT	10F	3849.	4.58	886.	638.	638.	5.68
+	ROUTED TO	R53-54	3073.	6.00	815.	587.	587.	5.68
+	HYDROGRAPH AT	10G	1883.	4.67	428.	308.	308.	4.28
+	2 COMBINED AT	C54	3144.	6.00	1106.	797.	797.	9.96
+	ROUTED TO	R54-59	2762.	7.17	901.	648.	648.	9.96
+	HYDROGRAPH AT	10H	1513.	5.00	307.	221.	221.	6.74
+	3 COMBINED AT	C59	3429.	7.17	1467.	1056.	1056.	36.99
+	ROUTED TO	R59-61	3323.	7.42	1320.	951.	951.	36.99
+	HYDROGRAPH AT	10I	3103.	4.83	821.	591.	591.	6.93
+	ROUTED TO	R60-61	2034.	7.42	451.	324.	324.	6.93
+	HYDROGRAPH AT	10J	2138.	4.92	429.	309.	309.	7.08
+	3 COMBINED AT	C61	3984.	7.58	1464.	1054.	1054.	51.00
+	ROUTED TO	R61-82	3594.	8.33	859.	619.	619.	51.00
+	HYDROGRAPH AT	10L	1935.	4.83	356.	256.	256.	6.34
+	2 COMBINED AT	C82.1	3577.	8.33	949.	684.	684.	57.34
+	HYDROGRAPH AT	10M	3580.	4.75	907.	653.	653.	6.17
+	ROUTED TO	R67-68	2586.	6.83	653.	470.	470.	6.17
+	HYDROGRAPH AT	10K	2328.	4.92	471.	339.	339.	5.44
+	ROUTED TO	R63-68	2093.	5.42	468.	337.	337.	5.44
+	HYDROGRAPH AT	10N	1702.	4.83	322.	232.	232.	3.47
+	3 COMBINED AT	C68	2504.	5.17	1239.	892.	892.	15.08
+	ROUTED TO	R68-72	2234.	7.17	1054.	759.	759.	15.08
+	HYDROGRAPH AT	10S	3046.	4.67	538.	388.	388.	3.92
+	ROUTED TO	R70-71	2584.	5.50	527.	379.	379.	3.92
+	HYDROGRAPH AT	10T	2296.	4.67	401.	289.	289.	3.81
+	ROUTED TO	R69-71	1963.	5.42	395.	285.	285.	3.81

+	HYDROGRAPH AT	10U	2247.	4.67	364.	262.	262.	4.26
+	3 COMBINED AT	C71	3826.	5.50	1018.	733.	733.	11.99
+	ROUTED TO	R71-72	3656.	5.83	1000.	720.	720.	11.99
+	2 COMBINED AT	C72	4352.	5.75	1641.	1181.	1181.	27.07
+	ROUTED TO	R72-81	4229.	6.00	1528.	1100.	1100.	27.07
+	HYDROGRAPH AT	10Q	2112.	4.42	367.	264.	264.	2.61
+	ROUTED TO	R75-76	1543.	5.83	359.	258.	258.	2.61
+	HYDROGRAPH AT	10O	3192.	4.42	613.	441.	441.	3.08
+	ROUTED TO	R73-74	2917.	4.92	598.	430.	430.	3.08
+	HYDROGRAPH AT	10P	3137.	4.75	779.	561.	561.	6.15
+	2 COMBINED AT	C74	5342.	4.83	1263.	909.	909.	9.23
+	ROUTED TO	R74-76	4542.	5.75	1230.	885.	885.	9.23
+	HYDROGRAPH AT	10R	2358.	4.75	569.	409.	409.	4.93
+	3 COMBINED AT	C76	5658.	5.83	1822.	1312.	1312.	16.77
+	ROUTED TO	R76-77	5221.	6.58	1688.	1215.	1215.	16.77
+	HYDROGRAPH AT	10V	1803.	4.67	296.	213.	213.	3.12
+	2 COMBINED AT	C77	5220.	6.58	1874.	1349.	1349.	19.89
+	ROUTED TO	R77-80	4900.	6.83	1710.	1232.	1232.	19.89
+	HYDROGRAPH AT	10W	3685.	4.67	936.	674.	674.	5.30
+	ROUTED TO	R78-79	3352.	5.33	910.	655.	655.	5.30
+	HYDROGRAPH AT	10X	1880.	4.58	405.	292.	292.	2.74
+	2 COMBINED AT	C79	3906.	5.25	1215.	875.	875.	8.04
+	ROUTED TO	R79-80	3384.	6.58	994.	716.	716.	8.04
+	HYDROGRAPH AT	10Y	1418.	4.67	321.	231.	231.	3.70
+	3 COMBINED AT	C80	6868.	6.83	2412.	1737.	1737.	31.63
+	ROUTED TO	R80-81	6684.	7.17	2118.	1525.	1525.	31.63
+	HYDROGRAPH AT	BR7281	4229.	6.00	1528.	1100.	1100.	27.07
+	2 COMBINED AT	C81	7134.	7.33	2739.	1972.	1972.	58.70
+	ROUTED TO	R81-82	6886.	7.75	2347.	1690.	1690.	58.70
+	HYDROGRAPH AT	10Z	1311.	4.58	245.	177.	177.	3.69
+	HYDROGRAPH AT	BC82.1	3402.	8.33	855.	616.	616.	57.34
+	3 COMBINED AT	C82	8274.	8.25	2347.	1690.	1690.	119.73
+	ROUTED TO	R82-84	6900.	8.33	1628.	1172.	1172.	119.73
+	HYDROGRAPH AT	10AA	1226.	4.42	210.	151.	151.	1.63
+	ROUTED TO	R83-84	583.	7.25	123.	89.	89.	1.63
+	HYDROGRAPH AT	10AB	2042.	4.67	477.	344.	344.	4.31
+	3 COMBINED AT	C84.2	6900.	8.33	1743.	1255.	1255.	125.67
+	HYDROGRAPH AT	BC84.1	2576.	8.00	1197.	862.	862.	34.88

+	2 COMBINED AT	C84	7054.	8.33	1804.	1299.	1299.	160.55
+	ROUTED TO	R84-38	5431.	8.33	1169.	842.	842.	160.55
+	HYDROGRAPH AT	8A	2044.	5.08	464.	334.	334.	6.27
+	2 COMBINED AT	C38I.2	5431.	8.33	1232.	887.	887.	166.82
+	HYDROGRAPH AT	BC38I1	4834.	8.33	535.	385.	385.	152.39
+	2 COMBINED AT	C38I	7457.	8.33	1232.	887.	887.	319.21
+	5 COMBINED AT	CLR1	9161.	8.33	1528.	1100.	1100.	590.89
+	HYDROGRAPH AT	9A	2413.	4.67	537.	386.	386.	4.64
+	ROUTED TO	R39-40	2296.	4.83	518.	373.	373.	4.64
+	HYDROGRAPH AT	9B	3593.	4.67	811.	584.	584.	8.49
+	2 COMBINED AT	C40	4945.	4.75	1155.	832.	832.	13.13
+	ROUTED TO	R40-41	4088.	5.58	1028.	740.	740.	13.13
+	HYDROGRAPH AT	9C	4008.	4.67	709.	510.	510.	7.32
+	2 COMBINED AT	C41	4230.	5.42	1449.	1043.	1043.	20.45
+	ROUTED TO	R41-43	4123.	6.00	1398.	1007.	1007.	20.45
+	HYDROGRAPH AT	9D	3442.	4.67	828.	596.	596.	6.24
+	ROUTED TO	R42-43	3140.	5.25	807.	581.	581.	6.24
+	2 COMBINED AT	C43	5335.	5.58	1874.	1349.	1349.	26.69
+	ROUTED TO	R43-44	5294.	5.67	1830.	1317.	1317.	26.69
+	HYDROGRAPH AT	9E	2328.	4.50	310.	223.	223.	6.08
+	HYDROGRAPH AT	9F	1359.	4.25	167.	120.	120.	1.75
+	3 COMBINED AT	C44	5195.	5.67	1975.	1422.	1422.	34.52
+	DIVERSION TO	CP44W	2538.	5.67	1133.	815.	815.	34.52
+	HYDROGRAPH AT	CP44E	2278.	5.58	697.	502.	502.	34.52
+	ROUTED TO	R44-45	2259.	5.83	690.	497.	497.	34.52
+	HYDROGRAPH AT	9G	963.	4.42	110.	79.	79.	1.00
+	2 COMBINED AT	C45	2222.	5.83	708.	510.	510.	35.52
+	ROUTED TO	R45-46	2128.	6.42	682.	491.	491.	35.52
+	HYDROGRAPH AT	9I	3271.	4.42	438.	315.	315.	4.81
+	DIVERSION TO	DT9IE	1635.	4.42	201.	144.	144.	4.81
+	HYDROGRAPH AT	9IW	1635.	4.42	237.	171.	171.	4.81
+	2 COMBINED AT	C46I	2128.	6.42	794.	572.	572.	40.33
+	ROUTED TO	C46O	1063.	7.42	420.	303.	303.	40.33
+	HYDROGRAPH AT	BCP44W	2538.	5.67	1133.	815.	815.	34.52
+	ROUTED TO	R44-47	2434.	6.33	1012.	728.	728.	34.52
+	HYDROGRAPH AT	9H	1071.	4.25	119.	86.	86.	1.47
+	2 COMBINED AT	C47I	2433.	6.33	1033.	744.	744.	35.99
+	ROUTED TO	C47O	934.	8.17	259.	187.	187.	35.99

+	HYDROGRAPH AT	11A	1447.	4.67	229.	165.	165.	2.18
+	ROUTED TO	C85O	241.	5.42	140.	101.	101.	2.18
+	HYDROGRAPH AT	12A	3565.	4.67	867.	624.	624.	4.88
+	ROUTED TO	R86-88	2780.	6.33	716.	515.	515.	4.88
+	HYDROGRAPH AT	12B	1449.	5.00	307.	221.	221.	4.79
+	ROUTED TO	R87-88	1379.	5.17	306.	221.	221.	4.79
+	HYDROGRAPH AT	12C	1554.	4.92	311.	224.	224.	3.64
+	3 COMBINED AT	C88	2748.	6.33	1111.	800.	800.	13.31
+	ROUTED TO	R88-89	2194.	7.50	757.	545.	545.	13.31
+	HYDROGRAPH AT	12D	2683.	4.83	515.	371.	371.	5.29
+	2 COMBINED AT	C89	2221.	7.58	1152.	829.	829.	18.60
+	ROUTED TO	R89-90	1904.	8.25	737.	531.	531.	18.60
+	HYDROGRAPH AT	12E	3002.	4.92	640.	461.	461.	7.54
+	2 COMBINED AT	C90I	2604.	5.33	1058.	762.	762.	26.14
+	ROUTED TO	C90O	2009.	5.83	955.	687.	687.	26.14
+	HYDROGRAPH AT	13A	1596.	4.17	131.	94.	94.	.90
+	ROUTED TO	C91O	205.	4.58	121.	87.	87.	.90
+	HYDROGRAPH AT	14A	276.	4.00	14.	10.	10.	.09
+	ROUTED TO	C92O	65.	4.17	14.	10.	10.	.09
+	HYDROGRAPH AT	14B	89.	4.00	4.	3.	3.	.03
+	ROUTED TO	C93O	32.	4.08	4.	3.	3.	.03
+	5 COMBINED AT	CLR2	2149.	5.75	1048.	754.	754.	29.34
+	5 COMBINED AT	CLR3	11774.	8.33	3172.	2284.	2284.	747.70
+	HYDROGRAPH AT	19A	181.	4.00	8.	6.	6.	.06
+	ROUTED TO	C49O	0.	4.25	0.	0.	0.	.06
+	HYDROGRAPH AT	19B	1201.	4.08	99.	71.	71.	.77
+	ROUTED TO	C48O	268.	4.50	98.	71.	71.	.77
+	HYDROGRAPH AT	BC90O	2009.	5.83	955.	687.	687.	26.14
+	ROUTED TO	R90-99	1862.	6.92	741.	534.	534.	26.14
+	HYDROGRAPH AT	16A	1047.	4.50	125.	90.	90.	1.94
+	2 COMBINED AT	C99	1852.	6.92	763.	549.	549.	28.08
+	HYDROGRAPH AT	17A	1539.	4.58	226.	163.	163.	2.17
+	HYDROGRAPH AT	BC46O	1063.	7.42	420.	303.	303.	40.33
+	ROUTED TO	R46-94	921.	8.33	156.	112.	112.	40.33
+	HYDROGRAPH AT	BC38I	4816.	8.33	711.	512.	512.	319.21
+	ROUTED TO	R38-94	2852.	8.33	400.	288.	288.	319.21
+	HYDROGRAPH AT	15A	1209.	4.42	133.	95.	95.	3.59
+	3 COMBINED AT	C94	2927.	8.33	400.	288.	288.	363.13

+	ROUTED TO	R94-96	1611.	8.33	213.	154.	154.	363.13
+	HYDROGRAPH AT	BC85O	241.	5.42	140.	101.	101.	2.18
+	ROUTED TO	R85-95	220.	7.50	59.	42.	42.	2.18
+	HYDROGRAPH AT	15B	1510.	4.58	218.	157.	157.	2.08
+	2 COMBINED AT	C95	1237.	4.58	238.	171.	171.	4.26
+	ROUTED TO	R95-96	1133.	4.83	225.	162.	162.	4.26
+	2 COMBINED AT	C96	1611.	8.33	221.	159.	159.	367.39
+	ROUTED TO	R96-97	1090.	8.33	163.	118.	118.	367.39
+	HYDROGRAPH AT	15C	933.	4.25	69.	50.	50.	1.83
+	2 COMBINED AT	C97	1090.	8.33	163.	118.	118.	369.22
+	ROUTED TO	R97-98	584.	8.33	60.	43.	43.	369.22
+	HYDROGRAPH AT	15D	967.	4.58	130.	94.	94.	2.87
+	2 COMBINED AT	C98	584.	8.33	60.	43.	43.	372.09
+	5 COMBINED AT	CLR4	3978.	8.33	763.	549.	549.	403.17
+	HYDROGRAPH AT	BC48O	268.	4.50	98.	71.	71.	.77
+	ROUTED TO	48-101	251.	5.00	94.	68.	68.	.77
+	HYDROGRAPH AT	BC49O	0.	4.25	0.	0.	0.	.06
+	ROUTED TO	49-101	0.	5.25	0.	0.	0.	.06
+	HYDROGRAPH AT	18A	395.	4.08	22.	16.	16.	.25
+	3 COMBINED AT	C101	278.	4.17	102.	74.	74.	1.08
+	HYDROGRAPH AT	BC47O	934.	8.17	259.	187.	187.	35.99
+	ROUTED TO	47-119	877.	8.33	187.	134.	134.	35.99
+	HYDROGRAPH AT	18T	592.	4.17	40.	29.	29.	.39
+	2 COMBINED AT	C119	877.	8.33	189.	136.	136.	36.38
+	HYDROGRAPH AT	18B	1760.	4.42	214.	154.	154.	1.81
+	HYDROGRAPH AT	18C	1615.	4.58	240.	173.	173.	1.90
+	HYDROGRAPH AT	18M	1278.	4.67	213.	154.	154.	1.50
+	HYDROGRAPH AT	18N	1679.	4.75	320.	230.	230.	2.40
+	5 COMBINED AT	CLR5	2537.	4.58	632.	455.	455.	43.99
+	HYDROGRAPH AT	18O	1112.	4.42	121.	87.	87.	.90
+	HYDROGRAPH AT	18P	1387.	4.50	197.	142.	142.	1.36
+	ROUTED TO	116117	1152.	5.17	195.	141.	141.	1.36
+	HYDROGRAPH AT	18Q	1517.	4.33	161.	116.	116.	1.13
+	2 COMBINED AT	C117	1471.	4.42	323.	232.	232.	2.49
+	5 COMBINED AT	CLR6	3967.	8.33	1216.	876.	876.	451.63
+	HYDROGRAPH AT	18R	1503.	4.83	289.	208.	208.	2.17
+	ROUTED TO	118-64	1292.	5.58	286.	206.	206.	2.17
+	HYDROGRAPH AT	18S	1528.	4.42	179.	129.	129.	1.35

+	2 COMBINED AT	C64	1347.	4.50	417.	300.	300.	3.52
+	HYDROGRAPH AT	18D	2227.	4.67	377.	271.	271.	3.60
+	ROUTED TO	104105	1697.	6.00	369.	265.	265.	3.60
+	HYDROGRAPH AT	18E	2563.	4.58	403.	290.	290.	3.83
+	2 COMBINED AT	C105	2226.	4.58	665.	479.	479.	7.43
+	ROUTED TO	105106	2093.	5.08	656.	472.	472.	7.43
+	HYDROGRAPH AT	18F	1134.	4.33	108.	78.	78.	.80
+	2 COMBINED AT	C106	2093.	5.08	718.	517.	517.	8.23
+	HYDROGRAPH AT	18G	1797.	4.58	273.	197.	197.	2.03
+	HYDROGRAPH AT	18K	1239.	4.25	103.	74.	74.	.80
+	5 COMBINED AT	CLR7	3962.	4.58	1610.	1159.	1159.	466.21
+	HYDROGRAPH AT	18H	2222.	4.42	280.	202.	202.	2.63
+	ROUTED TO	108109	1884.	4.83	278.	200.	200.	2.63
+	HYDROGRAPH AT	18I	2092.	4.50	301.	217.	217.	2.57
+	2 COMBINED AT	C109	2985.	4.67	506.	364.	364.	5.20
+	ROUTED TO	109110	2283.	5.83	496.	357.	357.	5.20
+	HYDROGRAPH AT	18J	1901.	4.42	247.	178.	178.	2.35
+	2 COMBINED AT	C110	2277.	5.83	700.	504.	504.	7.55
+	HYDROGRAPH AT	18L	2002.	4.42	246.	177.	177.	2.40
+	3 COMBINED AT	CLR8	4071.	4.58	1610.	1159.	1159.	476.16
+	HYDROGRAPH AT	10C1	1135.	4.42	133.	96.	96.	1.43
+	HYDROGRAPH AT	10C2	1872.	4.67	305.	219.	219.	4.23
+	HYDROGRAPH AT	10K1	927.	4.25	116.	83.	83.	.88
+	HYDROGRAPH AT	10K2	2435.	4.75	430.	310.	310.	4.56
+	HYDROGRAPH AT	10M1	2421.	4.25	362.	261.	261.	1.85
+	HYDROGRAPH AT	10M2	1490.	4.42	262.	188.	188.	1.48
+	HYDROGRAPH AT	10M3	1975.	4.58	410.	295.	295.	2.84

*** NORMAL END OF HEC-1 ***

Table R-6
Infiltration Loss Rates at CAP Structures

Structure	SCS Soil Map Unit	XKSAT (in/hr)	Loss Rate (cfs/acre)
CAP-1	123	0.49	0.494
CAP-2	48	0.10	0.101
CAP-3	117	0.43	0.434
CAP-4	20	0.27	0.272
CAP-6	117	0.43	0.434
CAP-7	117	0.43	0.434
CAP-8	71	0.33	0.333
CAP-9	71	0.33	0.333
CAP-10	71	0.33	0.333
CAP-11	71	0.33	0.333

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1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            SEPTEMBER 1990            *
*             VERSION 4.0              *
*                                      *
*  RUN DATE  02/17/1991  TIME  13:14:37 *
*                                      *
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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   FCDMC JACKRABBIT WASH, PROJECT NO. 10310
  2           ID   100-YEAR 24-HOUR DURATION STORM
  3           ID   FILENAME= 10310-24.H1,   15FEB91
              *
              *DIAGRAM
              *
  4           IT       5 01JAN90    0800     300
  5           IO       5      0.
  6           IN      30 01JAN90    0800
              *
  7           JD    4.20    0.01
  8           PC    .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
  9           PC    .068    .071    .080    .089    .098    .109    .120    .133    .147    .163
 10           PC    .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
 11           PC    .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
 12           PC    .952    .959    .965    .972    .978    .984    .989    .995   1.000
              *
 13           JD    4.12     5.0
              *
 14           JD    3.99    10.0
              *
 15           JD    3.70    50.0
              *
 16           JD    3.57   100.0
              *
 17           JD    3.28   500.0
              *
              *

 18           KK      1A
 19           KM   SUB-BASIN 1A
 20           KM      HEADWATERS OF JACKRABBIT WASH
 21           KM   NODE 1
 22           BA    6.69
 23           LG     .34     .31     6.9     .16     .00
 24           UI    662.   1323.   2847.   3688.   4580.   6146.   8158.   6346.   5091.   4008.
 25           UI   3115.   1927.   1146.    935.    662.    297.    203.    203.    203.    203.
 26           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

 27           KK    R1-2
 28           KM   REP. X-SECT. 1D1
 29           RS       5    FLOW      -1
 30           RL                   0.03    92.2
 31           RC   0.035   0.038   0.035    4224   0.001
 32           RX   510.0  1510.0  1585.0  1596.0  1600.0  1612.0  1662.0  2262.0
 33           RY    99.7    94.1    93.6    92.2    92.2    93.6    94.9    99.7
              *
              *
```



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

 34           KK      1B
 35           KM   SUB-BASIN 1B
 36           BA    5.70
 37           LG     .34     .31    6.80     .17     .00
 38           UI    619.   1479.   2868.   3690.   4744.   7138.   6619.   5048.   3917.   2972.
 39           UI   1776.   1062.    793.    560.    190.    190.    190.    190.      0.      0.
              *
              *

 40           KK      C2
 41           KM      COMBINE SURFACE RUNOFF AT NODE 2
 42           KM      1A + 1B
 43           HC       2
              *
              *

 44           KK    R2-4
 45           KM   X-SECT. 1D1
 46           RS       7    FLOW      -1
 47           RL                   0.03    92.2
 48           RC   0.035   0.038   0.035    6917   0.002
 49           RX   510.0  1510.0  1585.0  1596.0  1600.0  1612.0  1662.0  2262.0
 50           RY    99.7    94.1    93.6    92.2    92.2    93.6    94.9    99.7
              *
              *

 51           KK      1C
 52           KM   SUB-BASIN 1C
 53           KM   NODE 3  AT AGUILA ROAD
 54           BA     .81
 55           LG     .35     .36    5.40     .23     .00
 56           UI    124.    497.    747.   1130.   1398.    950.    661.    343.    193.    110.
 57           UI     38.     38.     38.      0.      0.      0.      0.      0.      0.      0.
              *
              *

 58           KK    R3-4
 59           KM   REP. X-SECT. 1D1
 60           RS      13    FLOW      -1
 61           RL                   0.17    92.2
 62           RC   0.035   0.038   0.035   11299   0.005
 63           RX   510.0  1510.0  1585.0  1596.0  1600.0  1612.0  1662.0  2262.0
 64           RY    99.7    94.1    93.6    92.2    92.2    93.6    94.9    99.7
              *
              *

 65           KK      1D
 66           KM   SUB-BASIN 1D
 67           BA    3.27
 68           LG     .35     .29    7.30     .14     .00
 69           UI    408.   1217.   2110.   2761.   4054.   4667.   3353.   2500.   1789.    890.
 70           UI    630.    408.    146.    125.    125.    125.      0.      0.      0.      0.
              *
              *
```

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

  71          KK      C4
  72          KM      COMBINE SURFACE RUNOFF AT NODE 4
  73          KM      R3-4 + 1C + 1D
  74          HC       3
              *
              *

  75          KK    R4-7
  76          KM   INTERPOLATE BETWEEN X-SECT. 1D1 AND 1H1
  77          RS       4    FLOW      -1
  78          RL                    2.45    91.8
  79          RC   0.035    0.03   0.035    6019   0.004
  80          RX   515.0  1515.0  1578.0  1592.0  1601.0  1612.0  1662.0  2287.0
  81          RY   102.0    97.0    96.5    91.8    91.8    96.0    97.0   102.0
              *
              *

  82          KK      1E
  83          KM   SUB-BASIN 1E
  84          KM   NODE 5  AT AGUILA ROAD
  85          BA    1.11
  86          LG     .27     .36    4.90     .26     .00
  87          UI    156.    556.    874.   1211.   1849.   1399.   1016.    698.    332.    219.
  88          UI    127.     48.     48.     48.      0.      0.      0.      0.      0.      0.
              *
              *

  89          KK    R5-7
  90          KM   REP. X-SECT. 2C1
  91          RS       5    FLOW      -1
  92          RL                    0.27    85.5
  93          RC   0.039    0.04   0.038    7181   0.007
  94          RX  1000.0  1520.0  1616.0  1632.0  1672.0  1744.0  1786.0  2061.0
  95          RY    99.5    94.3    91.7    85.5    85.5    87.9    90.2    99.5
              *
              *

  96          KK      1F
  97          KM   SUB-BASIN 1F
  98          KM   NODE 6  AT AGUILA ROAD
  99          BA    3.06
 100          LG     .15     .34    4.50     .29     .00
 101          UI    234.    234.    724.   1113.   1489.   1759.   2130.   2723.   1758.   1450.
 102          UI   1303.   1162.   1033.    916.    771.    642.    566.    523.    454.    375.
 103          UI    299.    277.    256.    204.    180.    177.    115.    115.    115.    115.
 104          UI     52.     45.     45.     45.     45.     45.     45.     45.     45.     45.
 105          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *
```



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

 106          KK    R6-7
 107          KM   REP. X-SECT. 2C1
 108          RS       3    FLOW      -1
 109          RL                    0.27    85.5
 110          RC    0.03   0.037    0.03    5491   0.005
 111          RX  1000.0  1520.0  1616.0  1632.0  1672.0  1744.0  1786.0  2061.0
 112          RY    99.5    94.3    91.7    85.5    85.5    87.9    90.2    99.5
              *
              *

 113          KK      1G
 114          KM   SUB-BASIN 1G
 115          BA    2.56
 116          LG     .30     .31    6.00     .37     .00
 117          UI    332.   1053.   1756.   2331.   3613.   3493.   2545.   1862.   1227.    584.
 118          UI    423.    246.    102.    102.    102.      0.      0.      0.      0.      0.
              *
              *

 119          KK      C7
 120          KM      COMBINE SURFACE RUNOFF AT NODE 7
 121          KM      R4-7 + R5-7 + R6-7 + 1G
 122          HC       4
              *
              *

 123          KK    R7-8
 124          KM   X-SECT. 1H1
 125          RS       3    FLOW      -1
 126          RL                    2.45    90.8
 127          RC    0.04   0.041    0.04    4013   0.004
 128          RX   520.0  1520.0  1570.0  1588.0  1603.0  1612.0  1662.0  1915.0
 129          RY   109.0    99.0    98.7    90.8    91.1    98.6    98.9   109.0
              *
              *

 130          KK      1H
 131          KM   SUB-BASIN 1H
 132          BA    7.55
 133          LG     .27     .34    4.50     .40     .00
 134          UI    636.    868.   2355.   3157.   3775.   4571.   5880.   7990.   6548.   5340.
 135          UI   4418.   3598.   2879.   1899.   1119.   1044.    655.    586.    195.    195.
 136          UI    195.    195.    195.      0.      0.      0.      0.      0.      0.      0.
              *
              *

 137          KK      C8
 138          KM      COMBINE SURFACE RUNOFF AT NODE 8
 139          KM      R7-8 + 1H
 140          HC       2
              *
              *
```

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

 141          KK   R8-10
 142          KM   REP. X-SECT. 1H1
 143          RS       2    FLOW      -1
 144          RL                    2.45    90.8
 145          RC    0.04   0.041    0.04    3379   0.004
 146          RX   520.0  1520.0  1570.0  1588.0  1603.0  1612.0  1662.0  1915.0
 147          RY   109.0    99.0    98.7    90.8    91.1    98.6    98.9   109.0
              *
              *

 148          KK      1I
 149          KM   SUB-BASIN 1I
 150          KM   NODE 9  AT AGUILA ROAD
 151          BA    6.88
 152          LG     .16     .35    4.80     .40     .00
 153          UI    362.    362.    400.   1052.   1461.   1937.   2289.   2587.   2837.   3311.
 154          UI   4173.   3718.   2640.   2307.   2128.   1977.   1825.   1699.   1545.   1428.
 155          UI   1290.   1147.    979.    903.    856.    812.    757.    617.    585.    462.
 156          UI    462.    412.    396.    387.    277.    277.    277.    253.    177.    177.
 157          UI    177.    177.    177.    153.     69.     69.     69.     69.     69.     69.
 158          UI     69.     69.     69.     69.     69.     69.     69.     69.     69.      0.
 159          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

 160          KK   R9-10
 161          KM   REP. X-SECT. 9B1
 162          RS       1    FLOW      -1
 163          RL                    2.45    91.2
 164          RC    0.04   0.037    0.04     792   0.006
 165          RX  1000.0  1521.0  1533.0  1541.0  1646.0  1664.0  1764.0  1772.0
 166          RY    98.2    93.0    92.6    91.2    92.2    94.7    96.6    99.5
              *
              *

 167          KK     C10
 168          KM      COMBINE SURFACE RUNOFF AT NODE 10
 169          KM      R8-10 + R9-10
 170          HC       2
              *
              *

 171          KK  R10-11
 172          KM   INTERPOLATE BETWEEN X-SECT. 1H1 AND 1L1
 173          RS       6    FLOW      -1
 174          RL                    2.45    90.8
 175          RC   0.035   0.045   0.037   14203   0.005
 176          RX  1170.0  1522.0  1558.0  1570.0  1622.0  1628.0  1675.0  2065.0
 177          RY   105.0    97.0    95.5    90.8    90.8    96.3    97.2   105.0
              *
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 178          KK      1J
 179          KM   SUB-BASIN 1J
 180          BA    2.57
 181          LG     .19     .36    5.30     .45     .00
 182          UI    184.    184.    489.    790.   1116.   1314.   1507.   1980.   1849.   1266.
 183          UI   1095.    994.    892.    797.    714.    606.    508.    452.    419.    379.
 184          UI    302.    252.    233.    202.    196.    141.    141.    127.     90.     90.
 185          UI     90.     90.     43.     35.     35.     35.     35.     35.     35.     35.
 186          UI     35.     35.     35.      0.      0.      0.      0.      0.      0.      0.
              *
              *

 187          KK      1K
 188          KM   SUB-BASIN 1K
 189          BA    5.02
 190          LG     .22     .34    5.50     .42     .00
 191          UI    282.    282.    408.    885.   1201.   1650.   1884.   2112.   2375.   2970.
 192          UI   3241.   2147.   1828.   1664.   1544.   1416.   1318.   1178.   1099.    961.
 193          UI    843.    733.    686.    648.    596.    518.    463.    372.    360.    323.
 194          UI    309.    290.    216.    216.    216.    169.    138.    138.    138.    138.
 195          UI    138.     57.     54.     54.     54.     54.     54.     54.     54.     54.
 196          UI     54.     54.     54.     54.     54.      0.      0.      0.      0.      0.
              *
              *

 197          KK     C11
 198          KM      COMBINE SURFACE RUNOFF AT NODE 11
 199          KM      R10-11 + 1J + 1K
 200          HC       3
              *
              *

 201          KK  R11-12
 202          KM   X-SECT. 1L1
 203          RS       6    FLOW      -1
 204          RL                    1.90    90.7
 205          RC    0.04   0.032    0.04   16790   0.005
 206          RX  1249.7  1524.0  1545.0  1552.0  1642.0  1650.0  1680.0  2430.0
 207          RY   103.0    95.0    92.6    90.8    90.7    94.1    95.5   103.0
              *
              *

 208          KK      1L
 209          KM   SUB-BASIN 1L
 210          BA    5.93
 211          LG     .15     .33    7.40     .21     .00
 212          UI    344.    344.    559.   1123.   1557.   2074.   2367.   2642.   3080.   3958.
 213          UI   3390.   2453.   2123.   1973.   1803.   1662.   1517.   1375.   1240.   1092.
 214          UI    919.    847.    800.    743.    657.    566.    467.    440.    396.    377.
 215          UI    348.    264.    264.    264.    189.    168.    168.    168.    168.    135.
 216          UI     66.     66.     66.     66.     66.     66.     66.     66.     66.     66.
 217          UI     66.     66.     66.      0.      0.      0.      0.      0.      0.      0.
              *
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 218          KK   C12.1
 219          KM      TOTAL SURFACE RUNOFF FROM MAJOR BASIN NO. 1 ONLY:  This is the flow
 220          KM      in Jackrabbit Wash prior to the confluence of Deadhorse Wash.
 221          KM      R11-12 + 1L
 222          KO                                  21
 223          HC       2
              *
              *

 224          KK      2A
 225          KM   SUB-BASIN 2A
 226          KM      HEADWATERS OF DEADHORSE WASH
 227          KM   NODE 13
 228          BA    7.76
 229          LG     .16      .36     5.40      .28      .00
 230          UI    622.     701.    2025.    3173.    4117.    4827.    6253.    6501.    4277.    3660.
 231          UI   3259.    2909.    2539.    2200.    1796.    1553.    1420.    1247.    1018.     795.
 232          UI    738.     681.     530.     477.     439.     304.     304.     304.     254.     119.
 233          UI    119.     119.     119.     119.     119.     119.     119.     119.       0.       0.
              *
              *

 234          KK  R13-14
 235          KM   REP. X-SECT. 9B1
 236          RS       4     FLOW       -1
 237          RL                     0.52     91.2
 238          RC    0.03    0.025     0.03     7022    0.007
 239          RX  1000.0   1521.0   1533.0   1541.0   1646.0   1664.0   1764.0   1772.0
 240          RY    98.2     93.0     92.6     91.2     92.2     94.7     96.6     99.5
              *
              *

 241          KK      2B
 242          KM   SUB-BASIN 2B
 243          BA    4.31
 244          LG     .17      .35     4.30      .54      .00
 245          UI    382.     562.    1389.    2197.    2744.    3362.    4313.    2752.    2278.    2003.
 246          UI   1757.    1526.    1269.    1020.     907.     821.     647.     512.     456.     418.
 247          UI    310.     293.     231.     187.     187.     186.      73.      73.      73.      73.
 248          UI     73.      73.      73.      73.      73.       0.       0.       0.       0.       0.
              *
              *

 249          KK     C14
 250          KM      COMBINE SURFACE RUNOFF AT NODE 14
 251          KM      2A + 2B
 252          HC       2
              *
              *
```



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

 253          KK  R14-15
 254          KM   X-SECT. 2C1
 255          RS       3     FLOW       -1
 256          RL                     2.45     85.5
 257          RC    0.03   0.037     0.03    11246     0.01
 258          RX  1000.0   1520.0   1616.0   1632.0   1672.0   1744.0   1786.0   2061.0
 259          RY    99.5     94.3     91.7     85.5     85.5     87.9     90.2     99.5
              *
              *

 260          KK      2C
 261          KM   SUB-BASIN 2C
 262          BA    3.82
 263          LG     .16      .35     5.10      .75      .00
 264          UI    415.     892.    2023.    2866.    3706.    4293.    2691.    2270.    1931.    1616.
 265          UI   1271.    1027.     908.     708.     532.     464.     377.     318.     236.     203.
 266          UI    203.     105.      80.      80.      80.      80.      80.      80.       0.       0.
              *
              *

 267          KK     C15
 268          KM      COMBINE SURFACE RUNOFF AT NODE 15
 269          KM      R14-15 + 2C
 270          KM
 271          HC       2
              *
              *

 272          KK  R15-17
 273          KM   X-SECT. 2D1
 274          RS       8     FLOW       -1
 275          RL                     1.70     87.0
 276          RC    0.035   0.041    0.035    14890    0.008
 277          RX  1000.0   1520.0   1540.0   1546.0   1606.0   1681.0   1714.0   2096.2
 278          RY    94.9     90.0     90.0     87.0     87.0     93.0     93.0     94.9
              *
              *

 279          KK      2D
 280          KM   SUB-BASIN 2D
 281          BA    5.12
 282          LG     .15      .36     5.40      .54      .00
 283          UI    254.     254.     254.     668.     919.    1244.    1534.    1719.    1898.    2093.
 284          UI   2525.    3068.    2283.    1799.    1587.    1483.    1380.    1282.    1195.    1103.
 285          UI   1012.     931.     830.     731.     655.     619.     583.     548.     511.     416.
 286          UI    392.     324.     324.     286.     278.     278.     198.     194.     194.     194.
 287          UI    132.     124.     124.     124.     124.     124.      87.      49.      49.      49.
 288          UI     49.      49.      49.      49.      49.      49.      49.      49.      49.      49.
 289          UI     49.      49.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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290          KK     C17
291          KM      COMBINE SURFACE RUNOFF AT NODE 17
292          KM      R15-17 + 2D
293          KM
294          HC       2
             *
             *

295          KK  R17-18
296          KM   X-SECT. 2F1
297          RS       3    FLOW       -1
298          RL                     2.45     93.0
299          RC   0.035   0.029   0.035     5914   0.009
300          RX  1000.0  1550.0  1586.0  1613.0  1688.0  1695.0  1705.0  1725.0
301          RY   100.5    95.0    94.5    93.0    93.0    96.5   100.5   100.8
             *
             *

302          KK      2E
303          KM   SUB-BASIN 2E
304          KM   NODE 16
305          BA    2.09
306          LG     .16     .35    4.80     .47     .00
307          UI    220.    441.   1032.   1481.   1868.   2397.   1503.   1247.   1071.    903.
308          UI    740.    572.    507.    417.    318.    266.    238.    169.    161.    108.
309          UI    108.    100.     42.     42.     42.     42.     42.     42.     42.      0.
310          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

311          KK  R16-18
312          KM   REP. X-SECT. 2C1
313          RS       6    FLOW       -1
314          RL                     0.11     85.5
315          RC    0.03   0.037    0.03    11088   0.007
316          RX  1000.0  1520.0  1616.0  1632.0  1672.0  1744.0  1786.0  2061.0
317          RY    99.5    94.3    91.7    85.5    85.5    87.9    90.2    99.5
             *
             *

318          KK     C18
319          KM      COMBINE SURFACE RUNOFF AT NODE 18
320          KM      R16-18 + R17-18
321          HC       2
             *
             *

322          KK  R18-12
323          KM   INTERPOLATE BETWEEN X-SECT. 3B1 AND 2F1
324          RS       5    FLOW       -1
325          RL                     1.90     84.0
326          RC   0.037   0.033   0.037    14520   0.006
327          RX  1000.0  1538.0  1567.0  1580.0  1720.0  1723.0  1752.0  2051.6
328          RY   100.1    93.0    87.0    84.0    84.0    88.0    91.0   100.1
             *
             *
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

329          KK      2F
330          KM   SUB-BASIN 2F
331          BA    4.89
332          LG     .15     .36    5.30     .49     .00
333          UI    220.    220.    220.    446.    705.    917.   1193.   1368.   1529.   1663.
334          UI   1813.   2150.   2645.   2205.   1641.   1445.   1319.   1257.   1171.   1093.
335          UI   1031.    954.    885.    826.    741.    676.    580.    548.    526.    505.
336          UI    466.    439.    361.    353.    281.    281.    264.    240.    240.    222.
337          UI    168.    168.    168.    168.    123.    107.    107.    107.    107.    107.
338          UI    107.     62.     42.     42.     42.     42.     42.     42.     42.     42.
339          UI     42.     42.     42.     42.     42.     42.     42.     42.     42.      0.
340          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

341          KK   C12.2
342          KM      TOTAL SURFACE RUNOFF FROM MAJOR BASIN NO. 2 ONLY: This is the flow in
343          KM      Deadhorse Wash prior to it's confluence with Jackrabbit Wash.
344          KM      R18-12 + 2F
345          HC       2
             *
             *

346          KK  8C12.1
347          KM   RECALL HYDROGRAPH C12.1
348          BI   C12.1      21
             *
             *

349          KK     C12
350          KM      COMBINE SURFACE RUNOFF AT NODE 12:  This is the flow in Jackrabbit
351          KM      Wash after the confluence of Deadhorse Wash.
352          KM      (MAJOR BASIN NO. 1) + (MAJOR BASIN NO. 2)
353          HC       2
             *
             *

354          KK  R12-21
355          KM   X-SECT. 3B1
356          RS       1    FLOW       -1
357          RL                     1.90     75.0
358          RC    0.04   0.036    0.04     4488   0.007
359          RX  1000.0  1520.0  1545.0  1550.0  1750.0  1755.0  1815.0  2550.0
360          RY    95.2    90.0    77.5    75.0    75.0    77.5    80.5    95.2
             *
             *

361          KK      3A
362          KM   SUB-BASIN 3A
363          KM   NODE 19
364          BA    5.97
```

```
365          LG     .22     .32    7.10     .27     .00
366          UI    372.    372.    732.   1304.   1915.   2363.   2716.   3054.   3879.   4160.
367          UI   2752.   2344.   2143.   1950.   1786.   1614.   1465.   1285.   1100.    956.
```



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

368          UI    890.    833.    761.    612.    531.    476.    432.    408.    361.    285.
369          UI    285.    271.    182.    182.    182.    182.    175.     71.     71.     71.
370          UI     71.     71.     71.     71.     71.     71.     71.     71.     71.      0.
371          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

372          KK  R19-21
373          KM   X-SECT. 3B2
374          RS       6    FLOW      -1
375          RL                   1.90    90.3
376          RC   0.045   0.037   0.045   15998    0.01
377          RX  1000.0  1520.0  1540.0  1544.0  1589.0  1619.0  1646.0  2122.2
378          RY   104.0    98.8    92.0    90.3    90.3    93.3    94.0   104.0
             *
             *

379          KK      3D
380          KM   SUB-BASIN 3D
381          KM   NODE 20
382          BA    5.01
383          LG     .24     .32    6.50     .29     .00
384          UI    260.    260.    264.    746.   1025.   1356.   1622.   1835.   2007.   2305.
385          UI   2864.   2888.   1965.   1693.   1543.   1450.   1330.   1240.   1143.   1047.
386          UI    958.    850.    744.    666.    629.    597.    550.    491.    426.    368.
387          UI    332.    318.    284.    284.    237.    199.    199.    199.    152.    127.
388          UI    127.    127.    127.    127.     85.     50.     50.     50.     50.     50.
389          UI     50.     50.     50.     50.     50.     50.     50.     50.     50.     50.
390          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

391          KK  R20-21
392          KM   X-SECT. 3C1
393          RS       5    FLOW      -1
394          RL                   1.90    92.1
395          RC    0.04   0.029   0.045    8976   0.012
396          RX  1000.0  1551.0  1562.0  1566.0  1602.0  1606.0  1627.0  1989.2
397          RY    98.9    94.6    93.7    92.1    92.5    94.2    95.3    98.9
             *
             *

398          KK      3B
399          KM   SUB-BASIN 3B
400          BA    6.25
401          LG     .16     .33    6.10     .41     .00
402          UI    309.    309.    309.    815.   1122.   1518.   1873.   2099.   2317.   2554.
403          UI   3082.   3745.   2786.   2196.   1938.   1810.   1685.   1565.   1459.   1347.
404          UI   1235.   1136.   1013.    892.    800.    756.    712.    669.    624.    508.
405          UI    479.    395.    395.    349.    339.    339.    241.    237.    237.    237.
406          UI    162.    151.    151.    151.    151.    151.    106.     59.     59.     59.
407          UI     59.     59.     59.     59.     59.     59.     59.     59.     59.     59.
408          UI     59.     59.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *
```



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

409          KK      3C
410          KM   SUB-BASIN 3C
411          BA    5.70
412          LG     .25     .32    6.20     .38     .00
413          UI    256.    256.    256.    520.    822.   1069.   1391.   1594.   1782.   1938.
414          UI   2114.   2506.   3084.   2571.   1913.   1684.   1538.   1465.   1365.   1274.
415          UI   1202.   1112.   1032.    962.    864.    788.    676.    638.    613.    589.
416          UI    543.    512.    420.    411.    327.    327.    308.    280.    280.    259.
417          UI    196.    196.    196.    196.    143.    125.    125.    125.    125.    125.
418          UI    125.     72.     49.     49.     49.     49.     49.     49.     49.     49.
419          UI     49.     49.     49.     49.     49.     49.     49.     49.     49.      0.
420          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

421          KK     C21
422          KM      COMBINE SURFACE RUNOFF AT NODE 21
423          KM      R12-21 + R19-21 + R20-21 + 3B + 3C
424          HC       5
             *
             *

425          KK  R21-22
426          KM   X-SECT. 3E1
427          RS       2    FLOW      -1
428          RL                   1.90    89.5
429          RC    0.04   0.035    0.04    6283   0.007
430          RX  1185.0  1605.0  1688.0  1700.0  1880.0  1904.0  2004.0  2284.0
431          RY   101.0    93.0    92.0    89.5    89.5    93.0    94.0   101.0
             *
             *

432          KK      3E
433          KM   SUB-BASIN 3E
434          BA    2.90
435          LG     .31     .35    4.00     .57     .00
436          UI    250.    368.    950.   1267.   1515.   1848.   2494.   3106.   2451.   2019.
437          UI   1642.   1331.   1030.    593.    429.    354.    250.    153.     77.     77.
438          UI     77.     77.     77.      0.      0.      0.      0.      0.      0.      0.
             *
             *

439          KK     C22
440          KM      COMBINE SURFACE RUNOFF AT NODE 22
441          KM      R21-22 + 3E
442          KM      (MAJOR BASIN 1) + (MAJOR BASIN 2) + (MAJOR BASIN 3)
```

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443          KM      AGUILA ROAD CROSSING
444          HC       2
             *
             *
1                                          HEC-1 INPUT                                                          PAGE 13

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

445          KK  R22-25
446          KM   X-SECT. 5B1
447          RS       1    FLOW       -1
448          RL                     1.90    87.2
449          RC   0.045   0.029   0.045    3010   0.004
450          RX  1150.0  1550.0  1590.0  1605.0  1773.0  1777.0  1827.0  2707.0
451          RY    99.7    91.7    90.7    87.2    87.4    90.4    90.9    99.7
             *
             *

452          KK      4A
453          KM   SUB-BASIN 4A
454          BA    7.43
455          LG     .15     .35    5.10     .37     .00
456          UI    261.    261.    261.    261.    546.    761.    999.   1178.   1492.   1616.
457          UI   1748.   1902.   2012.   2158.   2470.   2870.   3223.   2430.   1947.   1770.
458          UI   1625.   1548.   1484.   1401.   1329.   1266.   1211.   1128.   1066.   1017.
459          UI    946.    876.    810.    713.    682.    638.    625.    599.    577.    545.
460          UI    510.    428.    428.    370.    333.    333.    326.    285.    285.    285.
461          UI    275.    200.    200.    200.    200.    200.    174.    128.    128.    128.
462          UI    128.    128.    128.    128.    128.    101.     50.     50.     50.     50.
463          UI     50.     50.     50.     50.     50.     50.     50.     50.     50.     50.
464          UI     50.     50.     50.     50.     50.     50.     50.     50.      0.      0.
             *
             *

465          KK      4B
466          KM   SUB-BASIN 4B
467          BA    4.07
468          LG     .17     .35    4.70     .34     .00
469          UI    188.    188.    188.    414.    625.    806.   1067.   1197.   1336.   1447.
470          UI   1618.   1956.   2278.   1631.   1329.   1182.   1105.   1042.    964.    908.
471          UI    844.    778.    731.    658.    593.    517.    478.    456.    432.    406.
472          UI    388.    308.    308.    240.    240.    227.    206.    206.    186.    144.
473          UI    144.    144.    144.     96.     92.     92.     92.     92.     92.     88.
474          UI     36.     36.     36.     36.     36.     36.     36.     36.     36.     36.
475          UI     36.     36.     36.     36.     36.     36.     36.      0.      0.      0.
             *
             *

476          KK     C23
477          KM      COMBINE SURFACE RUNOFF AT NODE 23
478          KM      4A + 4B
479          HC       2
             *
             *

480          KK  R23-24
481          KM   REP. X-SECT. 2C1
482          RS       2    FLOW       -1
483          RL                     1.90    85.5
484          RC    0.03   0.037    0.03    4277   0.008
485          RX  1000.0  1520.0  1616.0  1632.0  1672.0  1744.0  1786.0  2061.0
486          RY    99.5    94.3    91.7    85.5    85.5    87.9    90.2    99.5
             *
             *
1                                          HEC-1 INPUT                                                          PAGE 14

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

487          KK      4C
488          KM   SUB-BASIN 4C
489          BA    2.65
490          LG     .33     .36    6.00     .19     .00
491          UI    203.    203.    695.    930.   1128.   1316.   1582.   2114.   2553.   2020.
492          UI   1689.   1421.   1181.    982.    701.    421.    344.    288.    203.    157.
493          UI     62.     62.     62.     62.     62.     62.      0.      0.      0.      0.
             *
             *

494          KK     C24
495          KM      COMBINE SURFACE RUNOFF AT NODE 24
496          KM      R23-24 + 4C
497          KM      This is the total runoff from Major Basin No. 4
498          HC       2
             *
             *

499          KK  R24-25
500          KM   REP. X-SECT. 5B1
501          RS       1    FLOW       -1
502          RL                     1.90    87.2
503          RC   0.045   0.029   0.045    3010   0.007
504          RX  1150.0  1550.0  1590.0  1605.0  1773.0  1777.0  1827.0  2707.0
505          RY    99.7    91.7    90.7    87.2    87.4    90.4    90.9    99.7
             *
             *

506          KK     C25
507          KM      COMBINE SURFACE RUNOFF AT NODE 25
508          KM      R22-25 + R24-25
509          HC       2
             *
             *

510          KK  R25-32
511          KM   INTERPOLATE BETWEEN X-SECT. 6C2 AND 5B1
512          RS       5    FLOW       -1
513          RL                     1.90    89.0
514          RC    0.04   0.034    0.04   15418   0.006
515          RX  1223.9  1535.0  1565.0  1575.0  1707.0  1842.0  1909.0  3109.0
516          RY   104.0    96.0    96.0    89.0    89.0    92.0    94.0   104.0
             *
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                *
517             KK      5A
518             KM   SUB-BASIN 5A
519             KM   WOODCHOPPER WASH
520             BA    8.03
521             LG     .26      .35     4.80      .37      .00
522             UI    436.     436.     584.    1500.    1851.    2189.    2460.    2738.    3137.    3546.
523             UI   4553.    5503.    5065.    4260.    3747.    3364.    2927.    2590.    2229.    1958.
524             UI   1477.    1025.     772.     724.     681.     436.     436.     353.     134.     134.
525             UI    134.     134.     134.     134.     134.     134.     134.       0.       0.       0.
                *
                *
1                                                HEC-1 INPUT                                                    PAGE 15

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

526             KK      5B
527             KM   SUB-BASIN 5B
528             BA    7.36
529             LG     .19      .35     6.10      .45      .00
530             UI    400.     400.     511.    1209.    1658.    2238.    2587.    2935.    3224.    3916.
531             UI   4809.    3461.    2745.    2439.    2281.    2094.    1941.    1780.    1630.    1483.
532             UI   1310.    1138.    1019.     959.     913.     836.     708.     657.     514.     511.
533             UI    456.     438.     419.     306.     306.     306.     260.     196.     196.     196.
534             UI    196.     196.     125.      77.      77.      77.      77.      77.      77.      77.
535             UI     77.      77.      77.      77.      77.      77.      77.       0.       0.       0.
                *
                *

536             KK     C32
537             KM      COMBINE SURFACE RUNOFF AT NODE 32:  This is the flow in Jackrabbit
538             KM      Wash after the confluence of Woodchopper Wash.
539             KM      R25-32 + 5A + 5B
540             HC       3
                *
                *

541             KK  R32-33
542             KM   REP. X-SECT. 6C2
543             RS       4     FLOW       -1
544             RL                     2.45     90.8
545             RC   0.035    0.038    0.035    11405    0.007
546             RX  1000.0   1520.0   1540.0   1545.0   1642.0   1906.0   1992.0   2632.0
547             RY   106.2    101.0    101.0     90.8     91.1     93.7     96.6    106.2
                *
                *

548             KK      5C
549             KM   SUB-BASIN 5C
550             BA    3.56
551             LG     .35      .35     6.20      .48      .00
552             UI    279.     293.     980.    1309.    1571.    1859.    2244.    3085.    3406.    2655.
553             UI   2239.    1850.    1536.    1248.     844.     493.     460.     324.     279.     130.
554             UI     85.      85.      85.      85.      85.       0.       0.       0.       0.       0.
                *
                *

555             KK     C33
556             KM      COMBINE SURFACE RUNOFF AT NODE 33
557             KM      R32-33 + 5C
558             KM      (MAJOR BASIN 1) + (MAJOR BASIN 2) + (MAJOR BASIN 3) + (MAJOR BASIN 4)
559             KM                      + (MAJOR BASIN 5)
560             KM      Crossing at Vulture Mine Road
561             HC       2
                *
                *
1                                                HEC-1 INPUT                                                    PAGE 16

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

562             KK  R33-34
563             KM   X-SECT. 6C-AM1
564             KM   Jackrabbit Wash HEC-2 Section 14.232
565             RS       9     FLOW       -1
566             RL                     2.45   1580.6
567             RC   0.035    0.038    0.035    28195    0.007
568             RX  8890.0   9690.0   9927.0  10035.0  10051.0  10095.0  10215.0  12285.0
569             RY  1603.9   1595.9   1585.4   1580.6   1581.4   1583.2   1583.2   1603.9
                *
                *

570             KK      6C
571             KM   SUB-BASIN 6C
572             BA    2.23
573             LG     .35      .35     4.40      .96      .00
574             UI    147.     147.     367.     597.     735.     846.     973.    1141.    1461.    1862.
575             UI   1625.    1348.    1178.     999.     856.     725.     581.     376.     260.     242.
576             UI    191.     147.     128.      45.      45.      45.      45.      45.      45.      45.
577             UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
                *
                *

578             KK     C34
579             KM      COMBINE SURFACE RUNOFF AT NODE 34
580             KM      R33-34 + 6C
581             HC       2
                *
                *

582             KK  R34-37
583             KM   X-SECT. 6D-AM3
584             KM   Jackrabbit Wash HEC-2 Section 11.608
585             RS       5     FLOW       -1
586             RL                     2.45   1485.3
587             RC   0.035    0.038    0.035    11405    0.006
588             RX  8983.0   9783.0   9905.0   9981.0  10000.0  10034.0  10302.0  10473.0
589             RY  1499.8   1491.8   1491.6   1485.3   1485.5   1488.8   1489.7   1501.6
                *
                *
```

```
590          KK      6A
591          KM   SUB-BASIN 6A
592          KM   NODE 35
593          BA    3.66
594          LG     .34      .36     6.80      .21      .00
595          UI    262.     262.     790.    1140.    1388.    1604.    1898.    2320.    3189.    3040.
596          UI   2440.    2102.    1761.    1487.    1255.     897.     556.     449.     407.     262.
597          UI    262.      84.      80.      80.      80.      80.      80.      80.       0.       0.
             *
             *
1                                                HEC-1 INPUT                                                    PAGE 17

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

598          KK  R35-36
599          KM   X-SECT. 6B-AM1
600          KM   Jackrabbit Wash West Fork HEC-2 Section 2.550
601          RS      13     FLOW      -1
602          RL                     0.40  1535.2
603          RC   0.035    0.036   0.035    28195    0.007
604          RX  9121.0   9921.0  9955.0   9985.0  10019.0  10049.0  10104.0  10451.5
605          RY  1555.2   1547.2  1540.0   1535.2   1535.5   1540.3   1538.1   1555.2
             *
             *

606          KK      6B
607          KM   SUB-BASIN 6B
608          BA    4.76
609          LG     .35      .35     4.40      .58      .00
610          UI    258.     258.     346.     889.    1097.    1298.    1458.    1623.    1859.    2102.
611          UI   2699.    3262.    3002.    2525.    2221.    1994.    1735.    1536.    1321.    1160.
612          UI    876.     608.     457.     429.     404.     258.     258.     209.      79.      79.
613          UI     79.      79.      79.      79.      79.      79.      79.       0.       0.       0.
             *
             *

614          KK     C36
615          KM      COMBINE SURFACE RUNOFF AT NODE 36
616          KM      R35-36 + 6B
617          HC       2
             *
             *

618          KK  R36-37
619          KM   X-SECT. 6D-AM2
620          KM   Jackrabbit Wash West Fork HEC-2 Section 1.064
621          RS       7     FLOW      -1
622          RL                     0.40  1483.5
623          RC   0.035    0.036   0.035     8976    0.007
624          RX  9010.0   9810.0  9955.0  10000.0  10030.0  10063.0  10180.0  10388.0
625          RY  1495.5   1487.5  1487.6   1483.6   1483.5   1487.7   1488.0   1499.8
             *
             *

626          KK     C37
627          KM      COMBINE SURFACE RUNOFF AT NODE 37
628          KM      R34-37 + R36-37
629          HC       2
             *
             *

630          KK  R37-38
631          KM   X-SECT. 6D-AM3
632          KM   Jackrabbit Wash HEC-2 Section 8.870
633          KM   CHANNEL ROUTE TO NODE 38I
634          RS       4     FLOW      -1
635          RL                     2.45  1395.3
636          RC   0.035    0.029   0.035    13200    0.007
1                                                HEC-1 INPUT                                                    PAGE 18

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

637          RX  9196.4   9670.0  9793.0   9910.0   9999.0  10218.0  10314.0  12194.0
638          RY  1415.5   1407.5  1400.7   1395.8   1395.3   1397.3   1396.7   1415.5
             *
             *

639          KK      6D
640          KM   SUB-BASIN 6D
641          BA    3.67
642          LG     .35      .35     3.30      .85      .00
643          UI    257.     257.     740.    1099.    1345.    1546.    1825.    2181.    2970.    3143.
644          UI   2493.    2132.    1818.    1540.    1281.    1025.     645.     453.     423.     300.
645          UI    257.     162.      79.      79.      79.      79.      79.      79.       0.       0.
             *
             *

646          KK  C38I.1
647          KM      R37-38 + 6D
648          KM      This is the flow in Jackrabbit Wash prior to the confluence of Star Wash.
649          KM      MAJOR BASIN'S  1 + 2 + 3 + 4 + 5 + 6
650          KO                                     21
651          HC       2
             *
             *

652          KK      7A
653          KM   SUB-BASIN 7A
654          KM   HEADWATERS OF POWERLINE WASH
655          KM   NODE 26
656          BA    5.19
657          LG     .26      .32     6.80      .21      .00
658          UI    282.     282.     377.     969.    1196.    1415.    1590.    1770.    2027.    2292.
659          UI   2943.    3557.    3273.    2754.    2422.    2174.    1892.    1674.    1441.    1265.
660          UI    955.     663.     499.     468.     440.     282.     282.     228.      86.      86.
661          UI     86.      86.      86.      86.      86.      86.      86.       0.       0.       0.
             *
             *

662          KK  R26-27
663          KM   X-SECT. 7B1
664          RS      14     FLOW      -1
```

```
665          RL                      0.26    91.0
666          RC   0.035   0.044   0.035   21384   0.009
667          RX  1000.0  1542.0  1610.0  1616.0  1621.0  1630.0  1669.0  2119.8
668          RY    99.5    94.1    94.4    91.0    91.3    94.2    95.1    99.5
             *
             *

669          KK      7B
670          KM   SUB-BASIN 7B
671          BA    6.11
672          LG     .34     .34    5.20     .41     .00
673          UI    343.    343.    531.   1202.   1501.   1758.   1978.   2228.   2549.   2969.
674          UI   3823.   4434.   3676.   3147.   2798.   2468.   2145.   1873.   1633.   1312.
675          UI    922.    607.    580.    563.    359.    343.    303.    105.    105.    105.
676          UI    105.    105.    105.    105.    105.      0.      0.      0.      0.      0.
             *
             *
```



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

677          KK     C27
678          KM      COMBINE SURFACE RUNOFF AT NODE 27
679          KM      R26-27 + 7B
680          HC       2
             *
             *

681          KK  R27-29
682          KM   INTERPOLATE BETWEEN X-SECT. 7B1 AND 7E1
683          RS       9    FLOW      -1
684          RL                     0.10    92.0
685          RC   0.033   0.042   0.033   12989   0.006
686          RX  1000.0  1555.0  1613.0  1622.0  1637.0  1647.0  1676.0  2051.0
687          RY    99.8    94.2    94.4    92.0    92.0    93.4    96.0    99.8
             *
             *

688          KK      7C
689          KM   SUB-BASIN 7C
690          KM   NODE 28
691          BA    6.81
692          LG     .27     .33    5.90     .42     .00
693          UI    353.    353.    361.   1178.   1439.   1702.   1933.   2129.   2404.   2706.
694          UI   3198.   4048.   4566.   3803.   3290.   2937.   2649.   2299.   2055.   1784.
695          UI   1565.   1193.    846.    624.    591.    580.    370.    353.    353.    125.
696          UI    108.    108.    108.    108.    108.    108.    108.    108.      0.      0.
             *
             *

697          KK  R28-29
698          KM   INTERPOLATE BETWEEN X-SECT. 7B1 AND 7E1
699          RS      11    FLOW      -1
700          RL                     0.28    92.0
701          RC   0.033   0.042   0.033   18586   0.009
702          RX  1000.0  1555.0  1613.0  1622.0  1637.0  1647.0  1676.0  2051.0
703          RY    99.8    94.2    94.4    92.0    92.0    93.4    96.0    99.8
             *
             *

704          KK     C29
705          KM      COMBINE SURFACE RUNOFF AT NODE 29
706          KM      R27-29 + R28-29
707          HC       2
             *
             *

708          KK  R29-30
709          KM   REP. XSECT. 7E1
710          RS       1    FLOW      -1
711          RL                     0.23    92.7
712          RC    0.03    0.04    0.03    3221   0.011
713          RX  1396.5  1569.0  1617.0  1626.0  1665.0  1672.7  1683.0  2223.0
714          RY   102.3    94.3    94.5    93.0    92.7    94.5    96.9   102.3
             *
             *
```



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

715          KK      7D
716          KM   SUB-BASIN 7D
717          BA    5.84
718          LG     .35     .35    4.80     .48     .00
719          UI    427.    427.   1347.   1893.   2294.   2661.   3172.   3959.   5389.   4696.
720          UI   3829.   3296.   2742.   2293.   1890.   1312.    756.    711.    553.    427.
721          UI    300.    131.    131.    131.    131.    131.    131.      0.      0.      0.
             *
             *

722          KK     C30
723          KM      COMBINE SURFACE RUNOFF AT NODE 30
724          KM      R29-30 + 7D
725          KM      Crossing at Vulture Mine Road
726          HC       2
             *
             *

727          KK  R30-31
728          KM   X-SECT. 7E1
729          RS      16    FLOW      -1
730          RL                     0.33    92.7
731          RC    0.03    0.04    0.03   36590   0.006
732          RX  1396.5  1569.0  1617.0  1626.0  1665.0  1672.7  1683.0  2223.0
733          RY   102.3    94.3    94.5    93.0    92.7    94.5    96.9   102.3
             *
             *

734          KK      7F
735          KM   SUB-BASIN 7F
736          BA    2.63
```

```
 737          LG     .35     .35    4.20     .51     .00
 738          UI    155.    155.    290.    560.    717.    828.    928.   1067.   1220.   1528.
 739          UI   1962.   1801.   1498.   1308.   1158.    994.    866.    748.    601.    411.
 740          UI    275.    261.    242.    155.    155.    100.     48.     48.     48.     48.
 741          UI     48.     48.     48.     48.      0.      0.      0.      0.      0.      0.
              *
              *

 742          KK     C31
 743          KM      COMBINE SURFACE RUNOFF AT NODE 31
 744          KM      R30-31 + 7F
 745          HC       2
              *
              *

 746          KK  R31-84
 747          KM   REP. X-SECT. 7E1
 748          RS       7    FLOW      -1
 749          RL                   0.33    92.7
 750          RC    0.03    0.04    0.03   13992   0.005
 751          RX  1396.5  1569.0  1617.0  1626.0  1665.0  1672.7  1683.0  2223.0
 752          RY   102.3    94.3    94.5    93.0    92.7    94.5    96.9   102.3
              *
              *
```



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

 753          KK      7E
 754          KM   SUB-BASIN 7E
 755          BA    8.30
 756          LG     .35     .35    4.50     .38     .00
 757          UI    333.    333.    333.    436.   1093.   1268.   1529.   1677.   1832.   1981.
 758          UI   2149.   2392.   2589.   2978.   3677.   4164.   4139.   3562.   3177.   2893.
 759          UI   2672.   2452.   2192.   2006.   1816.   1646.   1483.   1218.    956.    649.
 760          UI    589.    561.    547.    483.    333.    333.    333.    232.    102.    102.
 761          UI    102.    102.    102.    102.    102.    102.    102.    102.    102.    102.
 762          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

 763          KK   C84.1
 764          KM      R31-84 + 7E
 765          KM      TOTAL SURFACE RUNOFF FROM MAJOR BASIN NO. 7
 766          KM      This is the flow in Powerline Wash prior to it's confluence
 767          KM      with Star Wash.
 768          KO                                      21
 769          HC       2
              *
              *

 770          KK     10A
 771          KM   SUB-BASIN 10A
 772          KM   NODE 50
 773          BA    2.01
 774          LG     .15     .33    6.10     .32     .00
 775          UI    144.    144.    382.    618.    873.   1028.   1178.   1549.   1446.    990.
 776          UI    857.    778.    698.    623.    558.    474.    398.    353.    328.    296.
 777          UI    237.    197.    182.    158.    153.    110.    110.    100.     70.     70.
 778          UI     70.     70.     34.     28.     28.     28.     28.     28.     28.     28.
 779          UI     28.     28.     28.      0.      0.      0.      0.      0.      0.      0.
              *
              *

 780          KK  R50-51
 781          KM   X-SECT. 1081
 782          RS      25    FLOW      -1
 783          RL                   0.54    93.5
 784          RC    0.03   0.038    0.03   37594   0.013
 785          RX  1000.0  1587.0  1608.0  1612.0  1620.0  1624.0  1684.0  2324.6
 786          RY   101.1    94.4    94.7    93.5    93.8    95.0    94.1   101.1
              *
              *

 787          KK     10B
 788          KM   SUB-BASIN 10B
 789          BA    5.36
 790          LG     .35     .35    4.50     .62     .00
 791          UI    328.    328.    681.   1214.   1557.   1798.   2025.   2343.   2716.   3538.
 792          UI   4226.   3490.   2961.   2618.   2245.   1959.   1660.   1398.   1011.    615.
 793          UI    561.    539.    342.    328.    236.    101.    101.    101.    101.    101.
 794          UI    101.    101.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *
```



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

 795          KK     C51
 796          KM      COMBINE SURFACE RUNOFF AT NODE 51
 797          KM      R50-51 + 10B
 798          HC       2
              *
              *

 799          KK  R51-57
 800          KM   INTERPOLATE BETWEEN X-SECT. 10H1 AND 10B1
 801          RS       5    FLOW      -1
 802          RL                   0.54    93.0
 803          RC   0.033   0.038   0.033    8026   0.007
 804          RX  1014.0  1554.0  1587.0  1601.0  1641.0  1651.0  1691.0  2566.2
 805          RY   103.4    95.4    95.8    93.0    93.0    94.5    94.5   103.4
              *
              *

 806          KK     10D
 807          KM   SUB-BASIN 10D
 808          KM   HEADWATERS OF TANK WASH
 809          KM   NODE 52
 810          BA    4.54
 811          LG     .15     .32    7.30     .17     .00
```

```
812          UI    243.    243.    289.    719.    993.   1329.   1553.   1756.   1924.   2291.
813          UI   2900.   2270.   1726.   1509.   1408.   1298.   1196.   1114.   1008.    942.
814          UI    822.    730.    636.    594.    560.    524.    476.    399.    352.    310.
815          UI    299.    266.    266.    217.    186.    186.    186.    130.    119.    119.
816          UI    119.    119.    119.     53.     47.     47.     47.     47.     47.     47.
817          UI     47.     47.     47.     47.     47.     47.     47.     47.      0.      0.
             *
             *

818          KK  R52-55
819          KM   X-SECT. 10E2
820          RS      11    FLOW      -1
821          RL                    0.54    86.5
822          RC   0.035   0.036   0.035   18216   0.013
823          RX  1000.0  1520.0  1620.0  1623.0  1631.0  1637.0  1737.0  2257.0
824          RY    95.2    90.0    89.5    86.5    86.5    89.5    90.0    95.2
             *
             *

825          KK     10E
826          KM   SUB-BASIN 10E
827          BA    2.72
828          LG     .32     .36    4.80     .51     .00
829          UI    218.    252.    774.   1051.   1249.   1488.   1824.   2570.   2524.   1989.
830          UI   1679.   1375.   1135.    885.    526.    377.    337.    218.    185.     67.
831          UI     67.     67.     67.     67.     67.      0.      0.      0.      0.      0.
             *
             *
```



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

832          KK     C55
833          KM      COMBINE SURFACE RUNOFF AT NODE 55
834          KM      Crossing at Vulture Mine Road
835          KM      R52-55 + 10E
836          HC       2
             *
             *

837          KK  R55-57
838          KM   INTERPOLATE BETWEEN X-SECT. 10E1 AND 10H1
839          RS       9    FLOW      -1
840          RL                    0.54    93.0
841          RC   0.033   0.038   0.033   15523   0.01
842          RX  1000.0  1520.0  1699.0  1611.0  1652.0  1662.0  1686.0  2326.5
843          RY   101.1    95.9    95.7    93.0    93.0    94.3    95.0   101.1
             *
             *

844          KK     C57
845          KM      COMBINE SURFACE RUNOFF AT NODE 57
846          KM      R51-57 + R55-57
847          HC       2
             *
             *

848          KK  R57-58
849          KM   REP. X-SECT. 10H1
850          RS       3    FLOW      -1
851          RL                    0.43    92.6
852          RC   0.035   0.037   0.035    5597   0.007
853          RX  1000.0  1520.0  1568.0  1588.0  1664.0  1677.0  1697.0  2407.0
854          RY   102.1    96.9    97.0    92.6    92.6    94.0    95.0   102.1
             *
             *

855          KK     10C
856          KM   SUB-BASIN 10C
857          BA    5.66
858          LG     .35     .35    4.10     .63     .00
859          UI    323.    323.    534.   1143.   1440.   1678.   1885.   2130.   2445.   2904.
860          UI   3769.   4084.   3337.   2883.   2569.   2228.   1952.   1683.   1467.   1096.
861          UI    745.    571.    531.    462.    323.    323.    185.     99.     99.     99.
862          UI     99.     99.     99.     99.     99.      0.      0.      0.      0.      0.
             *
             *

863          KK     C58
864          KM      COMBINE SURFACE RUNOFF AT NODE 58
865          KM      R57-58 + 10C
866          HC       2
             *
             *
```



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

867          KK  R58-59
868          KM   X-SECT. 10H1
869          RS       2    FLOW      -1
870          RL                    1.90    92.6
871          RC   0.035   0.037   0.035    4013   0.005
872          RX  1000.0  1520.0  1568.0  1588.0  1664.0  1677.0  1697.0  2407.0
873          RY   102.1    96.9    97.0    92.6    92.6    94.0    95.0   102.1
             *
             *

874          KK     10F
875          KM   SUB-BASIN 10F
876          KM   NODE 53
877          BA    5.68
878          LG     .21     .30    7.80     .15     .00
879          UI    361.    361.    741.   1306.   1901.   2318.   2672.   3050.   3916.   3767.
880          UI   2572.   2211.   2042.   1846.   1694.   1506.   1373.   1185.   1009.    901.
881          UI    843.    778.    669.    587.    461.    452.    395.    395.    287.    277.
882          UI    277.    204.    177.    177.    177.    177.     96.     69.     69.     69.
883          UI     69.     69.     69.     69.     69.     69.     69.     69.      0.      0.
             *
             *
```

```
884          KK  R53-54
885          KM   X-SECT. 10G1
886          RS      18    FLOW       -1
887          RL                     0.38     92.3
888          RC   0.045   0.048    0.045    33792    0.015
889          RX  1000.0  1520.0  1601.0  1606.0  1616.0  1621.0  1630.0  1773.6
890          RY   100.8    95.6    93.6    92.6    92.3    93.6    94.0   100.8
             *
             *

891          KK     10G
892          KM   SUB-BASIN 10G
893          BA    4.28
894          LG     .20     .35    5.20     .42     .00
895          UI    240.    240.    348.    755.   1024.   1407.   1607.   1801.   2025.   2532.
896          UI   2763.   1831.   1558.   1419.   1316.   1207.   1123.   1006.    937.    819.
897          UI    718.    625.    585.    552.    508.    442.    395.    317.    307.    275.
898          UI    263.    247.    184.    184.    184.    144.    118.    118.    118.    118.
899          UI    118.     49.     46.     46.     46.     46.     46.     46.     46.     46.
900          UI     46.     46.     46.     46.     46.      0.      0.      0.      0.      0.
             *
             *

901          KK     C54
902          KM      COMBINE SURFACE RUNOFF AT NODE 54
903          KM      R53-54 + 10G
904          KM      Crossing at Vulture Mine Road
905          HC       2
             *
             *
```



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

906          KK  R54-59
907          KM   INTERPOLATE BETWEEN X-SECT. 10H1 AND 10G1
908          RS      15    FLOW       -1
909          RL                     0.54     92.5
910          RC   0.04   0.043     0.04    27614    0.009
911          RX  1120.0  1520.0  1585.0  1597.0  1639.0  1650.0  1665.0  1933.8
912          RY   104.1    96.1    95.3    92.5    92.5    93.8    94.5   104.1
             *
             *

913          KK     10H
914          KM   SUB-BASIN 10H
915          BA    6.74
916          LG     .35     .35    3.90     .76     .00
917          UI    334.    334.    334.    999.   1291.   1577.   1770.   1946.   2164.   2450.
918          UI   2745.   3447.   4182.   4037.   3401.   2993.   2708.   2421.   2131.   1907.
919          UI   1676.   1462.   1126.    815.    590.    564.    548.    394.    334.    334.
920          UI    197.    102.    102.    102.    102.    102.    102.    102.    102.    102.
921          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
             *
             *

922          KK     C59
923          KM      COMBINE SURFACE RUNOFF AT NODE 59
924          KM      R58-59 + R54-59 + 10H
925          HC       3
             *
             *

926          KK  R59-61
927          KM   REP. X-SECT. 10H1
928          RS       4    FLOW       -1
929          RL                     2.74     92.6
930          RC   0.035   0.037    0.035     7181    0.007
931          RX  1000.0  1520.0  1568.0  1588.0  1664.0  1677.0  1697.0  2407.0
932          RY   102.1    96.9    97.0    92.6    92.6    94.0    95.0   102.1
             *
             *

933          KK     10I
934          KM   SUB-BASIN 10I
935          KM   HEADWATERS OF MILL WASH
936          KM   NODE 60
937          BA    6.93
938          LG     .23     .32    6.70     .25     .00
939          UI    329.    329.    329.    781.   1133.   1461.   1936.   2143.   2393.   2592.
940          UI   2985.   3648.   3765.   2537.   2212.   1997.   1891.   1755.   1630.   1538.
941          UI   1405.   1306.   1200.   1075.    953.    855.    804.    762.    724.    687.
942          UI    555.    540.    431.    420.    399.    360.    360.    320.    252.    252.
943          UI    252.    242.    161.    161.    161.    161.    161.    161.    118.     63.
944          UI     63.     63.     63.     63.     63.     63.     63.     63.     63.     63.
945          UI     63.     63.     63.     63.     63.      0.      0.      0.      0.      0.
             *
             *
```



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

946          KK  R60-61
947          KM   INTERPOLATE BETWEEN X-SECT. 10J1 AND 10J2
948          RS      26    FLOW       -1
949          RL                     0.54     93.3
950          RC   0.038   0.035    0.038    44299    0.01
951          RX  1000.0  1520.0  1622.0  1627.0  1632.0  1638.0  1667.0  2427.0
952          RY   100.9    95.7    95.5    93.3    93.3    94.7    94.9   100.9
             *
             *

953          KK     10J
954          KM   SUB-BASIN 10J
955          BA    7.08
956          LG     .35     .34    4.40     .61     .00
957          UI    367.    367.    375.   1225.   1496.   1769.   2009.   2213.   2499.   2813.
958          UI   3324.   4209.   4747.   3953.   3421.   3053.   2754.   2391.   2136.   1854.
959          UI   1627.   1240.    879.    649.    614.    602.    385.    367.    367.    130.
960          UI    112.    112.    112.    112.    112.    112.    112.    112.      0.      0.
             *
```

```
                 *
 961             KK     C61
 962             KM      COMBINE SURFACE RUNOFF AT NODE 61
 963             KM      R59-61 + R60-61 + 10J
 964             HC       3
                 *
                 *

 965             KK  R61-82
 966             KM   X-SECT. 10L1
 967             RS      11    FLOW      -1
 968             RL                    1.90    90.7
 969             RC    0.04   0.034    0.03   17213   0.005
 970             RX  1248.0  1563.0  1695.0  1704.0  1749.0  1761.0  1979.0  2639.0
 971             RY   101.8    93.8    94.3    90.7    90.7    93.5    95.2   101.8
                 *
                 *

 972             KK     10L
 973             KM   SUB-BASIN 10L
 974             BA    6.34
 975             LG     .35     .35    3.90     .69     .00
 976             UI    362.    362.    598.   1280.   1613.   1880.   2112.   2386.   2739.   3253.
 977             UI   4221.   4575.   3738.   3229.   2878.   2496.   2187.   1886.   1644.   1228.
 978             UI    834.    640.    595.    518.    362.    362.    207.    111.    111.    111.
 979             UI    111.    111.    111.    111.    111.      0.      0.      0.      0.      0.
                 *
                 *
1                                          HEC-1 INPUT                                          PAGE 27

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

 980             KK   C82.1
 981             KM      COMBINE SURFACE RUNOFF AT NODE 82.1
 982             KM      R61-82 + 10L
 983             KM      This is the flow from the area to the west of Star Wash prior to
 984             KM      it's confluence with Star Wash.
 985             KO                                      21
 986             HC       2
                 *
                 *

 987             KK     10M
 988             KM   SUB-BASIN 10M
 989             KM   NODE 67
 990             BA    6.17
 991             LG     .21     .32    7.00     .17     .00
 992             UI    330.    330.    393.    978.   1349.   1806.   2110.   2386.   2615.   3114.
 993             UI   3941.   3085.   2345.   2051.   1914.   1764.   1626.   1515.   1370.   1281.
 994             UI   1117.    992.    864.    807.    762.    712.    647.    542.    479.    421.
 995             UI    406.    361.    361.    295.    253.    253.    253.    177.    161.    161.
 996             UI    161.    161.    161.     72.     63.     63.     63.     63.     63.     63.
 997             UI     63.     63.     63.     63.     63.     63.     63.     63.      0.      0.
                 *
                 *

 998             KK  R67-68
 999             KM   INTERPOLATE BETWEEN X-SECT. 10N1 AND 10N2
1000             RS      27    FLOW      -1
1001             RL                    0.65    90.8
1002             RC   0.035   0.045   0.035   43402   0.01
1003             RX  1000.0  1520.0  1619.0  1630.0  1637.0  1647.0  1753.0  2076.3
1004             RY    99.7    94.5    93.9    90.8    90.8    94.3    94.4    99.7
                 *
                 *

1005             KK     10K
1006             KM   SUB-BASIN 10K
1007             KM   NODE 63
1008             BA    5.44
1009             LG     .32     .35    5.10     .44     .00
1010             UI    291.    291.    359.    990.   1218.   1441.   1624.   1802.   2050.   2314.
1011             UI   2836.   3639.   3525.   2936.   2565.   2308.   2022.   1779.   1559.   1378.
1012             UI   1101.    795.    514.    496.    478.    342.    291.    291.    124.     89.
1013             UI     89.     89.     89.     89.     89.     89.     89.      0.      0.      0.
                 *
                 *

1014             KK  R63-68
1015             KM   REP. X-SECT. 10R1
1016             RS       7    FLOW      -1
1017             RL                    0.42    92.0
1018             RC   0.035   0.033   0.035   11986   0.008
1019             RX  1000.0  1520.0  1553.0  1562.0  1572.0  1580.0  1694.0  2244.0
1020             RY   102.9    97.7    94.9    92.0    92.1    95.6    97.4   102.9
                 *
                 *
1                                          HEC-1 INPUT                                          PAGE 28

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

1021             KK     10N
1022             KM   SUB-BASIN 10N
1023             BA    3.47
1024             LG     .35     .36    4.60     .47     .00
1025             UI    201.    201.    354.    719.    914.   1060.   1189.   1352.   1549.   1890.
1026             UI   2464.   2448.   2009.   1745.   1554.   1341.   1171.   1008.    851.    620.
1027             UI    387.    347.    331.    236.    201.    193.     62.     62.     62.     62.
1028             UI     62.     62.     62.     62.      0.      0.      0.      0.      0.      0.
                 *
                 *

1029             KK     C68
1030             KM      COMBINE SURFACE RUNOFF AT NODE 68
1031             KM      R67-68 + R63-68 + 10N
1032             HC       3
                 *
                 *

1033             KK  R68-72
```

```
1034          KM   REP. X-SECT. 10N2
1035          RS       4    FLOW      -1
1036          RL                   0.54    89.5
1037          RC    0.03   0.043   0.035    4805   0.005
1038          RX  1000.0  1520.0  1592.0  1607.0  1613.0  1625.0  1739.0  1989.0
1039          RY    99.6    94.4    93.4    89.6    89.5    94.4    93.1    99.6
              *
              *

1040          KK     10S
1041          KM   SUB-BASIN 10S
1042          KM   HEADWATERS OF STAR WASH
1043          KM   NODE 70
1044          BA    3.92
1045          LG     .30     .36    5.50     .23     .00
1046          UI    269.    269.    737.   1130.   1388.   1592.   1866.   2203.   2936.   3406.
1047          UI   2719.   2304.   1992.   1679.   1417.   1177.    833.    480.    452.    383.
1048          UI    269.    253.     83.     83.     83.     83.     83.     83.     83.      0.
1049          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1050          KK  R70-71
1051          KM   X-SECT. 10U1
1052          RS      12    FLOW      -1
1053          RL                   0.54    90.9
1054          RC    0.03   0.044    0.03   23179   0.009
1055          RX  1000.0  1551.0  1571.0  1584.0  1593.0  1607.0  1620.0  1730.5
1056          RY   101.1    95.6    92.6    90.9    91.0    94.1    98.9   101.1
              *
              *
```



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

1057          KK     10T
1058          KM   SUB-BASIN 10T
1059          KM   NODE 69
1060          BA    3.81
1061          LG     .34     .35    5.40     .36     .00
1062          UI    252.    252.    628.   1019.   1256.   1446.   1663.   1950.   2496.   3181.
1063          UI   2776.   2303.   2013.   1707.   1462.   1238.    992.    642.    445.    414.
1064          UI    326.    252.    218.     77.     77.     77.     77.     77.     77.     77.
1065          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1066          KK  R69-71
1067          KM   X-SECT. 10U2
1068          RS      11    FLOW      -1
1069          RL                   0.48    91.6
1070          RC    0.03    0.04    0.03   18586   0.009
1071          RX  1000.0  1575.0  1641.0  1651.0  1652.0  1663.0  1699.0  2027.3
1072          RY   101.7    94.0    94.8    91.6    91.6    94.6    95.1   101.7
              *
              *

1073          KK     10U
1074          KM   SUB-BASIN 10U
1075          BA    4.26
1076          LG     .35     .36    4.90     .47     .00
1077          UI    305.    305.    920.   1327.   1616.   1867.   2209.   2700.   3711.   3538.
1078          UI   2840.   2447.   2050.   1731.   1461.   1044.    647.    522.    473.    305.
1079          UI    305.     97.     94.     94.     94.     94.     94.     94.      0.      0.
              *
              *

1080          KK     C71
1081          KM      COMBINE SURFACE RUNOFF AT NODE 71
1082          KM      R70-71 + R69-71 + 10U
1083          HC       3
              *
              *

1084          KK  R71-72
1085          KM   REP. X-SECT. 10U2
1086          RS       4    FLOW      -1
1087          RL                   0.54    91.6
1088          RC    0.03    0.04    0.03    7181   0.005
1089          RX  1000.0  1575.0  1641.0  1651.0  1652.0  1663.0  1699.0  2027.3
1090          RY   101.7    94.0    94.8    91.6    91.6    94.6    95.1   101.7
              *
              *
```



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

1091          KK     C72
1092          KM      COMBINE SURFACE RUNOFF AT NODE 72
1093          KM      R68-72 + R71-72
1094          HC       2
              *
              *

1095          KK  R72-81
1096          KM   REP. X-SECT. 10U2
1097          KO                                   22
1098          RS       3    FLOW      -1
1099          RL                   0.54    91.6
1100          RC    0.03    0.04    0.03    6178   0.005
1101          RX  1000.0  1575.0  1641.0  1651.0  1652.0  1663.0  1699.0  2027.3
1102          RY   101.7    94.0    94.8    91.6    91.6    94.6    95.1   101.7
              *
              *

1103          KK     10Q
1104          KM   SUB-BASIN 10Q
1105          KM   NODE 75
1106          BA    2.61
1107          LG     .22     .32    7.10     .24     .00
1108          UI    231.    341.    841.   1331.   1661.   2036.   2612.   1667.   1380.   1213.
```

```
1109          UI   1064.    924.    769.    617.    549.    497.    392.    310.    276.    253.
1110          UI    188.    177.    140.    113.    113.    113.     44.     44.     44.     44.
1111          UI     44.     44.     44.     44.     44.      0.      0.      0.      0.      0.
              *
              *

1112          KK  R75-76
1113          KM   X-SECT. 10R3
1114          RS      19    FLOW      -1
1115          RL                    0.08    86.0
1116          RC   0.035   0.057   0.035   25397   0.011
1117          RX  1000.0  1520.0  1570.0  1577.0  1582.0  1589.0  1639.0  2159.0
1118          RY    95.2    90.0    89.5    86.0    86.0    89.5    90.0    95.2
              *
              *

1119          KK     100
1120          KM   SUB-BASIN 100
1121          KM   HEADWATERS OF BOX WASH
1122          KM   NODE 73
1123          BA    3.08
1124          LG     .17     .30    8.20     .09     .00
1125          UI    288.    474.   1114.   1765.   2158.   2820.   2892.   1883.   1621.   1412.
1126          UI   1220.   1031.    822.    699.    631.    507.    397.    345.    315.    228.
1127          UI    221.    160.    141.    141.    109.     55.     56.     55.     55.     55.
1128          UI     55.     55.     55.      0.      0.      0.      0.      0.      0.      0.
              *
              *
```



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

1129          KK  R73-74
1130          KM   X-SECT. 10P2
1131          RS       9    FLOW      -1
1132          RL                    0.21    91.1
1133          RC    0.03   0.031    0.03   24922   0.019
1134          RX  1000.0  1522.0  1534.0  1539.0  1611.0  1620.0  1644.0  1878.2
1135          RY    98.7    93.5    93.2    91.5    91.1    93.1    94.5    98.7
              *
              *

1136          KK     10P
1137          KM   SUB-BASIN 10P
1138          BA    6.15
1139          LG     .20     .32    7.00     .23     .00
1140          UI    324.    324.    358.    940.   1306.   1731.   2046.   2312.   2536.   2960.
1141          UI   3731.   3324.   2360.   2063.   1902.   1767.   1631.   1519.   1381.   1277.
1142          UI   1153.   1025.    875.    807.    765.    726.    676.    551.    523.    413.
1143          UI    413.    368.    354.    346.    248.    248.    248.    227.    158.    158.
1144          UI    158.    158.    158.    137.     62.     62.     62.     62.     62.     62.
1145          UI     62.     62.     62.     62.     62.     62.     62.     62.     62.      0.
1146          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1147          KK     C74
1148          KM      COMBINE SURFACE RUNOFF AT NODE 74
1149          KM      R73-74 + 10P
1150          HC       2
              *
              *

1151          KK  R74-76
1152          KM   X-SECT. 10R1
1153          RS      11    FLOW      -1
1154          RL                    0.17    92.0
1155          RC   0.035   0.033   0.035   26189   0.013
1156          RX  1000.0  1520.0  1553.0  1562.0  1572.0  1580.0  1694.0  2244.0
1157          RY   102.9    97.7    94.9    92.0    92.1    95.6    97.4   102.9
              *
              *

1158          KK     10R
1159          KM   SUB-BASIN 10R
1160          BA    4.93
1161          LG     .16     .36    5.80     .31     .00
1162          UI    263.    263.    314.    781.   1078.   1443.   1686.   1906.   2090.   2488.
1163          UI   3149.   2465.   1874.   1639.   1529.   1409.   1299.   1210.   1095.   1023.
1164          UI    893.    793.    690.    645.    609.    569.    517.    433.    382.    337.
1165          UI    324.    289.    289.    236.    202.    202.    202.    141.    129.    129.
1166          UI    129.    129.    129.     58.     50.     51.     50.     51.     50.     51.
1167          UI     50.     51.     51.     50.     51.     50.     51.     50.      0.      0.
              *
              *
```



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

1168          KK     C76
1169          KM      COMBINE SURFACE RUNOFF AT NODE 76
1170          KM      R75-76 + R74-76 + 10R
1171          HC       3
              *
              *

1172          KK  R76-77
1173          KM   INTERPOLATE BETWEEN X-SECT. 10V1 AND 10V2
1174          RS      10    FLOW      -1
1175          RL                    0.54    89.9
1176          RC   0.035    0.04   0.035   17002   0.008
1177          RX  1000.0  1520.0  1632.0  1637.0  1663.0  1670.0  1751.0  1949.0
1178          RY    95.8    93.2    92.3    89.9    89.9    92.3    92.5    95.8
              *
              *

1179          KK     10V
1180          KM   SUB-BASIN 10V
1181          BA    3.12
1182          LG     .35     .35    4.90     .46     .00
1183          UI    219.    219.    629.    934.   1143.   1315.   1551.   1854.   2525.   2672.
```

```
1184          UI   2120.   1812.   1546.   1310.   1089.    871.    548.    385.    360.    255.
1185          UI    219.    138.     67.     67.     67.     67.     67.     67.      0.      0.
              *
              *

1186          KK     C77
1187          KM      COMBINE SURFACE RUNOFF AT NODE 77
1188          KM      R76-77 + 10V
1189          HC       2
              *
              *

1190          KK  R77-80
1191          KM   REP. X-SECT. 10V2
1192          RS       3    FLOW      -1
1193          RL                    0.54    92.8
1194          RC   0.035   0.035   0.035    6178   0.007
1195          RX  1000.0  1520.0  1643.0  1650.0  1685.0  1692.0  1755.0  2040.0
1196          RY   101.7    96.5    95.6    92.8    92.8    95.9    96.0   101.7
              *
              *

1197          KK     10W
1198          KM   SUB-BASIN 10W
1199          KM   NODE 78
1200          BA    5.30
1201          LG     .20     .30    8.00     .11     .00
1202          UI    302.    302.    465.    969.   1322.   1804.   2050.   2296.   2622.   3311.
1203          UI   3267.   2221.   1917.   1766.   1619.   1486.   1370.   1245.   1130.    992.
1204          UI    856.    766.    720.    678.    632.    499.    460.    386.    375.    331.
1205          UI    331.    259.    232.    232.    216.    148.    148.    148.    148.    148.
1206          UI     90.     58.     58.     58.     58.     58.     58.     58.     58.     58.
```



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

1207          UI     58.     58.     58.     58.      0.      0.      0.      0.      0.      0.
              *
              *

1208          KK  R78-79
1209          KM   X-SECT. 10X1
1210          RS       9    FLOW      -1
1211          RL                    0.21    93.0
1212          RC   0.035   0.049   0.035   18691   0.012
1213          RX  1200.0  1520.0  1576.0  1579.0  1588.0  1596.0  1650.0  2005.0
1214          RY   104.0    96.0    96.2    93.0    93.1    95.1    96.9   104.0
              *
              *

1215          KK     10X
1216          KM   SUB-BASIN 10X
1217          BA    2.74
1218          LG     .30     .34    6.60     .20     .00
1219          UI    177.    177.    380.    663.    957.   1159.   1332.   1543.   2034.   1671.
1220          UI   1219.   1066.    979.    886.    808.    724.    646.    562.    465.    431.
1221          UI    404.    371.    295.    259.    227.    206.    194.    169.    136.    136.
1222          UI    120.     87.     87.     87.     87.     64.     34.     34.     34.     34.
1223          UI     34.     34.     34.     34.     34.     34.     34.     34.      0.      0.
              *
              *

1224          KK     C79
1225          KM      COMBINE SURFACE RUNOFF AT NODE 79
1226          KM      R78-79 + 10X
1227          HC       2
              *
              *

1228          KK  R79-80
1229          KM   X-SECT. 10Y1
1230          RS      20    FLOW      -1
1231          RL                    0.54    93.7
1232          RC   0.035   0.051    0.03   27614   0.008
1233          RX  1000.0  1520.0  1676.0  1683.0  1699.0  1705.0  1825.0  2375.0
1234          RY   102.8    97.6    96.9    93.7    93.7    95.8    97.3   102.8
              *
              *

1235          KK     10Y
1236          KM   SUB-BASIN 10Y
1237          BA    3.70
1238          LG     .35     .36    4.70     .49     .00
1239          UI    204.    204.    279.    630.    859.   1169.   1343.   1515.   1681.   2078.
1240          UI   2428.   1643.   1369.   1224.   1145.   1046.    970.    887.    809.    732.
1241          UI    647.    549.    506.    479.    449.    415.    336.    304.    261.    252.
1242          UI    224.    224.    179.    157.    157.    156.    100.    100.    100.    100.
1243          UI    100.     83.     39.     39.     39.     39.     39.     39.     39.     39.
1244          UI     39.     39.     39.     39.     39.     39.      0.      0.      0.      0.
              *
              *
```



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

1245          KK     C80
1246          KM      COMBINE SURFACE RUNOFF AT NODE 80
1247          KM      R77-80 + R79-80 + 10Y
1248          HC       3
              *
              *

1249          KK  R80-81
1250          KM   REP. X-SECT. 10Y1
1251          KM      This is the flow from the area to the east of Star Wash prior to
1252          KM      it's confluence with Star Wash.
1253          RS       5    FLOW      -1
1254          RL                    0.33    93.7
1255          RC   0.035   0.051    0.03    7920   0.005
1256          RX  1000.0  1520.0  1676.0  1683.0  1699.0  1705.0  1825.0  2375.0
1257          RY   102.8    97.6    96.9    93.7    93.7    95.8    97.3   102.8
              *
```

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                *
1258            KK  BR7281
1259            KM      RECALL HYDROGRAPH R72-81
1260            BI  R72-81      22
                *
                *

1261            KK     C81
1262            KM      COMBINE SURFACE RUNOFF AT NODE 81:  This is the total runoff at
1263            KM      Node 81.
1264            KM      R72-81 + R80-81
1265            HC       2
                *
                *

1266            KK  R81-82
1267            KM   REP. X-SECT. 10AB2
1268            RS       5    FLOW      -1
1269            RL                    1.90    94.1
1270            RC   0.035   0.029   0.035    9398   0.006
1271            RX   600.0  1500.0  1571.0  1578.0  1682.0  1693.0  1733.0  2733.0
1272            RY   102.0    97.5    97.3    94.1    94.1    96.8    97.0   102.0
                *
                *

1273            KK     10Z
1274            KM   SUB-BASIN 10Z
1275            BA    3.69
1276            LG     .35     .35    4.40     .65     .00
1277            UI    254.    254.    608.   1035.   1472.   1747.   1984.   2485.   2905.   1887.
1278            UI   1583.   1441.   1294.   1176.   1045.    928.    800.    660.    610.    567.
1279            UI    505.    417.    338.    320.    278.    275.    194.    194.    188.    124.
1280            UI    124.    124.    124.     88.     49.     49.     49.     49.     49.     49.
1281            UI     49.     49.     49.     49.     49.      0.      0.      0.      0.      0.
                *
                *
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LINE            ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1282            KK  BC82.1
1283            KM      RECALL HYDROGRAPH C82.1
1284            BI   C82.1      21
                *
                *

1285            KK     C82
1286            KM      COMBINE SURFACE RUNOFF AT NODE 82:  This is the total runoff at
1287            KM      Node 82
1288            KM      C82.1 + R81-82 + 10Z
1289            HC       3
                *
                *

1290            KK  R82-84
1291            KM   X-SECT. 10AB2
1292            RS       3    FLOW      -1
1293            RL                    1.90    94.1
1294            RC   0.035   0.029   0.035    7022   0.005
1295            RX   800.0  1500.0  1571.0  1578.0  1782.0  1793.0  1833.0  2333.0
1296            RY   101.0    97.5    97.3    94.1    94.1    96.8    97.0   101.0
                *
                *

1297            KK    10AA
1298            KM   SUB-BASIN 10AA
1299            KM   NODE 83
1300            BA    1.63
1301            LG     .35     .36    6.30     .29     .00
1302            UI    128.    133.    408.    628.    829.    973.   1218.   1420.    915.    769.
1303            UI    691.    615.    542.    475.    399.    328.    302.    274.    223.    183.
1304            UI    163.    140.    131.     98.     98.     76.     62.     62.     62.     40.
1305            UI     24.     24.     24.     24.     24.     24.     24.     24.     24.      0.
1306            UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                *
                *

1307            KK  R83-84
1308            KM   X-SECT. 10AB1
1309            RS      27    FLOW      -1
1310            RL                    0.21    83.5
1311            RC    0.04   0.071    0.04   30202   0.006
1312            RX  1000.0  1500.0  1540.0  1640.0  1650.0  1750.0  1790.0  2290.0
1313            RY    92.7    90.2    90.0    83.5    83.5    90.0    90.2    92.7
                *
                *

1314            KK    10AB
1315            KM   SUB-BASIN 10AB
1316            BA    4.31
1317            LG     .35     .35    5.20     .33     .00
1318            UI    238.    238.    324.    734.   1001.   1362.   1564.   1765.   1958.   2420.
1319            UI   2828.   1914.   1595.   1426.   1334.   1218.   1130.   1034.    943.    852.
1320            UI    754.    639.    589.    558.    523.    483.    391.    354.    304.    294.
1                                          HEC-1 INPUT                                                PAGE 36

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

1321            UI    261.    261.    208.    182.    182.    182.    116.    116.    116.    116.
1322            UI    116.     97.     46.     46.     46.     46.     46.     46.     46.     46.
1323            UI     46.     46.     46.     46.     46.     46.      0.      0.      0.      0.
                *
                *

1324            KK   C84.2
1325            KM      TOTAL SURFACE RUNOFF FROM MAJOR BASIN NO. 10 ONLY:  This is the flow
1326            KM      in Star Wash prior to the confluence of Powerline Wash.
1327            KM      R82-84 + R83-84 + 10AB
1328            HC       3
                *
                *
```

```
1329          KK  8C84.1
1330          KM      RECALL HYDROGRAPH C84.1
1331          BI   C84.1      21
              *
              *

1332          KK     C84
1333          KM      COMBINE SURFACE RUNOFF AT NODE 84:  This is the flow in Star Wash
1334          KM      after the confluence of Powerline Wash.
1335          KM      C84.2 + C84.1
1336          KM      (MAJOR BASIN 7) + (MAJOR BASIN 10)
1337          HC       2
              *
              *

1338          KK  R84-38
1339          KM   X-SECT. 8A-AM1
1340          KM   Star Wash HEC-2 Section 1.100
1341          KM   CHANNEL ROUTE TO NODE 38I
1342          RS       6    FLOW      -1
1343          RL                    1.50  1390.3
1344          RC   0.035   0.029   0.035   10982   0.006
1345          RX  9616.3  9815.0  9942.0  9957.0 10031.0 10083.0 10956.0 11726.0
1346          RY  1401.8  1393.8  1392.3  1390.5  1390.3  1392.9  1394.1  1401.8
              *
              *

1347          KK      8A
1348          KM   SUB-BASIN 8A
1349          BA    6.27
1350          LG     .35     .35    3.90     .57     .00
1351          UI    285.    285.    285.    674.   1025.   1241.   1421.   1571.   1720.   1901.
1352          UI   2127.   2374.   2915.   3537.   3573.   3021.   2660.   2411.   2202.   1955.
1353          UI   1758.   1571.   1404.   1229.    959.    723.    505.    491.    469.    412.
1354          UI    285.    285.    285.    106.     87.     87.     87.     87.     87.     87.
1355          UI     87.     87.     87.     87.      0.      0.      0.      0.      0.      0.
              *
              *
```



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

1356          KK  C38I.2
1357          KM      R84-38 + 8A
1358          KM      This is the flow in Star Wash prior to it's confluence with
1359          KM      Jackrabbit Wash.
1360          KM      (MAJOR BASIN 7) + (MAJOR BASIN 8) + (MAJOR BASIN 10)
1361          HC       2
              *
              *

1362          KK  BC38I1
1363          KM   RECALL HYDROGRAPH C38I.1
1364          BI  C38I.1      21
              *
              *

1365          KK    C38I
1366          KO                                    21
1367          KM      COMBINE SURFACE RUNOFF AT NODE 38I
1368          KM      This is the total flow to Node 38I at CAP Canal Structure  CAP-5.
1369          KM      (MAJOR BASINS 1 + 2 + 3 + 4 + 5 + 6) + (MAJOR BASINS 7 + 8 + 10)
1370          HC       2
              *
              *

1371          KK    CLR1
1372          KM      CLEAR HEC-1 STACK
1373          HC       5
              *
              *

1374          KK      9A
1375          KM   SUB-BASIN 9A
1376          KM   HEADWATERS OF COYOTE WASH
1377          KM   NODE 39
1378          BA    4.64
1379          LG     .21     .35    4.20     .38     .00
1380          UI    279.    279.    501.    943.   1347.   1717.   1981.   2200.   2681.   3322.
1381          UI   2316.   1865.   1657.   1534.   1398.   1288.   1155.   1052.    916.    785.
1382          UI    701.    658.    613.    551.    458.    388.    356.    322.    306.    276.
1383          UI    214.    214.    214.    140.    137.    137.    137.    137.     79.     53.
1384          UI     53.     53.     53.     53.     53.     53.     53.     53.     53.     53.
1385          UI     53.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1386          KK  R39-40
1387          KM   X-SECT. 9B1
1388          RS       4    FLOW      -1
1389          RL                    1.22    91.2
1390          RC   0.03   0.025    0.03    9398   0.013
1391          RX  1000.0  1521.0  1533.0  1541.0  1646.0  1664.0  1764.0  1772.0
1392          RY    98.2    93.0    92.6    91.2    92.2    94.7    96.6    99.5
              *
              *
```



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

1393          KK      9B
1394          KM   SUB-BASIN 9B
1395          BA    8.49
1396          LG     .25     .35    5.20     .36     .00
1397          UI    493.    493.    800.   1608.   2229.   2970.   3388.   3783.   4410.   5666.
1398          UI   4854.   3512.   3040.   2825.   2582.   2379.   2173.   1968.   1775.   1564.
1399          UI   1316.   1212.   1145.   1063.    940.    810.    669.    630.    567.    540.
1400          UI    498.    378.    378.    378.    271.    241.    241.    241.    241.    193.
1401          UI     94.     94.     94.     94.     94.     94.     94.     94.     94.     94.
1402          UI     94.     94.     94.      0.      0.      0.      0.      0.      0.      0.
```

```
                 *
                 *
1403             KK     C40
1404             KM      COMBINE SURFACE RUNOFF AT NODE 40
1405             KM      R39-40 + 9B
1406             HC       2
                 *
                 *
1407             KK  R40-41
1408             KM   X-SECT. 9C1
1409             KM      This is the flow in Coyote Wash prior to the confluence of Blue Wash.
1410             RS      10    FLOW      -1
1411             RL                    2.45    87.3
1412             RC   0.035   0.032   0.035   21226   0.008
1413             RX  1000.0  1520.0  1570.0  1582.0  1657.0  1669.0  1699.0  2208.6
1414             RY    95.0    90.0    89.8    87.3    87.3    89.3    89.9    95.0
                 *
                 *
1415             KK      9C
1416             KM   SUB-BASIN 9C
1417             KM      BLUE WASH;  This is the flow in Blue Wash prior to it's confluence
1418             KM      with Coyote Wash.
1419             BA    7.32
1420             LG     .29     .34    6.40     .32     .00
1421             UI    483.    483.   1206.   1958.   2414.   2778.   3195.   3746.   4796.   6112.
1422             UI   5334.   4424.   3867.   3280.   2809.   2379.   1906.   1233.    855.    796.
1423             UI    627.    483.    419.    148.    148.    148.    148.    148.    148.    148.
1424             UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                 *
                 *
1425             KK     C41
1426             KM      COMBINE SURFACE RUNOFF AT NODE  41
1427             KM      R40-41 + 9C
1428             KM      This is the flow in Coyote Wash after the confluence of Blue Wash.
1429             HC       2
                 *
                 *
```



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

1430             KK  R41-43
1431             KM   X-SECT. 9E1
1432             KM      This is ONLY a channel route to Node 43:  This is NOT the TOTAL flow
1433             KM      in Coyote Wash just prior to the confluence of Beer Bottle Wash.
1434             RS      10    FLOW      -1
1435             RL                    0.77    89.9
1436             RC    0.04   0.036    0.03   15998   0.008
1437             RX  1000.0  1590.0  1620.0  1639.0  1675.0  1684.0  1846.0  1906.0
1438             RY    99.0    94.8    95.0    91.0    89.9    94.6    95.5    99.1
                 *
                 *
1439             KK      9D
1440             KM   SUB-BASIN 9D
1441             KM      HEADWATERS OF BEER BOTTLE WASH
1442             KM      NODE 42
1443             BA    6.24
1444             LG     .25     .30    7.10     .21     .00
1445             UI    350.    350.    508.   1101.   1493.   2051.   2342.   2625.   2952.   3692.
1446             UI   4028.   2669.   2272.   2069.   1919.   1760.   1638.   1465.   1366.   1194.
1447             UI   1047.    911.    853.    805.    741.    644.    575.    463.    447.    401.
1448             UI    384.    361.    268.    268.    268.    210.    171.    171.    171.    171.
1449             UI    171.     71.     67.     67.     67.     67.     67.     67.     67.     67.
1450             UI     67.     67.     67.     67.     67.      0.      0.      0.      0.      0.
                 *
                 *
1451             KK  R42-43
1452             KM   REP. X-SECT. 9E1
1453             KM      This is ONLY a channel route to Node 43:  This is NOT the TOTAL flow
1454             KM      in Beer Bottle Wash just prior to it's confluence with Coyote Wash.
1455             RS       8    FLOW      -1
1456             RL                    0.77    89.9
1457             RC    0.04   0.036    0.03   11616   0.008
1458             RX  1000.0  1590.0  1620.0  1639.0  1675.0  1684.0  1846.0  1906.0
1459             RY    99.0    94.8    95.0    91.0    89.9    94.6    95.5    99.1
                 *
                 *
1460             KK     C43
1461             KM      ADD CHANNEL ROUTES AT NODE 43:  This is  NOT  the flow in
1462             KM      Coyote Wash after the confluence of Beer Bottle Wash.
1463             KM      R41-43 + R42-43
1464             HC       2
                 *
                 *
1465             KK  R43-44
1466             KM   INTERPOLATE BETWEEN X-SECT. 3B1 AND 2F1
1467             RS       1    FLOW      -1
1468             RL                    2.01    84.0
1469             RC   0.037   0.033   0.037    4277   0.007
1470             RX  1000.0  1538.0  1567.0  1580.0  1720.0  1723.0  1752.0  2051.6
1471             RY   100.1    93.0    87.0    84.0    84.0    88.0    91.0   100.1
                 *
                 *
```



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

1472             KK      9E
1473             KM   SUB-BASIN 9E
1474             BA    6.08
1475             LG     .29     .36    5.10     .64     .00
1476             UI    525.    772.   1992.   2656.   3177.   3875.   5229.   6511.   5138.   4233.
1477             UI   3442.   2792.   2160.   1243.    899.    743.    525.    321.    161.    161.
```

```
1478          UI    161.    161.    161.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1479          KK      9F
1480          KM   SUB-BASIN 9F
1481          BA    1.75
1482          LG     .23     .35    4.90     .58     .00
1483          UI    210.    545.   1156.   1577.   2264.   1577.   1203.   1013.    832.    641.
1484          UI    513.    439.    319.    256.    219.    161.    133.    103.    103.     50.
1485          UI     40.     40.     40.     40.     40.      0.      0.      0.      0.      0.
              *
              *

1486          KK     C44
1487          KO                                     21
1488          KM      COMBINE SURFACE RUNOFF AT NODE 44
1489          KM      This is the flow in Coyote Wash approximately 4480 feet downstream
1490          KM      of the confluence of Beer Bottle Wash with Coyote Wash.
1491          KM      This is also the flow in Coyote Wash prior to the the flow split.
1492          KM      R43-44 + 9E + 9F
1493          HC       3
              *
              *

1494          KK   CP44E
1495          KO                                     21
1496          KM      Flow split diversion operation at Node 44 in Coyote Wash
1497          KM      CP44W = FLOW CONTINUING IN WEST FORK: R44-47
1498          KM      CP44E = FLOW DIVERTED TO EAST FORK: R44-45
1499          DT   CP44W
1500          DI      0.   1000.   1800.   4000.   6500.   9500.  13200.  17600.  22800.  28000.
1501          DQ      0.   1000.   1800.   2000.   3100.   4300.   5700.   7600.  10000.  12500.
              *
              *                   100%    50      48      45

1502          KK  R44-45
1503          KM   X-SECT. DIV1E
1504          KM      THIS IS THE RUNOFF TRAVELING THROUGH THE EAST FINGER OF COYOTE WASH AFTER
1505          KM      THE FLOW SPLIT.
1506          RS       3    FLOW      -1
1507          RL                    0.70    49.0
1508          RC   0.035   0.049   0.035    3379   0.006
1509          RX  1000.0  1695.0  1758.0  2155.0  2195.0  2215.0  2299.0  2985.4
1510          RY    59.6    56.0    52.0    49.0    49.0    52.0    52.7    59.6
              *
              *
```



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

1511          KK      9G
1512          KM   SUB-BASIN 9G
1513          BA    1.00
1514          LG     .35     .35    4.00     .60     .00
1515          UI     96.    182.    403.    524.    645.    833.   1189.    976.    779.    620.
1516          UI    491.    344.    186.    159.     99.     73.     30.     30.     30.     30.
1517          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1518          KK     C45
1519          KM      COMBINE SURFACE RUNOFF AT NODE 45
1520          KM      R44-45 + 9G
1521          KM      Crossing at Wickenburg Road
1522          HC       2
              *
              *

1523          KK  R45-46
1524          KM   X-SECT. 9I1
1525          KM      CHANNEL ROUTE TO NODE 46I
1526          RS       8    FLOW      -1
1527          RL                    0.54    88.2
1528          RC   0.035   0.049   0.035   10402   0.006
1529          RX  1000.0  1520.0  1540.0  1550.0  1572.0  1577.0  1597.0  1957.0
1530          RY    95.2    90.0    89.8    88.2    88.2    91.2    91.6    95.2
              *
              *

1531          KK      9I
1532          KM   SUB-BASIN 9I
1533          BA    4.81
1534          LG     .35     .35    3.70     .51     .00
1535          UI    463.    875.   1936.   2522.   3102.   4008.   5718.   4695.   3749.   2983.
1536          UI   2361.   1654.    896.    764.    475.    351.    142.    142.    142.    142.
1537          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1538          KK     9IW
1539          KO                                     21
1540          KM      DIVERT FLOW TO EAST SIDE OF SUB-BASIN 9I TO SIMULATE
1541          KM      RETENTION PONDING IN THE EAST SIDE DEPRESSION UP TO 117 Ac-Ft.
1542          KM      9IW = Flow continuing to Node 46 at CAP-4
1543          KM      DT9IE = Flow diverted to depression at East side of
1544          KM              Sub-basin 9I along C.A.P. Canal.
1545          DT   DT9IE     117
1546          DI       0     200    1000    2000    3000    4000    5000
1547          DQ       0     100     500    1000    1500    2000    2500
              *
              *
```



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

1548          KK    C46I
1549          KO                                     21
1550          KM      COMBINE SURFACE RUNOFF AT NODE 46I
1551          KM      R45-46 + 9IW
1552          KM      This is the flow to Node 46I at the CAP Canal,from the East finger
```

```
1553          KM      of the Coyote Wash flow split. (CAP-4)
1554          HC       2
              *
              *

1555          KK    C46O
1556          KM      ROUTE NODE 46 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1557          KM      BOX FLUME OVERSHOOT  STATION 293+50,   U.S. IE.= 1376.71
1558          KM      TOP OF DIKE ELEVATION = 1385.7
1559          KO                                      21
1560          RS       1    ELEV    1368
1561          RL                   0.272    1368
1562          SV       0     2.1    19.1    35.0    72.0   133.0   478.0  1288.0
1563          SE    1368    1372    1376 1376.71  1378.4    1380  1381.1    1384
1564          SQ       0       0       0       0     475    1220    2120    3899
              *
              *

1565          KK  BCP44W
1566          KO                                      21
1567          KM      RETRIEVE WEST FINGER OF FLOW SPLIT DIVERSION AT NODE 44 IN COYOTE WASH.
1568          DR   CP44W
              *
              *

1569          KK  R44-47
1570          KM   X-SECT. DIV1W
1571          KM      THIS IS THE RUNOFF TRAVELING THROUGH THE WEST FINGER OF COYOTE WASH
1572          KM      AFTER THE FLOW SPLIT.
1573          RS       9    FLOW      -1
1574          RL                   0.44    49.0
1575          RC   0.035   0.049   0.035   12514   0.007
1576          RX  1000.0  1300.0  1370.0  1450.0  1495.0  1600.0  1770.0  1933.0
1577          RY    55.7    52.7    52.0    49.0    49.0    54.0    52.0    57.0
              *
              *

1578          KK      9H
1579          KM   SUB-BASIN 9H
1580          BA    1.47
1581          LG     .23     .35    4.00     .81     .00
1582          UI    183.    501.   1053.   1421.   1979.   1255.   1008.    837.    677.    506.
1583          UI    424.    338.    248.    207.    159.    137.     90.     90.     61.     35.
1584          UI     35.     35.     35.     35.      0.      0.      0.      0.      0.      0.
              *
              *
```



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

1585          KK    C47I
1586          KO                                      21
1587          KM      COMBINE SURFACE RUNOFF AT NODE 47I
1588          KM      R44-47 + 9H
1589          KM      This is the flow to Node 47I at the CAP Canal,from the West finger
1590          KM      of the Coyote Wash flow split. (CAP-3)
1591          HC       2   35.99
              *
              *

1592          KK    C47O
1593          KM      ROUTE NODE 47 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1594          KM      BOX FLUME OVERSHOOT  STATION 180+50,   U.S. IE.= 1377.18
1595          KM      TOP OF DIKE ELEVATION = 1385.7
1596          KO                                      21
1597          RS       1    ELEV    1371
1598          RL                   0.434    1371
1599          SV       0     4.0    84.8   130.0   359.2   970.6
1600          SE   1371.    1372    1376 1377.18    1380    1384
1601          SQ       0       0       0       0     880    3380
              *
              *

1602          KK     11A
1603          KO                                      21
1604          KM   SUB-BASIN 11A
1605          KM   This is the flow to Node 85I at the CAP Canal. (CAP-6  AND  CAP-7)
1606          BA    2.18
1607          LG     .35     .35    4.10     .50     .00
1608          UI    156.    156.    471.    679.    827.    956.   1130.   1382.   1899.   1811.
1609          UI   1454.   1252.   1049.    886.    748.    534.    331.    267.    242.    156.
1610          UI    156.     50.     48.     48.     48.     48.     48.     48.      0.      0.
              *
              *

1611          KK    C85O
1612          KM      ROUTE NODE 85 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1613          KM      CAP-6; 66" CULVERT, STATION 393+00.,  U.S. IE= 1372.18
1614          KM              TOP OF DIKE ELEVATION = 1381.4
1615          KM      CAP-7; 66" CULVERT, STATION 402+50.,  U.S. IE= 1371.80
1616          KM              TOP OF DIKE ELEVATION = 1381.4
1617          KM      [ASSUMED U.S. IE.=1371.9]
1618          KO                                      21
1619          RS       1    ELEV  1371.9
1620          RL                   0.434  1371.9
1621          SA       0     2.71   22.88   78.79
1622          SE  1371.9    1372    1376    1380
1623          SQ       0       6     183     478
              *
              *
```



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

1624          KK     12A
1625          KM   SUB-BASIN 12A
1626          KM      NODE 86
1627          BA    4.88
1628          LG     .19     .31    8.00     .11     .00
1629          UI    299.    299.    562.   1028.   1489.   1869.   2148.   2402.   2987.   3514.
1630          UI   2299.   1927.   1754.   1605.   1463.   1334.   1206.   1082.    948.    791.
```

```
1631          UI    731.    688.    632.    534.    476.    382.    373.    327.    327.    244.
1632          UI    229.    229.    183.    146.    146.    146.    146.    112.     57.     57.
1633          UI     57.     57.     57.     57.     57.     57.     57.     57.     57.     57.
1634          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1635          KK  R86-88
1636          KM   X-SECT. 12C2
1637          RS      23    FLOW      -1
1638          RL                    0.21    91.2
1639          RC    0.03   0.047   0.035   41501   0.011
1640          RX  1000.0  1533.0  1596.0  1604.0  1617.0  1627.0  1648.0  1833.2
1641          RY    98.6    93.3    94.5    91.2    91.5    94.5    94.0    98.6
              *
              *

1642          KK     12B
1643          KM   SUB-BASIN 12B
1644          KM      HEADWATERS OF DAGGS WASH
1645          KM      NODE 87
1646          BA    4.79
1647          LG     .27     .34    5.60     .58     .00
1648          UI    230.    230.    230.    641.    858.   1070.   1191.   1321.   1453.   1637.
1649          UI   1819.   2172.   2709.   2985.   2497.   2178.   1956.   1778.   1568.   1403.
1650          UI   1248.   1103.    944.    703.    485.    408.    382.    379.    243.    230.
1651          UI    230.    119.     71.     71.     71.     71.     71.     71.     71.     71.
1652          UI     71.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1653          KK  R87-88
1654          KM   REP. X-SECT. 12C1
1655          RS       2    FLOW      -1
1656          RL                    0.42    92.7
1657          RC   0.036   0.033   0.035    2006   0.002
1658          RX  1233.2  1572.0  1644.0  1654.0  1665.0  1675.0  1750.0  2340.0
1659          RY   101.8    93.8    94.6    92.9    92.7    94.8    95.9   101.8
              *
              *

1660          KK     12C
1661          KM   SUB-BASIN 12C
1662          BA    3.64
1663          LG     .30     .34    5.60     .48     .00
1664          UI    195.    195.    240.    663.    815.    964.   1086.   1206.   1371.   1548.
1665          UI   1897.   2435.   2359.   1965.   1716.   1544.   1353.   1190.   1043.    922.
```



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

1666          UI    737.    532.    344.    332.    320.    229.    195.    195.     83.     60.
1667          UI     60.     60.     60.     60.     60.     60.     60.      0.      0.      0.
              *
              *

1668          KK     C88
1669          KM      COMBINE SURFACE RUNOFF AT NODE 88
1670          KM      R86-88 + R87-88 + 12C
1671          HC       3
              *
              *

1672          KK  R88-89
1673          KM   INTERPOLATE BETWEEN X-SECT. 12D1 AND 12D2
1674          RS      14    FLOW      -1
1675          RL                    1.10    92.0
1676          RC   0.035   0.032   0.035   16315   0.003
1677          RX  1351.3  1560.0  1744.0  1762.0  1806.0  1819.0  1903.0  2368.0
1678          RY   102.2    94.2    95.0    92.0    92.0    94.7    94.7   102.2
              *
              *

1679          KK     12D
1680          KM   SUB-BASIN 12D
1681          BA    5.29
1682          LG     .35     .34    5.90     .35     .00
1683          UI    307.    307.    540.   1096.   1393.   1616.   1813.   2062.   2361.   2881.
1684          UI   3757.   3733.   3063.   2661.   2369.   2044.   1785.   1537.   1298.    945.
1685          UI    590.    530.    504.    360.    307.    294.     94.     94.     94.     94.
1686          UI     94.     94.     94.     94.      0.      0.      0.      0.      0.      0.
              *
              *

1687          KK     C89
1688          KM      COMBINE SURFACE RUNOFF AT NODE 89
1689          KM      R88-89 + 12D
1690          HC       2
              *
              *

1691          KK  R89-90
1692          KM   X-SECT. 12E1
1693          KM      CHANNEL ROUTE TO NODE 90I
1694          RS      16    FLOW      -1
1695          RL                    0.77    91.3
1696          RC    0.04   0.034    0.04   32525   0.009
1697          RX  1000.0  1520.0  1540.0  1550.0  1593.0  1605.0  1645.0  2145.0
1698          RY   102.6    97.4    97.0    91.3    91.6    96.1    97.6   102.6
              *
              *
```



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

1699          KK     12E
1700          KM   SUB-BASIN 12E
1701          BA    7.54
1702          LG     .35     .35    5.60     .38     .00
1703          UI    379.    379.    379.   1174.   1499.   1799.   2035.   2235.   2494.   2819.
1704          UI   3207.   4096.   4828.   4408.   3742.   3316.   3005.   2657.   2346.   2079.
1705          UI   1834.   1565.   1158.    780.    670.    623.    593.    379.    379.    369.
```

```
1706          UI    116.    116.    116.    116.    116.    116.    116.    116.    116.    116.
1707          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1708          KK    C90I
1709          KO                                    21
1710          KM      COMBINE SURFACE RUNOFF AT NODE 90I
1711          KM      This is the flow to Node 90I at CAP Canal Structure CAP-8.
1712          KM      R89-90 + 12E
1713          HC       2
              *
              *

1714          KK    C90O
1715          KM      ROUTE NODE 90 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1716          KM      BOX FLUME OVERSHOOT  STATION 485+00,   U.S. IE.= 1373.3
1717          KM      TOP OF DIKE ELEVATION = 1383.0
1718          KO                                    21
1719          RS       1    ELEV  1373.3
1720          RL                   0.333  1373.3
1721          SA       0   12.27   31.17   56.96   92.15
1722          SE  1373.3    1376    1380    1384    1388
1723          SQ       0     600    2300    4220    5600
              *
              *

1724          KK     13A
1725          KM   SUB-BASIN 13A
1726          KM      This is the total flow from Major Basin 13:  Node 91I at CAP Canal
1727          KM      Structure CAP-9
1728          KO                                    21
1729          BA     .90
1730          LG     .35     .35    3.90     .38     .00
1731          UI    205.    720.   1100.   1811.   1356.    892.    440.    225.    104.     49.
1732          UI     49.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1733          KK    C91O
1734          KM      ROUTE NODE 91 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1735          KM      DOUBLE 36" CULVERTS, STATION 344+25.,  U.S. IE.= 1343.70
1736          KM      TOP OF DIKE ELEVATION = 1372.7
1737          KO                                    21
1738          RS       1    ELEV  1343.7
1739          RL                   0.333  1343.7
1740          SA       0     .21    2.49    7.32   13.63   19.61   24.99   32.52   41.59  206.44
```



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

1741          SE  1343.7    1344    1348    1352    1356    1360    1364    1368    1372    1376
1742          SQ       0       9     104     169     223     261     300     311     329     342
              *
              *

1743          KK     14A
1744          KM   SUB-BASIN 14A
1745          KM      This is the flow to Node 92I at CAP Canal Structure CAP-10.
1746          KO                                    21
1747          BA     .09
1748          LG     .35     .35    3.90     .38     .00
1749          UI    129.    362.    166.     32.      0.      0.      0.      0.      0.      0.
              *
              *

1750          KK    C92O
1751          KM      ROUTE NODE 92 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1752          KM      36" CULVERT, STATION 561+50.,  U.S. IE.= 1340.21
1753          KM      TOP OF DIKE ELEVATION = 1372.1
1754          KO                                    21
1755          RS       1    ELEV  1340.2
1756          RL                   0.333  1340.2
1757          SA       0     .19    1.27    2.51    3.96    5.57    7.86   10.16   12.42
1758          SE  1340.2    1344    1348    1352    1356    1360    1364    1368    1372
1759          SQ       0      37      61      80      90     101     107     113     119
              *
              *

1760          KK     14B
1761          KM   SUB-BASIN 14B
1762          KM      This is the flow to Node 93I at CAP Canal Structure CAP-11.
1763          KO                                    21
1764          BA     .03
1765          LG     .35     .35    3.90     .38     .00
1766          UI    210.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1767          KK    C93O
1768          KM      ROUTE NODE 93 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1769          KM      30" CULVERT, STATION 571+50.,  U.S. IE.= 1349.50
1770          KM      TOP OF DIKE ELEVATION = 1372.1
1771          KO                                    21
1772          RS       1    ELEV  1349.5
1773          RL                   0.333  1349.5
1774          SA       0     .24    1.39
1775          SE  1349.5    1352    1356
1776          SQ       0      20      54
              *
              *
```



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

1777          KK    CLR2
1778          KM      CLEAR HEC-1 STACK
1779          HC       5
              *
              *

1780          KK    CLR3
```

```
1781          KM      CLEAR HEC-1 STACK
1782          HC       5
              *
              *

1783          KK     19A
1784          KO                                    21
1785          KM   SUB-BASIN 19A
1786          KM      This is the flow to Node 49I at CAP Canal Structure CAP-1.
1787          BA     .06
1788          LG     .25      .35     4.10      .57      .00
1789          UI    293.     138.      28.       0.       0.       0.       0.       0.       0.       0.
              *
              *

1790          KK    C49O
1791          KM      ROUTE NODE 49 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1792          KM      30" CULVERT, STATION 121+60.,  U.S. IE.= 1357.4
1793          KM      TOP OF DIKE ELEVATION = 1373.7 (ASSUMED;  Use storage volume data
1794          KM                                     from CAP-2)
1795          KO                                     21
1796          RS       1     ELEV  1357.4
1797          RL                    0.494  1357.4
1798          SA       0     6.38   13.11   22.51   33.08
1799          SE  1357.4     1360    1364    1368    1372
1800          SQ       0        2      43      65      81
              *
              *

1801          KK     19B
1802          KO                                    21
1803          KM   SUB-BASIN 19B
1804          KM      This is the flow to Node 48I at CAP Canal Structure CAP-2.
1805          BA     .77
1806          LG     .21      .35     4.50      .52      .00
1807          UI    215.     815.    1441.    1076.     746.     527.     362.     247.     175.     117.
1808          UI     76.      58.      29.      29.      29.       0.       0.       0.       0.       0.
              *
              *

1809          KK    C48O
1810          KM      ROUTE NODE 48 INFLOW THROUGH PONDING AREA UPSTREAM OF C.A.P. CANAL
1811          KM      DOUBLE 48" CULVERTS, STATION 146+50.,  U.S. IE.= 1353.5
1812          KM      TOP OF DIKE ELEVATION = 1373.7
1813          KO                                    21
1814          RS       1     ELEV  1353.5
1815          RL                    0.101  1353.5
```



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

1816          SA       0     1.08    6.38   13.11   22.51   33.08   45.86
1817          SE  1353.5     1356    1360    1364    1368    1372    1376
1818          SQ       0       25     213     331     415     486     543
              *
              *

1819          KK   8C90O
1820          KM      RECALL RESERVOIR OUTFLOW FROM NODE 90O
1821          KM      HYDROGRAPH C90O
1822          BI    C90O      21
              *
              *

1823          KK  R90-99
1824          KM   REP. X-SECT. 15A1
1825          RS      13     FLOW      -1
1826          RL                   2.45    91.2
1827          RC    0.04    0.049    0.04   17582   0.007
1828          RX  1000.0   1520.0  1559.0  1571.0  1621.0  1637.0  1685.0  1887.8
1829          RY    98.8     96.2    95.9    92.6    91.2    96.1    96.2    98.8
              *
              *

1830          KK     16A
1831          KM   SUB-BASIN 16A
1832          BA    1.94
1833          LG     .35      .35     3.30      .92      .00
1834          UI    177.     297.     701.     926.    1120.    1393.    1996.    2040.    1569.    1286.
1835          UI   1030.     815.     521.     308.     272.     177.     121.      54.      54.      54.
1836          UI     54.      54.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

1837          KK     C99
1838          KM      COMBINE SURFACE RUNOFF AT NODE 99
1839          KM       R90-99 + 16A
1840          KM      This is the flow in Daggs Wash prior to it's confluence with
1841          KM      the Hassayampa River.
1842          KM      (MAJOR BASIN 12) + (MAJOR BASIN 16)
1843          HC       2
              *
              *

1844          KK     17A
1845          KM   SUB-BASIN 17A
1846          KM      NODE 100
1847          KM      This is the total runoff from Major Basin 17
1848          BA    2.17
1849          LG     .35      .35     5.30      .43      .00
1850          UI    170.     178.     597.     798.     958.    1133.    1368.    1880.    2076.    1619.
1851          UI   1365.    1128.     936.     761.     515.     301.     280.     197.     170.      79.
1852          UI     52.      52.      52.      52.      52.       0.       0.       0.       0.       0.
              *
              *
```



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

1853          KK   8C46O
1854          KM      RECALL RESERVOIR OUTFLOW FROM NODE 46.
1855          KM      HYDROGRAPH C46O
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```
1856          BI    C460      21
              *
              *

1857          KK  R46-94
1858          KM   X-SECT. FROM 1' CI BELMONT MAPPING
1859          RS      13    FLOW      -1
1860          RL                    0.47    82.0
1861          RC    0.04   0.049    0.04   16315   0.007
1862          RX  1000.0  1550.0  1770.0  1785.0  1810.0  1830.0  2010.0  2516.3
1863          RY    90.0    84.5    83.5    82.0    82.0    83.5    82.5    90.0
              *
              *

1864          KK   BC38I
1865          KM       RECALL HYDROGRAPH C38I
1866          BI    C38I      21
              *
              *

1867          KK  R38-94
1868          KM   REP. X-Sect. 15D1
1869          RS       5    FLOW      -1
1870          RL                    2.45    91.8
1871          RC   0.035   0.031   0.035   14784   0.006
1872          RX  1157.8  1780.0  1810.0  1820.0  2020.0  2053.0  2083.0  3163.0
1873          RY   102.4    94.4    93.3    91.8    91.8    95.1    97.0   102.4
              *
              *

1874          KK     15A
1875          KM   SUB-BASIN 15A
1876          BA    3.59
1877          LG     .35     .35    3.50     .99     .00
1878          UI    366.    774.   1611.   2089.   2610.   3620.   4438.   3320.   2651.   2066.
1879          UI   1551.    833.    616.    423.    305.    112.    112.    112.    112.      0.
1880          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

1881          KK     C94
1882          KM      COMBINE SURFACE RUNOFF AT NODE 94
1883          KM      R46-94 + R38-94 + 15A
1884          HC       3
              *
              *
```



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

1885          KK  R94-96
1886          KM   REP. X-SECT. 15D1
1887          RS       2    FLOW      -1
1888          RL                    2.45    91.8
1889          RC   0.035   0.033   0.035    5386   0.005
1890          RX  1250.0  1780.0  1810.0  1820.0  2070.0  2103.0  2133.0  3493.0
1891          RY   103.0    92.4    93.3    91.8    91.8    95.1    97.0   103.0
              *
              *

1892          KK   BC85O
1893          KM      RECALL RESERVOIR OUTFLOW FROM NODE 85
1894          KM      HYDROGRAPH C85O
1895          BI    C85O      21
              *
              *

1896          KK  R85-95
1897          KM   X-SECT. FROM 1' CI BELMONT MAPPING
1898          RS      23    FLOW      -1
1899          RL                    0.43    76.0
1900          RC    0.07   0.041    0.07   19114   0.005
1901          RX  1000.0  1500.0  1530.0  1715.0  1730.0  1845.0  1855.0  2355.0
1902          RY    92.5    90.0    80.0    76.0    76.0    80.0    90.0    92.5
              *
              *

1903          KK     15B
1904          KM   SUB-BASIN 15B
1905          BA    2.08
1906          LG     .35     .35    4.20     .50     .00
1907          UI    167.    193.    592.    803.    955.   1138.   1395.   1965.   1930.   1521.
1908          UI   1284.   1052.    868.    677.    402.    288.    258.    167.    142.     51.
1909          UI     51.     51.     51.     51.     51.      0.      0.      0.      0.      0.
              *
              *

1910          KK     C95
1911          KM      COMBINE SURFACE RUNOFF AT NODE 95
1912          KM      R85-95 + 15B
1913          HC       2
              *
              *

1914          KK  R95-96
1915          KM   X-SECT. FROM 1' CI BELMONT MAPPING
1916          RS       4    FLOW      -1
1917          RL                    0.43    76.0
1918          RC   0.035   0.033   0.035    5016   0.006
1919          RX  1000.0  1530.0  1710.0  1715.0  1730.0  1735.0  1845.0  1855.0
1920          RY    85.3    80.0    77.5    76.0    76.0    77.5    80.0    90.0
              *
              *
```



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

1921          KK     C96
1922          KM      COMBINE SURFACE RUNOFF AT NODE 96
1923          KM      R94-96 + R95-96
1924          HC       2
```

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                 *
                 *

1925             KK  R96-97
1926             KM   REP. X-SECT. 15D1
1927             RS       2    FLOW       -1
1928             RL                     2.45    91.8
1929             RC   0.035   0.033   0.035    6178   0.006
1930             RX  1157.8  1780.0  1810.0  1820.0  2080.0  2113.0  2143.0  3223.0
1931             RY   102.4    94.4    93.3    91.8    91.8    95.1    97.0   102.4
                 *
                 *

1932             KK     15C
1933             KM   SUB-BASIN 15C
1934             BA    1.83
1935             LG     .35     .35    4.20    1.16     .00
1936             UI    280.   1122.   1688.   2552.   3158.   2147.   1493.    775.    436.    249.
1937             UI     86.     86.     86.      0.      0.      0.      0.      0.      0.      0.
                 *
                 *

1938             KK     C97
1939             KM      COMBINE SURFACE RUNOFF AT NODE  97
1940             KM      R96-97 + 15C
1941             HC       2
                 *
                 *

1942             KK  R97-98
1943             KM   X-SECT. 15D1
1944             RS       5    FLOW       -1
1945             RL                     2.45    91.8
1946             RC   0.035   0.033   0.035   14784   0.006
1947             RX  1157.8  1780.0  1810.0  1820.0  2080.0  2113.0  2143.0  3223.0
1948             RY   102.4    94.4    93.3    91.8    91.8    95.1    97.0   102.4
                 *
                 *

1949             KK     15D
1950             KM   SUB-BASIN 15D
1951             BA    2.87
1952             LG     .35     .35    3.80     .91     .00
1953             UI    230.    266.    816.   1109.   1318.   1570.   1925.   2711.   2663.   2099.
1954             UI   1772.   1451.   1197.    934.    555.    398.    356.    230.    195.     71.
1955             UI     71.     71.     71.     71.     71.      0.      0.      0.      0.      0.
                 *
                 *
```



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

1956             KK     C98
1957             KM      COMBINE SURFACE RUNOFF AT NODE 98
1958             KM      R97-98 + 15D
1959             KM      This is the flow in Jackrabbit Wash prior to it's confluence
1960             KM      with the Hassayampa River.
1961             KM      (MAJOR BASINS 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + [a portion of 9] + 10 + 11)
1962             KM              + (MAJOR BASIN 15)
1963             HC       2
                 *
                 *

1964             KK    CLR4
1965             KM      CLEAR HEC-1 STACK
1966             HC       5
                 *
                 *

1967             KK   BC48O
1968             KM      RECALL RESERVOIR OUTFLOW FROM NODE 48
1969             KM      HYDROGRAPH C48O
1970             BI    C48O      21
                 *
                 *

1971             KK  48-101
1972             KM      R48-101
1973             KM   X-SECT. 18A1
1974             RS       4    FLOW       -1
1975             RL                     1.90    88.4
1976             RC    0.03   0.033    0.03    4488   0.007
1977             RX  1000.0  1520.0  1545.0  1549.0  1551.0  1556.0  1581.0  2101.0
1978             RY    95.2    90.0    89.9    88.4    88.4    89.9    90.0    95.2
                 *
                 *

1979             KK   BC49O
1980             KM      RECALL RESERVOIR OUTFLOW FROM NODE 49
1981             KM      HYDROGRAPH C49O
1982             BI    C49O      21
                 *
                 *

1983             KK  49-101
1984             KM      R49-101
1985             KM   X-SECT. 18A2
1986             RS       6    FLOW       -1
1987             RL                     0.52    87.9
1988             RC   0.045   0.039   0.045    3379    0.01
1989             RX  1000.0  1520.0  1545.0  1549.0  1551.0  1556.0  1580.0  2100.0
1990             RY    95.2    90.0    89.9    87.9    87.9    89.9    90.0    95.2
                 *
                 *
```



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

1991             KK     18A
1992             KM   SUB-BASIN 18A
1993             BA     .25
```

```
1994          LG     .35     .35    2.80    1.50     .00
1995          UI    114.    348.    636.    464.    234.     86.     29.     18.      0.      0.
              *
              *

1996          KK    C101
1997          KM      COMBINE SURFACE RUNOFF AT NODE 101
1998          KM      R48O-101 + R49O-101 + 18A
1999          KM      371st AVENUE CROSSING
2000          KM      (MAJOR BASIN 19) + (a portion of MAJOR BASIN 18)
2001          HC       3
              *
              *

2002          KK   BC47O
2003          KM      RECALL RESERVOIR OUTFLOW FROM NODE 47
2004          KM      HYDROGRAPH C47O
2005          BI    C47O      21
              *
              *

2006          KK  47-119
2007          KM      R47-119
2008          KM   X-SECT. 18T1
2009          RS       5    FLOW      -1
2010          RL                    1.19    90.4
2011          RC    0.03   0.034    0.03    8184   0.007
2012          RX  1000.0  1536.0  1628.0  1633.0  1650.0  1657.0  1757.0  2233.0
2013          RY    99.2    93.8    95.0    91.1    90.4    94.9    94.4    99.2
              *
              *

2014          KK     18T
2015          KM   SUB-BASIN 18T
2016          BA     .39
2017          LG     .35     .35    3.50    1.04     .00
2018          UI     89.    312.    477.    785.    588.    387.    191.     98.     45.     21.
2019          UI     21.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2020          KK    C119
2021          KM      COMBINE SURFACE RUNOFF AT NODE 119
2022          KM      R47O-119 + 18T
2023          KM      371st AVENUE CROSSING
2024          KM      (a portion of Major Basin 9) + (a portion of Major Basin 18)
2025          HC       2
              *
              *
```



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

2026          KK     18B
2027          KM   SUB-BASIN 18B
2028          KM      NODE 102 AT 371st AVENUE
2029          BA    1.81
2030          LG     .33     .35    3.90     .46     .00
2031          UI    185.    390.    812.   1053.   1316.   1825.   2238.   1674.   1336.   1041.
2032          UI    782.    420.    311.    213.    154.     57.     57.     57.     57.      0.
2033          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2034          KK     18C
2035          KM   SUB-BASIN 18C
2036          KM      NODE 103 AT 371st AVENUE
2037          BA    1.90
2038          LG     .33     .35    3.70     .42     .00
2039          UI    149.    156.    523.    699.    838.    992.   1197.   1646.   1818.   1417.
2040          UI   1195.    987.    820.    666.    451.    263.    245.    173.    149.     69.
2041          UI     46.     46.     46.     46.     46.      0.      0.      0.      0.      0.
              *
              *

2042          KK     18M
2043          KM   SUB-BASIN 18M
2044          KM      NODE 113 AT 371st AVENUE
2045          BA    1.50
2046          LG     .35     .33    4.90     .31     .00
2047          UI     99.     99.    247.    401.    495.    569.    655.    768.    983.   1252.
2048          UI   1093.    907.    792.    672.    576.    487.    390.    253.    175.    163.
2049          UI    128.     99.     86.     30.     30.     30.     30.     30.     30.     30.
2050          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2051          KK     18N
2052          KM   SUB-BASIN 18N
2053          KM      NODE 114 AT 371st AVENUE AND INDIAN SCHOOL ROAD
2054          BA    2.40
2055          LG     .35     .33    4.90     .31     .00
2056          UI    142.    142.    264.    511.    654.    756.    847.    974.   1113.   1395.
2057          UI   1791.   1644.   1367.   1193.   1057.    907.    790.    682.    548.    375.
2058          UI    251.    238.    221.    142.    142.     92.     43.     43.     43.     43.
2059          UI     43.     43.     43.     43.      0.      0.      0.      0.      0.      0.
              *
              *

2060          KK    CLR5
2061          KM      CLEAR HEC-1 STACK
2062          HC       5
              *
              *
```



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

2063          KK     18O
2064          KM   SUB-BASIN 18O
2065          KM      NODE 115 AT 371st AVENUE
```

```
2066          BA     .90
2067          LG     .35      .35     4.10      .43      .00
2068          UI     98.     233.     453.     583.     749.    1127.    1045.     797.     618.     469.
2069          UI    280.     168.     125.      88.      30.      30.      30.      30.      0.       0.
              *
              *

2070          KK     18P
2071          KM   SUB-BASIN 18P
2072          KM     NODE 116 AT INDIAN SCHOOL ROAD
2073          BA    1.36
2074          LG     .35      .31     6.00      .28      .00
2075          UI    112.     141.     404.     548.     650.     783.     978.    1376.    1218.     977.
2076          UI    820.     669.     547.     391.     227.     188.     144.     112.      60.      34.
2077          UI     34.      34.      34.      34.       0.       0.       0.       0.       0.       0.
              *
              *

2078          KK  116117
2079          KM      R116-117
2080          KM   REP. X-SECT. 18E1
2081          RS       9     FLOW      -1
2082          RL                     0.39     88.0
2083          RC    0.07    0.041     0.07     7392    0.006
2084          RX  1000.0   1520.0   1574.0   1579.0   1603.0   1609.0   1625.0   2045.0
2085          RY    96.2     91.0     90.0     88.0     88.0     91.0     92.0     96.2
              *
              *

2086          KK     18Q
2087          KM   SUB-BASIN 18Q
2088          BA    1.13
2089          LG     .35      .35     3.90      .37      .00
2090          UI    136.     381.     686.     888.    1259.    1615.    1190.     905.     673.     384.
2091          UI    231.     166.      91.      42.      42.      42.       0.       0.       0.       0.
              *
              *

2092          KK    C117
2093          KM      COMBINE SURFACE RUNOFF AT NODE 117
2094          KM      116117 + 18Q
2095          KM      This is the flow at Interstate-10 crossing I10-6
2096          HC       2
              *
              *
```



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

2097          KK    CLR6
2098          KM      CLEAR HEC-1 STACK
2099          HC       5
              *
              *

2100          KK     18R
2101          KM   SUB-BASIN 18R
2102          KM     NODE 118 AT INDIAN SCHOOL ROAD
2103          BA    2.17
2104          LG     .35      .34     4.30      .34      .00
2105          UI    124.     124.     205.     438.     552.     643.     723.     817.     937.    1114.
2106          UI   1445.    1566.    1279.    1105.     985.     854.     749.     645.     563.     420.
2107          UI    285.     219.     204.     177.     124.     124.      71.      38.      38.      38.
2108          UI     38.      38.      38.      38.      38.       0.       0.       0.       0.       0.
              *
              *

2109          KK  118-64
2110          KM      R118-64
2111          KM   REP. X-SECT. 18E1
2112          RS      11     FLOW      -1
2113          RL                     0.40     88.0
2114          RC    0.07    0.041     0.07     8818    0.006
2115          RX  1000.0   1520.0   1574.0   1579.0   1603.0   1609.0   1625.0   2045.0
2116          RY    96.2     91.0     90.0     88.0     88.0     91.0     92.0     96.2
              *
              *

2117          KK     18S
2118          KM   SUB-BASIN 18S
2119          BA    1.35
2120          LG     .35      .34     4.50      .38      .00
2121          UI    142.     320.     641.     827.    1046.    1520.    1636.    1222.     962.     744.
2122          UI    513.     268.     219.     142.      74.      44.      44.      44.      44.       0.
2123          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

2124          KK     C64
2125          KM      COMBINE SURFACE RUNOFF AT NODE 64
2126          KM      118-64 + 18S
2127          KM      This is the flow at Interstate-10 crossing I10-12
2128          HC       2
              *
              *

2129          KK     18D
2130          KM   SUB-BASIN 18D
2131          KM      HEADWATERS OF PHILLIPS WASH
2132          KM      NODE 104
2133          BA    3.60
2134          LG     .35      .35     3.90      .45      .00
2135          UI    247.     247.     677.    1038.    1274.    1462.    1714.    2023.    2697.    3128.
```



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

2136          UI   2497.    2116.    1830.    1542.    1301.    1081.     765.     441.     415.     352.
2137          UI    247.     232.      76.      76.      76.      76.      76.      76.      76.       0.
2138          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *
```

```
2139          KK  104105
2140          KM      R104-105
2141          KM   INTERPOLATE BETWEEN X-SECT. 18E1 AND 18F1
2142          RS      17    FLOW      -1
2143          RL                    0.43    85.2
2144          RC    0.07   0.039    0.06   18322   0.006
2145          RX  1000.0  1515.0  1567.0  1574.5  1596.5  1602.0  1622.5  2337.5
2146          RY    95.7    90.5    88.7    85.2    85.2    87.7    88.5    95.7
              *
              *

2147          KK     18E
2148          KM   SUB-BASIN 18E
2149          BA    3.83
2150          LG     .35     .35    4.20     .42     .00
2151          UI    293.    293.   1005.   1344.   1631.   1902.   2286.   3056.   3690.   2920.
2152          UI   2441.   2054.   1707.   1419.   1014.    608.    497.    416.    293.    227.
2153          UI     90.     90.     90.     90.     90.     90.      0.      0.      0.      0.
              *
              *

2154          KK    C105
2155          KM      COMBINE SURFACE RUNOFF AT NODE 105
2156          KM      104105 + 18E
2157          KM      Crossing at Indian School Road
2158          HC       2
              *
              *

2159          KK  105106
2160          KM      R105-106
2161          KM   X-SECT. 18F1
2162          RS       8    FLOW      -1
2163          RL                    0.33    82.5
2164          RC    0.05   0.037    0.05    9610   0.004
2165          RX  1000.0  1510.0  1560.0  1570.0  1590.0  1595.0  1620.0  1822.0
2166          RY    95.1    90.0    87.5    82.5    82.5    84.5    85.0    95.1
              *
              *

2167          KK     18F
2168          KM   SUB-BASIN 18F
2169          BA     .80
2170          LG     .35     .35    4.00     .45     .00
2171          UI    104.    329.    549.    729.   1129.   1092.    795.    582.    383.    183.
2172          UI    132.     77.     32.     32.     32.      0.      0.      0.      0.      0.
              *
              *
```



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

2173          KK    C106
2174          KM      COMBINE SURFACE RUNOFF AT NODE 106
2175          KM      105106 + 18F
2176          KM      This is the flow at Interstate-10 crossing I10-15
2177          HC       2
              *
              *

2178          KK     18G
2179          KM   SUB-BASIN 18G
2180          KM      NODE 107 AT INTERSTATE-10 CROSSING I10-18
2181          BA    2.03
2182          LG     .35     .35    5.30     .29     .00
2183          UI    159.    167.    559.    747.    896.   1060.   1279.   1759.   1942.   1514.
2184          UI   1277.   1055.    876.    712.    481.    281.    262.    185.    159.     74.
2185          UI     49.     49.     49.     49.     49.      0.      0.      0.      0.      0.
              *
              *

2186          KK     18K
2187          KM   SUB-BASIN 18K
2188          KM      NODE 111 AT INTERSTATE-10 CROSSING I10-19
2189          BA     .80
2190          LG     .35     .35    4.00     .49     .00
2191          UI    122.    491.    738.   1116.   1381.    939.    653.    339.    191.    109.
2192          UI     38.     38.     38.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2193          KK    CLR7
2194          KM      CLEAR HEC-1 STACK
2195          HC       5
              *
              *

2196          KK     18H
2197          KM   SUB-BASIN 18H
2198          KM      NODE 108
2199          BA    2.63
2200          LG     .35     .35    5.20     .40     .00
2201          UI    277.    623.   1248.   1611.   2038.   2961.   3187.   2380.   1875.   1450.
2202          UI   1000.    521.    426.    277.    144.     85.     85.     85.     85.      0.
2203          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *

2204          KK  108109
2205          KM      R108-109
2206          KM   REP. X-SECT. 18F1
2207          RS       6    FLOW      -1
2208          RL                    0.27    82.5
2209          RC    0.05   0.037    0.05   16210   0.017
2210          RX  1000.0  1510.0  1560.0  1570.0  1590.0  1595.0  1620.0  1822.0
2211          RY    95.1    90.0    87.5    82.5    82.5    84.5    85.0    95.1
              *
              *
```



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

```
2212          KK     18I
2213          KM   SUB-BASIN 18I
2214          BA    2.57
2215          LG     .35      .35     6.20      .31      .00
2216          UI    222.     326.     842.    1123.    1343.    1638.    2210.    2752.    2172.    1789.
2217          UI   1455.    1180.     913.     525.     380.     314.     222.     136.      68.      68.
2218          UI     68.      68.      68.      0.       0.       0.       0.       0.       0.       0.
              *
              *

2219          KK    C109
2220          KM      COMBINE SURFACE RUNOFF AT NODE 109
2221          KM      108109 + 18I
2222          KM      Crossing at Indian School Road
2223          HC       2
              *
              *

2224          KK  109110
2225          KM      R109-110
2226          KM   REP. X-SECT. 18E1
2227          RS      14    FLOW      -1
2228          RL                   0.52     88.0
2229          RC    0.07   0.041    0.07    14203    0.006
2230          RX  1000.0  1520.0  1574.0   1579.0   1603.0   1609.0   1625.0   2045.0
2231          RY    96.2    91.0    90.0     88.0     88.0     91.0     92.0     96.2
              *
              *

2232          KK     18J
2233          KM   SUB-BASIN 18J
2234          BA    2.35
2235          LG     .35      .35     4.20      .48      .00
2236          UI    226.     428.     946.    1232.    1516.    1958.    2794.    2294.    1832.    1457.
2237          UI   1154.     808.     438.     373.     232.     172.      69.      69.      69.      69.
2238          UI     0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

2239          KK    C110
2240          KM      COMBINE SURFACE RUNOFF AT NODE 110
2241          KM      109110 + 18J
2242          KM      This is the flow at Interstate-10 crossing I10-25
2243          HC       2
              *
              *

2244          KK     18L
2245          KM   SUB-BASIN 18L
2246          KM      This is the flow prior to it's confluence with the Hassayampa River
2247          KM      NODE 112
2248          BA    2.40
2249          LG     .35      .35     4.40      .48      .00
2250          UI    253.     568.    1139.    1470.    1860.    2702.    2908.    2172.    1711.    1323.
```



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

2251          UI    912.     476.     389.     253.     132.      77.      77.      77.      77.       0.
2252          UI     0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

2253          KK    CLR8
2254          KM   ,CLEAR HEC-1 STACK
2255          KO       5        0
2256          HC       3
              *
              *

2257          KK    10C1
2258          KM   SUB-BASIN 10C1
2259          KM   This is flow at a Vulture Mine Road crossing for information only.
2260          BA    1.43
2261          LG     .35      .35     4.20      .65      .00
2262          UI    138.     260.     576.     750.     922.    1192.    1700.    1396.    1115.     887.
2263          UI    702.     492.     267.     227.     141.     104.      42.      42.      42.      42.
2264          UI     0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

2265          KK    10C2
2266          KM   SUB-BASIN 10C2
2267          KM   This is an intermediate flow for information only.
2268          BA    4.23
2269          LG     .35      .35     4.10      .62      .00
2270          UI    291.     291.     796.    1219.    1497.    1718.    2013.    2377.    3168.    3675.
2271          UI   2934.    2486.    2150.    1811.    1529.    1270.     899.     518.     488.     414.
2272          UI    291.     273.      89.      89.      89.      89.      89.      89.      89.       0.
2273          UI     0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
              *
              *

2274          KK    10K1
2275          KM   SUB-BASIN 10K1
2276          KM   This is flow at a Vulture Mine Road crossing for information only.
2277          BA     .88
2278          LG     .16      .35     5.50      .43      .00
2279          UI     96.     206.     466.     660.     854.     989.     620.     523.     445.     372.
2280          UI    293.     237.     209.     163.     123.     107.      87.      73.      54.      47.
2281          UI     47.      24.      18.      18.      18.      18.      18.      18.       0.       0.
              *
              *

2282          KK    10K2
2283          KM   SUB-BASIN 10K2
2284          KM   This is an intermediate flow for information only.
2285          BA    4.56
2286          LG     .35      .35     4.90      .42      .00
2287          UI    295.     295.     706.    1170.    1455.    1673.    1919.    2233.    2753.    3683.
2288          UI   3422.    2801.    2431.    2102.    1794.    1523.    1274.     912.     540.     500.
2289          UI    459.     295.     295.     143.      91.      91.      91.      91.      91.      91.
```

```
2290          UI     91.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *
              *
1                                          HEC-1 INPUT                                          PAGE 62

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

2291          KK    10M1
2292          KM   SUB-BASIN 10M1
2293          KM   This is flow at a Vulture Mine Road crossing for information only.
2294          BA    1.85
2295          LG     .22     .30    8.20     .10     .00
2296          UI    231.    631.   1326.   1788.   2491.   1579.   1268.   1054.    852.    637.
2297          UI    534.    425.    312.    260.    200.    172.    113.    113.     76.     44.
2298          UI     44.     44.     44.     44.      0.      0.      0.      0.      0.      0.
              *
              *

2299          KK    10M2
2300          KM   SUB-BASIN 10M2
2301          KM   This is flow at a Vulture Mine Road crossing for information only.
2302          BA    1.48
2303          LG     .17     .32    7.40     .16     .00
2304          UI    122.    148.    403.    642.    821.    966.   1290.   1165.    799.    699.
2305          UI    617.    548.    481.    401.    329.    291.    266.    221.    179.    155.
2306          UI    133.    122.     93.     93.     66.     59.     59.     59.     25.     23.
2307          UI     23.     23.     23.     23.     23.     23.     23.      0.      0.      0.
              *
              *

2308          KK    10M3
2309          KM   SUB-BASIN 10M3
2310          KM   This is an intermediate flow for information only.
2311          BA    2.84
2312          LG     .23     .35    5.70     .24     .00
2313          UI    195.    195.    468.    797.   1133.   1344.   1527.   1913.   2236.   1452.
2314          UI   1219.   1109.    996.    905.    805.    714.    615.    508.    469.    437.
2315          UI    388.    321.    260.    246.    214.    212.    150.    150.    145.     95.
2316          UI     95.     95.     95.     67.     37.     37.     37.     37.     37.     37.
2317          UI     37.     37.     37.     37.     37.      0.      0.      0.      0.      0.
              *
              *
2318          ZZ
1
          SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   18        1A
              V
              V
   27      R1-2
              .
              .
   34         .          18
              .           .
              .           .
   40        C2............
              V
              V
   44      R2-4
              .
              .
   51         .          1C
              .           V
              .           V
   58         .        R3-4
              .           .
              .           .
   65         .           .          1D
              .           .           .
              .           .           .
   71        C4........................
              V
              V
   75      R4-7
              .
              .
   82         .          1E
              .           V
              .           V
   89         .        R5-7
              .           .
              .           .
   96         .           .          1F
              .           .           V
              .           .           V
  106         .           .        R6-7
              .           .           .
              .           .           .
  113         .           .           .          1G
              .           .           .           .
              .           .           .           .
  119        C7.....................................
              V
              V
  123      R7-8
              .
              .
  130         .          1H
              .           .
              .           .
  137        C8............
              V
              V
  141     R8-10
              .
              .
  148         .          1I
              .           V
```

```
160          :        V
             :     R9-10
             :        :
167          :   C10...........
             :     V
             :     V
171          : R10-11
             :        :
178          :       1J
             :        :
187          :        :          1K
             :        :           :
197          :   C11.......................
             :     V
             :     V
201          : R11-12
             :        :
208          :       1L
             :        :
218          :  C12.1...........
             :        :
224          :       2A
             :        V
             :        V
234          :     R13-14
             :        :
241          :        :          2B
             :        :           :
249          :      C14...........
             :        V
             :        V
253          :     R14-15
             :        :
260          :        :          2C
             :        :           :
267          :      C15...........
             :        V
             :        V
272          :     R15-17
             :        :
279          :        :          2D
             :        :           :
290          :      C17...........
             :        V
             :        V
295          :     R17-18
             :        :
302          :        :          2E
             :        :           V
             :        :           V
311          :        :       R16-18
             :        :           :
318          :      C18...........
             :        V
             :        V
322          :     R18-12
             :        :
329          :        :          2F
             :        :           :
341          :    C12.2...........
             :        :
346          :        :       BC12.1
             :        :           :
349          :      C12...........
             :        V
             :        V
354          :     R12-21
             :        :
361          :        :          3A
             :        :           V
             :        :           V
372          :        :       R19-21
             :        :           :
379          :        :           :        3D
             :        :           :         V
             :        :           :         V
391          :        :           :     R20-21
             :        :           :         :
398          :        :           :         :          3B
             :        :           :         :           :
409          :        :           :         :           :          3C
             :        :           :         :           :           :
421          :      C21.......................................................
             :        V
             :        V
425          :     R21-22
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432          :        :          3E
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439          C22.............
                V
445       R22-25
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452                   4A
                      .
465                   .          4B
                      .          .
476                   C23.........
                      V
                      V
480            R23-24
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487                   .          4C
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494                   C24.........
                      V
                      V
499            R24-25
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506          C25.............
                V
                V
510       R25-32
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517                   5A
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526                   .          5B
                      .          .
536          C32........................
                V
                V
541       R32-33
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548                   5C
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555          C33.............
                V
                V
562       R33-34
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570                   6C
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578          C34.............
                V
                V
582       R34-37
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590                   6A
                      V
                      V
598            R35-36
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606                   .          6B
                      .          .
614                   C36.........
                      V
                      V
618            R36-37
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626          C37.............
                V
                V
630       R37-38
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639                   6D
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646       C38I.1..........
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652                   7A
                      V
                      V
662            R26-27
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669                   .          7B
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677                   C27.........
                      V
                      V
681            R27-29
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688                   .          7C
                      .          V
                      .          V
697                   .       R28-29
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704          .          .        C29............
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             .          .         V
708          .          .     R29-30
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715          .          .         .          7D
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722          .          .        C30............
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             .          .         V
727          .          .     R30-31
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734          .          .         .          7F
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742          .          .        C31............
             .          .         V
             .          .         V
746          .          .     R31-84
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753          .          .         .          7E
             .          .         .           .
             .          .         .           .
763          .          .      C84.1...........
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770          .          .         .         10A
             .          .         .          V
             .          .         .          V
780          .          .         .      R50-51
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             .          .         .           .
787          .          .         .           .          10B
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795          .          .         .        C51............
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             .          .         .          V
799          .          .         .      R51-57
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             .          .         .           .
806          .          .         .           .          10D
             .          .         .           .           V
             .          .         .           .           V
818          .          .         .           .      R52-55
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825          .          .         .           .           .          10E
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             .          .         .           .           .           .
832          .          .         .           .          C55............
             .          .         .           .           V
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837          .          .         .           .      R55-57
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844          .          .         .        C57............
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             .          .         .          V
848          .          .         .      R57-58
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             .          .         .           .
855          .          .         .           .          10C
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             .          .         .           .           .
863          .          .         .        C58............
             .          .         .          V
             .          .         .          V
867          .          .         .      R58-59
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             .          .         .           .
874          .          .         .           .          10F
             .          .         .           .           V
             .          .         .           .           V
884          .          .         .           .      R53-54
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891          .          .         .           .           .          10G
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             .          .         .           .           .           .
901          .          .         .           .          C54............
             .          .         .           .           V
             .          .         .           .           V
906          .          .         .           .      R54-59
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913          .          .         .           .           .          10H
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922          .          .         .        C59.......................
             .          .         .          V
             .          .         .          V
926          .          .         .      R59-61
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933          .          .         .           .          10I
             .          .         .           .           V
             .          .         .           .           V
946          .          .         .           .      R60-61
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953          .          .         .           .           .          10J
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961          .          .         .        C61.......................
             .          .         .          V
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965          .          .         .      R61-82
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980                             C82.1.....
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987                                  10M
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                                      V
998                             R67-68
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1005                                  .          10K
                                      .           V
                                      .           V
1014                                  .       R63-68
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1021                                  .           .          10N
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1029                             C68...........................
                                      V
                                      V
1033                            R68-72
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1040                                  .          10S
                                      .           V
                                      .           V
1050                                  .       R70-71
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1057                                  .           .          10T
                                      .           .           V
                                      .           .           V
1066                                  .           .       R69-71
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1073                                  .           .           .          10U
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1080                                  .          C71...........................
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1091                             C72.............
                                      V
                                      V
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                                      .           V
                                      .           V
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1119                                  .           .          10O
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                                      .           .           V
1129                                  .           .       R73-74
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1136                                  .           .           .          10P
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1147                                  .           .          C74.............
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                                      .           .           V
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1158                                  .           .           .          10R
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1168                                  .          C76...........................
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                                      .           V
1172                                  .       R76-77
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1179                                  .           .          10V
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                                      .           V
                                      .           V
1190                                  .       R77-80
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1197                                  .           .          10W
                                      .           .           V
                                      .           .           V
1208                                  .           .       R78-79
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1215                                  .           .           .          10X
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1224                                  .           .          C79.............
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1228                                  .           .       R79-80
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1235                                  .           .           .          10Y
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1245                                  .          C80...........................
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1249                                                           R80-81
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1258                                                                  .      BR72B1
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1261                                                              C81........
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                                                                  V
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1273                                                                  .         10Z
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1282                                                                  .          .      BC82.1
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1285                                                              C82........................
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                                                                  V
1290                                                           R82-84
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1314                                                                  .          .          10AB
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1324                                                              C84.2......................
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1329                                                                  .      BC84.1
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1332                                                              C84........
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                                                                  V
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1362                                                                  .      BC38I1
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1365                                                              C38I........
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1374                 .        9A
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                     .        V
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1403                 .     C40........
                     .        V
                     .        V
1407                 .     R40-41
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1415                 .        .          9C
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1425                 .     C41........
                     .        V
                     .        V
1430                 .     R41-43
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1439                 .        .          9D
                     .        .          V
                     .        .          V
1451                 .        .       R42-43
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                     .        V
                     .        V
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1486                 .     C44.......................
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1499                 .        .-------->   CP44W
1494                 .     CP44E
                     .        V
                     .        V
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1511                                   9G
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1518                            C45............
                                  V
                                  V
1523                         R45-46
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1531                                   9I
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1545                                    .-------->   DT9IE
1538                                 9IW
                                        .
1548                            C46I...........
                                  V
                                  V
1555                            C46O
                                  .
1568                                    .<-------   CP44W
1565                          BCP44W
                                  V
                                  V
1569                          R44-47
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1578                                    .          9H
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1585                                 C47I...........
                                        V
                                        V
1592                                 C47O
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1602                                    .         11A
                                        .           V
                                        .           V
1611                                    .        C85O
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1624                                    .           .        12A
                                        .           .         V
                                        .           .         V
1635                                    .           .     R86-88
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1642                                    .           .           .        12B
                                        .           .           .         V
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1653                                    .           .           .     R87-88
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1660                                    .           .           .           .        12C
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1668                                    .           .           .           .         .
                                        .           .        C88........................
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1672                                    .           .     R88-89
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1679                                    .           .           .        12D
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1687                                    .           .           .         .
                                        .           .        C89............
                                        .           .         V
                                        .           .         V
1691                                    .           .     R89-90
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1699                                    .           .           .        12E
                                        .           .           .         .
1708                                    .           .           .         .
                                        .           .       C90I............
                                        .           .         V
                                        .           .         V
1714                                    .           .       C90O
                                        .           .           .
1724                                    .           .           .        13A
                                        .           .           .         V
                                        .           .           .         V
1733                                    .           .           .       C91O
                                        .           .           .           .
1743                                    .           .           .           .        14A
                                        .           .           .           .         V
                                        .           .           .           .         V
1750                                    .           .           .           .       C92O
                                        .           .           .           .           .
1760                                    .           .           .           .           .        14B
                                        .           .           .           .           .         V
                                        .           .           .           .           .         V
1767                                    .           .           .           .           .       C93O
                                        .           .           .           .           .           .
1777                                    .           .        CLR2...........................................
                                        .           .           .
1780                         CLR3.......................................
                                        .
1783                            19A
                                  V
                                  V
1790                            C49O
                                  .
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1801          :           :        19B
              :           :         V
1809          :           :        C48O
              :           :         :
1819          :           :         :      BC90O
              :           :         :          V
1823          :           :         :      R90-99
              :           :         :         :
1830          :           :         :         :        16A
              :           :         :         :         :
1837          :           :         :       C99.........
              :           :         :         :
1844          :           :         :         :        17A
              :           :         :         :         :
1853          :           :         :         :         :      8C46O
              :           :         :         :         :          V
1857          :           :         :         :         :      R46-94
              :           :         :         :         :         :
1864          :           :         :         :         :         :      BC38I
              :           :         :         :         :         :          V
1867          :           :         :         :         :         :      R38-94
              :           :         :         :         :         :         :
1874          :           :         :         :         :         :         :        15A
              :           :         :         :         :         :         :         :
1881          :           :         :         :         :         :       C94.........
              :           :         :         :         :         :         V
1885          :           :         :         :         :         :      R94-96
              :           :         :         :         :         :         :
1892          :           :         :         :         :         :         :      BC85O
              :           :         :         :         :         :         :          V
1896          :           :         :         :         :         :         :      R85-95
              :           :         :         :         :         :         :         :
1903          :           :         :         :         :         :         :         :        15B
              :           :         :         :         :         :         :         :         :
1910          :           :         :         :         :         :         :         C95.........
              :           :         :         :         :         :         :         V
1914          :           :         :         :         :         :         :      R95-96
              :           :         :         :         :         :         :         :
1921          :           :         :         :         :         :         :       C96.........
              :           :         :         :         :         :         :         V
1925          :           :         :         :         :         :         :      R96-97
              :           :         :         :         :         :         :         :
1932          :           :         :         :         :         :         :         :        15C
              :           :         :         :         :         :         :         :         :
1938          :           :         :         :         :         :         :       C97.........
              :           :         :         :         :         :         :         V
1942          :           :         :         :         :         :         :      R97-98
              :           :         :         :         :         :         :         :
1949          :           :         :         :         :         :         :         :        15D
              :           :         :         :         :         :         :         :         :
1956          :           :         :         :         :         :         :       C98.........
              :           :         :         :         :         :         :         :
1964          :       CLR4...........................................................
              :           :         :         :         :         :         :         :
1967          :           :      BC48O        :         :         :         :         :
              :           :         V         :         :         :         :         :
1971          :           :      48-101       :         :         :         :         :
              :           :         :         :         :         :         :         :
1979          :           :         :      BC49O        :         :         :         :
              :           :         :         V         :         :         :         :
1983          :           :         :      49-101       :         :         :         :
              :           :         :         :         :         :         :         :
1991          :           :         :         :        18A        :         :         :
              :           :         :         :         :         :         :         :
1996          :           :      C101.........        :         :         :         :
              :           :         :         :         :         :         :         :
2002          :           :         :      BC47O        :         :         :         :
              :           :         :         V         :         :         :         :
2006          :           :         :      47-119       :         :         :         :
              :           :         :         :         :         :         :         :
2014          :           :         :         :        18T        :         :         :
              :           :         :         :         :         :         :         :
2020          :           :         :       C119.........        :         :         :
              :           :         :         :         :         :         :         :
2026          :           :         :         :        18B        :         :         :
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2034                                                  18C
                                                       .
2042                                                   .          18M
                                                       .           .
2051                                                   .           .          18N
                                                       .           .           .
2060                                  CLR5.............................................
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2063                                                   .      18O
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2070                                                   .      18P
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                                                       .       V
2078                                                   .    116117
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2086                                                   .       .          18Q
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2092                                                   .      C117.........
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2097                        CLR6.......................................
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2100                                 18R
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                                      V
2109                             118-64
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2117                                  .        18S
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2124                                 C64........
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2129                                  .        18D
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                                      .         V
2139                                  .     104105
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2147                                  .         .      18E
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2154                                  .       C105......
                                      .         V
                                      .         V
2159                                  .     105106
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2167                                  .         .      18F
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2173                                  .       C106......
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2178                                  .         .      18G
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2186                                  .         .       .      18K
                                      .         .       .       .
2193                        CLR7.......................................
                                      .
2196                                 18H
                                      V
                                      V
2204                             108109
                                      .
2212                                  .        18I
                                      .         .
2219                                 C109......
                                      V
                                      V
2224                             109110
                                      .
2232                                  .        18J
                                      .         .
2239                                 C110......
                                      .
2244                                  .        18L
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2253                        CLR8.............
                                      .
2257                                 10C1
                                      .
2265                                  .       10C2
                                      .         .
2274                                  .         .      10K1
                                      .         .       .
2282                                  .         .       .      10K2
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 2291          .         .         .         .         .         .         10M1
               .         .         .         .         .         .           .
 2299          .         .         .         .         .         .           .      10M2
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 2308          .         .         .         .         .         .           .        .        10M3

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                    ****************************************
*                                      *                    *                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                    *    U.S. ARMY CORPS OF ENGINEERS      *
*            SEPTEMBER 1990            *                    *    HYDROLOGIC ENGINEERING CENTER     *
*             VERSION 4.0              *                    *          609 SECOND STREET           *
*                                      *                    *       DAVIS, CALIFORNIA 95616        *
*  RUN DATE  02/17/1991  TIME  13:14:37 *                    *           (916) 756-1104             *
*                                      *                    *                                      *
****************************************                    ****************************************


                        FCDMC JACKRABBIT WASH, PROJECT NO. 10310
                        100-YEAR 24-HOUR DURATION STORM
                        FILENAME= 10310-24.H1,   15FEB91

  5 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

   IT           HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1JAN90  STARTING DATE
                      ITIME        0800  STARTING TIME
                         NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2JAN90  ENDING DATE
                     NDTIME        0855  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   24.92 HOURS

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

  7 JD          INDEX STORM NO. 1
                       STRM        4.20  PRECIPITATION DEPTH
                       TRDA         .01  TRANSPOSITION DRAINAGE AREA

  8 PI            PRECIPITATION PATTERN
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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 13 JD          INDEX STORM NO. 2
                       STRM        4.12  PRECIPITATION DEPTH
                       TRDA        5.00  TRANSPOSITION DRAINAGE AREA

  0 PI            PRECIPITATION PATTERN
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                     .00       .00       .00       .00       .00       .00       .01       .01       .01       .01
                     .01       .01       .01       .01       .01       .01       .01       .01       .06       .06
                     .06       .06       .06       .06       .01       .01       .01       .01       .01       .01
                     .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
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14 JD INDEX STORM NO. 3

STRM 3.99 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.06	.06
.06	.06	.06	.06	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
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15 JD INDEX STORM NO. 4

STRM 3.70 PRECIPITATION DEPTH

TRDA 50.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

.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	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.06	.06
.06	.06	.06	.06	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
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16 JD INDEX STORM NO. 5

STRM 3.57 PRECIPITATION DEPTH

TRDA 100.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.01	.01	.01	.01	.01	.01	.01	.01	.06	.06
.06	.06	.06	.06	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
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 17 JD          INDEX STORM NO. 6
                      STRM       3.28  PRECIPITATION DEPTH
                      TRDA     500.00  TRANSPOSITION DRAINAGE AREA

  0 PI            PRECIPITATION PATTERN
                  .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
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                  .01        .01        .01        .01        .01        .01        .01        .01        .06        .06
                  .06        .06        .06        .06        .01        .01        .01        .01        .01        .01
                  .01        .01        .01        .01        .01        .01        .00        .00        .00        .00
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            *            *
218 KK      *    C12.1   *
            *            *
            **************

222 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE
                        IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                         IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       .083  TIME INTERVAL IN HOURS

348 BI          READ STATION    C12.1 HYDROGRAPH FROM UNIT 21

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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            *            *
646 KK      *   C38I.1   *
            *            *
            **************

650 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE
                        IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                         IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       .083  TIME INTERVAL IN HOURS


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            *            *
763 KK      *    C84.1   *
            *            *
            **************

768 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE
                        IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                         IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       .083  TIME INTERVAL IN HOURS


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            *            *
980 KK      *    C82.1   *
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 985 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


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            *            *
1095 KK     *    R72-81  *
            *            *
            **************

1097 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  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         300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS

        WARNING EXCESS AT PONDING LESS THAN ZERO FOR PERIOD. EXCESS SET TO ZERO

1260 BI          READ STATION   R72-81 HYDROGRAPH FROM UNIT 22

1284 BI          READ STATION    C82.1 HYDROGRAPH FROM UNIT 21

1331 BI          READ STATION    C84.1 HYDROGRAPH FROM UNIT 21

1364 BI          READ STATION   C38I.1 HYDROGRAPH FROM UNIT 21


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            *            *
1365 KK     *      C38I  *
            *            *
            **************

1366 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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            *            *
1486 KK     *       C44  *
            *            *
            **************

1487 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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            *            *
1494 KK     *     CP44E  *
            *            *
            **************

1495 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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            *            *
1538 KK     *      9IW   *
            *            *
            **************

1539 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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            *            *
1548 KK     *      C46I  *
            *            *
            **************

1549 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
1555 KK     *      C46O  *
            *            *
            **************

1559 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
1565 KK     *    BCP44W  *
            *            *
            **************

1566 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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            *            *
1585 KK     *      C47I  *
            *            *
            **************

1586 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS


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                 *            *
1592 KK          *      C470  *
                 *            *
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1596 KO               OUTPUT CONTROL VARIABLES
                            IPRNT           5  PRINT CONTROL
                            IPLOT           0  PLOT CONTROL
                            QSCAL          0.  HYDROGRAPH PLOT SCALE
                            IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                             IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                            ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                            ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                           TIMINT        .083  TIME INTERVAL IN HOURS


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                 *            *
1602 KK          *       11A  *
                 *            *
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1603 KO               OUTPUT CONTROL VARIABLES
                            IPRNT           5  PRINT CONTROL
                            IPLOT           0  PLOT CONTROL
                            QSCAL          0.  HYDROGRAPH PLOT SCALE
                            IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                             IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                            ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                            ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                           TIMINT        .083  TIME INTERVAL IN HOURS


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                 *            *
1611 KK          *      C850  *
                 *            *
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1618 KO               OUTPUT CONTROL VARIABLES
                            IPRNT           5  PRINT CONTROL
                            IPLOT           0  PLOT CONTROL
                            QSCAL          0.  HYDROGRAPH PLOT SCALE
                            IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                             IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                            ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                            ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                           TIMINT        .083  TIME INTERVAL IN HOURS


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                 *            *
1708 KK          *      C90I  *
                 *            *
                 **************

1709 KO               OUTPUT CONTROL VARIABLES
                            IPRNT           5  PRINT CONTROL
                            IPLOT           0  PLOT CONTROL
                            QSCAL          0.  HYDROGRAPH PLOT SCALE
                            IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                             IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                            ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                            ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                           TIMINT        .083  TIME INTERVAL IN HOURS


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                 *            *
1714 KK          *      C900  *
                 *            *
                 **************

1718 KO               OUTPUT CONTROL VARIABLES
                            IPRNT           5  PRINT CONTROL
                            IPLOT           0  PLOT CONTROL
                            QSCAL          0.  HYDROGRAPH PLOT SCALE
                            IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                             IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                            ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                            ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                           TIMINT        .083  TIME INTERVAL IN HOURS


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                 *            *
1724 KK          *       13A  *
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1728 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *             *
1733 KK     *      C910   *
            *             *
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1737 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *             *
1743 KK     *       14A   *
            *             *
            ***************

1746 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *             *
1750 KK     *      C920   *
            *             *
            ***************

1754 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *             *
1760 KK     *       14B   *
            *             *
            ***************

1763 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *             *
1767 KK     *      C930   *
            *             *
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1771 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *            *
1783 KK     *       19A  *
            *            *
            **************

1784 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *            *
1790 KK     *      C490  *
            *            *
            **************

1795 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


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            *            *
1801 KK     *       19B  *
            *            *
            **************

1802 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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            *            *
1809 KK     *      C480  *
            *            *
            **************

1813 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
                       IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                        IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT        .083  TIME INTERVAL IN HOURS

1822 BI          READ STATION     C900 HYDROGRAPH FROM UNIT 21

1856 BI          READ STATION     C460 HYDROGRAPH FROM UNIT 21

1866 BI          READ STATION     C38I HYDROGRAPH FROM UNIT 21

1895 BI          READ STATION     C850 HYDROGRAPH FROM UNIT 21

1970 BI          READ STATION     C480 HYDROGRAPH FROM UNIT 21

1982 BI          READ STATION     C490 HYDROGRAPH FROM UNIT 21

2005 BI          READ STATION     C470 HYDROGRAPH FROM UNIT 21
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2255 KO OUTPUT CONTROL VARIABLES

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

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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	1A	7432.	12.33	971.	243.	234.	6.69		
+	ROUTED TO	R1-2	6365.	12.75	970.	243.	234.	6.69		
+	HYDROGRAPH AT	1B	6707.	12.25	823.	206.	198.	5.70		
+	2 COMBINED AT	C2	8963.	12.50	1702.	426.	410.	12.39		
+	ROUTED TO	R2-4	8288.	13.00	1701.	425.	410.	12.39		
+	HYDROGRAPH AT	1C	1106.	12.08	108.	27.	26.	.81		
+	ROUTED TO	R3-4	701.	13.08	108.	27.	26.	.81		
+	HYDROGRAPH AT	1D	4360.	12.17	505.	126.	122.	3.27		
+	3 COMBINED AT	C4	8917.	13.00	2225.	556.	536.	16.47		
+	ROUTED TO	R4-7	8323.	13.33	2198.	550.	530.	16.47		
+	HYDROGRAPH AT	1E	1446.	12.17	147.	37.	35.	1.11		
+	ROUTED TO	R5-7	1279.	12.42	146.	36.	35.	1.11		
+	HYDROGRAPH AT	1F	2329.	12.33	408.	102.	98.	3.06		
+	ROUTED TO	R6-7	2222.	12.58	406.	101.	98.	3.06		
+	HYDROGRAPH AT	1G	2793.	12.17	295.	74.	71.	2.56		
+	4 COMBINED AT	C7	8939.	13.25	2892.	723.	697.	23.20		
+	ROUTED TO	R7-8	8735.	13.50	2878.	720.	693.	23.20		
+	HYDROGRAPH AT	1H	6146.	12.42	858.	214.	207.	7.55		
+	2 COMBINED AT	C8	11417.	12.58	3579.	895.	862.	30.75		
+	ROUTED TO	R8-10	10804.	12.75	3565.	892.	859.	30.75		
+	HYDROGRAPH AT	1I	3424.	12.58	790.	197.	190.	6.88		
+	ROUTED TO	R9-10	3399.	12.67	786.	197.	189.	6.88		
+	2 COMBINED AT	C10	13549.	12.67	4192.	1049.	1010.	37.63		
+	ROUTED TO	R10-11	12049.	13.25	4103.	1027.	990.	37.63		
+	HYDROGRAPH AT	1J	1510.	12.42	277.	69.	67.	2.57		
+	HYDROGRAPH AT	1K	2524.	12.58	556.	139.	134.	5.02		
+	3 COMBINED AT	C11	13236.	13.17	4713.	1182.	1139.	45.22		
+	ROUTED TO	R11-12	11945.	13.83	4593.	1153.	1111.	45.22		
+	HYDROGRAPH AT	1L	3671.	12.50	793.	198.	191.	5.93		
+	2 COMBINED AT	C12.1	12452.	13.83	5195.	1309.	1261.	51.15		
+	HYDROGRAPH AT	2A	5739.	12.33	967.	242.	233.	7.76		
+	ROUTED TO	R13-14	5490.	12.50	962.	240.	232.	7.76		
+	HYDROGRAPH AT	2B	2880.	12.25	454.	113.	109.	4.31		
	2 COMBINED AT									

+	C14	7563.	12.50	1352.	338.	326.	12.07
+ ROUTED TO	R14-15	6942.	12.67	1309.	327.	315.	12.07
+ HYDROGRAPH AT	2C	2173.	12.25	295.	74.	71.	3.82
+ 2 COMBINED AT	C15	7588.	12.67	1534.	384.	369.	15.89
+ ROUTED TO	R15-17	6661.	13.25	1479.	370.	356.	15.89
+ HYDROGRAPH AT	2D	2053.	12.67	496.	124.	119.	5.12
+ 2 COMBINED AT	C17	7470.	13.25	1869.	468.	451.	21.01
+ ROUTED TO	R17-18	7252.	13.42	1831.	458.	441.	21.01
+ HYDROGRAPH AT	2E	1644.	12.25	230.	58.	55.	2.09
+ ROUTED TO	R16-18	1406.	12.67	229.	57.	55.	2.09
+ 2 COMBINED AT	C18	7680.	13.33	2013.	503.	485.	23.10
+ ROUTED TO	R18-12	7331.	13.67	1917.	479.	462.	23.10
+ HYDROGRAPH AT	2F	1944.	12.75	506.	127.	122.	4.89
+ 2 COMBINED AT	C12.2	7916.	13.58	2302.	578.	556.	27.99
+ HYDROGRAPH AT	BC12.1	12452.	13.83	5195.	1309.	1261.	51.15
+ 2 COMBINED AT	C12	18752.	13.75	7033.	1770.	1705.	79.14
+ ROUTED TO	R12-21	18528.	13.83	6975.	1755.	1690.	79.14
+ HYDROGRAPH AT	3A	3621.	12.50	736.	184.	177.	5.97
+ ROUTED TO	R19-21	3255.	12.92	699.	175.	168.	5.97
+ HYDROGRAPH AT	3D	2660.	12.58	621.	155.	150.	5.01
+ ROUTED TO	R20-21	2429.	13.00	606.	151.	146.	5.01
+ HYDROGRAPH AT	3B	2824.	12.67	682.	170.	164.	6.25
+ HYDROGRAPH AT	3C	2450.	12.75	637.	160.	154.	5.70
+ 5 COMBINED AT	C21	21106.	13.75	8817.	2218.	2137.	102.07
+ ROUTED TO	R21-22	20770.	13.92	8728.	2196.	2115.	102.07
+ HYDROGRAPH AT	3E	2134.	12.42	293.	73.	70.	2.90
+ 2 COMBINED AT	C22	20769.	13.92	8919.	2249.	2166.	104.97
+ ROUTED TO	R22-25	20486.	14.00	8854.	2232.	2150.	104.97
+ HYDROGRAPH AT	4A	2725.	13.00	850.	216.	208.	7.43
+ HYDROGRAPH AT	4B	1988.	12.75	509.	127.	122.	4.07
+ 2 COMBINED AT	C23	4274.	12.92	1300.	328.	316.	11.50
+ ROUTED TO	R23-24	4173.	13.00	1282.	324.	312.	11.50
+ HYDROGRAPH AT	4C	2430.	12.50	372.	93.	90.	2.65
+ 2 COMBINED AT	C24	5261.	12.67	1601.	404.	389.	14.15
+ ROUTED TO	R24-25	5177.	12.75	1577.	397.	383.	14.15
+ 2 COMBINED AT	C25	21891.	14.00	10043.	2533.	2440.	119.12
+ ROUTED TO	R25-32	21314.	14.33	9810.	2480.	2388.	119.12
+ HYDROGRAPH AT	5A	4743.	12.75	921.	230.	222.	8.03

+	HYDROGRAPH AT	5B	3269.	12.58	735.	184.	177.	7.36
+	3 COMBINED AT	C32	21430.	14.33	10824.	2763.	2661.	134.51
+	ROUTED TO	R32-33	21112.	14.50	10593.	2706.	2606.	134.51
+	HYDROGRAPH AT	5C	2282.	12.50	334.	84.	80.	3.56
+	2 COMBINED AT	C33	21101.	14.50	10724.	2760.	2658.	138.07
+	ROUTED TO	R33-34	20042.	15.25	10164.	2635.	2538.	138.07
+	HYDROGRAPH AT	6C	773.	12.67	126.	31.	30.	2.23
+	2 COMBINED AT	C34	20035.	15.25	10163.	2648.	2551.	140.30
+	ROUTED TO	R34-37	19714.	15.50	9965.	2603.	2507.	140.30
+	HYDROGRAPH AT	6A	3015.	12.50	477.	119.	115.	3.66
+	ROUTED TO	R35-36	2346.	13.50	467.	117.	112.	3.66
+	HYDROGRAPH AT	6B	2341.	12.83	453.	113.	109.	4.76
+	2 COMBINED AT	C36	3018.	13.42	877.	219.	211.	8.42
+	ROUTED TO	R36-37	2868.	13.83	871.	218.	210.	8.42
+	2 COMBINED AT	C37	19789.	15.50	10204.	2748.	2647.	148.72
+	ROUTED TO	R37-38	19294.	15.75	9902.	2646.	2548.	148.72
+	HYDROGRAPH AT	6D	1832.	12.58	290.	72.	70.	3.67
+	2 COMBINED AT	C38I.1	19290.	15.75	9900.	2688.	2589.	152.39
+	HYDROGRAPH AT	7A	3603.	12.75	706.	177.	170.	5.19
+	ROUTED TO	R26-27	3016.	13.75	701.	175.	169.	5.19
+	HYDROGRAPH AT	7B	3521.	12.75	662.	166.	160.	6.11
+	2 COMBINED AT	C27	3423.	12.75	1287.	322.	310.	11.30
+	ROUTED TO	R27-29	3146.	14.25	1281.	321.	310.	11.30
+	HYDROGRAPH AT	7C	3578.	12.83	716.	179.	172.	6.81
+	ROUTED TO	R28-29	3111.	13.58	710.	178.	171.	6.81
+	2 COMBINED AT	C29	5702.	13.50	1883.	472.	454.	18.11
+	ROUTED TO	R29-30	5637.	13.58	1880.	471.	454.	18.11
+	HYDROGRAPH AT	7D	3864.	12.50	595.	149.	143.	5.84
+	2 COMBINED AT	C30	5666.	13.58	2346.	590.	568.	23.95
+	ROUTED TO	R30-31	5155.	14.92	2269.	580.	559.	23.95
+	HYDROGRAPH AT	7F	1514.	12.67	276.	69.	66.	2.63
+	2 COMBINED AT	C31	5155.	14.92	2407.	639.	616.	26.58
+	ROUTED TO	R31-84	4977.	15.42	2354.	627.	604.	26.58
+	HYDROGRAPH AT	7E	3787.	13.08	934.	234.	225.	8.30
+	2 COMBINED AT	C84.1	4976.	15.42	3033.	825.	794.	34.88
+	HYDROGRAPH AT	10A	1360.	12.42	248.	62.	60.	2.01
+	ROUTED TO	R50-51	797.	14.42	226.	57.	55.	2.01
+	HYDROGRAPH AT	10B	2722.	12.67	478.	119.	115.	5.36

+	2 COMBINED AT	C51	2631.	12.67	665.	170.	164.	7.37
+	ROUTED TO	R51-57	2378.	13.00	653.	168.	162.	7.37
+	HYDROGRAPH AT	10D	2859.	12.58	672.	168.	162.	4.54
+	ROUTED TO	R52-55	2427.	13.42	663.	166.	160.	4.54
+	HYDROGRAPH AT	10E	1876.	12.50	273.	68.	66.	2.72
+	2 COMBINED AT	C55	2464.	13.42	906.	227.	219.	7.26
+	ROUTED TO	R55-57	2207.	14.17	884.	223.	215.	7.26
+	2 COMBINED AT	C57	3706.	13.08	1441.	367.	353.	14.63
+	ROUTED TO	R57-58	3578.	13.33	1429.	365.	351.	14.63
+	HYDROGRAPH AT	10C	2784.	12.75	516.	129.	124.	5.66
+	2 COMBINED AT	C58	4594.	13.17	1814.	466.	449.	20.29
+	ROUTED TO	R58-59	4460.	13.33	1788.	458.	441.	20.29
+	HYDROGRAPH AT	10F	4088.	12.50	855.	214.	206.	5.68
+	ROUTED TO	R53-54	3109.	13.92	838.	210.	203.	5.68
+	HYDROGRAPH AT	10G	2180.	12.58	480.	120.	116.	4.28
+	2 COMBINED AT	C54	3417.	13.83	1250.	315.	304.	9.96
+	ROUTED TO	R54-59	2970.	15.00	1201.	306.	295.	9.96
+	HYDROGRAPH AT	10H	2554.	12.92	527.	132.	127.	6.74
+	3 COMBINED AT	C59	6319.	13.42	3139.	811.	781.	36.99
+	ROUTED TO	R59-61	6061.	13.67	3070.	789.	760.	36.99
+	HYDROGRAPH AT	10I	3500.	12.67	874.	219.	211.	6.93
+	ROUTED TO	R60-61	2209.	15.17	827.	208.	201.	6.93
+	HYDROGRAPH AT	10J	3177.	12.83	634.	158.	153.	7.08
+	3 COMBINED AT	C61	6553.	13.50	4067.	1067.	1028.	51.00
+	ROUTED TO	R61-82	6288.	14.17	3936.	1029.	991.	51.00
+	HYDROGRAPH AT	10L	2938.	12.75	544.	136.	131.	6.34
+	2 COMBINED AT	C82.1	6288.	14.08	4138.	1120.	1079.	57.34
+	HYDROGRAPH AT	10M	3824.	12.58	898.	224.	216.	6.17
+	ROUTED TO	R67-68	2640.	14.67	860.	216.	208.	6.17
+	HYDROGRAPH AT	10K	2951.	12.83	577.	144.	139.	5.44
+	ROUTED TO	R63-68	2632.	13.33	575.	144.	138.	5.44
+	HYDROGRAPH AT	10N	1989.	12.75	365.	91.	88.	3.47
+	3 COMBINED AT	C68	3324.	12.92	1631.	416.	400.	15.08
+	ROUTED TO	R68-72	3293.	13.25	1621.	414.	399.	15.08
+	HYDROGRAPH AT	10S	3207.	12.58	524.	131.	126.	3.92
+	ROUTED TO	R70-71	2668.	13.42	517.	129.	125.	3.92
+	HYDROGRAPH AT	10T	2625.	12.58	437.	109.	105.	3.81
+	ROUTED TO	R69-71	2228.	13.33	432.	108.	104.	3.81

+	HYDROGRAPH AT	10U	2786.	12.50	439.	110.	106.	4.26
+	3 COMBINED AT	C71	4894.	13.33	1287.	322.	310.	11.99
+	ROUTED TO	R71-72	4670.	13.58	1280.	321.	309.	11.99
+	2 COMBINED AT	C72	7180.	13.50	2731.	693.	667.	27.07
+	ROUTED TO	R72-81	7007.	13.75	2707.	690.	665.	27.07
+	HYDROGRAPH AT	10Q	2149.	12.25	339.	85.	82.	2.61
+	ROUTED TO	R75-76	1473.	13.75	337.	84.	81.	2.61
+	HYDROGRAPH AT	10O	3181.	12.25	539.	135.	130.	3.08
+	ROUTED TO	R73-74	2827.	12.83	531.	133.	128.	3.08
+	HYDROGRAPH AT	10P	3464.	12.58	801.	200.	193.	6.15
+	2 COMBINED AT	C74	5903.	12.75	1283.	321.	309.	9.23
+	ROUTED TO	R74-76	4807.	13.67	1274.	320.	308.	9.23
+	HYDROGRAPH AT	10R	2662.	12.58	606.	152.	146.	4.93
+	3 COMBINED AT	C76	6649.	13.67	2076.	523.	504.	16.77
+	ROUTED TO	R76-77	6028.	14.42	2045.	516.	497.	16.77
+	HYDROGRAPH AT	10V	2060.	12.58	328.	82.	79.	3.12
+	2 COMBINED AT	C77	6028.	14.42	2323.	589.	568.	19.89
+	ROUTED TO	R77-80	5786.	14.67	2281.	579.	558.	19.89
+	HYDROGRAPH AT	10W	3751.	12.58	864.	216.	208.	5.30
+	ROUTED TO	R78-79	3328.	13.25	858.	215.	207.	5.30
+	HYDROGRAPH AT	10X	1872.	12.42	376.	94.	91.	2.74
+	2 COMBINED AT	C79	3987.	13.17	1193.	299.	288.	8.04
+	ROUTED TO	R79-80	3365.	14.50	1159.	293.	282.	8.04
+	HYDROGRAPH AT	10Y	1701.	12.58	378.	94.	91.	3.70
+	3 COMBINED AT	C80	8673.	14.58	3537.	903.	869.	31.63
+	ROUTED TO	R80-81	8431.	15.00	3514.	900.	866.	31.63
+	HYDROGRAPH AT	BR7281	7007.	13.75	2707.	690.	665.	27.07
+	2 COMBINED AT	C81	10661.	15.00	5853.	1496.	1441.	58.70
+	ROUTED TO	R81-82	10333.	15.42	5751.	1464.	1411.	58.70
+	HYDROGRAPH AT	10Z	1721.	12.42	324.	81.	78.	3.69
+	HYDROGRAPH AT	BC82.1	6279.	14.08	4133.	1119.	1078.	57.34
+	3 COMBINED AT	C82	13936.	15.67	9217.	2440.	2350.	119.73
+	ROUTED TO	R82-84	13739.	15.92	9119.	2401.	2313.	119.73
+	HYDROGRAPH AT	10AA	1136.	12.33	194.	49.	47.	1.63
+	ROUTED TO	R83-84	544.	15.25	180.	47.	45.	1.63
+	HYDROGRAPH AT	10AB	2316.	12.58	515.	129.	124.	4.31
+	3 COMBINED AT	C84.2	14027.	15.92	9465.	2520.	2427.	125.67
+	HYDROGRAPH AT	BC84.1	4931.	15.42	3006.	818.	788.	34.88

+	2 COMBINED AT	C84	17561.	15.75	11713.	3145.	3030.	160.55
+	ROUTED TO	R84-38	17291.	16.08	11491.	3094.	2980.	160.55
+	HYDROGRAPH AT	8A	2776.	13.00	616.	154.	148.	6.27
+	2 COMBINED AT	C38I.2	17283.	16.08	11733.	3199.	3082.	166.82
+	HYDROGRAPH AT	BC38I1	19235.	15.75	9873.	2681.	2582.	152.39
+	2 COMBINED AT	C38I	33207.	15.92	19417.	5382.	5184.	319.21
+	5 COMBINED AT	CLR1	55622.	15.92	32453.	9088.	8754.	590.89
+	HYDROGRAPH AT	9A	2721.	12.50	566.	142.	136.	4.64
+	ROUTED TO	R39-40	2594.	12.75	552.	138.	133.	4.64
+	HYDROGRAPH AT	9B	4497.	12.50	962.	241.	232.	8.49
+	2 COMBINED AT	C40	6534.	12.67	1443.	361.	347.	13.13
+	ROUTED TO	R40-41	5297.	13.42	1322.	331.	318.	13.13
+	HYDROGRAPH AT	9C	4997.	12.58	833.	208.	201.	7.32
+	2 COMBINED AT	C41	5927.	13.33	2036.	510.	491.	20.45
+	ROUTED TO	R41-43	5740.	13.83	2011.	505.	487.	20.45
+	HYDROGRAPH AT	9D	3777.	12.58	843.	211.	203.	6.24
+	ROUTED TO	R42-43	3428.	13.08	835.	209.	201.	6.24
+	2 COMBINED AT	C43	7870.	13.42	2709.	680.	655.	26.69
+	ROUTED TO	R43-44	7780.	13.50	2676.	670.	646.	26.69
+	HYDROGRAPH AT	9E	3640.	12.42	496.	124.	119.	6.08
+	HYDROGRAPH AT	9F	1312.	12.17	167.	42.	40.	1.75
+	3 COMBINED AT	C44	7780.	13.42	3153.	793.	764.	34.52
+	DIVERSION TO	CP44W	3596.	13.42	1700.	429.	414.	34.52
+	HYDROGRAPH AT	CP44E	4144.	13.42	1437.	359.	346.	34.52
+	ROUTED TO	R44-45	4084.	13.58	1428.	357.	344.	34.52
+	HYDROGRAPH AT	9G	764.	12.33	97.	24.	23.	1.00
+	2 COMBINED AT	C45	4084.	13.58	1505.	376.	362.	35.52
+	ROUTED TO	R45-46	3897.	14.17	1488.	372.	359.	35.52
+	HYDROGRAPH AT	9I	4079.	12.33	519.	130.	125.	4.81
+	DIVERSION TO	DT9IE	2040.	12.33	236.	59.	57.	4.81
+	HYDROGRAPH AT	9IW	2040.	12.33	283.	71.	68.	4.81
+	2 COMBINED AT	C46I	3896.	14.17	1704.	427.	411.	40.33
+	ROUTED TO	C46O	1902.	15.50	1461.	401.	386.	40.33
+	HYDROGRAPH AT	BCP44W	3596.	13.42	1700.	429.	414.	34.52
+	ROUTED TO	R44-47	3417.	14.17	1661.	424.	409.	34.52
+	HYDROGRAPH AT	9H	948.	12.17	117.	29.	28.	1.47
+	2 COMBINED AT	C47I	3416.	14.17	1723.	447.	430.	35.99
+	ROUTED TO	C47O	1526.	15.92	1124.	354.	341.	35.99

+	HYDROGRAPH AT	11A	1477.	12.50	233.	58.	56.	2.18
+	ROUTED TO	C85O	244.	13.25	180.	55.	53.	2.18
+	HYDROGRAPH AT	12A	3641.	12.50	795.	199.	191.	4.88
+	ROUTED TO	R86-88	2655.	14.25	778.	196.	189.	4.88
+	HYDROGRAPH AT	12B	2028.	12.92	429.	107.	103.	4.79
+	ROUTED TO	R87-88	1957.	13.08	428.	107.	103.	4.79
+	HYDROGRAPH AT	12C	1876.	12.83	366.	92.	88.	3.64
+	3 COMBINED AT	C88	3297.	12.92	1428.	363.	349.	13.31
+	ROUTED TO	R88-89	2737.	13.92	1363.	347.	334.	13.31
+	HYDROGRAPH AT	12D	3263.	12.75	599.	150.	144.	5.29
+	2 COMBINED AT	C89	2943.	12.75	1808.	471.	454.	18.60
+	ROUTED TO	R89-90	2753.	13.33	1740.	459.	442.	18.60
+	HYDROGRAPH AT	12E	3916.	12.83	806.	202.	194.	7.54
+	2 COMBINED AT	C90I	4957.	13.17	2279.	625.	602.	26.14
+	ROUTED TO	C90O	3277.	13.67	2231.	623.	600.	26.14
+	HYDROGRAPH AT	13A	1199.	12.08	109.	27.	26.	.90
+	ROUTED TO	C91O	193.	12.50	109.	27.	26.	.90
+	HYDROGRAPH AT	14A	134.	12.00	11.	3.	3.	.09
+	ROUTED TO	C92O	61.	12.17	11.	3.	3.	.09
+	HYDROGRAPH AT	14B	42.	12.00	3.	1.	1.	.03
+	ROUTED TO	C93O	26.	12.00	3.	1.	1.	.03
+	5 COMBINED AT	CLR2	3618.	13.67	2443.	689.	664.	29.34
+	5 COMBINED AT	CLR3	60071.	15.75	38132.	10746.	10351.	747.70
+	HYDROGRAPH AT	19A	78.	12.00	6.	2.	1.	.06
+	ROUTED TO	C49O	0.	12.25	0.	0.	0.	.06
+	HYDROGRAPH AT	19B	829.	12.08	81.	20.	20.	.77
+	ROUTED TO	C48O	246.	12.42	81.	20.	20.	.77
+	HYDROGRAPH AT	BC90O	3277.	13.67	2231.	623.	600.	26.14
+	ROUTED TO	R90-99	3041.	14.83	2146.	594.	572.	26.14
+	HYDROGRAPH AT	16A	1080.	12.42	142.	35.	34.	1.94
+	2 COMBINED AT	C99	3041.	14.83	2150.	622.	599.	28.08
+	HYDROGRAPH AT	17A	1570.	12.50	231.	58.	56.	2.17
+	HYDROGRAPH AT	BC46O	1902.	15.50	1461.	401.	386.	40.33
+	ROUTED TO	R46-94	1843.	16.58	1402.	388.	373.	40.33
+	HYDROGRAPH AT	BC38I	33207.	15.92	19417.	5382.	5184.	319.21
+	ROUTED TO	R38-94	32593.	16.33	19105.	5252.	5059.	319.21
+	HYDROGRAPH AT	15A	1903.	12.33	229.	57.	55.	3.59
+	3 COMBINED AT	C94	33554.	16.33	19765.	5459.	5258.	363.13

+	ROUTED TO	R94-96	33310.	16.50	19620.	5397.	5198.	363.13
+	HYDROGRAPH AT	BC85O	244.	13.25	180.	55.	53.	2.18
+	ROUTED TO	R85-95	223.	15.42	158.	48.	46.	2.18
+	HYDROGRAPH AT	15B	1517.	12.42	220.	55.	53.	2.08
+	2 COMBINED AT	C95	1510.	12.42	324.	103.	99.	4.26
+	ROUTED TO	R95-96	1405.	12.75	320.	102.	98.	4.26
+	2 COMBINED AT	C96	33409.	16.50	19680.	5451.	5250.	367.39
+	ROUTED TO	R96-97	33142.	16.67	19532.	5384.	5186.	367.39
+	HYDROGRAPH AT	15C	817.	12.17	73.	18.	18.	1.83
+	2 COMBINED AT	C97	33138.	16.67	19529.	5387.	5189.	369.22
+	ROUTED TO	R97-98	32485.	17.08	19166.	5230.	5037.	369.22
+	HYDROGRAPH AT	15D	1364.	12.50	195.	49.	47.	2.87
+	2 COMBINED AT	C98	32480.	17.08	19162.	5248.	5055.	372.09
+	5 COMBINED AT	CLR4	33485.	17.08	20266.	5676.	5467.	403.17
+	HYDROGRAPH AT	BC48O	246.	12.42	81.	20.	20.	.77
+	ROUTED TO	48-101	232.	12.92	78.	20.	19.	.77
+	HYDROGRAPH AT	BC49O	0.	12.25	0.	0.	0.	.06
+	ROUTED TO	49-101	0.	.08	0.	0.	0.	.06
+	HYDROGRAPH AT	18A	117.	12.08	8.	2.	2.	.25
+	3 COMBINED AT	C101	232.	12.92	86.	22.	21.	1.08
+	HYDROGRAPH AT	BC47O	1526.	15.92	1124.	354.	341.	35.99
+	ROUTED TO	47-119	1500.	16.33	1108.	348.	335.	35.99
+	HYDROGRAPH AT	18T	269.	12.08	24.	6.	6.	.39
+	2 COMBINED AT	C119	1500.	16.33	1108.	352.	339.	36.38
+	HYDROGRAPH AT	18B	1662.	12.33	204.	51.	49.	1.81
+	HYDROGRAPH AT	18C	1526.	12.50	225.	56.	54.	1.90
+	HYDROGRAPH AT	18M	1131.	12.58	188.	47.	45.	1.50
+	HYDROGRAPH AT	18N	1655.	12.67	301.	75.	73.	2.40
+	5 COMBINED AT	CLR5	4616.	12.42	1512.	537.	517.	43.99
+	HYDROGRAPH AT	18O	877.	12.25	103.	26.	25.	.90
+	HYDROGRAPH AT	18P	1206.	12.42	172.	43.	41.	1.36
+	ROUTED TO	116117	1035.	13.00	170.	43.	41.	1.36
+	HYDROGRAPH AT	18Q	1248.	12.25	138.	35.	33.	1.13
+	2 COMBINED AT	C117	1504.	12.33	308.	77.	74.	2.49
+	5 COMBINED AT	CLR6	34075.	17.08	20783.	6078.	5855.	451.63
+	HYDROGRAPH AT	18R	1447.	12.75	270.	67.	65.	2.17
+	ROUTED TO	118-64	1256.	13.42	267.	67.	64.	2.17
+	HYDROGRAPH AT	18S	1327.	12.25	160.	40.	39.	1.35

+	2 COMBINED AT	C64	1503.	12.42	426.	107.	103.	3.52
+	HYDROGRAPH AT	18D	2518.	12.58	408.	102.	98.	3.60
+	ROUTED TO	104106	1888.	13.92	402.	101.	97.	3.60
+	HYDROGRAPH AT	18E	2930.	12.50	439.	110.	106.	3.83
+	2 COMBINED AT	C105	2840.	12.50	813.	203.	196.	7.43
+	ROUTED TO	105106	2662.	13.00	808.	202.	195.	7.43
+	HYDROGRAPH AT	18F	859.	12.17	91.	23.	22.	.80
+	2 COMBINED AT	C106	2661.	13.00	888.	223.	214.	8.23
+	HYDROGRAPH AT	18G	1713.	12.50	253.	63.	61.	2.03
+	HYDROGRAPH AT	18K	898.	12.08	87.	22.	21.	.80
+	5 COMBINED AT	CLR7	34062.	17.08	20911.	6345.	6112.	466.21
+	HYDROGRAPH AT	18H	2413.	12.25	292.	73.	70.	2.63
+	ROUTED TO	108109	2072.	12.67	290.	72.	70.	2.63
+	HYDROGRAPH AT	18I	2198.	12.42	302.	75.	73.	2.57
+	2 COMBINED AT	C109	3794.	12.58	588.	147.	142.	5.20
+	ROUTED TO	109110	2770.	13.75	580.	145.	140.	5.20
+	HYDROGRAPH AT	18J	1992.	12.33	253.	63.	61.	2.35
+	2 COMBINED AT	C110	2770.	13.75	831.	208.	200.	7.55
+	HYDROGRAPH AT	18L	2119.	12.25	256.	64.	62.	2.40
+	3 COMBINED AT	CLR8	34050.	17.08	20972.	6510.	6270.	476.16
+	HYDROGRAPH AT	10C1	1014.	12.33	129.	32.	31.	1.43
+	HYDROGRAPH AT	10C2	2450.	12.58	395.	99.	95.	4.23
+	HYDROGRAPH AT	10K1	710.	12.25	98.	24.	24.	.88
+	HYDROGRAPH AT	10K2	2953.	12.58	501.	125.	121.	4.56
+	HYDROGRAPH AT	10M1	2245.	12.17	310.	77.	75.	1.85
+	HYDROGRAPH AT	10M2	1282.	12.33	223.	56.	54.	1.48
+	HYDROGRAPH AT	10M3	1992.	12.42	379.	95.	91.	2.84

*** NORMAL END OF HEC-1 ***

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

Section 3.6

SECTION 3: Hydrologic Analysis

3.6 Project Input Data Files on Diskettes

FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

Section 5

SECTION 5: EROSION & SEDIMENT TRANSPORT

SECTION 5: Erosion and Sediment Transport

The USBR considered sediment transport and deposition during the design of the collective and transition dikes, and the canal cross drainage structures. All sediment calculations were done for the 6-hour general storm. Sediment transport and deposition has not been addressed or included in the hydraulic computations for this study. All 100-year ponding elevations and peak discharges at the CAP canal were estimated using storage volumes available at the time the aerial photography of the upstream side of the canal was flown. No factors for the effects of culvert blockage or debris have been applied.

FLOOD CONTROL
DISTRICT
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MARICOPA
COUNTY
1959

JACKRABBIT WASH
FLOODPLAIN DELINEATION STUDY

FCD 90-05

Section 6

SECTION 6: Reference Materials

6.5 Bibliography

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FLOOD CONTROL
DISTRICT
of
MARICOPA
COUNTY
1959

JACKRABBIT WASH FLOODPLAIN DELINEATION STUDY

FCD 90-05

Section 7

SECTION 7: Cross-Referencing & Labeling Information

SECTION 7: Other Studies Impacted

The United States Bureau of Reclamation performed hydrologic and hydraulic analyses for design of the CAP Canal, drainage structures, and protective embankment (Reference 23). Flood hazards along the CAP Canal and Jackrabbit Wash have been previously delineated by FEMA using approximate methods.

The Master Drainage Study for Belmont Planned Community (Reference 17) presented hydrology developed for areas south of the CAP Canal. Reference 17 also included a discussion of hydrology previously developed for detailed study of the Hassayampa River by FEMA.